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United States Government

Department of Energy

memorandum

 Carlsbad Field Office
 Carlsbad, New Mexico 88221


DATE: APR 25 2012

REPLY TO
ATTN OF: CBFO:OQA:CF:CC:12-1370:UFC 2300.00

SUBJECT: Transmittal of Interim Audit Report A-12-08, ORNL/CCP Waste Characterization Activities in Accordance with the Hazardous Waste Facility Permit

TO: William (Bill) McMillan, DOE-Oak Ridge

The Carlsbad Field Office (CBFO) conducted the subject audit March 27-29, 2012. The interim audit report is attached.

The audit team concluded that the Oak Ridge National Laboratory (ORNL) Central Characterization Project (CCP) technical and quality assurance programs for data generated during waste characterization activities performed from the previous audit (Audit A-11-08, February 8-10, 2011) until the suspension of characterization activities in July 2011, were adequate to requirements in the Waste Isolation Pilot Plant (WIPP) Hazardous Waste Facility Permit (HWFP), the CBFO Quality Assurance Program Document, the Waste Isolation Pilot Plant (WIPP) Waste Acceptance Criteria, and the Remote-Handled Transuranic (TRU) Waste Characterization Program Implementation Plan. The audit team determined that the applicable ORNL/CCP procedures were satisfactorily implemented and the evaluated processes were effective for data generated during the referenced timeframe.

Since ORNL/CCP suspended characterization activities at the ORNL, the audit team was unable to evaluate Headspace Gas (HSG) sampling, Real-Time Radiography (RTR), Visual Examination (VE), Nondestructive Assay (NDA), and Dose-To-Curie (D-T-C) characterization activities in the field, or verify personnel and equipment were available to continue characterization activities. For this reason, the audit team was unable to determine the implementation and effectiveness of characterization procedures for HSG sampling, RTR, VE, NDA, and D-T-C; therefore, these processes were deemed indeterminate.

The audit team verified that acceptable knowledge activities (including data quality objective reconciliation and preparation of waste stream profile forms), project level data validation and verification, WIPP Waste Information System/Waste Data System data entry, and quality assurance activities (nonconformance reporting, records management, and training qualifications), as related to the HWFP Waste Analysis Plan, continue to be adequate, satisfactorily implemented, and effective.

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No CBFO Corrective Action Reports were issued as a result of the audit. Two conditions adverse to quality, isolated in nature, were corrected during the audit. No Observations were identified during the audit and no Recommendations were offered to ORNL/CCP management for consideration.

If you have any questions, please contact me at (575) 234-7065.



for Randy Unger
Director, Office of Quality Assurance

Attachment

cc: w/attachment

- | | | | |
|------------------------|------|------------------------------|----|
| J. R. Stroble, CBFO | * ED | S. Ghose, EPA | ED |
| C. Fesmire, CBFO | ED | R. Lee, EPA | ED |
| R. Farrell, CBFO | ED | J. Kieling, NMED | ED |
| E. Preciado, CBFO | ED | T. Kliphuis, NMED | ED |
| T. Morgan, CBFO | ED | T. Hall, NMED | ED |
| N. Castaneda, CBFO | ED | S. Holmes, NMED | ED |
| D. Ploetz, WTS/CCP | ED | R. Maestas, NMED | ED |
| M. Sensibaugh, WTS/CCP | ED | T. Kesterson, NMED/DOE OB | ED |
| V. Cannon, WTS/CCP | ED | J. Marple, NMED/DOE OB | ED |
| A. J. Fisher, WTS/CCP | ED | D. Winters, DNFSB | ED |
| I. Quintana, WTS/CCP | ED | P. Gilbert, LANL-CO | ED |
| M. Walker, WTS/CCP | ED | G. Lyshik, LANL-CO | ED |
| Y. Salmon, WTS/CCP | ED | P. Martinez, CTAC | ED |
| J. Carter, WTS/CCP | ED | M. Mager, CTAC | ED |
| T. Peake, EPA | ED | WIPP Operating Record | ED |
| M. Eagle, EPA | ED | WWIS Database Administrators | ED |
| E. Felcorn, EPA | ED | CBFO QA File | |
| R. Joglekar, EPA | ED | CBFO M&RC | |

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for Randy Unger
Director, Office of Quality Assurance

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U.S. DEPARTMENT OF ENERGY
CARLSBAD FIELD OFFICE

INTERIM AUDIT REPORT

OF THE

OAK RIDGE NATIONAL LABORATORY (ORNL)
CENTRAL CHARACTERIZATION PROJECT (CCP)

FOR

WASTE CHARACTERIZATION ACTIVITIES IN ACCORDANCE WITH
THE HAZARDOUS WASTE FACILITY PERMIT

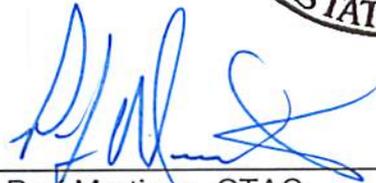
CARLSBAD, NEW MEXICO

AUDIT NUMBER A-12-08

MARCH 27 – 29, 2012



Prepared by:

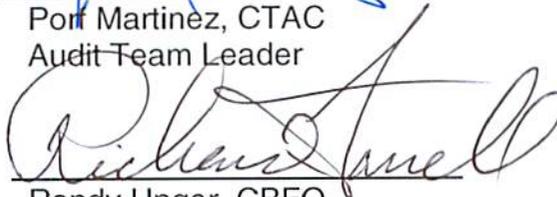


Port Martinez, CTAC
Audit Team Leader

Date:

4/11/2012

Approved by:



Randy Unger, CBFO
for Director, Office of Quality Assurance

Date:

4-25-2012

1.0 EXECUTIVE SUMMARY

Carlsbad Field Office (CBFO) Recertification Audit A-12-08 was performed to evaluate the continued adequacy, implementation, and effectiveness of Oak Ridge National Laboratory (ORNL) transuranic (TRU) waste characterization activities performed by the Washington TRU Solutions (WTS) Central Characterization Project (CCP) for remote-handled (RH) and contact-handled (CH) Summary Category Group (SCG) S5000 debris waste and CH SCG S4000 soils waste. Activities were evaluated relative to the requirements of the Waste Isolation Pilot Plant (WIPP) Hazardous Waste Facility Permit (HWFP), the *CBFO Quality Assurance Program Document (QAPD)*, the *Waste Acceptance Criteria (WAC) for the Waste Isolation Pilot Plant*, and the *Remote-Handled TRU Waste Characterization Program Implementation Plan (WCPIP)*. The audit was performed in the Skeen-Whitlock Building in Carlsbad, New Mexico, March 27 – 29, 2012.

