

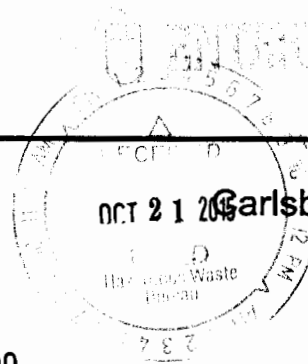
United States Government

Department of Energy

memorandum

Carlsbad Field Office

Carlsbad, New Mexico 88221



DATE: OCT 21 2015

REPLY TO
ATTN OF: CBFO:OQA:MPN:BA:15-0924:UFC 2300.00

SUBJECT: Interim Audit Report A-15-24, ANL/CCP TRU Waste Characterization and Certification

to: Mr. Dale J. Dietzel, DOE-ASO

The Carlsbad Field Office (CBFO) conducted annual Recertification Audit A-15-24, Argonne National Laboratory Central Characterization Program (ANL/CCP) Transuranic (TRU) Waste Characterization and Certification, September 29 – October 1, 2015. The interim audit report is attached.

The audit team concluded that, overall, the ANL/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.

As a result of the audit, one CBFO corrective action report was issued and transmitted under separate cover. Additionally, the audit team identified one observation.

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

Martin P. Navarrete
Senior Quality Assurance Specialist

Attachment



Mr. Dale J. Dietzel

-2-

cc: w/attachment

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U.S. DEPARTMENT OF ENERGY
CARLSBAD FIELD OFFICE

INTERIM AUDIT REPORT

OF THE

ARGONNE NATIONAL LABORATORY
CENTRAL CHARACTERIZATION PROGRAM

LEMONT, ILLINOIS,
AND CARLSBAD, NEW MEXICO

AUDIT NUMBER A-15-24

SEPTEMBER 29 – OCTOBER 1, 2015

CHARACTERIZATION AND CERTIFICATION ACTIVITIES
FOR REMOTE-HANDLED TRANSURANIC WASTE



Prepared by: Katelyn D. Martin Date: 10/14/15
Katelyn D. Martin, CTAC
Audit Team Leader

Approved by: Michael R. Brown Date: 10/21/2015
Michael R. Brown, CBFO
Director, Office of Quality Assurance

1.0 EXECUTIVE SUMMARY

Carlsbad Field Office (CBFO) Recertification Audit A-15-24 was conducted to evaluate the continued adequacy, implementation, and effectiveness of established programs for transuranic (TRU) waste characterization activities performed for the Argonne National Laboratory (ANL) by the Nuclear Waste Partnership LLC (NWP) Central Characterization Program (CCP). Characterization and certification activities for remote-handled (RH) Summary Category Group (SCG) S5000 debris waste were reviewed and evaluated for compliance to the applicable program requirements. The activities were performed consistent with the requirements described in the Waste Isolation Pilot Plant (WIPP) Hazardous Waste Facility Permit (HWFP), the *Remote-Handled TRU Waste Characterization Program Implementation Plan (WCPIP)*, the *CBFO Quality Assurance Program Document (QAPD)*, and the *Transuranic Waste Acceptance Criteria for the Waste Isolation Pilot Plant (WAC)*.

The audit was conducted simultaneously at the ANL facilities in Lemont, Illinois, and the Skeen-Whitlock Building in Carlsbad, New Mexico, September 29 – October 1, 2015. Overall, the audit team concluded that the ANL/CCP technical and quality assurance (QA) programs evaluated were adequately established for compliance with applicable upper-tier requirements, satisfactorily implemented, and effective.

Two concerns were identified during Audit A-15-24, one of which was determined to be a condition adverse to quality (CAQ) resulting in issuance of a corrective action report (CAR). The CAQ was identified in the area of visual examination (VE) (see section 6.1, CAR 16-001). The remaining concern was identified in the area of acceptable knowledge (AK) and resulted in an observation (see section 6.3, Observations).

The identified concerns are further discussed in the associated sections of this report.

2.0 SCOPE AND PURPOSE

2.1 Scope

The audit team evaluated the following ANL/CCP programs and processes for RH TRU waste characterization and certification activities for RH SCG S5000 debris waste.

The following elements 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

The following QA elements were evaluated only to the extent needed to support the technical elements listed below:

- Control of Nonconforming Items
- Personnel Qualification and Training
- Records

Technical Activities

- AK
- Project Level Data Validation and Verification (PL V&V)
- VE
- Dose-to-Curie (DTC)
- Dimensional Measurement (DM)
- WIPP Waste Information System/Waste Data System (WWIS/WDS)

The evaluation of ANL/CCP RH TRU waste activities was based on current revisions of the following documents:

- *Waste Isolation Pilot Plant HWFP*, NM4890139088-TSDF, New Mexico Environment Department
- *CBFO Quality Assurance Program Document*, DOE/CBFO-94-1012
- *Remote-Handled TRU Waste Characterization Program Implementation Plan*, DOE/WIPP-02-3214
- *Transuranic Waste Acceptance Criteria for the Waste Isolation Pilot Plant*, DOE/WIPP-02-3122
- *CCP Transuranic Waste Characterization Quality Assurance Project Plan*, CCP-PO-001
- *CCP Transuranic Waste Certification Plan*, CCP-PO-002
- *CCP/ANL RH-TRU Waste Interface Document*, CCP-PO-500
- Related technical and QA implementing procedures

2.2 Purpose

Audit A-15-24 was conducted to assess sustained compliance with requirements applicable to waste characterization and certification activities for RH SCG S5000

debris waste and to determine if these activities are adequately established and the degree to which they are effectively implemented.

