

United States Government

Department of Energy

memorandum

Carlsbad Field Office
Carlsbad, New Mexico 88221


DATE: September 15, 2020
REPLY TO
ATTN OF: CBFO:OQA:JL:JM:20-0882:UFC 2300.00
SUBJECT: Interim Audit Report A-20-18, LLNL/CCP TRU Waste Characterization Activities
TO: James Davis III, Department Of Energy – Lawrence Livermore National Laboratory

The Carlsbad Field Office (CBFO) conducted the annual Recertification Audit A-20-18, Lawrence Livermore National Laboratory Central Characterization Program (LLNL/CCP) Transuranic (TRU) Waste Characterization Activities, August 25 – 27, 2020. The interim audit report is attached.

The audit team concluded that, overall, the LLNL/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 exception documented in the audit report. One CBFO corrective action report was issued as a result of this audit.

If you have any questions or comments concerning the interim audit report, please contact me at (575) 499-5054.

JOE
LOPEZ



Digitally signed by
JOE LOPEZ
Date: 2020.09.15
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Joe Lopez
Software Quality Assurance Specialist

Attachment

cc: w/attachment
L. Perkins, EM-3.113 * ED
R. Knerr, CBFO ED
M. Hall, CBFO ED
K. Princen, CBFO ED
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K. Stone, NWP/CCP ED
R. Lee, NWP/CCP ED
R. Reeves, NWP/CCP ED
R. Hollister, NWP/CCP ED
D. Moody, NWP/CCP ED
B. Verlanic, NWP/CCP ED
L. Calder, NWP/CCP ED
D. Wade, NWP/CCP ED
J. Harvill, NWP/CCP ED
B. Pace, NWP/CCP ED
J. Carter, NWP/CCP ED
D. Ivey, NWP/QA ED
V. Ballew, NWP/QA ED
S. Saiz, NWP/QA ED
A. Boyea, NWP/QA ED
J. Mosser, EPA ED
J. Ellis, EPA ED
T. Peake, EPA ED
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K. Pierard, NMED ED
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CBFO M&RC
CBFO QA File
*ED denotes electronic distribution

**U.S. DEPARTMENT OF ENERGY
CARLSBAD FIELD OFFICE**

INTERIM AUDIT REPORT

OF THE

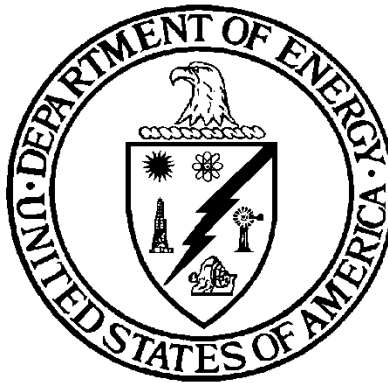
**LAWRENCE LIVERMORE NATIONAL LABORATORY
CENTRAL CHARACTERIZATION PROGRAM**

FOR

**TRU WASTE ACTIVITIES
AT
LIVERMORE, CALIFORNIA
and CARLSBAD, NEW MEXICO**

AUDIT NUMBER A-20-18

August 25 – 27, 2020



Prepared by: _____

Tim Boswell, CTAC
Audit Team Leader

Date: _____

Approved by: _____

Michael R. Brown, Acting Director
CBFO Office of Quality Assurance

Date: _____

1.0 EXECUTIVE SUMMARY

U.S. Department of Energy (DOE) Carlsbad Field Office (CBFO) Recertification Audit A-20-18 was performed to evaluate the continued adequacy, implementation, and effectiveness of established programs for transuranic (TRU) waste characterization activities performed for the Lawrence Livermore National Laboratory (LLNL) 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) TRU Summary Category Groups (SCGs) S3000 solids and S5000 debris wastes. The audit team also verified that a technical review of the generator site's processes was performed, and that any issues identified during the technical review had been resolved per DOE/WIPP-16-3564, *Generator Site Technical Review Procedure*. 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)*, and the *Waste Isolation Pilot Plant Documented Safety Analysis (DSA)*, Chapter 18.

Due to heightened awareness and to decrease the potential development, spread, and impact of the acute respiratory illness, COVID-19, the audit team did not travel to the LLNL site. Audit activities were conducted via teleconference, August 25 - 27, 2020.