ORNL/CCP suspended characterization activities at the end of July 2011 due to funding issues. No new containers were introduced into the characterization process after July 2011. Containers requiring the completion of data generation level and project level activities to finalize the characterization process continued for a short time thereafter.

The audit team evaluated headspace gas (HSG) sampling, real-time radiography (RTR), visual examination (VE), nondestructive assay (NDA), dose-to-curie (D-T-C) batch data reports (BDRs), acceptable knowledge (AK) documentation, training documentation, nonconformance reports, records, logbooks, and audio/video media generated from the date of the previous audit (CBFO Recertification Audit A-11-08, February 8-10, 2011) to the July 2011 referenced timeframe. The audit team concluded that, for the documentation reviewed, the overall adequacy of the ORNL/CCP technical and quality assurance (QA) programs was satisfactory in meeting upper-tier requirements as applicable to the audited activities. The audit team verified that for the documentation evaluated, the ORNL/CCP program for characterization and certification activities related to SCG S5000 RH and CH debris waste and SCG S4000 CH soils waste was satisfactorily implemented and effective.

Since ORNL/CCP suspended characterization activities at the ORNL, the audit team was unable to evaluate HSG sampling, RTR, VE, NDA, and D-T-C characterization activities in the field, or verify personnel and equipment were available to continue characterization activities. For this reason, the audit team was unable to determine the implementation and effectiveness of characterization procedures for HSG sampling, RTR, VE, NDA, and D-T-C; therefore, these processes were deemed indeterminate.

The audit team verified that AK activities (including data quality objective reconciliation and preparation of waste stream profile forms), project level data validation and verification, WIPP Waste Information System (WWIS)/Waste Data System (WDS) data entry, and QA activities (nonconformance reporting, records management, and training qualifications) as related to the HWFP Waste Analysis Plan (WAP), continue to be adequate, satisfactorily implemented, and effective.

During the audit, the audit team identified two conditions adverse to quality. Both deficiencies were isolated in nature and required only remedial corrective actions and were corrected during the audit (CDA). Objective evidence of corrective actions was provided and the audit team verified the corrective actions were completed prior to the end of the audit. See section 6.2 for details. No corrective action reports (CARs) or Observations were identified during the audit. No recommendations are being offered for management consideration.

2.0 SCOPE AND PURPOSE

2.1 Scope

The audit team evaluated documentation to verify continued adequacy, implementation, and effectiveness of the ORNL/CCP TRU waste characterization activities for SCG S5000 RH and CH debris waste and SCG S4000 CH soils waste generated from the date of the previous audit to the July 2011 timeframe. The following elements were evaluated.

General

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

Quality Assurance

- Personnel Qualification and Training
- Nonconformances
- Records

Technical

- Acceptable Knowledge (AK) (including waste certification, e.g. Waste Stream Profile Form)
- Project-Level Data Validation and Verification (V&V)
- Headspace Gas (HSG) Sampling
- Real-time Radiography (RTR)
- Visual Examination (VE)
- Nondestructive Assay (NDA)
- Radiological Characterization (Dose-to-Curie)
- WIPP Waste Information System (WWIS)/ Waste Data System (WDS)

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

Waste Isolation Pilot Plant Hazardous Waste Facility Permit NM4890139088-TSDF

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

*Transuranic Waste Acceptance Criteria for the Waste Isolation Pilot Plant (WAC),
DOE/WIPP-02-3122*

*Remote-Handled TRU Waste Characterization Program Implementation Plan
(WCPIP), DOE/WIPP-02-3214*

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

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

CCP Transuranic Waste Certification Plan, CCP-PO-002

Related technical and QA implementing procedures

2.2 Purpose

ORNL/CCP annual Recertification Audit A-12-08 was conducted to assess the level of compliance to the requirements of the HWFP, WAC, QAPD, and the WCPIP from waste characterization and certification activities for SCG S5000 RH and CH debris waste, and SCG S4000 CH soils waste.

3.0 AUDIT TEAM AND OBSERVERS

Courtland Fesmire	Management Representative, CBFO QA
Porf Martinez	Audit Team Leader, CBFO Technical Assistance Contractor (CTAC)
Prissy Martinez	Auditor, CTAC
Rick Castillo	Auditor, CTAC
Greg Knox	Auditor, CTAC
Katie Martin	Auditor, CTAC
Cindi Castillo	Auditor, CTAC
Melissa Mager	Auditor-in-training, CTAC
Sheila Hailey	Auditor-in-training, CTAC
Dick Blauvelt	Technical Specialist, CTAC
B. J. Verret	Technical Specialist, CTAC
James Oliver	Technical Specialist, CTAC
Rhett Bradford	Technical Specialist, CTAC
Paul Gomez	Technical Specialist, CTAC

OBSERVERS

Steve Holmes	New Mexico Environment Department (NMED)
Connie Walker	NMED Contractor
Norma Castaneda	National TRU Program

4.0 AUDIT PARTICIPANTS

The individuals who were contacted during the audit are identified in Attachment 1. A pre-audit meeting was held in room T-224 at the Skeen-Whitlock Building in Carlsbad, New Mexico, on March 27, 2012. Daily meetings were held with ORNL/CCP management and staff to discuss the previous day's issues, audit progress, and potential deficiencies. The audit was concluded with a post-audit meeting held in room T-224 at the Skeen-Whitlock Building in Carlsbad, New Mexico, on March 29, 2012.

Attachment 2 contains a summary table of audit results. Attachment 3 contains a list of ORNL/CCP documents audited. Attachment 4 lists the processes and equipment evaluated during the audit. Audit activities, including objective evidence reviewed, are described below.