3.0 AUDIT TEAM, MANAGEMENT REPRESENTATIVES, AND OBSERVERS

Martin Navarrete	Management Representative, CBFO Office of Quality Assurance
Katie Martin	Audit Team Leader (ATL), CBFO Technical Assistance Contractor (CTAC)
Tamara Ackman	Auditor, CTAC
Cindi Castillo	Auditor, CTAC
Priscilla Martinez	Auditor, CTAC
Berry Pace	Auditor, CTAC
Judith Stewart	Auditor, CTAC
Dick Blauvelt	Technical Specialist, CTAC
Rhett Bradford	Technical Specialist, CTAC
Paul Gomez	Technical Specialist, CTAC
Jim Oliver	Technical Specialist, CTAC

OBSERVERS

Gary Birge	CBFO TRU Sites and Transportation Division
Dale Bignell	CBFO Senior Management Representative

4.0 AUDIT PARTICIPANTS

The ANL/CCP individuals involved in the audit process are identified in Attachment 1. A pre-audit meeting was held at the ANL in Lemont, Illinois, and the Skeen-Whitlock Building in Carlsbad, New Mexico, on September 29, 2015. Daily management briefings were held with ANL/CCP management and staff to discuss issues and potential deficiencies. The audit was concluded with a post-audit meeting held at the ANL in Lemont, Illinois, and the Skeen-Whitlock Building in Carlsbad, New Mexico, on October 1, 2015.

5.0 SUMMARY OF AUDIT RESULTS

5.1 Program Adequacy and Implementation

The audit team concluded that the applicable ANL/CCP TRU waste characterization and certification programs for RH SCG S5000 debris waste are adequately established for compliance with upper-tier requirements, satisfactory in the implementation of these requirements, and effective in achieving the desired results.

A summary table of audit results is provided in Attachment 2. Audit activities, including objective evidence reviewed, are described below and in checklists and/or forms for objective evidence reviewed. Attachment 3 contains a list of documents that were

assessed during the audit. Attachment 4 lists the processes and equipment evaluated during the audit.

5.2 General Activities

5.2.1 Results of Previous Audits

The audit team examined the results of the previous CBFO Recertification Audit (A-14-20) of the ANL/CCP. Audit A-14-20 identified two CAQs, which resulted in the initiation of CARs 14-061 and 14-062. CAR 14-061 regarded an incorrect annotation on one DTC batch data report (BDR) and CAR 14-062 dealt with an error/lack of information on a Site Project Manager (SPM) checklist.

During the performance of this audit, the audit team did not observe any instances similar to the conditions identified in the previous audit, suggesting that the corrective actions taken to address those CAQs were adequate in precluding recurrence.

5.2.2 Changes in Programs or Operations

The audit team determined through interviews with the CCP RH Operations Manager that there were no significant changes in ANL/CCP programs or operations since the previous recertification audit. During the audit, the ventilation system in the Alpha Gamma Hot Cell Facility (AGHCF) was out of service due to an inoperative damper. Therefore, VE field activities/operations could not be verified.

5.2.3 New Programs or Activities Being Implemented

The audit team determined through interviews with the CCP RH Operations Manager that there were no new ANL/CCP programs or activities implemented since the previous recertification audit.

5.2.4 Changes in Key Personnel

Interviews with the ANL/CCP management team concluded that there were no significant changes in key personnel since CBFO Recertification Audit A-14-20.

5.2.5 ANL/CCP Program Interface

The audit team reviewed the current revisions of CCP-PO-500, CCP-PO-001, and CCP-PO-002, to verify the documents address the requirements in the WIPP HWFP Waste Analysis Plan (WAP) and DOE/WIPP 02-3122. The results of this review indicate that the documents adequately address the associated requirements.

The audit team interviewed the CCP RH Operations Manager, the CCP Vendor Project Manager (VPM), and the Site Technical Representative (STR) responsible for ANL waste characterization activities. The audit team reviewed objective evidence to

confirm establishment of requirements specified in the ANL/CCP Interface Document, CCP-PO-500, Revision 6, dated June 21, 2013, for RH TRU waste characterization activities. Requirements and implementation for the following elements were examined:

- ANL-provided radiological controls
- ANL site-specific training
- AK summary report provisions
- QA validation of nonconformance reports (NCRs)
- QA receipt inspections
- Program document review coordination
- Host-site performance of QA assessments
- Certified container segregation
- VPM daily pre-operational briefings
- Measuring & test equipment (M&TE) recall notifications
- Site-provided bioassay participation
- CCP QA surveillances

CCP-PO-500 is in the process of being revised to include the requirements of the newly issued CCP-PO-043, Rev. 0, *CCP Interface Document Preparation*.

