DATE: APR 17 2018
REPLY TO ATTN OF: CBFO:OQA:MPN:JM:18-1742:UFC 2300.00
SUBJECT: Interim Audit Report A-18-13, ORNL/CCP TRU Waste Characterization Activities

TO: Bill McMillan/DOE-OR


The audit team concluded that, overall, the ORNL/CCP programs evaluated are adequate relative to the flow-down of requirements, and the technical activities evaluated are satisfactorily implemented and effective in all areas, with the exceptions documented in the audit report.

The acceptable knowledge (AK) process implementation of enhanced AK, as specified in DOE/WIPP-02-3122, Transuranic Waste Acceptance Criteria for the Waste Isolation Pilot Plant, Rev. 8, was evaluated by the audit team. Some of the requisite enhanced AK requirements have not been completed; therefore, implementation and effectiveness of the AK process will be deemed indeterminate.

There were no corrective action reports issued as a result of this audit. The audit team identified and offered one recommendation for management consideration.

If you have any questions or comments concerning the interim audit report, please contact me at (575) 234-7483.

Martin P. Navarrete, Acting Director
Carlsbad Field Office, Office of Quality Assurance

Attachment
cc: w/attachment
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U.S. DEPARTMENT OF ENERGY
CARLSBAD FIELD OFFICE

INTERIM AUDIT REPORT

OF THE

OAK RIDGE NATIONAL LABORATORY
CENTRAL CHARACTERIZATION PROGRAM

FOR

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

AUDIT NUMBER A-18-13

MARCH 26 – 28, 2018

Prepared by: Katie D. Gentry
Katie D. Gentry, CTAC
Audit Team Leader

Date: 4/10/2018

Approved by: Martin P. Navarrete
Martin P. Navarrete, Acting Director
CBFO Office of Quality Assurance

Date: 4/17/18
1.0 EXECUTIVE SUMMARY

U.S. Department of Energy (DOE) Carlsbad Field Office (CBFO) Recertification Audit A-18-13 was performed to evaluate the continued adequacy, implementation, and effectiveness of established programs for transuranic (TRU) waste characterization activities performed for the Oak Ridge National Laboratory (ORNL) by the Nuclear Waste Partnership LLC (NWP) Central Characterization Program (CCP). The audit team evaluated the programs, procedures, and processes for characterizing contact-handled (CH) Summary Category Groups (SCGs) S4000 soils/gravel and S5000 debris wastes, and remote-handled (RH) SCG S5000 debris waste. The audit was conducted relative to the requirements of the Waste Isolation Pilot Plant (WIPP) Hazardous Waste Facility Permit (HWFP), the CBFO Quality Assurance Program Document (QAPD), the Transuranic Waste Acceptance Criteria for the Waste Isolation Pilot Plant (WAC), the Remote-Handled TRU Waste Characterization Program Implementation Plan (RH TRU WCPIP), and the Waste Isolation Pilot Plant Documented Safety Analysis (DSA), Chapter 18.

Audit activities were conducted at the ORNL TRU Waste Processing Center (TWPC) facilities in Oak Ridge, Tennessee, and at the Skeen-Whitlock Building in Carlsbad, New Mexico, March 26 – 28, 2018. Overall, the audit team concluded that the ORNL/CCP technical and quality assurance (QA) programs evaluated were adequately established for compliance with applicable upper-tier requirements, satisfactorily implemented, and effective in achieving the desired results. The CBFO has not completed and approved the required Basis of Knowledge (BoK) document specifying when waste with oxidizing chemicals is acceptable; therefore, it was not available for evaluation during the audit. Until all enhanced Acceptable Knowledge (AK) requirements are implemented, the AK process at ORNL will be deemed indeterminate. Further, the Generator Site Technical Review (GSTR) was completed on September 19 – 23, 2016, and the report (GSTR-OR-1-16-01) was completed and submitted to ORNL on January 13, 2017.

The audit team identified one concern during the audit. The concern was identified in the area of AK and was offered to management as a Recommendation (see section 6.4).

2.0 SCOPE AND PURPOSE

2.1 Scope

The scope of the audit included evaluations for the continued adequacy, implementation, and effectiveness of the technical and QA activities performed by NWP/CCP at ORNL for characterization of CH and RH SCG S5000 debris wastes, and CH SCG S4000 soils/gravel waste. Transportation evaluations were not included in the scope of this audit. The following areas were evaluated:
General Activities
- Results of Previous Audits
- Changes in Programs or Operations
- New Programs or Activities Being Implemented
- Changes in Key Personnel

Quality Assurance Activities
- Nonconformances
- Personnel Qualification and Training
- Measuring and Test Equipment (M&TE)
- Software Version Installation
- Records

Technical Activities
- Enhanced AK (including waste certification)
- Project-Level Data Validation and Verification (PL/V&V)
- Real-time Radiography (RTR)
- Visual Examination (VE)
- Nondestructive Assay (NDA), including Performance Demonstration Program (PDP)
- Radiological Characterization (Dose-to-Curie [DTC])
- Container Management
- WIPP Waste Information System (WWIS)/Waste Data System (WDS)

The evaluation of the adequacy of ORNL/CCP documents was based on current versions 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 (RH TRU WCPIP), DOE/WIPP-02-3214

Waste Isolation Pilot Plant Documented Safety Analysis (DSA), DOE/WIPP-07-3372, Chapter 18

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

CCP Transuranic Waste Characterization Quality Assurance Project Plan (QAP/P), CCP-PO-001
2.2 Purpose

Audit A-18-13 was conducted to determine the degree of adequacy and effective implementation of program requirements for the characterization and certification of CH and RH SCG S5000 debris wastes and CH SCG S4000 soils/gravel waste at the ORNL.