5.0 SUMMARY OF AUDIT RESULTS

5.1 Program Adequacy, Implementation, and Effectiveness

This audit was performed to assess the ability of ORNL/CCP to characterize RH and CH SCG S5000 debris waste and SCG S4000 CH soils waste to the requirements specified in the WIPP HWFP Waste Analysis Plan (WAP), WIPP WAC, the QAPD, and the RH TRU WCIIP. The characterization methods assessed were AK, HSG Sampling, VE, RTR, NDA, and Dose-to-Curie (D-T-C). Other areas evaluated were generation and project-level data V&V, WWIS/WDS data entry, data quality objective (DQO) reconciliation, and the preparation of Waste Stream Profile Forms (WSPFs).

The audit team concluded that, for the documentation reviewed, the applicable ORNL/CCP TRU waste characterization activities for RH and CH SCG S5000 debris waste and CH SCG S4000 soils waste, as described in the implementing procedures, were adequate, satisfactorily implemented, and effective. The audit team was unable to evaluate HSG, RTR, VE, NDA, and D-T-C characterization activities in the field, or verify personnel and equipment were available to continue characterization activities. For this reason, the audit team was unable to evaluate the implementation and effectiveness of characterization procedures for HSG, RTR, VE, NDA, and D-T-C; therefore, these processes were deemed indeterminate.

5.2 General

5.2.1 Results of Previous Audits

The results of CBFO Recertification Audit A-11-08 of ORNL/CCP were examined. No conditions adverse to quality (CAQ) were issued as a result of the referenced audit.

5.2.2 Changes in Programs or Operations

ORNL/CCP suspended characterization activities at the end of July 2011 due to funding issues. Only those containers already in the characterization process that could be completed and certified for shipment to WIPP were processed during that timeframe. Containers requiring project level validation and verification continued for a short time thereafter until completion. No new containers were brought into the characterization process after July 2011.

ORNL/CCP has identified the four containers that have been fully characterized since the previous audit but have not yet been shipped. The container numbers are as follows: NFS0335, X10C9311454A, X10C9311558A, and X10C9313063A. All other fully characterized containers have been shipped to WIPP.

During the audit, no characterization activities were being performed at the ORNL facility. The audit team was unable to evaluate HSG, RTR, VE, NDA, or D-T-C field operations including procedure implementation, personnel/operator availability, and personnel/operator training qualifications.

5.2.3 New Programs or Activities Being Implemented

No new programs or activities have been implemented by the ORNL/CCP since the previous audit (CBFO Recertification Audit A-11-08).

5.2.4 Changes in Key Personnel

No changes in key personnel have been made by ORNL/CCP since the previous audit (CBFO recertification Audit A-11-08).

5.3 Quality Assurance Activities

The audit team evaluated the QA elements for personnel qualification and training, QA records, and control of nonconformances to requirements applicable to the HWFP WAP. The evaluation results for each area audited are described below.

5.3.1 Personnel Qualification and Training

The audit team conducted interviews with responsible personnel and reviewed implementing procedure CCP-QP-002, Rev. 31, *CCP Training and Qualification Plan*, to determine the degree to which the procedure adequately addresses upper-tier

requirements. Personnel training records associated with VE, RTR, NDA, D-T-C, HSG Sampling, AK, and Site Project Management were examined to verify implementation of associated requirements and to verify that personnel performing characterization activities are appropriately qualified. Record reviews included qualification cards and other pertinent qualification documentation such as attendance sheets/briefings on newly-revised AK summaries for RTR and VE operators, VE expert appointment letters, test drums and training container documentation, and eye exams.

No concerns were identified during the audit. The procedures reviewed and objective evidence assembled and evaluated during the audit provided evidence that the applicable requirements for personnel training and qualification are adequately established for compliance with upper-tier requirements, satisfactory in the implementation of these requirements, and effective in achieving the desired results.

5.3.2 Nonconformances

The audit team interviewed the resident QA engineer and then randomly selected a sampling of nonconformance reports (NCRs) to confirm that deficiencies are being appropriately documented and tracked through resolution, as required. The following NCRs were reviewed: NCR-ORNL-0105-11, NCR-ORNL-2069-11, NCR-ORNL-2245-11, NCR-ORNL-2845-11, NCR-ORNL-0300-11, and NCR-ORNL-3023-11, NCR-RHORN-2090-11, and NCR-RHORN-2091-11.

The audit team reviewed three NCRs (NCR-ORNL-2247-11, NCR-ORNL-2248-11, and NCR-ORNL-0502-11) which documented non-administrative deficiencies first identified at the site project manager (SPM) level, and determined that the deficiencies had been reported to the Permittee within seven days, as required. There were no reportable RH NCRs since the previous recertification audit. All NCRs were verified as being managed and tracked in the CCP data center and on the CCP NCR Logs. No RH Project-level NCRs had been written since the previous recertification audit; therefore, an NCR Log was not created for RH Project-level NCRs.

No concerns were identified during the audit. The procedures reviewed and objective evidence assembled and evaluated during the audit provided evidence that the applicable requirements for control of nonconformances are adequately established for compliance with upper-tier requirements, satisfactory in the implementation of these requirements, and effective in achieving the desired results.

5.3.3 Records

The audit team conducted interviews and reviewed implementing procedures relative to the control and administration of QA records to determine the degree to which the procedures adequately address upper-tier requirements. The audit team reviewed procedures CCP-PO-001, Rev. 20, *CCP Transuranic Waste Characterization Quality Assurance Project Plan*; CCP-QP-008, Rev. 19, *CCP Records Management*; and CCP-QP-028, Rev. 14, *CCP Records Filing, Inventorying, Scheduling, and Dispositioning*.

Control of QA records was verified through review of the CH Records Inventory and Disposition Schedule (RIDS) dated 8/15/2011 and RH RIDS dated 8/15/2011.

One concern was identified regarding completeness of records. During the review of records, the audit team determined that one of the page numbers in the table of contents (Attachment 4 – CCP Radiography Batch Data Report Table of Contents and Batch Narrative) for BDR # OR-RTR6-0402 was not recorded. In the Records area, the audit team reviewed a total of 12 BDRs and only one error was identified. This was corrected and resulted in a CDA (see CDA #1 in section 6.2 for details).

The procedures reviewed and objective evidence assembled and evaluated during the audit provided evidence that the applicable requirements for QA records are adequately established for compliance with upper-tier requirements, satisfactory in the implementation of these requirements, and effective in achieving the desired results.