As a result of personnel interviews and reviews of objective evidence, the requirements specified in the interface documents were determined to be adequate, satisfactorily implemented, and effective. No concerns related to the interface documents were identified.

5.3 Quality Assurance Activities

5.3.1 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 the CCP NCR Coordinator and reviewed the NCR log and selected all of the NCRs generated since the previous audit for review.

NCR-RHANL-0320-14, Rev. 0
NCR-RHANL-0214-15, Rev. 0
NCR-RHANL-0413-15, Rev. 0 and Rev. 1

The team concluded that deficiencies are being appropriately documented and tracked through resolution as required. There were no NCRs generated that required reporting to the Permittee within seven days, as prescribed by the Permit. All the NCRs examined were verified to have been entered, managed, and tracked in the CCP Integrated Data Center (IDC)/Nonconformance Report Log, and through the required reconciliation reporting mechanism.

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

5.3.2 Personnel Qualification and Training

The audit team conducted interviews with responsible personnel and reviewed implementing procedure CCP-QP-002, Rev. 39, *CCP Training and Qualification Plan*, to determine compliance with upper-tier requirements of the CBFO QAPD. Personnel training record packages that are associated with VE, DTC, AK Experts (AKEs), and SPM positions were examined to verify implementation of associated requirements and to verify that personnel performing characterization activities are appropriately qualified. Training record packages were determined to be adequate and included appropriate qualification cards, appointment letters, and other associated qualification documentation. Packages included attendance sheets for required briefings on AK waste stream summary training for VE operators.

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

5.3.3 QA 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 the following CCP procedures:

- CCP-PO-001, Rev. 21, *CCP Transuranic Waste Characterization Quality Assurance Project Plan*
- CCP-PO-002, Rev. 27, *CCP Transuranic Waste Certification Plan*
- CCP-QP-008, Rev. 24, *CCP Records Management*
- CCP-QP-028, Rev. 16, *CCP Records Filing, Inventorying, Scheduling, and Dispositioning*

Details for control of QA records were verified by review of the Records Inventory and Disposition Schedule dated June 15, 2015, for NWP/CCP RH (All Sites).

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

5.3.4 Container Management

The audit team reviewed implementing procedure CCP-TP-509, Rev. 6, *CCP Remote-Handled Transuranic Container Tracking*, to determine the degree to which it adequately addresses applicable upper-tier requirements. The results of this review confirmed that the procedure continues to adequately address upper-tier requirements.

During the course of this audit, the only field operations being performed and observed were DTC activities in Building #331-Shell. Movement of containers at ANL is performed by ANL personnel; therefore, the only container management requirements applicable to CCP personnel are the requirements in section 4.3 of CCP-TP-509. During DTC activities, the audit team observed a survey of a 30-gallon container (container ID #1356). This container was confirmed to be identified on the CCP AK Tracking Spreadsheet (AKTS), as required by procedural step 4.3.1. The dose acquisition was performed compliantly with CCP-TP-504, *CCP Dose-To-Curie Survey Procedure for Remote-Handled Transuranic Waste*, Rev. 17, as required by step 4.3.3. During the course of this dose acquisition, there was no condition necessitating the initiation of an NCR, which would have been required by step 4.3.4 if necessary. There was no evidence observed suggesting questionable integrity of the container. The container was confirmed to be appropriately and legibly identified as required for traceability.

The procedure reviews, field observations, and document reviews provided evidence that the applicable requirements for container management are adequately established for compliance with upper-tier requirements, satisfactory in the implementation of these requirements, 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 HWFP is cited briefly, and the result of the assessment is provided.

5.4.1 Acceptable Knowledge

The audit team reviewed the following CCP documents/procedures as they relate to AK to determine the degree to which they adequately address applicable upper-tier requirements:

- CCP-PO-001, Rev. 21, *CCP Transuranic Waste Characterization Quality Assurance Project Plan*
- CCP-QP-005, Rev. 25, *CCP TRU Nonconforming Item Reporting and Control*
- CCP-QP-021, Rev. 10, *CCP Surveillance Program*
- CCP-TP-001, Rev. 21, *CCP Project Level Data Validation and Verification*

- CCP-TP-002, Rev. 26, *CCP Reconciliation of DQOs and Reporting Characterization Data*
- CCP-TP-005, Revs. 26 and 27, *CCP Acceptable Knowledge Documentation*
- WP 13-QA.03, Rev. 24, *Quality Assurance Independent Assessment Program*

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

The audit team examined AK summary reports and approved waste stream profile forms (WSPFs) for waste stream AERHDM, SGC S5000 debris associated with activities in the ANL AGHCF and the K-Wing Hot Cells at ANL.

The AK portion of this recertification audit was based upon the requirements contained in the WIPP HWFP, specifically the WAP, and also based upon requirements of the WIPP WAC. The audit team reviewed documentation to support all applicable AK requirements, completing WAP C6-2 and C6-1 checklists and applicable WAC checklists, and compiling and reviewing objective evidence to demonstrate compliance.