In response to the New Mexico Environment Department (NMED) letter, dated April 24, 2020, from Kevin Pierard, Chief, Hazardous Waste Bureau, to Greg Sosson, Acting Manager, CBFO and Sean Dunagan, Project Manager, NWP, this report documents in detail the actions taken by auditors and technical specialists to verify compliance to WIPP HWFP Waste Analysis Plan (WAP) requirements. Although no field activities were evaluated at the LLNL facilities, verification of compliance was demonstrated through review of Batch Data Reports (BDRs) and specific waste characterization process logbooks, and interviews conducted with appropriate operations and project management personnel. The CBFO audit team will evaluate field activities at a date to be determined or during the next recertification audit.

The audit team concluded that the LLNL/CCP TRU waste characterization program procedures for characterizing CH SCGs S3000 solids and S5000 debris wastes adequately address upper-tier requirements, were satisfactorily implemented, and effective in achieving the desired results. No field activities have taken place for Gas Generation Testing (GGT) since the previous certification audit and therefore GGT is deemed indeterminate.

No WIPP HWFP WAP-affecting conditions adverse to quality (CAQs) or WAP-affecting Observations were identified during the audit. One non-WAP-affecting CAQ was identified, resulting in the issuance of a corrective action report (CAR) (see section 6.1.2). There were no remedial actions that were corrected during the audit (CDA) (see section 6.2.2). There were no non-WAP-affecting Observations identified during the audit (see section 6.3.2), and no concerns were 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 adequacy, implementation, and effectiveness of the technical and quality assurance (QA) activities performed by the NWP CCP at LLNL for characterization of CH TRU SCGs S3000 solids and S5000 debris wastes. The audit team also verified a technical review of the generator site's processes was performed and any issues identified during the technical review had been resolved per DOE/WIPP-16-3564, Rev. 0, *Generator Site Technical Review Procedure*. Due to heightened awareness and to reduce the potential development, spread, and impact of the acute respiratory illness, COVID-19, the audit team did not travel to the LLNL site. All audit activities were conducted via teleconference. Transportation activities were not included in the scope of this audit.

The following areas were evaluated; however, field activities were not conducted during the audit due to COVID-19 restrictions:

General Activities

- Results of Previous Audits
- Changes in Programs or Operations
- New Programs or Activities Being Implemented
- Changes in Key Personnel
- Generator Site Technical Review (GSTR) (non-WAP-related)

WAP-Related Quality Assurance Activities

- Nonconformances
- Personnel Qualification and Training
- Records

Non-WAP-Related Quality Assurance Activities

- LLNL/CCP Program Interface
- Measuring and Test Equipment (M&TE)*
- Software Version Installation*

*These QA activity evaluations are found within the report and do not have their own respective sections.

WAP-Related Technical Activities

- Acceptable Knowledge (AK)
- Project-Level Data Validation and Verification (PL V&V)
- Real-time Radiography (RTR)
- Visual Examination (VE)
- WIPP Waste Information System (WWIS)/Waste Data System (WDS)

Non-WAP-Related Technical Activities

- Nondestructive Assay (NDA), including Performance Demonstration Program (PDP)
- Container Management (CM)

- Flammable Gas Analysis (FGA)
- Gas Generation Testing (GGT)

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

- Waste Isolation Pilot Plant Hazardous Waste Facility Permit NM4890139088-TSDF
- DOE/CBFO-94-1012, *CBFO Quality Assurance Program Document (QAPD)*
- DOE/WIPP-02-3122, *Transuranic Waste Acceptance Criteria for the Waste Isolation Pilot Plant (WAC)*
- DOE/WIPP-07-3372, *Waste Isolation Pilot Plant Documented Safety Analysis (DSA)*, Chapter 18
- WP 13-1, *Nuclear Waste Partnership LLC Quality Assurance Program Description*

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

- CCP-PO-001, *CCP Transuranic Waste Characterization Quality Assurance Project Plan (QAPjP)*
- CCP-PO-002, *CCP Transuranic Waste Certification Plan*
- CCP-PO-048, *CCP/LLNL Interface Document*
- Related CCP QA and technical implementing procedures

2.2 Purpose

Audit A-20-18 was conducted to evaluate the adequacy and effective implementation of program requirements for the characterization and certification of CH TRU SCGs S3000 solids and S5000 debris wastes at the LLNL for compliance with applicable upper-tier requirements.