3.0 AUDIT TEAM, MANAGEMENT REPRESENTATIVES, TECHNICAL SPECIALISTS, AND OBSERVERS

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<thead>
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<th>Name</th>
<th>Position and Affiliation</th>
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<tbody>
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<td>Martin Navarrete</td>
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<td>Dustin Stegman</td>
<td>Technical Specialist, CTAC</td>
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OBSERVERS

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<tr>
<th>Name</th>
<th>Agency</th>
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<td>New Mexico Environment Department (NMED)</td>
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<td>David Biswell</td>
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<td>Megan McLean</td>
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<td>Hernesto Tellez</td>
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4.0 AUDIT PARTICIPANTS

The ORNL/CCP individuals involved in the audit process are identified in Attachment 1. A pre-audit meeting was held on March 26, 2018, at the TWPC in Oak Ridge, Tennessee, and at the Skeen-Whitlock Building in Carlsbad, New Mexico.
Management briefings were held to update ORNL/CCP management and staff on audit progress and identified concerns. A post-audit meeting was held on March 28, 2018, at the TWPC in Oak Ridge, Tennessee, and at the Skeen-Whitlock Building in Carlsbad, New Mexico.

Attachment 2 contains a summary table of audit results. Attachment 3 contains a list of ORNL/CCP documents audited. Attachment 4 contains the list of 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 capability of ORNL/CCP to characterize CH and RH SCG S5000 debris wastes and CH SCG S4000 soils/gravel waste for compliance with the requirements specified in the WIPP HWFP Waste Analysis Plan (WAP), the WIPP WAC, Chapter 18 of the DSA, the CBFO QAPD, and the RH TRU WCP. The characterization methods assessed were AK, VE, RTR, NDA (including PDP), and DTC. Other areas evaluated were data generation level (DGL) and PL/V&V, WWIS/WDS data entry, data quality objective (DQO) reconciliation, container management, and the preparation of Waste Stream Profile Forms (WSPFs).

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

5.2 General Activities

5.2.1 Results of Previous Audits

The audit team examined the results of the previous CBFO recertification audit of the ORNL/CCP (A-17-21), wherein two conditions adverse to quality (CAQs) were identified. One CAQ resulted in the initiation of CAR 17-031, related to the use of an obsolete version of a form. The other CAQ resulted in the initiation of CAR 17-032, related to a data-affecting non-editorial change made to a batch data report (BDR) without receiving the same level of review or approval as the original record. During the performance of this audit, the audit team did not observe any instances similar to the CAQs identified during audit A-17-21, suggesting that the corrective actions taken were adequate in precluding recurrence.
5.2.2 Changes in Programs or Operations

There were no significant changes in the programs or operations at the ORNL TWPC since the previous recertification audit.

5.2.3 New Programs or Activities Being Implemented

In response to the breached drum event at the WIPP in February 2014, the DOE and NWP are strengthening their programs to provide more oversight of TRU waste generator site processing/treatment activities being applied to active waste streams prior to waste being transferred to CCP for characterization, certification, and shipment.

5.2.4 Changes in Key Personnel

Changes in key personnel include a new ORNL/CCP Vendor Project Manager (VPM), who is also performing the duties as the Visual Examination Expert (VEE). During the audit, the position of QA Engineer at the ORNL site was vacant; however, a candidate had been selected for the position and was scheduled to begin training after completion of this audit.

5.2.5 ORNL/CCP Program Interface

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

5.3 Quality Assurance Activities

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

5.3.1 Personnel Qualification and Training

The audit team conducted interviews and reviewed implementing procedures to determine the degree to which they address upper-tier requirements:

- CCP-QP-002, Rev. 44, CCP Training and Qualification Plan
- CCP-QP-041, Rev. 2, CCP Job Needs Analysis and Design
- CCP-QP-042, Rev. 1, CCP Project Level Training and Qualification
- CCP-QP-043, Rev. 1, CCP Operations Level Training and Qualification
- CCP-PO-047, Rev. 2, CCP Training and Qualification Program Document

Results of the review indicate that the procedures adequately address upper-tier requirements.

Personnel training records associated with VE, RTR, NDA, DTC, AK, and SPM were examined to verify implementation of associated requirements and to verify that personnel performing waste 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; appointment letters for VEEs, RH waste technical staff, and NDA expert analysts (EAs); comprehensive exams; training container documentation; and eye examinations for qualified RTR operators.

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

5.3.2 Control of Nonconforming Items

The audit team reviewed implementing procedure CCP-QP-005, Rev. 25, CCP TRU Nonconforming Item Reporting and Control, to determine the degree to which the procedure adequately addresses upper-tier requirements. Results of the review indicate that the procedure adequately addresses upper-tier requirements. The audit team interviewed a CCP QA Engineer and randomly selected nonconformance reports (NCRs) for review.

The following NCRs reviewed were initiated at the DGL:

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<tr>
<td>NCR-ORNL-0085-17</td>
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<tr>
<td>NCR-RHORNL-0371-17</td>
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The following NCRs reviewed were initiated at the project level (PL):

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<tr>
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<tr>
<td>NCR-ORNL-0118-17</td>
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The team concluded that nonconformances are being appropriately documented and tracked through resolution as required. NCRs reviewed included original and revised NCRs. There were no NCRs related to CH or RH waste characterization activities written at the PL that required reporting to the CBFO. The audit team verified CCP personnel are familiar with the process for reporting NCRs to the Permittee via email to the CBFO within the time frame required by the Permit. All the NCRs examined were verified to have been entered, managed, and tracked in both the CCP Integrated Data Center (IDC) and the NCR Logs, as well as through the required reconciliation reporting mechanism. A CCP QA Engineer performed an evaluation of all NCRs written within the last 12 months and determined that there were 7 NCRs of similar subject that identified a reportable trend. This evaluation resulted in generation of NCR-ORNL-0117-17 and an associated WIPP Form, WF17-181, which address programmatic corrective actions. The audit team reviewed the identification of this recurring condition during the previous recertification audit, A-17-21. The audit team verified that the recurring condition was addressed and resolved under closure of NCR-ORNL-0118-17 and that the WIPP Form WF17-181 was closed on July 31, 2017. The NCR and WIPP Form were reviewed during the current assessment.