This stream, designated as AERHDM, originally consisted of 44 30-gallon drums of debris waste from the AGHCF, for which VE tapes of packaging done by ANL staff were reviewed by CCP personnel. Subsequently, the waste stream has been expanded with the packaging of additional debris drums and fuel examination waste (FEW) from the AGHCF and the K-Wing Hot Cells, along with solidified liquid waste in the K-Wing that was consolidated, sampled, and incorporated into K-Wing debris waste containers. Documentation of the most recent projections was reviewed during this audit and indicates a total waste stream population of 81 55-gallon drums from the K-Wing (complete) and 621 30-gallon drums from the AGHCF. The AK record for all aspects of this waste stream was examined to demonstrate that the waste stream has been properly delineated and populated and that applicable waste stream parameters, including the assignment of hazardous waste numbers, the waste stream physical characteristics and estimate of waste material parameter weights, and the characterization of the radiological properties of this waste stream have been completed in accordance with all applicable requirements.

The AK auditors reviewed the latest revision to the AK Summary Report for this waste stream, CCP-AK-ANLE-500, Rev. 13, and a copy of the WSPF and attachments in addition to numerous AK source documents to establish support, as noted above, for the conclusions noted in the AK summary.

The audit team also examined the following completed procedure attachments for the waste stream, as required by CCP procedure CCP-TP-005: Attachment 1, *AK Documentation Checklist*; Attachment 4, *AK Information List*; Attachment 5, *Hazardous Constituents*; Attachment 6, *Waste Form, Waste Material Parameters, Prohibited Items, and Packaging*, along with the attached justification memorandum for waste material parameter weight estimates; and Attachment 8, *Waste Containers List*, with memoranda

supporting the addition of containers to the waste stream as applicable. Examples of the resolution of AK discrepancies in the AK record, WAP-compliant AK Accuracy Report, and the most recent internal audit/surveillance were also collected and examined. In addition, screenshots from the IDC database, a copy of the AKTS, and ANL WMO-195 waste container input forms for individual containers were reviewed. The following three documents were reviewed as a result of the most recent revision to CCP-TP-005: Interface Waste Management Documents List, Acceptable Knowledge Assessment, and Chemical Compatibility Evaluation Memorandum. The Interface Waste Management Documents List has been prepared for waste stream AERHDM and is in the AK record. The AK Assessment will be performed for each new waste stream and existing waste streams with unshipped containers. The AK Assessment for waste stream AERHDM is in process. AK source document C6001 was reviewed and is included in the objective evidence as an example of the intent of this process. The Chemical Compatibility Evaluation Memorandum is in process. A copy of the memorandum has been included in the objective evidence compilation to describe the application of the process. In addition, several AK source documents related to the use and properties of Acid Bond 660 (Nochar A660) and other absorbents were examined.

The WAP-required traceability exercise was performed for five of the drums (1231, 1299, 1321, 1328, and RW48260) that have been completed through the characterization and certification process, including a review of relevant VE BDRs and both DTC and dimensional data packages specifically for the FEW. The reconciliation of characterization data with the AK record, including a review of the applicable Waste Stream Characterization Checklists, was completed.

The AK auditors also examined the AK record and compiled objective evidence that demonstrates compliance with the requirements of the WCPIP, as noted above. Documents reviewed included CCP-AK-ANLE-500, Rev. 13; CCP-AK-ANLE-501, Rev. 11, *CCP RH TRU Radiological Characterization Technical Report*; a WCPIP-compliant AK Accuracy Report; and Characterization Reconciliation Reports, along with the examination of relevant AK source documents. The audit team verified that nonconforming data and discrepancies between AK documentation and characterization results are being appropriately identified, reported, and documented on NCRs, and the affected waste containers associated with the discrepant conditions are controlled, as required, until resolution of the deficient conditions is completed. Training records for AKEs and SPMs were reviewed and found to be in compliance with the requirements of the training program.

The audit team verified that AK documentation is developed and maintained in accordance with controlled implementing procedures. Additionally, the audit team verified that the records generated while developing AK documentation are identified in the records section of each procedure and located in the CCP Records Center as required. The audit team verified that record copies of the BDRs selected for verification of the traceability exercise were legible, accurate, and complete, and properly numbered. The audit team verified that corrections to the selected BDRs and associated forms were made according to procedural requirements. Further, the audit

team verified that NWP QA conducts annual independent assessments of the CCP program, which includes evaluation of the AK program.

The AK audit team identified one concern. The CCP AKEs have developed an in-process Chemical Compatibility Evaluation Memorandum for waste stream AERHDM. The document is a very comprehensive and thorough review of all of the chemicals identified for this waste stream and lists whether the chemical is present as a trace, minor, or major constituent. The chemicals have, as applicable, been assigned a Reactivity Group Number (RGN) from the U.S. Environmental Protection Agency (EPA) method, and corresponding reaction codes of concern were evaluated. However, CCP-TP-005, Rev. 27, section 4.4.21, notes that this exercise is a joint effort with the Transportation Engineer (TE). The finalized memorandum should provide a means to evidence the involvement of the TE (see section 6.3, Observations).