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

Joe Lopez	CBFO Quality Assurance Management Representative
Tim Boswell	Audit Team Leader, CBFO Technical Assistance Contractor (CTAC)
Cindi Castillo	Audit Team Trainer/Co-Lead, CTAC
Rick Castillo	Auditor, CTAC (C6 QA)
Steve Shafer	Auditor, CTAC (NDA/PDP)
Harley Kirschenmann	Auditor, CTAC (Program Status)
Bob Prentiss	Auditor, CTAC (C6 QA)
Nathan Denney	Auditor, CTAC (AK)
Charlie Riggs	Auditor, CTAC (RTR)
Shelly Gomez	Auditor, CTAC (VE/CM)

Dick Blauvelt	Technical Specialist, CTAC (AK)
Randy Fitzgerald	Technical Specialist, CTAC (AK)
Dustin Stegman	Technical Specialist, CTAC (VE/CM)
Paul Gomez	Technical Specialist, CTAC (PL V&V and FGA/GGT)
Prissy Yanez	Technical Specialist, CTAC (RTR)
Jim Oliver	Technical Specialist, CTAC (NDA)

OBSERVERS

Ricardo Maestas	NMED
David Biswell	NMED
Megan McLean	NMED
Tom Carver	CBFO Office of the National TRU Program (ONTP)
Andy Walker	CBFO ONTP
Beverly Schrock	TechSpecs (on behalf of CBFO ONTP)
Jerry Ellis	U.S. Environmental Protection Agency (EPA)

4.0 AUDIT MEETING ATTENDEES AND PERSONNEL CONTACTED

The audit meeting attendees and personnel contacted during the audit process are identified in Attachment 1. A pre-audit meeting was held on August 25, 2020, via teleconference. Daily management briefings were held to update LLNL/CCP management and staff on audit progress and identified concerns. A post-audit meeting was held on August 27, 2020, via teleconference.

Attachment 2 lists the LLNL/CCP personnel contacted during the audit by subject area. Attachment 3 contains a summary table of audit results. Attachment 4 identifies the WAP-related objective evidence compiled (provided in boxes). Attachment 5 lists the audited procedures. Attachment 6 lists the processes and equipment evaluated.

5.0 SUMMARY OF AUDIT RESULTS

5.1 Program Adequacy, Implementation, and Effectiveness

This audit was performed to assess the capability of LLNL/CCP to characterize CH TRU SCGs S3000 solids and S5000 debris wastes for compliance with the requirements specified in the WIPP HWFP WAP, the WIPP WAC, Chapter 18 of the WIPP DSA, and the CBFO QAPD. The characterization methods assessed were AK, VE, RTR, NDA (including PDP), GGT, and FGA. Other areas evaluated were data generation level (DGL) and PL V&V, WWIS/WDS data entry, data quality objective (DQO) reconciliation, CM, and the preparation of Waste Stream Profile Forms (WSPFs).

The audit team concluded that, based on personnel interviews and review of associated documentation and records, the LLNL/CCP TRU waste characterization program and activities for characterizing CH SCGs S3000 solids and S5000 debris wastes adequately address upper-tier requirements. The processes utilized for characterizing CH TRU SCGs S3000 solids and S5000 debris wastes were satisfactorily implemented

and effective in achieving the desired results. BDRs have not been generated and field activities were not performed for GGT since the previous certification audit and this area was deemed indeterminate.

5.2 General Activities

5.2.1 Results of Previous Audits

The audit team examined the results of the previous CBFO certification audit of the LLNL/CCP (A-19-29), wherein one non-WAP-affecting CAQ was identified. The CAQ resulted in the initiation of CBFO CAR 19-075, related to the review of CCP-PO-048, Rev 1, *CCP/LLNL Interface Document*, when it was identified that the CCP AK Assessments are not listed in the procedures section (4.21) of the document. The CBFO conducted an evaluation and verification of the corrective actions associated with CAR 19-075 and found them to be acceptable. The CAR is considered closed.

During the performance of this audit, the audit team verified sustained corrective actions and did not observe any similar instances to the CAQ identified during the previous recertification audit (A-19-29), indicating that steps taken to address these issues were adequate in precluding recurrence.

5.2.2 Changes in Programs or Operations

The audit team determined through interviews with the LLNL/CCP Project Manager that there was one significant change in programs or operations since the previous certification audit (A-19-29). Demobilization of RTR2 unit was accomplished. LLNL's Nondestructive Examination (NDE) operations are complete at LLNL.