5.4 Technical Activities

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

5.4.1 Acceptable Knowledge

The audit team reviewed the AK record for both CH and RH SCG S5000 TRU debris waste streams and a CH SCG S4000 TRU soils/gravel waste stream as part of the ORNL/CCP recertification audit. In examining activities since the previous audit for the only RH SCG S5000 waste stream approved, OR-REDC-RH-HET, and the only CH SCG S4000 waste stream approved, OR-NFS-CH-SOIL, it was noted that very little AK activity had occurred for either stream up until the time CCP suspended operations at the ORNL. For this reason, the audit team focused on OR-GENR-CH-HET, an S5000 CH TRU waste stream that had not been previously reviewed during an audit. The complete AK record was examined during the audit as detailed below.

This audit was based on the requirements contained in the WIPP HWFP and described in the WAP, as well as the latest requirements of the WIPP WAC. The audit team reviewed documentation in support of all relevant requirements, completing the WAP C6-1 and C6-3 checklists and compiling and reviewing objective evidence to demonstrate compliance.

The objective evidence reviewed and compiled included AK Summary Report CCP-AK-ORNL-006, Rev. 1, numerous AK source documents, a WAP-compliant and CBFO-approved WSPF and attachments, and BDRs for HSG sampling and analysis, VE, RTR, and NDA. Random container selection memos for HSG sampling lots 1 and 2 were reviewed along with the corresponding HSG Analysis Summary Reports.

With regard to other WAP requirements, in addition to the AK Summary Reports, AK Source Document Summaries and other relevant AK records cited above, the audit

team reviewed for waste stream OR-GENR-CH-HET the AK Documentation Checklist, attachment 1; the AK Information List, attachment 4; the Hazardous Constituents List, attachment 5; the Waste Form, Waste Material Parameters, Prohibited Items and Packaging form, attachment 6, along with the applicable justification memo for waste material parameter weight estimates; the Radionuclides form, attachment 7, with the corresponding AK/NDA memo and the Waste Containers List, attachment 8, with AK Source Document M182 detailing the process for adding containers to the waste stream. Examples of the resolution of AK discrepancies in the AK record and at characterization, NCRs dealing with prohibited items, an AK Accuracy Report, and the most recent internal surveillances were also collected and examined. Requisite training records were reviewed for AK experts and SPMs.

The WAP-required container traceability exercise was conducted for a total of four waste containers from the candidate waste stream, including a container from each of the two HSG sampling and analysis (S&A) lots and two other containers spanning the long generation time. In addition to the BDRS, the auditors compiled and examined Integrated Data Center screenshots, the AK Tracking Spreadsheet, and the container input forms for these containers and their parent drums/boxes along with AK characterization checklists and data reconciling characterization testing with the AK record.

The AK audit team identified one concern that dealt with an inconsistency with the AK Summary on AK attachment 6 regarding the potential for heat-sealed bags in this waste stream and an omission on AK attachment 1 regarding the availability of AK Source Documents that fit into the category of additional AK Information section S4, waste packaging records, and section S15, NMMA inventory records. These attachments were revised and record copies were provided during the audit. The audit team was able to verify completion of corrective actions prior to the end of the audit. (See CDA #2 in section 6.2 for details.)

The procedure reviews, field observations, and document reviews provided evidence that the applicable requirements for Acceptable Knowledge are adequately established for compliance with upper-tier requirements, satisfactory in the implementation of these requirements, and effective in achieving the desired results.

5.4.2 Project-Level Data Validation and Verification

The audit team conducted interviews with responsible personnel and reviewed implementing procedures CCP-TP-001, Rev. 19, *CCP Project Level Data Validation and Verification*; CCP-TP-003, Rev. 18, *CCP Data Analysis for S3000, S4000, and S5000 Characterization*; and CCP-TP-162, Rev. 1, *CCP Random Selection of Containers for Solids and Headspace Gas Sampling and Analysis*, relative to project-level V&V activities, to determine the degree to which procedures adequately address upper-tier requirements.

The audit team reviewed objective evidence to ensure project-level V&V activities were adequately performed to support waste characterization activities. BDRs were

evaluated based on project-level V&V requirements for CH and RH SCG S5000 debris waste and CH SCG S4000 soil/gravel waste and WSPF/characterization information summary (CIS) for OR-GENR-CH-HET and OR-ISTP-CH-HET waste streams. The audit team also verified the random selections completed for Lot 2 of OR-REDC-RH-HET, the second lot random selection of ORNL isotopes program CH-TRU waste, and the second lot of New Brunswick Laboratory CH-TRU waste. The audit team verified quarterly reports and results for 1st and 2nd quarter 2011 VE, nondestructive examination, and HSG sampling. The audit team verified that the Field Reference Sample results were satisfactorily reported in support of the HSG BDR that was examined. The memorandum for the disposition of HSG samples was also reviewed.

The project-level data V&V process was evaluated by reviewing the following BDRs:

Radiography

OR-RTR6-0390
OR-RTR6-0393
OR-RTR6-0407

Visual Examination

ORVECH0075
ORVECH0094
ORVECH0100
RHORVE110003
RHORVE110004

Headspace Gas

ORHSGS1101 ECL11012G ECL11012M

Nondestructive Assay

OR-IQ3-0192
OR-IQ3-0220

Dose-to-Curie

ORRHDTTC10080
ORRHDTTC11001
ORRHDTTC11002
ORRHDTTC11003
ORRHDTTC11004

The audit team found the project-level RTR, VE, NDA, D-T-C, soils/gravel sampling and analysis, and HSG S&A review of the BDRs to be acceptable.

The procedure and document reviews provided evidence that the applicable requirements for the project-level data V&V process are adequately established for compliance with upper-tier requirements, satisfactory in the implementation of these requirements, and effective in achieving the desired results.

5.4.3 Headspace Gas Sampling

The audit team conducted interviews with responsible personnel and reviewed implementing procedures CCP-TP-082, Rev. 8, *CCP Preparing and Handling Waste Containers*; CCP-TP-093, Rev. 16, *CCP Sampling of TRU Waste Containers*; and CCP-TP-106, Rev. 7, *CCP Headspace Gas Sampling Batch Data Report Preparation*, relative to HSG sampling activities, to determine the degree to which procedures adequately address upper-tier requirements.