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

5.3.3 QA Records

The audit team conducted interviews with responsible personnel and reviewed the following implementing procedures relative to the control and administration of QA records to determine the degree to which the procedures adequately address upper-tier requirements:

- CCP-PO-001, Rev. 22, CCP Transuranic Waste Characterization Quality Assurance Project Plan
- CCP-QP-008, Rev. 26, CCP Records Management
- CCP-QP-028, Rev. 17, CCP Records Filing, Inventorying, Scheduling, and Dispositioning

Results of the review indicate that the procedures adequately address upper-tier requirements.

The level of control for QA records was verified through review of the CH Records Inventory and Disposition Schedule (RIDS) dated July 18, 2017, and the RH RIDS
dated July 10, 2017. Each RIDS is reviewed annually, as required. The audit team reviewed a sample of EA15RM3002-1-0, WIPP Records Inventory Work Sheet, forms related to changes proposed for the CH RIDS and the RH RIDS. Changes on the worksheet forms are adequately collected and detailed for inclusion on the next RIDS release version. The audit team evaluated a sample of transmittal forms used to document submittal of records from the ORNL/CCP Host Site location to the CCP Records Center in Carlsbad, New Mexico. The audit team determined that the completed forms adequately described the records being transmitted, and that the transmittal process was performed in accordance with the procedure.

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

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

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 WIPP HWFP is cited briefly, and the result of the assessment is provided.

5.4.1 Acceptable Knowledge

The audit team conducted interviews with responsible personnel and reviewed the following implementing procedures relative to the AK process to determine the degree to which the procedures address upper-tier requirements:

- CCP-PO-001, Rev. 22, CCP Transuranic Waste Characterization Quality Assurance Project Plan
• CCP-QP-002, Rev. 44, **CCP Training and Qualification Plan**
• CCP-QP-042, Rev. 1, **CCP Project Level Training and Qualification**
• CCP-TP-001, Rev. 22, **CCP Project Level Data Validation and Verification**
• CCP-TP-002, Rev. 27, **CCP Reconciliation of DQOs and Reporting Characterization Data**
• CCP-TP-005, Rev. 29, **CCP Acceptable Knowledge Documentation**
• CCP-TP-068, Rev. 12, **CCP Standardized Container Management**
• CCP-TP-200, Rev. 3, **Enhanced Acceptable Knowledge Review**
• CCP-TP-500, Rev. 15, **CCP Remote-Handled Waste Visual Examination**
• CCP-TP-506, Rev. 5, **CCP Preparation of the Remote-Handled Transuranic Waste Acceptable Knowledge Characterization Reconciliation Report**
• WP 13-QA.03, Rev. 26, **Quality Assurance Independent Assessment Program**

Results of the review indicate that the procedures adequately address upper-tier requirements.

The audit team evaluated the AK process for characterizing CH TRU SCG S4000 soils/gravel and S5000 debris wastes and RH TRU mixed SCG S5000 debris waste. The audit team specifically evaluated compliance with the requirements listed in the WIPP HWFP WAP. The team also reviewed the AK record with respect to relevant requirements of the WIPP WAC and, specifically for the RH waste stream, the requirements of the RH TRU WCPIP, Rev. 3. A significant portion of the audit addressed the status of enhanced AK products for the waste streams examined with the upper-tier requirements identified in the WIPP WAC, Appendices H and I.

The AK auditors reviewed the latest revision to the AK summary reports for the distinct waste streams representing the respective SCGs identified above. The AK summary reports and respective waste stream designations are as follows:

• CCP-AK-ORNL-001, Rev. 11, for CH S5000 waste stream OR-NFS-CH-HET-A and S4000 waste stream OR-NFS-CH-SOIL
• CCP-AK-ORNL-002, Rev. 5, for CH S5000 waste stream OR-REDC-CH-HET
• CCP-AK-ORNL-500, Rev. 6, for RH S5000 waste stream OR-REDC-RH-HET
These AK summary reports were reviewed by the audit team with respect to the information that relates to specific WAP and WAC requirements. In addition, WSPFs or draft WSPFs and attachments were examined for each audited waste stream. Numerous AK source documents were reviewed to establish support for the waste stream descriptions and parameters noted in the AK summaries, including descriptions of waste processing activities, assignment of hazardous waste numbers, identification of the two most prevalent radionuclides, and the management of the containers in the waste streams.

The audit team performed a detailed review of AK source document C354 for waste stream OR-NFS-CH-HET-A. The document is an evaluation of a subpopulation of this waste stream that was machine compacted to the extent that some of the waste containers could not be examined by RTR; that is, the waste mass was impenetrable by RTR and the absence of prohibited items could not be verified. Since VE of the waste mass could not provide any additional information, AK has been used to demonstrate the absence of prohibited items as allowed by the WAP, section C1-1. The waste material parameter weights were assigned from the average weights calculated from the RTR data for the machine-compacted waste population that could be successfully examined by RTR.

The audit team also examined the following completed attachments from CCP-TP-005 for the distinct waste streams identified above: the respective AK Documentation Checklist (Attachment 1); the AK Information List (Attachment 4); the AK Hazardous Constituents List (Attachment 5); the respective AK Waste Form, Waste Material Parameters, Prohibited Items, and Packaging (Attachment 6), alongside the justification memoranda for waste material parameter weight estimates; the Radionuclides List (Attachment 7) and AK/NDA memoranda for the CH waste streams; and the Waste Containers List (Attachment 8), together with the Add-Containers documentation that demonstrates that the parameters and properties of containers added to a waste stream are examined to assure that the assignment is appropriate. For some of the attachments, no changes have occurred since the initial draft. CCP-TP-005 requires that when AK summary reports are revised, AK Attachments 5, 6, and 7 must be reexamined and reissued with a new date, even if there are no changes. The audit team confirmed this activity for the AK summary report that had been revised since the previous recertification audit. The auditors also examined the Container Tracking Spreadsheet and reconciled that data with the AK Waste Container List.