5.2.3 New Programs or Activities Being Implemented

The audit team determined through interviews with the CCP Technical Support Manager that there were no new programs or activities implemented.

5.2.4 Changes in Key Personnel

Changes in key personnel since the previous certification audit (A-19-29) include the following:

- National TRU Program Manager
- CCP NDE Cognizant Engineer

5.2.5 Generator Site Technical Review (non-WAP-related)

The CBFO and NWP, as WIPP HWFP co-permittees performed GSTR LL-1-18-01, February 26 - March 2, 2018, at the LLNL in Livermore, California. The GSTR Final Report was issued on November 13, 2018 (CBFO:ONTP:CF:RMS:18-2245:UFC 5900.00). The GSTR team completed their review of the program, LLNL satisfactorily

addressed and resolved all of the identified issues related to the GSTR, and the GSTR closure letter was issued on May 21, 2019 (CBFO:ONTP:CF:RMS:19-1281:UFC 2300.00).

5.3 WAP-Related 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 the following implementing procedures to determine the degree to which the procedures adequately address upper-tier requirements:

- CCP-PO-047, Rev. 3, *CCP Training and Qualification Program Document*
- CCP-QP-002, Rev. 45, *CCP Training and Qualification Plan*
- CCP-QP-041, Rev. 4, *CCP Job Needs Analysis and Design*
- CCP-QP-042, Rev. 2, *CCP Project Level Training and Qualification*
- CCP-QP-043, Rev. 3, *CCP Operations Level Training and Qualification*

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

Personnel training records associated with VE, RTR, NDA, AK, Site Project Manager (SPM), GGT, and FGA were examined to verify implementation of associated requirements. The audit team verified that personnel performing waste characterization and certification activities are appropriately qualified.

Record reviews included an evaluation of the LLNL/CCP CH List of Qualified Individuals (LOQI) dated August 18, 2020. Other record reviews included qualification cards and pertinent supporting qualification documentation, such as: attendance sheets/briefings on newly-revised Acceptable Knowledge Summary Reports for RTR and VE operators (VEOs); appointment letters for VE experts (VEEs) and subject matter experts (SMEs)/on-the-job training (OJT), and NDA expert analysts (EAs); comprehensive exams; and training container documentation, eye examinations, and American Society of Nondestructive Testing (ASNT)-SNT-TC-1A NDE certificates for qualified RTR operators.

The procedures reviewed and objective evidence assembled provided evidence 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 WAP-affecting, or non-WAP-affecting concerns in the area of personnel qualification and training were identified.

5.3.2 Control of Nonconforming Items

The audit team reviewed implementing procedure CCP-QP-005, Rev. 26, *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 the procedure adequately addresses upper-tier requirements.

The audit team interviewed a CCP QA engineer and selected a random sample of nonconformance reports (NCRs) for review.

The following closed NCRs were reviewed:

<u>Number</u>	<u>Revision</u>	<u>Number</u>	<u>Revision</u>
NCR-LLNL-0026-20	0	NCR-LLNL-0661-19	0
NCR-LLNL-0027-20	0	NCR-LLNL-0662-19	0
NCR-LLNL-0028-20	0	NCR-LLNL-0664-19	0
NCR-LLNL-0031-20	0	NCR-LLNL-0693-19	1
NCR-LLNL-0032-20	0	NCR-LLNL-0694-19	1
NCR-LLNL-0035-20	0	NCR-LLNL-0702-19	0
NCR-LLNL-0652-19	1	NCR-LLNL-0709-19	0
NCR-LLNL-0659-19	0	NCR-LLNL-0710-19	0

The audit team verified CCP personnel are familiar with the process for reporting NCRs to the Permittees via email to the CBFO within the time frame required by the Permit. The audit team determined there were no NCRs generated at PL within the last 12 months that required reporting to the Permittees.

The team concluded that nonconformances are appropriately documented and tracked through resolution, or voided in accordance with the procedure. NCRs reviewed included original and revised NCRs and all applicable supporting documentation in the records package. The NCRs examined were verified to have been entered, managed, and tracked in the NCR log/module located within the CCP Integrated Data Center (IDC).

The procedures reviewed and objective evidence assembled provided evidence 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 WAP-affecting or non-WAP-affecting concerns in the area of nonconformances 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. 23, *CCP Transuranic Waste Characterization Quality Assurance Project Plan*
- CCP-QP-008, Rev. 27, *CCP Records Management*
- CCP-QP-028, Rev. 17, *CCP Records Filing, Inventorying, Scheduling, and Dispositioning*

Results of the review indicate 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 January 27, 2020. RIDS are reviewed annually by the CCP Records Manager, as required.