The audit team reviewed documentation generated from the previous audit to the July 2011 timeframe to assess the ability of ORNL/CCP to collect HSG samples for the purpose of characterizing CH and RH waste from SCG S5000 (debris). ORNL/CCP operations for HSG sampling is performed using SUMMA[®] canisters. No HSG sampling activities were evaluated during the audit. HSG sample analyses are performed by the Idaho National Laboratory Environmental Chemistry Laboratory and are evaluated under a separate audit. The audit team examined one HSG sampling BDR (ORHSG11001) that was generated during the referenced timeframe.

The audit team was unable to evaluate HSG sampling activities in the field or identify and verify HSG operators were properly qualified.

No concerns were identified during the audit. The procedures and documents reviewed provided evidence that the applicable requirements for Headspace Gas Sampling are adequately established for compliance with upper-tier requirements. Since the audit team was unable to evaluate HSG sampling activities in the field or identify and verify HSG operators were properly qualified, the audit team concluded that the implementation and effectiveness of the referenced procedures was indeterminate for HSG sampling.

5.4.4 Real-time Radiography

The audit team evaluated the adequacy, implementation, and effectiveness of ORNL/CCP ability to characterize and certify CH SCG S4000 soils waste and SCG S5000 debris waste using the RTR characterization process for documentation generated from the previous audit to the July 2011 timeframe.

The audit team evaluated the following RTR related CCP procedures: CCP-TP-028, Rev. 6, *CCP Radiographic Test and Training Drum Requirements*, CCP-TP-053, Rev. 11, *CCP Standard Real-Time Radiography (RTR) Inspection Procedure*, and CCP-TP-165, Rev. 2, *CCP Real-Time Radiography #6 Operating Procedure*. The results of the review indicated that the procedures adequately address upper-tier requirements.

The audit team examined the following CH RTR BDRs generated from the referenced timeframe:

OR-RTR6-0390
OR-RTR6-0393
OR-RTR6-0407

The audit team evaluated evidence of RTR operator required capability demonstrations for three RTR operators. Records of RTR operator training and qualification, including audio/video media of capability demonstrations, were examined by the audit team. The document reviews indicated that the RTR operators were appropriately qualified as required for those activities performed during the referenced time frame.

The audit team was unable to identify and verify RTR operators were properly qualified or evaluate RTR activities in the field.

No concerns were identified during the audit. The procedures and documents reviewed provided evidence that the applicable requirements for Real-time Radiography are adequately established for compliance with upper-tier requirements. Since the audit team was unable to evaluate RTR activities in the field or identify and verify RTR operators were properly qualified, the audit team concluded that the implementation and effectiveness of the referenced procedures was indeterminate for the RTR waste characterization process.

5.4.5 Visual Examination

The audit team evaluated the adequacy, implementation, and effectiveness of ORNL/CCP's ability to characterize and certify CH SCG S4000 soils waste and CH and RH SCG S5000 debris waste using the VE characterization process for documentation generated from the previous audit to the July 2011 timeframe.

A review of ORNL/CCP procedures CCP-TP-113, Rev. 16, *CCP Standard Contact-Handled Waste Visual Examination*; CCP-TP-163, Rev. 2, *CCP Evaluation of Waste Packaging Records for Visual Examination of Records*; and CCP-TP-500, Rev.11, *CCP Remote-Handled Waste Visual Examination*, was performed to determine their adequacy in addressing upper-tier requirements. The review indicated that the procedures adequately address requirements.

ORNL/CCP uses the two-operator method when performing VE characterization activities. VE is performed by two qualified operators as the waste is visually examined and placed into 55-gallon drums. The audit team examined the following CH and RH VE BDRs to verify implementation and compliance with the requirements for documenting VE activities, as stipulated in CCP-TP-500 and CCP-TP-113, for waste characterized during the referenced timeframe:

CH

ORVECH0075
ORVECH0094
ORVECH0100

RH

RHORVE110003
RHORVE110004

There were no SCG S4000 CH soils/gravel BDRs generated during the referenced timeframe.

The audit team examined training records and qualification cards for six VE operators based on the BDRs reviewed, and concluded that the required training was adequate and qualifications were current. The audit team also confirmed the appointment of the ORNL/CCP VE experts, as required.

The audit team was unable to identify and verify VE operators were properly qualified or evaluate VE activities in the field.

No concerns were identified during the audit. The procedures and documents reviewed provided evidence that the applicable requirements for VE are adequately established for compliance with upper-tier requirements. Since the audit team was unable to evaluate VE activities in the field or identify and verify VE operators were properly qualified, the audit team concluded that the implementation and effectiveness of the referenced procedures was indeterminate for the VE waste characterization process.

5.4.6 Nondestructive Assay

The audit team assessed the adequacy, implementation, and effectiveness of the NDA systems used at ORNL/CCP to characterize waste from CH SCG S4000 (soils) and S5000 (debris) on the Mobile Qualitative and Quantitative Drum Counter with Isotopics (IQ3) for documentation generated from the previous audit to the July 2011 timeframe.

A review of ORNL/CCP procedures CCP-TP-046, Rev. 4, *CCP Mobile IQ3 System Calibration Procedure*; CCP-TP-047, Rev. 11, *CCP Mobile IQ3 Gamma Scanner Operation*; CCP-TP-048, Rev. 15, *CCP Mobile IQ3 System Data Reviewing, Validating, and Reporting Procedure*; and CCP-TP-058, Rev. 4, *CCP NDA Performance Demonstration Program*, was performed to determine their adequacy in addressing upper-tier requirements. The review indicated that the procedures adequately address requirements.

The IQ3 quantifies the activities and masses of radionuclides in the waste through the detection of gamma rays emitted by those radionuclides. The IQ3 system contains three High-Purity Germanium (HPGe) coaxial detectors for wide energy range detection and three Low-Energy Germanium (LEGe) detectors used along with the Multi-Group Analysis (MGA) software package to determine the isotopic ratios of Plutonium and/or

Uranium. When used in the Segmented Analysis mode, the system uses three Barium-133 (Ba-133) transmission sources to correct for the attenuation of photons by the waste matrix, while in the Summed Spectrum mode, multi-density calibration curves are used.