Examples of the resolution of AK discrepancies in the AK record and discrepancy resolution at characterization, alongside the associated AK reevaluation forms, were reviewed and added to the AK objective evidence. With regard to non-compliant waste containers, the auditors examined NCRs dealing with prohibited items and compiled objective evidence of container inspection prior to characterization activities. Further, an examination was performed on the available Waste Stream Characterization Checklists and supporting data, reconciling the results of characterization activities with the information in the AK record. AK Accuracy Reports were also reviewed and evaluated by the audit team.
The WAP-required container traceability exercise was conducted by the audit team for a total of nine waste containers from the four waste streams. The containers selected provided BDRs for RTR, VE, NDA, and the DTC processes. Additional traceability documentation was collected through IDC database screenshots, AK tracking spreadsheet data, waste container lists, and ORNL waste container input forms completed by the waste generators.

For waste stream OR-REDC-RH-HET, the AK auditors also reviewed and compiled objective evidence that demonstrates compliance with the requirements of the RH TRU WCPIP as noted above. Documents reviewed included a RH TRU WCPIP-compliant AK Accuracy Report, the CCP TRU Waste Correlation and Surrogate Form, and Characterization Reconciliation Reports (CRRs), with the examination of relevant AK source documents supporting these RH TRU WCPIP requirements.

In addition, the audit team reviewed training records for six Acceptable Knowledge Experts and sixteen SPMs who have participated or could potentially participate in characterization activities for ORNL/CCP. The audit team reviewed BDRs, discrepancy resolutions, and NCRs. The audit team examined the handling of AK records for compliance with preparation, legibility, accuracy, review, approval, and maintenance requirements. The distribution, control, and use of appropriate AK procedures was reviewed. The audit team also examined the most recent internal audit report relevant to AK, NWP Quality Assurance Audit I18-01, completed November 2, 2017, at the Los Alamos National Laboratory. Although this internal audit report was not specific to ORNL, the activities evaluated are relevant to all of CCP’s sites. In addition, the audit team examined nine NWP Quality Assurance surveillances specific to ORNL/CCP characterization activities, five of which were performed since the last audit which include NWP surveillances S17-31, S17-41, S17-45, S17-55, and S18-03.

A significant part of the AK portion of this recertification audit was dedicated to the review of enhanced AK products for the waste streams audited. Those enhanced AK products include the Interface Waste Management Documents List (IWMDL), AK Assessments (AKA), Chemical Compatibility Evaluation (CCE), BoK, and AK Briefings.

IWMDL
An Interface Waste Management Documents List (AK Attachment 9) has been developed and maintained for two of the four waste streams audited; that is, OR-REDC-CH-HET and OR-REDC-RH-HET. A single IWMDL covers activities in the TWPC for both of these waste streams. The IWMDL includes a current list of generator site plans, procedures, and reports associated with current waste management and packaging (e.g., waste management, waste generation, waste treatment, waste packaging, waste repackaging, waste remediation, waste stream delineation, and waste characterization procedures) that have the ability to affect waste stream characterization and certification activities. During this audit, the team examined objective evidence that assured that revisions to these procedures were identified, reviewed, and properly documented. An IWMDL has not been prepared for the OR-NFS-CH-SOIL waste stream.
AK Assessments
AK Assessments have been completed for the OR-NFS-CH-HET-A, OR-NFS-CH-SOIL, and OR-REDC-CH-HET waste streams. The AK Assessment for OR-NFS-CH-SOIL was examined by the AK auditors during CBFO Surveillance S-17-40 in 2017. The AKAs for the other two waste streams were thoroughly reviewed during this audit, including the examination of supporting AK source documents and Document Review Record (DRR) comments from CCP reviewers. In addition, the SPM-prepared checklists from CCP-TP-200 were compiled and reviewed. The lists of containers covered by the AKAs were also examined and compared with data on the AK Tracking Spreadsheet. An AKA for the OR-REDC-RH-HET waste stream had not been developed at the time of the audit.

CCE
A CCE Memorandum for waste stream OR-NFS-CH-SOIL has been prepared, reviewed, and approved by the CBFO. It was examined during CBFO Surveillance S-17-40 in 2017. A draft CCE for waste stream OR-NFS-CH-HET-A was reviewed during this audit by the audit team. The review process included a detailed examination of the CCE, the DRRs from the CCP internal review, and DRR comments from the CBFO reviewers. In addition, the audit team conducted a review of a CCE that covered both the OR-REDC-CH-HET and the OR-REDC-RH-HET waste streams. This is possible because the chemical and physical properties of these waste streams are essentially identical. The CCE for the REDC (Radiochemical Engineering Development Center) waste streams has received final approval from the CBFO.

AK Briefings
When an AK summary report is revised, current CCP and WIPP WAC guidance requires that a presentation be prepared and provided to requisite CCP waste characterization staff. In addition, if the waste stream covered by the AK summary has an IWMDL, the points-of-contact and Subject Matter Expert, along with the generator site SMR, are required to attend the briefing. For the two AK summary reports revised since the last audit, CCP-AK-ORNL-002 and CCP-AK-ORNL-500, the audit team examined a copy of the briefing presentations and also compiled an attendance list that confirmed that all appropriate personnel were briefed.

Basis of Knowledge
With the exception of waste stream OR-NFS-CH-SOIL, none of the waste streams reviewed during this audit have met the requirements of the BoK procedure as described in DOE/WIPP-17-3589, Basis of Knowledge for Evaluation Oxidizing Chemicals in TRU Waste. The BoK determination for waste stream OR-NFS-CH-SOIL was made prior to the issuance of the BoK procedure. The CCP was able to document that this waste stream contains no oxidizing chemicals and was thus approved under CBFO management procedure (MP) 4.15, Review of TRU Waste Acceptable Knowledge Documents.
The audit team documented one concern that addressed the evaluation of the machine-compacted waste in waste stream OR-NFS-CH-HET-A, AK Source Document C354, *Evaluation of Machine-Compacted Waste Generated at Nuclear Fuel Services*. It was recommended that the source document be revised for clarification as follows: On page two, indicate that the number of TRU drums containing pucks that were successfully examined by the RTR process was 288; add relevant AK source documents to the evaluation such as a reference to the study that concluded that the source of detectable liquid in drums received at ORNL from the compaction process at SEG was the result of evaporation and condensation of residual moisture; consider deleting language in the conclusion paragraph on page four regarding TWPC "procedures" that have no relevance to this evaluation and may be improperly interpreted (see Recommendation in section 6.4).