The audit team selected and reviewed digitally captured records packages transmitted from the LLNL/CCP Facility Records Coordinator to the CCP Records Center in Carlsbad, NM. The audit team verified that the completed transmittal forms adequately described the records being transmitted, and that the transmittal process was performed in accordance with the procedure.

It was determined through an interview with the CCP Records Manager that files are adequately organized and maintained in both paper and electronic file systems. Records are adequately segregated from non-record documents. Also, electronic 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 file servers where computer access is restricted. Hard 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 are controlled administratively in the case of physical electronic media and by use of network 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 WAP-affecting or non-WAP-affecting concerns in the area of QA records were identified.

5.4 Non-WAP-Related Quality Assurance Activities

Each non-WAP-related QA 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 CBFO QAPD, WIPP WAC, or WIPP DSA, as applicable, is cited briefly, and the result of the assessment is provided.

5.4.1 LLNL/CCP Program Interface

The audit team reviewed documents and conducted interviews with the Technical Support Manager and the CCP SPM responsible for LLNL/CCP waste characterization activities. The program interface was evaluated as established between the CCP and LLNL and documented in CCP-PO-048, Rev. 2, *CCP/LLNL Interface Document*. This document describes the interfaces, roles, responsibilities, and program requirements applicable to both organizations in support of CCP waste characterization activities at LLNL. The audit team verified that CCP-PO-048 addresses flow-down requirements of CCP-PO-043, Rev. 0, *CCP Interface Document Preparation*.

The audit team verified CCP and LLNL provide routine status for their respective scheduled activities by review of *The Project Outline* dated July 15, 2020, and CCP provides a monthly organization chart to LLNL. The audit team also verified that documents and revisions of procedures are provided by CCP to LLNL for review and comment.

The audit team verified that the CCP Vendor Project Manager (VPM) monitors the LOQI at the beginning of the shift to confirm that only qualified personnel perform waste characterization activities, that CCP performs safety walk-downs, and LLNL management release/approve of work prior to performing CCP operations daily. The audit team verified that the LLNL oversight of the CCP program is performed to ensure CCP work is performed in accordance with CCP procedures, as required by CCP-PO-048, Section 6, *Oversight*. The audit team verified that the CCP QA organization conducts periodic surveillances to assess compliance with applicable WIPP requirements. The audit team evaluated the NWP QA Independent Assessment Schedule for fiscal years 2019-2021, per WP 13-QA.03, Rev. 30, *Quality Assurance Independent Assessment Program*. As a result of this review, the audit team examined the following audits/surveillances:

- NWP internal audit I20-08, Procurement/Centralized Procurement Program
- NWP internal audit I20-01, Central Characterization Program QA Review
- NWP surveillance S19-29, CCP Management Assessments

The procedure reviewed and objective evidence assembled provided evidence that the applicable requirements for the interface document are adequately established for compliance with upper-tier requirements, satisfactorily implemented, and effective in achieving the desired results. No non-WAP-affecting concerns in the area of LLNL/CCP Program Interface were identified.

5.5 WAP-Related 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.

5.5.1 Table C6-1, WAP Checklist

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

Technical elements evaluated for waste characterization activities consisted of DGL and PL V&V, AK, RTR, VE, WWIS/WDS, and preparation of WSPFs. Objective evidence was selected and reviewed to evaluate the implementation of the associated waste characterization activities. BDRs, sampling records, and personnel qualification and training documentation were included in the evaluation. Each characterization process involves:

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

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

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

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

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-TP-001, Rev. 22, *CCP Project Level Data Validation and Verification*
- CCP-TP-002, Rev. 29, *CCP Reconciliation of DQOs and Reporting Characterization Data*
- CCP-TP-005, Rev. 32, *CCP Acceptable Knowledge Documentation*
- CCP-QP-042, Rev. 2, *CCP Project Level Training and Qualification*

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

The audit team reviewed the qualifications of two SPMs in accordance with CCP-QP-042. The SPMs involved with PL V&V activities at LLNL/CCP were found to be adequately trained and qualified.