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 Validation and Verification

The audit team reviewed the following CCP procedures to determine the degree to which they adequately address PL V&V upper-tier requirements:

- CCP-TP-001, Rev. 21, *CCP Project Level Data Validation and Verification*
- CCP-TP-002, Rev. 26, *CCP Reconciliation of DQOs and Reporting Characterization Data*
- CCP-TP-005, Revs. 26 and 27, *CCP Acceptable Knowledge Documentation*
- CCP-TP-500, Rev. 15, *CCP Remote-Handled Waste Visual Examination*
- CCP-TP-504, Rev. 17, *CCP Dose-to-Curie Survey Procedure for Remote-Handled Transuranic Waste*
- CCP-TP-513, Rev. 3, *CCP Procedure for Dimensional or Gravimetric Measurements for Radiological Characterization of Remote-Handled Transuranic Waste*

The review of documented procedures indicates that the procedures adequately address upper-tier requirements.

The following WSPF/Characterization Information Summaries (CIS) and associated BDRs were reviewed:

WSPF AERHDM with CIS Lot 55 and Lot 56, and AK Discrepancy Report DR025 BDRs:

VE

ANLRHVE14004 ANLRHVE15001 ANLRHVE15002
ANLRHVE15003

DM

RHANLDG13002 (there have been no new DM BDRs since the previous audit)

DTC

ANLRHDTTC15001 ANLRHDTTC15002 ANLRHDTTC15003
ANLRHDTTC15004

The BDRs were examined to verify compliance with PL V&V per CCP-TP-001 for quarterly evaluations; CCP-TP-500 for VE; CCP-TP-504 for DTC; and CCP-TP-513 for dimensional measurements.

The waste stream AERHDM was reviewed, along with the quarterly repeat of data-generation level reviews for VE (first and second quarter of calendar year 2015). Both were determined to be compliant with project-level requirements. Training records for SPMs identified in selected BDRs were reviewed to verify required qualifications and training.

The procedures reviewed and objective evidence assembled and evaluated during the audit provided evidence that the applicable requirements for data generation-level and project-level validation and verification 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 Visual Examination

The audit team evaluated the adequacy, implementation, and effectiveness of the ANL/CCP VE characterization process for RH SCG S5000 debris waste. The audit team reviewed the following CCP procedures to determine the degree to which they adequately address upper-tier requirements:

- CCP-TP-500, Rev. 15, *CCP Remote-Handled Waste Visual Examination*
- CCP-QP-002, Rev. 39, *CCP Training and Qualification Plan*
- CCP-TP-163, Rev. 4, *CCP Evaluation of Waste Packaging Records for Visual Examination of Records*

The review determined that the procedures adequately address upper tier requirements. ANL/CCP has not performed VE of records since Audit A-14-20.

ANL/CCP uses the two-operator method when performing RH VE characterization of waste. The two qualified operators visually examine the waste and place it into containers. The audit team interviewed VE operators and the VE Expert (VEE). The audit team also examined the VE operational logbook (RH-ANLE-VE-017) and verified logbook entries were logged correctly and reviewed by the VPM as required. During the audit, the ventilation system in the AGHCF in Building 212 was out of service due to a non-working damper. Therefore, VE field activities/operations could not be observed. The audit team examined the following RH VE BDRs generated from operations performed in the AGHCF in Building 212 to verify implementation and compliance with the requirements for documenting VE activities, as stipulated in CCP-TP-500:

ANLRHVE14004
ANLRHVE15003

ANLRHVE15001

ANLRHVE15002

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

One CAQ was identified during the audit. Per procedure CCP-TP-500, Rev. 15, section 4.2.5 [B.2], Attachment 1 is signed and dated to annotate that the VE has been completed; however, indirect load containers 1348 and 1379 from BDR ANLRHVE14004 were completed and then characterized again using the same Attachment 1 (i.e., removing items from the waste description, striking the first instance of the operators' signatures, and operators re-signing the form), and there is no procedural instruction to perform this process (see CAR 16-001, section 6.1).

With the exception of the CAQ listed above, the procedure reviews and document reviews provided evidence that the applicable requirements for characterizing RH SCG S5000 debris waste using the VE process is adequately established for compliance with upper-tier requirements, satisfactory in the implementation of these requirements, and effective in achieving the desired results.

5.4.4 Dose-to-Curie/Dimensional Measurement

The audit team assessed the continued adequacy, implementation, and effectiveness of the DTC method and dimensional measurement used at ANL by the CCP to characterize waste stream AERHDM. The audit team evaluated the actual measurement of the dose rate and the subsequent determination of required waste container data. For DTC, the dose rate is defined as the external exposure rate from gamma-ray emitting radionuclides within the waste matrix, predominately Cesium-137 (Cs-137). The application of the DTC methodology at ANL to characterize RH TRU waste was previously evaluated by CBFO as part of Audit A-14-20.