The auditors concluded that with respect to upper-tier requirements, the CCP AK processes applied to the four waste streams representing the three SCGs examined are adequate with respect to procedural compliance with requirements of upper-tier documents. However, since all of the requisite enhanced AK products have not been completed, implementation and effectiveness must be deemed indeterminate.

### 5.4.2 Project-Level Data Validation and Verification

The audit team conducted interviews with responsible personnel and reviewed the following implementing procedures relative to the PL/V&V process to determine the degree to which the procedures address upper-tier requirements:

- CCP-PO-045, Rev. 3, *CCP Waste Management Field Observation*
- CCP-TP-001, Rev. 22, *CCP Project Level Data Validation and Verification*
- CCP-TP-002, Rev. 27, *CCP Reconciliation of DQOs and Reporting Characterization Data*
- CCP-TP-200, Rev. 3, *Enhanced Acceptable Knowledge Review*
- CCP-TP-201, Rev. 0, *Verification of Shipping Criteria and Emplacement Criteria*
- CCP-TP-500, Rev. 15, *CCP Remote-Handled Waste Visual Examination*
- CCP-TP-504, Rev. 20, *CCP Dose-to-Curie Survey Procedure for Remote-Handled Transuranic Waste*

Results of the review indicate that the procedures adequately address upper-tier requirements.
The audit team evaluated the following BDRs in support of both CH and RH waste characterization activities completed at the ORNL to verify that PL/V&V activities are performed in compliance with applicable procedural requirements:

**RTR**
- OR-RTR6-0822
- OR-RTR6-0840
- OR-RTR6-0842
- OR-RTR6-0843
- OR-RTR6-0849
- OR-RTR6-0856
- OR-RTR6-0859

**VE**
- ORNLRHVE17006
- ORNLRHVE17009
- ORNLRHVE17014
- ORNLRHVE17038
- ORNLRHVE17039
- ORVECH0180
- ORVECH0185
- ORVECH0173

**NDA**
- OR-IQ3-0734
- OR-IQ3-0710
- OR-MILCC2-0360
- OR-MILCC2-0376
- OR-MILCC2-0408
- OR-MILCC2-0419
- OR-MILCC2-0425
- OR-MILCC2-0427
- OR-MILCC2-0433

**DTC**
- ORRHDTC16025
- ORRHDTC17004
- ORRHDTC17007

**Radiological Characterization**
- ORRH170

The audit team reviewed WSPFs for OR-CHEM-CH-HET, OR-ISTP-CH-HET, OR-REDC-CH-HET, and OR-NFS-CH-SOIL (Rev.1). The WSPFs were properly completed with Characterization Information Summaries (CIS). CIS lots were reviewed for OR-CHEM-CH-HET lots 7 and 8, OR-ISTP-CH-HET lots 16 and 17, and OR-NFS-CH-SOIL lot 33.

The audit team verified the required quarterly repeat of the DGL data by the project level for the following:

- **4th** Quarter 2017 Requests and Results for VE, RTR, RH-VE
- **3rd** Quarter 2017 Requests and Results for RTR and RH-VE (CH VE was not completed during the 3rd Quarter of 2017)
- **2nd** Quarter 2017 Requests and Results for VE, RTR, RH-VE
- **1st** Quarter 2017 Requests and Results for VE, RTR, RH-VE

The results from each quarterly package indicate there were no inconsistencies reported in the data.
The audit team reviewed all of the completed Waste Management Field Observation Planning (Attachment 1) and Waste Management Field Observation Results (Attachment 2) from CCP-PO-045. The results from the review of the completed Attachments 1 and 2 indicate there were no inconsistencies reported in the data.

Prior to the audit, it was noted that CCP-TP-201 was obsoleted on December 12, 2017, as the last of the waste in the WIPP Waste Handling Building had been approved for downloading into the underground and the procedure was no longer needed.

During the previous recertification audit, A-17-21, CAR 17-032 was written due to a non-editorial change made to a BDR. During the performance of this audit, the audit team did not observe any instances similar to the CAQ identified in CAR 17-032, suggesting that the corrective actions taken were adequate in precluding recurrence.

The procedures reviewed and objective evidence assembled and evaluated during the audit provided evidence that the applicable requirements for PLV&V activities are adequately established for compliance with upper-tier requirements, satisfactorily implemented, and effective in achieving the desired results. No concerns were identified.

5.4.3 Real-time Radiography

The audit team evaluated the adequacy, implementation, and effectiveness of ORNL/CCP activities to characterize CH SCGs S4000 soils/gravel waste and S5000 debris waste using RTR Unit #6. BDRs from RTR Unit #6 were evaluated during the audit.

The audit team conducted interviews with responsible personnel and reviewed the following implementing procedures relative to the RTR process to determine the degree to which the procedures address upper-tier requirements:

- CCP-PO-001, Rev. 22, CCP Transuranic Waste Characterization Quality Assurance Project Plan
- CCP-QP-002, Rev. 44, CCP Training and Qualification Plan
- CCP-QP-041, Rev. 2, CCP Job Needs Analysis and Design
- CCP-QP-043, Rev. 1, CCP Operations Level Training and Qualification
- CCP-TP-028, Rev. 10, CCP Radiographic Training Container Construction
- CCP-TP-053, Rev. 16, CCP Standard Real-Time Radiography (RTR) Inspection Procedure
- CCP-TP-165, Rev. 3, CCP Real-Time Radiography #6 Operating Procedure
Results of the review indicate that the procedures adequately address upper-tier requirements.