Based on a review of the current revisions of CCP procedures provided prior to the audit, checklists were prepared and used to evaluate the following:

- Operability and condition of the IQ3 for the referenced timeframe;
- System stability as evidenced by the implementation and effectiveness of quality control measurements, calibration verifications, and weekly interfering matrix checks;
- Successful calibration verifications and calibration confirmation, as required;
- Applicability of each system's calibration and operational range to the waste assayed during the referenced timeframe;
- Successful participation in the CBFO-sponsored NDA PDP Cycles 18A;
- Completed BDRs to ensure data are reported and reviewed as required; and
- Data storage and retrievability.

The IQ3 has received approval from CBFO for Performance Demonstration Program Cycle 18A.

The following IQ3 BDRs were reviewed:

OR-IQ3-0182
OR-IQ3-0194
OR-IQ3-0207

The audit team did review electronic and paper copies of reports and records. The audit team was unable to identify and verify NDA operators were properly qualified or evaluate NDA activities in the field.

No concerns were identified during the audit. The procedures and documents reviewed provided evidence that the applicable requirements for NDA are adequately established for compliance with upper-tier requirements. Since the audit team was unable to evaluate NDA activities in the field or identify and verify NDA operators were properly qualified, the audit team concluded that the implementation and effectiveness of the referenced procedures was indeterminate for the NDA waste characterization process.

5.4.7 Radiological Characterization (Dose-to-Curie)

The audit team assessed the adequacy, implementation, and effectiveness of the D-T-C methodology used by ORNL/CCP to characterize RH SCG S5000 debris waste for documentation generated from the previous audit to the July 2011 timeframe. The audit team reviewed documentation for waste stream OR-REDC-RH-HET. For waste

characterized using D-T-C during the referenced timeframe, approximately seven (7) 55-gallon drums of RH TRU debris waste have been measured resulting in two completed BDR's.

A review of ORNL/CCP procedures CCP-TP-504, Rev. 11, *CCP Dose-to-Curie Survey Procedure for Remote-Handled Transuranic Waste*, and CCP-TP-509, Rev. 3, *CCP Remote-Handled Transuranic Container Tracking*, was performed to determine their adequacy in addressing upper-tier requirements. The review indicated that the procedures adequately address requirements.

The audit team interviewed D-T-C personnel and examined electronic and paper copies of reports, BDRs, operational logs, and records. The audit team previously evaluated the collection and analysis of swipe samples from the hot cells; the development of scaling factors that relate the measured dose rate to the average activity; and the actual measurement of the dose rate. There were no changes in any of these areas since Audit A-11-08. For D-T-C, the dose rate is defined as the external exposure rate from gamma-ray emitting radionuclides within the waste matrix, predominately Cesium-137 (Cs-137).

Based on a review of the current revisions of CCP procedures and data provided prior to and during the audit, a checklist was prepared and used to evaluate the following:

- Continued use of average radionuclide ratios previously developed through examination of swipe sample data and corroborated by the NDA of CH waste derived from the original RH waste stream;
- Continued use of the previously approved relationship between the measured dose or exposure rate and the activity of Cs-137;
- Measurement of the external dose or exposure rate of the waste containers;
- Calculation of the radionuclide activities and other derived radiological quantities and associated uncertainties;
- Results of applying the D-T-C methodology to characterize waste as evidenced in BDRs ORRHDTTC11003 and ORRHDTTC11004.
- Determination of the number of containers examined, completed BDRs and BDRs that had been through project-level review that were generated during the referenced timeframe;
- Completed BDRs to ensure data are reported and reviewed as required;
- Data storage and retrievability; and
- Personnel qualification and training.

The source of the RH waste at the ORNL, Radiochemical Engineering Development Center Hot Cells, that were presented as part of this audit was the decontamination of the cell following years of efforts to produce Curium and trans-Curium elements. Based on sample data collected for 63 swipe samples, scaling factors were developed to establish ratios of the isotopes of interest to Cs-137. An understanding of the similarity of the chemical processes used during various time periods was used to develop a

mathematical relationship to relate the isotopic quantities between the various time periods of waste generation. CH waste that was separated from the original RH waste stream was subjected to NDA and the results used to confirm the radionuclide ratios developed by the mathematical relationship.

Measurements of the external dose or exposure rates of the waste are made in a hot cell in building 7880, Room 231 (DTC Hotcell/Alcove). The exposure rate, attributed entirely to Cs-137, is measured four times at a distance of 1.0 meter from the 55-gallon waste containers. A Thermo Scientific Model FHZ-612 (XC-0677) survey meter is used to measure the dose rate. Each container is rotated 90 degrees successively between each of the four measurements. The average measured dose or exposure rate for each 55-gallon waste container and associated scaling factors are used to estimate the activity of individual radionuclides and other derived radiological quantities and associated uncertainties.

The audit team interviewed D-T-C personnel and examined electronic and paper copies of reports and records. The audit team was unable to identify and verify D-T-C operators were properly qualified or evaluate D-T-C activities in the field.

No concerns were identified during the course of the audit. The procedures and documents reviewed provided evidence that the applicable requirements for D-T-C are adequately established for compliance with upper-tier requirements. Since the audit team was unable to evaluate D-T-C activities in the field or identify and verify D-T-C operators were properly qualified, the audit team concluded that the implementation and effectiveness of the referenced procedures was indeterminate for the D-T-C waste characterization process.

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

The audit team conducted interviews and reviewed implementing procedures relative to the WWIS/WDS data entry process to determine the degree to which the procedures adequately address upper-tier requirements. The procedures reviewed included CCP-TP-030, Rev. 29, *CCP CH TRU Waste Certification and WWIS/WDS Data Entry*, and CCP-TP-530, Rev. 10, *CCP RH TRU Waste Certification and WWIS/WDS Data Entry*.

The audit team evaluated the implementation of the WWIS/WDS data entry procedures for manual data entry and electronic data transfer into the WWIS/WDS software application. The evaluation included data population of the spreadsheet, review of data entry by a Waste Certification Assistant, and waste certification by the Waste Certification Official. Record reviews included container information summaries, pages from BDRs showing analyses values, WWIS/WDS Container Data Reports, and submittals for WWIS/WDS review/approval.