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

- Proper development and documentation of the waste stream's Acceptable Knowledge as documented in an Acceptable Knowledge Summary Report (a "500" report)
- Proper development, implementation, and products were produced from a Radiological Characterization Technical Report (a "501" report)
- Waste stream AERHDM is adequately addressed in a Waste Certification Plan for 40 Code of Federal Regulations (CFR) Part 194 Compliance (a "502" report)
- Development of average radionuclide ratios through sampling and/or modeling
- Development of the 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
- Calculation of the radionuclide activities and other derived radiological quantities and associated uncertainties
- Any significant program changes or deviation since Audit A-14-20
- Results of applying the DTC methodology to characterize waste since Audit A-14-20
- Determination of the number of containers examined, completed BDRs and BDRs that had been through project-level review that were generated since Audit A-14-20
- Completed BDRs to ensure data are reported and reviewed as required
- Data storage and retrievability
- Personnel qualification and training
- Continued operability and condition of the equipment used in the DTC method since Audit A-14-20

The following procedures were reviewed to verify compliance with applicable upper-tier requirements:

- CCP-TP-504, Rev. 17, *CCP Dose-to-Curie Survey Procedure for Remote-Handled Transuranic Waste*
- CCP-TP-513, Rev. 3, *CCP Procedure for Dimensional or Gravimetric Measurements for Radiological Characterization of Remote-Handled Transuranic Waste*
- CCP-AK-ANLE-500, Rev. 13, *CCP Acceptable Knowledge Summary Report*

- CCP-AK-ANLE-501, Rev. 11, *CCP RH TRU Radiological Characterization Technical Report*
- CCP-AK-ANLE-502, Rev. 7, *CCP RH TRU Waste Certification Plan for 40 CFR Part 194 Compliance*

The results of the review confirmed that the procedures are adequately established for compliance with upper-tier requirements.

The source of the RH waste at the ANL was the examination of fuel pins and reactor materials in the AGHCF and the K-Wing in the Chemical Technology Building. Scaling factors were developed from information about these fuel pins and reactor materials. This information included the fuel's initial composition and irradiation history. The ORIGEN2.2 computer code was used to model the burn-up of nuclear fuel including the decay and in-growth of progeny radionuclides to arrive at a radionuclide inventory. This radionuclide inventory was used to estimate the ratios of the activities of all radionuclides present in any appreciable quantity and particularly any of the 10 WIPP tracked radionuclides present to that of Cs-137 in cases where the DTC methodology was applied.

To confirm the ORIGEN2.2 modeling results, radionuclide ratios were calculated for approximately 400 fuel pins that were also examined at the Los Alamos National Laboratory (LANL) using mass spectrometry. The modeled values were compared to the mass spectrometry results. Agreement between the ratios calculated using ORIGEN2.2 and those measured by mass spectrometry demonstrate that ORIGEN2.2 is an appropriate model for calculating the radionuclide ratios for irradiated fuel pins with fuel compositions and irradiation histories similar to those examined at LANL.

The DTC measurement apparatus remained in service in the Building 331 Shell for the previous year since audit A-14-20. In this apparatus, the exposure rate, attributed entirely to Cs-137, is measured four times at a distance of 1.0 meter from the waste containers. Auditors interviewed operations personnel about the set-up and calibration of the measurement apparatus for performing DTC and reviewed calibration certification documentation as well as operations logbooks. A Thermo Electron Model RO-7 survey meter fitted with the appropriate probe (RO-7LD or RO-7BM) is used to gather high-range measurements and a Model FH 40G fitted with a FHZ 612 probe is used to gather low-range measurements. Each container is rotated 90 degrees successively between each of the four measurements. The average measured dose or exposure rate for each 30-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 DTC personnel, and examined electronic and paper copies of reports, records, and results.

Since Audit A-14-20, four BDRs have been completed through project-level review:

ANLRHDTTC15001 ANLRHDTTC15002 ANLRHDTTC15003
ANLRHDTTC15004

RH waste characterization utilizing DTC, including all procedures and activities, was determined to be adequately established for compliance with upper-tier requirements, satisfactory in the implementation of these requirements, and effective in achieving the desired results.

5.4.5 Transportation

Transportation was not evaluated during this audit.

5.4.6 WIPP Waste Information System/Waste Data System

The audit team reviewed CCP procedure CCP-TP-530, Rev. 11, *CCP RH TRU Waste Certification and WWIS/WDS Data Entry*, to determine the degree to which it adequately addresses upper-tier requirements. Results of the review indicate that the procedure adequately addresses upper-tier requirements.

The audit team interviewed responsible personnel and examined related data. Record reviews included CCP data spreadsheet reports, evidence of verification of resolution of NCRs associated with a container, container information summaries, pages from BDRs showing analyses values, WWIS/WDS Container Data Reports, and submittals for WWIS review/approval.

The team reviewed one WWIS/WDS waste certification package for RH waste containers. The package reviewed involved three internal containers (RW48259, 1217, and 1331). Data for the three containers has been certified in WWIS/WDS, but the containers have not yet been built into a canister. The RH WWIS/WDS waste certification package was for the one currently active waste stream at ANL (AERHDM).