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

- OR-RTR6-0815
- OR-RTR6-0822
- OR-RTR6-0828
- OR-RTR6-0832
- OR-RTR6-0840
- OR-RTR6-0842
- OR-RTR6-0843
- OR-RTR6-0848
- OR-RTR6-0849
- OR-RTR6-0851
- OR-RTR6-0855
- OR-RTR6-0856
- OR-RTR6-0858
- OR-RTR6-0859
- OR-RTR6-0860

The audit team observed RTR operations for RTR Unit #6, interviewed the RTR operators, and verified the use of current AK summaries and RTR operating procedures. The audit team also examined RTR Unit #6 operational logbook CCP-CH-ORNL-RTR-Unit6-02, 2018, ORNL-TWPC-RTR6, 7880J and CCP-CH-ORNL-RTR-Unit6-01, 2017, ORNL-TWPC-RTR6, Building 7880J, and verified logbook entries were reviewed by the VPM, as required. The audit team observed the image (lines/pair) test and the RTR characterization scan on containers NFSS7931488 and NFSS7931512 from BDR OR-RTR6-0875 and waste stream OR-NFS-CH-SOIL performed on RTR Unit #6. The RTR unit contained the components required by the HWFP WAP to effectively characterize waste from each CH SCG subject to the scope of the audit.

The audit team verified that RTR operators were appropriately trained and qualified as required by the HWFP WAP and procedures CCP-QP-002 and CCP-QP-043. The audit team examined required RTR operator training container data and evaluation sheets, with the applicable audio/video media for three RTR operators. RTR training and qualification records reviewed included ASNT SNT-TC-1A certificates; container inventory sheets (as required by CCP-TP-028, Attachment 1); annual eye exams; and waste stream training for the applicable AK summaries. Semiannual training and requalification documentation and associated audio/video media were also evaluated and found to be compliant with applicable requirements.

The procedure reviews, field observations, and document reviews provided evidence that the applicable requirements for RTR are adequately established for compliance with upper-tier requirements, satisfactorily implemented, and effective in achieving the desired results. No concerns were identified.

5.4.4 Visual Examination

The audit team evaluated the adequacy, implementation, and effectiveness of ORNL/CCP activities to characterize CH SCGs S4000 soils/gravel waste and CH and RH SCG S5000 debris waste relative to the VE process.
The audit team conducted interviews with responsible personnel and reviewed the following implementing procedures relative to the VE process to determine the degree to which the procedures address upper-tier requirements:

- CCP-TP-113, Rev. 21, *CCP Standard Contact-Handled Waste Visual Examination*
- CCP-TP-500, Rev. 15, *CCP Remote-Handled Waste Visual Examination*
- CCP-QP-002, Rev. 44, *CCP Training and Qualification Plan*
- CCP-QP-043, Rev. 1, *CCP Operations Level Training and Qualification*

Results of the review indicate that the procedures adequately address upper-tier requirements.

The ORNL/CCP uses the two-operator method when performing VE characterization of waste. The audit team interviewed VE operators and the VEE. The audit team also examined the VE operational logbooks (CCP-CH-ORNL-VE-02 and CCP-RH-ORNL-VE-02) and verified logbook entries were logged correctly and reviewed by the VPM as required. During the audit, the VE audit team toured the TWPC Hot Cell Facility and observed VE being performed on RH container ORRH00993 and CH container X10C0503127A.

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

- ORNLRHVE17009
- ORNLRHVE17011
- ORNLRHVE17034
- ORNLRHVE17038
- ORNLRHVE17039
- ORNLRHVE17042
- ORNLRHVE17048
- ORNLRHVE17057
- ORNLRHVE18002
- ORNLRHVE18004
- ORVECH0173
- ORVECH0177
- ORVECH0180
- ORVECH0182
- ORVECH0185
- ORVECH0187
- ORVECH0189

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

The audit team examined the approved M&TE list and calibration results for scales WIPP002, torque wrenches WIPP124 and WIPP150, and test weights WIPP116.
The audit team also verified continued corrective actions for CAR 17-031 identified during the previous recertification audit, A-17-21, related to the use of an obsolete version of an SPM Appointment Letter form to prepare an SME/VEE appointment letter. No similar instances were identified during this audit.

The procedure reviews, field observations, and document reviews provided evidence that the applicable requirements for VE are adequately established for compliance with upper-tier requirements, satisfactorily implemented, and effective in achieving the desired results. No concerns were identified.

5.4.5 Nondestructive Assay

The audit team conducted interviews with responsible personnel and reviewed the following implementing procedures relative to the NDA process to determine the degree to which the procedures address upper-tier requirements:

- CCP-TP-046, Rev. 6, CCP Mobile IQ3 System Calibration Procedure
- CCP-TP-047, Rev. 13, CCP Mobile IQ3 Gamma Scanner Operation
- CCP-TP-048, Rev. 17, CCP ORNL NDA System Data Reviewing, Validating, and Reporting Procedure
- CCP-TP-076, Rev. 2, CCP Operating the Mobile ISOCS Large Container Counter Using NDA 2000
- CCP-TP-077, Rev. 2, CCP Calibrating the Mobile ISOCS Large Container Counter Using NDA 2000
- CCP-TP-058, Rev. 6, CCP NDA Performance Demonstration Program

Results of the review indicate that the procedures adequately address upper-tier requirements.

The audit team evaluated the adequacy, implementation, and effectiveness of NDA activities at ORNL to characterize CH SCGs S4000 soils/gravel waste and S5000 debris waste using the Mobile Qualitative and Quantitative Drum Counter with Isotopics (IQ3) and the Mobile ISOCS Large Container Counter 2 (MILCC2).

IQ3

The audit team interviewed IQ3 personnel, which included operators and NDA EAs. The audit team also reviewed electronic and paper copies of reports and records. Further, based on a review of the current revisions of CBFO requirements documents (WIIPP WAC, Rev. 8) and CCP procedures (listed above), checklists were prepared and used to evaluate the following:
Operability and condition of the IQ3 since the previous recertification audit, A-17-21


Successful calibration verifications and calibration confirmation, as required

Applicability of each system's calibration and operational range to the waste assayed since the previous recertification audit, A-17-21

Successful participation in the CBFO-sponsored PDP (Cycle 24A)

Completed BDRs to ensure data are collected, analyzed, reviewed, and reported as required

Data storage and retrievability

CCP-CH-ORNL-NDA-IQ3-01, 2017 IQ3 NDA Operational Logbook

ENV4057, Mixed Gamma Standard Certificate of Calibration, Serial Number 65536

Operator Aid: OA-ORNL-0123-11, Operator Aid IQ3 for Performance Checks and Standard Assay, dated December 19, 2016

CCP-CH-ORNL-NDA-IQ3-02, IQ3 NDA Operational Logbook 2018

The following IQ3 BDRs were reviewed prior to and during the audit:

- OR-IQ3-0734
- OR-IQ3-0740
- OR-IQ3-0774
- OR-IQ3-0736

MILCC2

The audit team interviewed MILCC2 operators, observed actual measurement operations, and interviewed ORNL/CCP representatives to verify compliance with operating procedures and governing requirements applicable to NDA.