The audit team reviewed one WWIS/WDS waste certification package for RH waste canister OR0073, which had three internal containers (ORRH00019, ORRH00049, and ORRH00050). Two waste certification packages (X10C09801421A and X10C9902206A) for CH waste from Waste Stream OR-REDC-CH-HET were reviewed.

One waste certification package (X10C0506047) for CH Waste Stream OR-NFS-CH-SOIL was also reviewed.

No concerns were identified during the audit. The procedures reviewed and objective evidence assembled and evaluated during the audit provided evidence that the applicable requirements for WWIS/WDS activities are adequately established for compliance with upper-tier requirements, satisfactory in the implementation of these requirements, and effective in achieving the desired results.

6.0 CORRECTIVE ACTIONS, OBSERVATIONS, AND RECOMMENDATIONS

6.1 Corrective Action Reports

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

Condition Adverse to Quality (CAQ) – Term used in reference to failures, malfunctions, deficiencies, defective items, and nonconformances.

Significant Condition Adverse to Quality – A condition which, if uncorrected, could have a serious effect on safety, operability, waste confinement, TRU waste site certification, compliance demonstration, or the effective implementation of the Quality Assurance (QA) program.

No CARs were issued during this audit.

6.2 Deficiencies Corrected During the Audit

During the audit, the audit team may identify CAQs. The audit team members and the Audit Team Leader (ATL) evaluate the CAQs to determine if they are significant.

Once a determination is made that the CAQ is not significant, the audit team member, in conjunction with the ATL, determines if the CAQ is an isolated case requiring only remedial action and therefore can be corrected during the audit. Upon determination that the CAQ is isolated, the audit team member, in conjunction with the ATL, evaluates/verifies any objective evidence/actions submitted or taken by the audited organization and determines if the condition was corrected in an acceptable manner. Once it has been determined that the CAQ has been corrected, the ATL categorizes the condition as a CDA according to the definition below.

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

Two CDAs were identified and corrected during this audit as described below.

CDA 1

During the review of records, the audit team identified that one of the page numbers in the table of contents (Attachment 4 – CCP Radiography Batch Data Report Table of Contents and Batch Narrative) for BDR # OR-RTR6-0402 was not recorded. While evaluating records, the audit team reviewed a total of 12 BDRs and only one error was identified. The error was corrected during the audit and the audit team was able to verify corrective actions were completed prior to the end of the audit.

CDA 2

During the evaluation of AK, the audit team identified an inconsistency with the AK Summary on Waste Form, Waste Material Parameters, Prohibited Items and Packaging form, attachment 6, regarding the potential for heat-sealed bags in waste stream OR-GENR-CH-HET and an omission on AK Documentation Checklist, attachment 1, regarding the availability of AK Source Documents that fit into the category of additional AK Information recorded in section S4, waste packaging records, and section S15, NMMA inventory records. The omissions on the attachments were corrected and record copies were provided during the audit. The audit team was able to verify completion of corrective actions prior to the end of the audit.

7.0 SUMMARY OF OBSERVATIONS AND RECOMMENDATIONS

During the audit, the audit team may identify potential problems or suggestions for improvement that should be communicated to the audited organization. The audit team member, in conjunction with the ATL, evaluates these conditions and classifies them as Observations or Recommendations using the following definitions.

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

Recommendations – Suggestions that are directed toward identifying opportunities for improvement and enhancing methods of implementing requirements.

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

7.1 Observations

No Observations were identified during this audit.

7.2 Recommendations

No Recommendations were provided to management during this audit.

8.0 LIST OF ATTACHMENTS

Attachment 1: Personnel Contacted During the Audit

Attachment 2: Summary Table of Audit Results

Attachment 3: Table of Audited Documents

Attachment 4: List of Processes and Equipment Reviewed

PERSONNEL CONTACTED DURING THE AUDIT

PERSONNEL CONTACTED DURING AUDIT A-12-08				
NAME	ORG/TITLE	PREAUDIT MEETING	CONTACTED DURING AUDIT	POST-AUDIT MEETING
Randall Allen	CTAC QA Manager	X		X
Cheryl Armijo	CCP Records Clerk		X	
Michele Billet	CCP Training Coordinator		X	
Norma Castaneda	CBFO/NTP CH Certification Manager	X		X
Neil Dickes	CCP NDA Nuclear Engineer		X	
Courtland Fesmire	CBFO QA Representative	X	X	X
A.J. Fisher	CCP Senior Technical Advisor			X
Christine Gomez	CCP QA Specialist			X
Jeff Harrison	CCP AK Expert	X	X	
Joe P. Harvill	CTAC Senior Manager	X		X
Steve Holmes	NMED Observer	X		X
Laura Jones	CCP QA Representative	X	X	
Richard Kantrowitz	CCP SPM			X
Creta Kirkes	CCP WDS WCO		X	
Ryan Martin	CCP Records Analyst		X	
Laura Nelson	CCP RH SPM	X	X	X
Derek Ott	MCS Operator		X	
Tami Parker	CCP Records Clerk		X	
Jose Payanes	CCP Document Services Manager		X	
Mark Percy	CCP SPM	X		X
Sheila Percy	CCP Records Manager	X	X	X
Kevin Peters	CCP AK Expert	X	X	
D. K. Ploetz	CCP RCT Manager			X
Ron Reeves	CCP Project Manager	X	X	X

PERSONNEL CONTACTED DURING AUDIT A-12-08				
NAME	ORG/TITLE	PREAUDIT MEETING	CONTACTED DURING AUDIT	POST-AUDIT MEETING
Beverly Schrock	CCP Lead SPM	X	X	X
Andrew Stallings	NDE Cognizant Engineer	X	X	X
Joe Wachter	Canberra/MCS EA	X	X	X
Connie Walker	NMED Contractor	X	X	
Ronald Whitson	MCS Lead Operator	X	X	X

SUMMARY TABLE OF AUDIT RESULTS

Documents	Concern Classification				QA Evaluation	Technical Evaluation	
	CARs	CDAs	Obs	Rec	Adequacy	Implementation	Effectiveness
Activity							
Acceptable Knowledge		1			A	S	E
Reconciliation of DQO's WSPFs					A	S	E
Project Level Data V & V					A	S	E
Headspace Gas Sampling					A	I	I
Real-time Radiography					A	I	I
Visual Examination					A	I	I
Dose-to-Curie					A	I	I
Nondestructive Assay					A	I	I
QA General C6-1 Training					A	S	E
QA General C6-1 NCRs / WWIS					A	S	E
QA General C6-1 Trans/Records		1			A	S	E
TOTALS	0	2	0	0	A	S	E