Overall, the audit team determined that the WWIS/WDS activities were adequately established for compliance with upper-tier requirements, satisfactory in the implementation of these requirements, and effective in achieving the desired result.

6.0 CARS, CDAs, OBSERVATIONS, AND RECOMMENDATIONS

6.1 Corrective Action Reports

During the audit, the audit team may identify conditions adverse to quality, as described below, and document such conditions on CARs.

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

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.

CAR 16-001

Per procedure CCP-TP-500, Rev. 15, section 4.2.5 [B.2], Attachment 1 is signed and dated to annotate that the VE has been completed; however, indirect load containers 1348 and 1379 from BDR ANLRHVE14004 were completed and then characterized again using the same Attachment 1 (i.e., removing items from the waste description, striking the first instance of the operators' signatures, and operators re-signing the form), and there is no procedural instruction to perform this process.

6.2 Deficiencies Corrected During the Audit

During the audit, the audit team may identify CAQs. The audit team members and the 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 (CDA).

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 following definition:

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.

There were no CAQs corrected during the 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 member, in conjunction with the ATL, evaluates these conditions and classifies them as observations using the following definition:

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

There was one observation generated during Audit A-15-24. The AKEs have developed an in-process Chemical Compatibility Evaluation Memorandum for waste stream

AERHDM. The document is a very comprehensive and thorough review of all of the chemicals identified for this waste stream and lists whether the chemical is present as a trace, minor, or major constituent. The chemicals have, as applicable, been assigned an RGN from the EPA method, and corresponding reaction codes of concern were evaluated. However, CCP-TP-005, Rev. 27, infers that this exercise is a joint effort with the TE. The finalized memorandum should provide a means to indicate the involvement of the TE.

6.4 Recommendations

During the audit, the audit team may offer 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.

There were no recommendations offered to CCP management as a result of the audit.

7.0 LIST OF ATTACHMENTS

Attachment 1:	Personnel Contacted During Audit A-15-24
Attachment 2:	Summary Table of Audit A-15-24 Results
Attachment 3:	List of Audited Procedures
Attachment 4:	Processes and Equipment Evaluated During Audit A-15-24

PERSONNEL CONTACTED DURING AUDIT A-15-24				
NAME	TITLE/ORG	PRE-AUDIT MEETING	CONTACTED DURING AUDIT	POST-AUDIT MEETING
Cheryl Armijo	Training Records Analyst CCP/TFE		X	
Pat Beallis	VE/DTC Operator CCP/NWP		X	
Tim Benoit	Quality Assurance Engineer NWM	X		X
Dale Bignell	CBFO Senior Management Representative Observer CTAC	X		X
Gary Birge	Physical Scientist CBFO	X		X
D.J. Carlson	Argonne Nuclear Waste Management Division Director NWM	X		X
Dale Dietzel	Federal Project Director DOE Argonne Site Office	X		X
Dan Dildey	Waste Management Department Manager NWM	X		
A.J. Fisher	CCP Support Services Manager CCP/NWP	X		
Jon Grochocinski	Business Analyst ANL-PMA	X		X
Monterrey Harris	VE/DTC Operator CCP/NWP		X	
Karen Hellman	CPM Manager FMS			X
John Daniel Hlotke	AGHCF Facility Manager NWM	X		
Steve Holmes	Observer NMED Hazardous Waste Bureau	X		
Laura Jones	Quality Assurance Engineer CCP/NWP		X	
Irene Joo	RH Operations Manager CCP/NWP	X	X	X
Rich Kantrowitz	SPM CCP/NWP	X	X	X
Creta Kirkes	WCAWCO CCP/NWP		X	
Stu Meredith	Oversight and Assessment Manager ANL PMA	X		X
Leslie Oberbeck	Software QA CCP/NWP		X	
Dan Pancake	ANL STR-PM FMS-Deactivation Projects Manager	X	X	X

PERSONNEL CONTACTED DURING AUDIT A-15-24				
NAME	TITLE/ORG	PRE-AUDIT MEETING	CONTACTED DURING AUDIT	POST-AUDIT MEETING
Spencer Pattee	VPM-VEE CCP/NWP	X	X	X
Sheila Pearcy	CCP Records CCP/TFE	X	X	X
Kevin Peters	AKE CCP/NWP	X	X	X
Cindy Rock	Program Manager FMS	X		X
Wesley Root	VPM CCP/NWP	X	X	X
Steve Schafer	AKE CCP/NWP	X	X	X
Chris Sexton	Engineer CCP/NWP		X	
Mark Sreniawski	AGHCF Health Physicist/ESQ	X		

SUMMARY TABLE OF AUDIT A-15-24 RESULTS

Program Element	Concern Classification				QA Evaluation		Technical
	CARs	CDAs	Obs.	Rec	Adequacy	Implementation	Effectiveness
Activity							
Program Status					A	S	E
Acceptable Knowledge (AK)			1		A	S	E
Visual Examination (VE)	1				A	S	E
Project Level V&V					A	S	E
Dose-to-Curie (DTC)/ Dimensional Measurement (DM)					A	S	E
WIPP Waste Information System					A	S	E
Personnel Qualification & Training					A	S	E
Nonconformance Reporting					A	S	E
Records					A	S	E
TOTALS	1		1		A	S	E