The audit team reviewed the following BDRs during the audit:

- OR-MILCC2-0355
- OR-MILCC2-0360
- OR-MILCC2-0376
- OR-MILCC2-0395
- OR-MILCC2-0400
- OR-MILCC2-0408
- OR-MILCC2-0415
- OR-MILCC2-0417
- OR-MILCC2-0419
- OR-MILCC2-0420
- OR-MILCC2-0425
- OR-MILCC2-0427
- OR-MILCC2-0433
- OR-MILCC2-0437


The following documents were reviewed by the audit team during the audit:

- CI-MILCC2-NDA-1001, Calibration Report for the MCS Mobile ISOCS Large Container Counter 2 (MILCC II) at the Transuranic Waste Processing Center in Oak Ridge, TN, Rev. 0, dated March 10, 2014
- CI-MILCC2-NDA-1003, Calibration Confirmation Report for Measurement of 6” and 12” Pipe Overpack Containers Using the MCS MILCC2, dated February 11, 2015
- CI-MILCC2-CAL-CONF-2014-1, Calibration Confirmation and Verification Test Plan for the MCS MILCC2 at the Transuranic Waste Processing Center, Rev. 0, dated January 22, 2014
- CI-MILCC2-NDA-1009, Calibration Verification Report for the MCS MILCC2, Rev. 0, dated March 7, 2017
- CCP-CH-ORNL-NDA-MILCC-01, 2017 MILCC2 NDA Operational Logbook
- EuNa Dec2013-79, Source Certificate, 4066298 Data Sheet, Spectrum Techniques
• EuNa Dec2013-80, Source Certificate, 400298 Data Sheet, Spectrum Techniques

• Verification of Live Time Correction Factor for Lynx Digital Signal Analyzer (DSA), Canberra, January 27, 2015

• Operator Aid: OA-ORNL-0134-14, MILCC2 Assay Detector Positions and Count Times, Dated: July 31, 2014

• CCP-CH-ORNL-NDA-MILCC-02, MILCC2 NDA Operational Logbook 2018

The procedure reviews, field observations, and document reviews provided evidence that the applicable requirements for NDA are adequately established for compliance with upper-tier requirements, satisfactorily implemented, and effective in achieving the desired results. No concerns were identified.

5.4.6 Radiological Characterization (Dose-to-Curie)

The audit team conducted interviews with responsible personnel and reviewed the following implementing procedures relative to the DTC process to determine the degree to which the procedures address upper-tier requirements:

• CCP-TP-504, Rev. 20, CCP Dose-to-Curie Survey Procedure for Remote-Handled Transuranic Waste

• CCP-TP-509, Rev. 6, CCP Remote-Handled Transuranic Container Tracking

Results of the review indicate that the procedures adequately address upper-tier requirements.

The audit team evaluated the adequacy, implementation, and effectiveness of the DTC methodology used by the ORNL/CCP to characterize RH SCG S5000. The audit team interviewed operators, observed actual measurement operations, and interviewed ORNL/CCP representatives to verify compliance with operating procedures and governing requirements applicable to RH DTC.

The following documents were reviewed and provided to the audit team prior to and during the audit:

• CCP-AK-ORNL-500, Rev. 6, CCP AK Summary Report for ORNL Radiochemical Engineering Development Center RH Transuranic Waste


• CCP-AK-ORNL-503, Rev. 2, CCP ORNL QA Equivalency Report and Procedure Matrix for RH TRU Debris Waste

• CCP-AK-ORL-505A, Rev. 1, CCP Nondestructive Assay Sampling Plan for ORNL Radiochemical Engineering Development Center RH Transuranic Waste (Pre-SETF)

• CCP-AK-ORL-505B, Rev. 1, CCP Nondestructive Assay Sampling Plan for ORNL Radiochemical Engineering Development Center RH Transuranic Waste (SETF)

• CCP-AK-ORNL-510, Rev. 1, CCP AK Summary Report for ORNL Irradiated Fuels Examination Laboratory RH TRU Waste - Waste Stream: OR-RF-RH-HET


• CCP-AK-ORNL-520, Rev. 0, CCP AK Summary Report for ORNL RH TRU Waste From Analytical Chemistry Laboratory Operations - Waste Stream: OR-CHEM-RH-HET


• CCP-RH-ORNL-DTC-01, Operational Logbook for Remote-Handled Dose-to-Curie Operations – Calendar year 2017

• RH Cf-252 Source Certificate, FTC-CF-5603, Model 100

• RH Cs-137 Source Certificate, CS730110005M, Nominal Source Data Sheet

• WIPP191-12-4, Probe Setup Sheet, CCP M&TE ID #WIPP191

• WIPP191-12-4, Neutron Instrument Certificate of Calibration, ORNL Radiation Standards and Calibration Laboratory

• XC0677 Probe Setup Sheet, FHZ 612, MFG Serial #921, CCP M&TE ID# XC0677

• XC1002-42-41L, Probe Setup Sheet, Probe 42-41L CCP M&TE ID #XC1002
• Certificate of Calibration Model 2363, 42-41L, Ludlum Measurements, Inc.

• Operator Aid: OA-ORNL-0160-18, *DTC Operator Aid for Calibrations of Scales and Detectors*, Dated February 1, 2018

• CCP-RH-ORNL-DTC-02, *DTC Logbook*

The audit team reviewed the following BDRs during the audit:

• ORRHDTC16025
• ORRHDTC17004
• ORRHDTC17007
• ORRHDTC17008

• ORRHDTC17012
• ORRHDTC17014
• ORRHDTC17017
• ORRHDTC18001

• ORRHDTC18002
• ORRH1702

The procedure reviews, field observations, and document reviews provided evidence that the applicable requirements for radiological characterization are adequately established for compliance with upper-tier requirements, satisfactorily implemented, and effective in achieving the desired results. No concerns were identified.