Definitions

E = Effective

S = Satisfactory

I = Indeterminate

M = Marginal

U = Unsatisfactory

CAR = Corrective Action Report

CDA = Corrected During Audit

NE = Not Effective

Obs – Observation

Rec = Recommendation

A = Adequate

NA = Not Adequate

TABLE OF AUDITED DOCUMENTS

No.	Procedure Number	REV	DOCUMENT TITLE
1.	CCP-PO-001	19	CCP Transuranic Waste Characterization Quality Assurance Project Plan
2.	CCP-PO-002	25	CCP Transuranic Waste Certification Plan
3.	CCP-QP-002	30	CCP Training and Qualification Plan
4.	CCP-QP-005	19	CCP TRU Nonconforming Item Reporting and Control
5.	CCP-QP-008	17	CCP Records Management
6.	CCP-QP-011	10	CCP Laboratory Logbooks
7.	CCP-QP-021	7	CCP surveillance Program
8.	CCP-QP-023	3	CCP Handling, Storage and Shipping
9.	CCP-QP-028	12	CCP Records Filing, Inventorying, Scheduling, and Dispositioning
10.	CCP-TP-001	19	CCP Project Level Data Validation and Verification
11.	CCP-TP-002	23	CCP Reconciliation of DQOs and Reporting Characterization Data
12.	CCP-TP-003	18	CCP Data Analysis for S3000, S4000, and S5000 Characterization
13.	CCP-TP-005	21	CCP Acceptable Knowledge Documentation
14.	CCP-TP-028	6	CCP Radiographic Test and Training Drum Requirements
15.	CCP-TP-030	28	CCP CH TRU Waste Certification and WWIS/WDS Data Entry
16.	CCP-TP-033	18	CCP Shipping of CH TRU Waste
17.	CCP-TP-046	3	CCP Mobile IQ3 System Calibration Procedure
18.	CCP-TP-047	10	CCP Mobile IQ3 Gamma Scanner Operation
19.	CCP-TP-048	14	CCP Mobile IQ3 System Data Reviewing, Validating, and Reporting Procedure
20.	CCP-TP-053	9	CCP Standard Real-Time Radiography (RTR) Inspection Procedure
21.	CCP-TP-058	4	CCP NDA Performance Demonstration Program
22.	CCP-TP-068	8	CCP Standardized Container Management
23.	CCP-TP-082	7	CCP Preparing and Handling Waste Containers for Headspace Gas Sampling
24.	CCP-TP-093	14	CCP Sampling of TRU Waste Containers
25.	CCP-TP-106	7	CCP Headspace Gas Sampling Batch Data Report Preparation
26.	CCP-TP-113	15	CCP Standard Contact-Handled Waste Visual Examination
27.	CCP-TP-162	1	CCP Random Selection of Containers for Solids and Headspace Gas Sampling and Analysis
28.	CCP-TP-165	1	CCP Real-Time Radiography #6 Operating Procedure
29.	CCP-TP-500	10	CCP RH Waste Visual Examination
30.	CCP-TP-504	10	CCP Dose-to-Curie Survey Procedure for Remote-Handled Transuranic Waste
31.	CCP-TP-506	2	CCP Preparation of the Remote Handled Transuranic Waste Acceptable Knowledge Characterization reconciliation Report
32.	CCP-TP-507	7	CCP Shipping of Remote-Handled Transuranic Waste
33.	CCP-TP-509	2	CCP Remote-Handled Transuranic Container Tracking
34.	CCP-TP-530	9	CCP RH TRU Waste Certification and WWIS Data Entry
35.	WP 13-QA.03	17	Quality Assurance Independent Assessment Program

List of Processes and Equipment Reviewed

WIPP #	Process/Equipment Description	Applicable to the Following Waste Streams/Groups of Waste Streams	Currently Approved by NMED	Currently Approved by EPA
PREVIOUSLY APPROVED PROCESSES OR EQUIPMENT				
N/A	Acceptable Knowledge Procedures – CCP-TP-002, CCP-TP-003, CCP-TP-005, & CCP-TP-506	Soils (S4000) Debris (S5000)	YES	YES
N/A	Data Generation and Project Level Validation & Verification (V&V) Procedure – CCP-TP-001	Soils (S4000) Debris (S5000)	YES	YES
N/A	WIPP Waste Information System (WWIS) Procedures – CCP-TP-030, CCP-TP-033, & CCP-TP-530	Soils (S4000) Debris (S5000)	YES	YES
16RHVE1	Visual Examination (VE) Procedures – CCP-TP-163 and CCP-TP-500	Debris (S5000)	YES	YES
16RR1	Real-Time Radiography Mobile Characterization System (MCS) RTR #6 Procedures – CCP-TP-053 & CCP-TP-165	Soils (S4000) Debris (S5000)	YES	YES
16DTC1	Radiological characterization (Dose-to-Curie) Procedure - CCP-TP-504	Debris (S5000)	N/A	YES
N/A	Headspace Gas Sampling Procedures – CCP-TP-082 & CCP-TP-093	Debris (S5000)	YES	YES
16IQ1	Nondestructive Assay – Canberra Mobile Qualitative and Quantitative Drum Counter with Isotopics (IQ3) Procedures – CCP-TP-046, CCP-TP-047, & CCP-TP-048	Soils (S4000) Debris (S5000)	N/A	YES

List of Processes and Equipment Reviewed

WIPP #	Process/Equipment Description	Applicable to the Following Waste Streams/Groups of Waste Streams	Currently Approved by NMED	Currently Approved by EPA
NEW PROCESSES OR EQUIPMENT				
NONE				
DEACTIVATED PROCESSES OR EQUIPMENT				
16SG1	Nondestructive Assay - DWAS/IPAN/SGS Procedures - CCP-TP-166, CCP-TP-167, CCP-TP-168, CCP-TP-169 & CCP-TP-172	Soils (S4000) Debris (S5000)	N/A	YES