Definitions

E = Effective

S = Satisfactory

I = Indeterminate

CAR = Corrective Action Report

CDA = Corrected During the Audit

NE = Not Effective

Obs. = Observation

Rec. = Recommendation

A = Adequate

NA = Not Adequate

Audit A-15-24 LIST OF AUDITED PROCEDURES

	Document No.	Rev.	Document Title
1.	CCP-PO-001	21	CCP Transuranic Waste Characterization Quality Assurance Project Plan
2.	CCP-PO-002	27	CCP Transuranic Waste Certification Plan
3.	CCP-PO-005	26	CCP Conduct of Operations
4.	CCP-PO-500	6	CCP/ANL RH-TRU Waste Interface Document
5.	CCP-PO-505	3	CCP Remote-Handled Transuranic Waste Authorized Methods For Payload Control (CCP RH-TRAMPAC)
6.	CCP-QP-002	39	CCP Training and Qualification Plan
7.	CCP-QP-005	25	CCP TRU Nonconforming Item Reporting and Control
8.	CCP-QP-008	24	CCP Records Management
9.	CCP-QP-010	25	CCP Document Preparation, Approval, and Control
10.	CCP-QP-016	21	CCP Control of Measuring and Testing Equipment
11.	CCP-QP-017	4	CCP Identification and Control of Items
12.	CCP-QP-021	10	CCP Surveillance Program (OBSOLETE)
13.	CCP-QP-022	16	CCP Software Quality Assurance Plan
14.	CCP-QP-028	16	CCP Records Filing, Inventorying, Scheduling, and Dispositioning
15.	CCP-TP-001	21	CCP Project Level Data Validation and Verification
16.	CCP-TP-002	26	CCP Reconciliation of DQOs and Reporting Characterization Data
17.	CCP-TP-005	27	CCP Acceptable Knowledge Documentation
18.	CCP-TP-163	4	CCP Evaluation of Waste Packaging Records for VE of Records
19.	CCP-TP-500	15	CCP Remote-Handled Waste Visual Examination
20.	CCP-TP-504	17	CCP Dose-to-Curie Survey Procedure for Remote-Handled Transuranic Waste
21.	CCP-TP-506	5	CCP Preparation of the Remote-Handled Transuranic Waste Acceptable Knowledge Characterization Reconciliation Report
22.	CCP-TP-507	8	CCP Shipping of Remote-Handled Transuranic Waste
23.	CCP-TP-509	6	CCP Remote-Handled Transuranic Container Tracking
24.	CCP-TP-513	3	CCP Procedure for Dimensional or Gravimetric Measurements for Radiological Characterization of Remote-Handled Transuranic Waste
25.	CCP-TP-530	11	CCP RH TRU Waste Certification and WWIS/WDS Data Entry
26.	WP 13-QA.03	24	NWP Quality Assurance Independent Assessment Program

PROCESSES AND EQUIPMENT EVALUATED DURING AUDIT A-15-24

WIPP #	Process/Equipment Description	Applicable to the Following Summary Category Groups	Currently Approved by NMED	Currently Approved by EPA
PREVIOUSLY APPROVED PROCESSES OR EQUIPMENT				
The following were reevaluated during CBFO Audit A-15-24				
8RHVE1	Visual Examination CCP-TP-163, CCP Evaluation of Waste Packaging Records for Visual Examination of Records	Debris (S5000)	YES	YES
8RHVE2	Visual Examination of Newly Packaged RH Waste Drums CCP-TP-500, CCP Remote-Handled Waste Visual Examination	Debris (S5000)	YES	YES
N/A	Acceptable Knowledge CCP-TP-005, CCP Acceptable Knowledge Documentation	Debris (S5000)	YES	YES
N/A	Data Verification and Validation CCP-TP-001, CCP Project Level Data Validation and Verification CCP-TP-500, CCP Remote-Handled Waste Visual Examination CCP-TP-504, CCP Dose-to-Curie Survey Procedure for Remote-Handled Transuranic Waste	Debris (S5000)	YES	YES
8DTC1	Dose-to-Curie CCP-TP-504, CCP Dose-to-Curie Survey Procedure for Remote-Handled Transuranic Waste	Debris (S5000)	N/A	YES

WIPP #	Process/Equipment Description	Applicable to the Following Summary Category Groups	Currently Approved by NMED	Currently Approved by EPA
8RHGM1	Dimensional Measurement CCP-TP-513, CCP Procedure for Dimensional or Gravimetric Measurements for Radiological Characterization of Remote-Handled Transuranic Waste	Debris (S5000)	N/A	YES
N/A	Quality Assurance	N/A	N/A	YES
N/A	WIPP Waste Information System (WWIS)/Waste Data System (WDS)	NA	YES	YES