### 5.4.7 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. 36, *CCP CH TRU Waste Certification and WWIS/WDS Data Entry*

• CCP-TP-530, Rev. 12, *CCP RH TRU Waste Certification and WWIS/WDS Data Entry*

Results of the review indicate that the procedures adequately address upper-tier requirements.

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

The audit team reviewed waste characterization case files for three CH SCG S4000 containers. ORNL CH containers NFS0667A, NFSS7932593, and X10C0506150B
were certified under the current procedural process, CCP-TP-030, Rev. 36, which provides for certification using modules of the IDC. There have been no RH waste characterization activities performed since the last recertification audit, A-17-21, so there were no RH waste characterization case files reviewed. When RH characterization activities resume, containers will be processed using CCP-TP-530, which utilizes functions of the IDC for certification and electronic submittal to WWIS/WDS.

The audit team determined that the IDC processes for CH waste container certification were performed in accordance with the appropriate procedures. Per interviews with CCP personnel, the audit team determined that personnel are familiar with the processes for characterization of RH waste containers and building of RH and CH waste packages and that procedure implementation is expected to be adequate once these activities resume.

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

The audit team interviewed WCO personnel regarding procedure work steps for performance of Unreviewed Safety Question Determinations (USQDs) and Material at Risk (MAR) evaluations. The audit team determined that WCO personnel have not received containers for certification that exceed the WIPP WAC PE-Ci limit requiring a USQD, and WCO personnel have not received a request from a transportation certification official for a high MAR evaluation. The audit team determined that WCO personnel are familiar with these two processes, simulations of procedure steps have been performed, and that implementation is expected to be adequate if personnel receive containers or evaluation requests.

The procedures reviewed and objective evidence assembled and evaluated during the audit provided evidence that the applicable requirements for WWIS/WDS data entry are adequately established, satisfactorily implemented, and effective in achieving the desired results. No concerns were identified.

5.4.8 Container Management

The audit team reviewed the implementing procedure for container management (CM) activities conducted at ORNL by the CCP. The audit team verified that CCP conducts CM activities only for CH waste, using procedure CCP-TP-068, Rev. 12, CCP Standardized Container Management. CM activities for RH waste are performed by ORNL personnel, using ORNL procedures.

The audit team interviewed personnel and examined in-process and completed records for containers undergoing waste characterization, observed CM activities from initiating
containers into the CCP characterization process to final characterization, and verified that CCP ORNL storage of acceptable containers reasonably precluded shipment of unacceptable containers to the WIPP.

The audit team verified CM activities are being performed in compliance with the applicable procedural requirements from the current procedure revision. The audit team also examined the approved M&TE list and calibration results for a scale, WIPP151, and test weight, WIPP173.

The procedure review, field observations, and document reviews provided evidence that the applicable requirements for container management are adequately established for compliance with upper-tier requirements, satisfactorily implemented, and effective in achieving the desired results. No concerns were identified.

6.0 CARs, CDAs, OBSERVATIONS, AND RECOMMENDATIONS

6.1 Corrective Action Reports

During the audit, the audit team may identify conditions adverse to quality (CAQs), as defined below, and document such conditions on a Corrective Action Report (CAR).

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 QA program.

There were no CARs issued as a result of this audit.

6.2 Deficiencies Corrected During the Audit

During the audit, the audit team may identify CAQs. Audit team members, the Audit Team Leader (ATL), and the CBFO QA Representative 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 and the CBFO QA Representative, determines if the CAQ is a minor and isolated case requiring only remedial action and therefore can be corrected during the audit.

Upon determination that the CAQ is minor and isolated, the audit team member, in conjunction with the ATL and the CBFO QA Representative, 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 CBFO QA Representative
categorizes the condition as corrected during audit (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.

No CAQs were corrected during this audit.

6.3 Observations

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

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

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

There were no Observations identified during this audit.

6.4 Recommendations

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

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.

Recommendation:

It was recommended that AK Source Document C354, Evaluation of Machine-Compacted Waste Generated at Nuclear Fuel Services, from waste stream OR-NFS-CH-HET-A, be revised for clarification as follows:
a. On page 2 indicate that the number of TRU drums containing pucks that were successfully examined by the RTR process was 288.

b. Add relevant AK source documents to the evaluation such as a reference to the study that concluded that the source of detectable liquid in drums received at ORNL from the compaction process at SEG was the result of evaporation and condensation of residual moisture.

c. Consider deleting language in the conclusion paragraph on page 4 regarding TWPC "procedures" that have no relevance to this evaluation and may be improperly interpreted.

7.0 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
<table>
<thead>
<tr>
<th>NAME</th>
<th>ORG/TITLE</th>
<th>PRE-AUDIT MEETING</th>
<th>CONTACTED DURING AUDIT</th>
<th>POST-AUDIT MEETING</th>
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</thead>
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<td>Veronica Ballew</td>
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<td>Gio Barton</td>
<td>TWPC/North Wind Solutions SMR</td>
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<td>Linda Beach</td>
<td>TWPC/North Wind Solutions Program Manager</td>
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<tr>
<td>Michele Billett</td>
<td>NWP/CCP TFE Training Specialist</td>
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<td>x</td>
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<tr>
<td>David Biswell</td>
<td>NMED Observer</td>
<td>x</td>
<td></td>
<td>x</td>
</tr>
<tr>
<td>Bob Ceo</td>
<td>NDA Lead Operator</td>
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**Definitions**

- E = Effective
- S = Satisfactory
- I = Indeterminate
- M = Marginal
- U = Unsatisfactory
- CAR = Corrective Action Report
- CDAs = Corrected During Audit
- Obs = Observation
- Rec = Recommendation
- NE = Not Effective
- A = Adequate
- NA = Not Adequate
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# NEW PROCESSES OR EQUIPMENT

NONE

# DEACTIVATED PROCESSES OR EQUIPMENT

NONE