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

RTR

LL-RTR2-0040	LL-RTR2-0047	LL-RTR2-0056
LL-RTR2-0070	LL-RTR2-0076	

VE

LLVECH0008	LLVECH0010	LLVECH0011
LLVECH0012	LLVECH0013	

NDA

LL-MILCC4-0082 R1	LL-MILCC4-0104	LL-MILCC4-0113
LL-MILCC4-0136	LL-SGS1-0009	

The BDRs were verified to be complete and accurate, and were found to be in compliance with all applicable procedural requirements.

The audit team verified that the WSPF was complete with Characterization Information Summaries (CIS). CIS lots were reviewed for the following:

- For waste stream LL-M001-S5400-002 with CIS Lot 1; CIS Lots 2-4; and Lots 5-7
- For audit purposes the draft WSPF and CIS for LL-T004-S3141-002 and LL-W019-S3900-002 were reviewed to verify BDR results from these waste streams
- Five discrepancy resolutions (DRs) were verified during the audit DR100, DR101, DR102, DR103 and DR105 and were properly reported.

The audit team verified the required quarterly repeat of the RTR and VE DGL data by the PL for the following:

RTR Quarterlies

- 4Q2019 Request (CP:20:01026)
- 4Q2019 Results (CP:20:01032)

- 1Q2020 Request (CP:20:01080)

VE Quarterlies

- 4Q2019 Request (CP:20:01027)
- 4Q2019 Results (CP:2001033)
- 1Q2020 Request (CP:20:01142)

The results from the quarterly package indicate there were no inconsistencies reported in the data results. There were no VE characterization activities performed during the first quarter of 2020.

The procedures reviewed and objective evidence assembled provided evidence that the applicable requirements for PL V&V activities are adequately established for compliance with upper-tier requirements, satisfactorily implemented, and effective in achieving the desired results. No WAP-affecting or non-WAP-affecting concerns in the area of PL V&V were identified.

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

The audit team conducted interviews and reviewed implementing procedure CCP-TP-030, Rev. 38, *CCP CH TRU Waste Certification and WWIS/WDS Data Entry*, relative to the WWIS/WDS data entry process to determine the degree to which the procedure adequately addresses upper-tier requirements. Results of the review indicate the procedure adequately addresses upper-tier requirements.

The audit team evaluated the implementation of the WWIS/WDS data entry procedure for electronic population of data, manual update of data, and electronic transfer of data from the IDC software database to the WWIS/WDS. 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 CH waste characterization and certification data were reviewed.

The audit team reviewed waste characterization case files for the following four CH containers:

Containers from SCG S5000

- LL85234430TRU
- LL85234453TRU
- LL85234455TRU
- LL85238221TRU

The LLNL CH containers listed above were certified under the current procedural process from CCP-TP-030, Rev. 38, which provides certification for using modules of the IDC. The audit team determined that the IDC processes for CH waste container certification were performed in accordance with the appropriate procedure.

The audit team interviewed the CCP Lead Waste Certification Official (WCO) 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 (Plutonium-Equivalent Curie) limit requiring a USQD. The WCO personnel have not received a request from a Transportation Certification Official (TCO) for a high MAR evaluation. The audit team determined that WCO personnel are familiar with these two processes due to simulations of procedure steps demonstrated during the audit. Implementation of the USQD and MAR processes are expected to be effective if future occurrences are presented.

The procedures reviewed and objective evidence assembled provided evidence that the applicable requirements for WWIS/WDS data entry were adequately established for compliance with upper-tier requirements, satisfactorily implemented, and effective in achieving the desired results. No WAP-affecting or non-WAP-affecting concerns in the area of WWIS/WDS were identified.

5.5.2 Table C6-2 – Acceptable Knowledge Checklist

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. 23, *CCP Transuranic Waste Characterization Quality Assurance Project Plan*
- CCP-QP-002, Rev. 45, *CCP Training and Qualification Plan*
- CCP-QP-042, Rev. 2, *CCP Project Level Training and Qualification*
- CCP-TP-001, Rev. 22, *CCP Project Level Data Validation and Verification*
- CCP-TP-002, Rev. 29, *CCP Reconciliation of DQOs and Reporting Characterization Data*
- CCP-TP-005, Rev. 32, *CCP Acceptable Knowledge Documentation*
- CCP-TP-068, Rev. 12, *CCP Standardized Container Management*
- CCP-TP-200, Rev. 6, *Enhanced Acceptable Knowledge Review*
- WP 13-QA.03, Rev. 30, *QA 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 SCGs S3000 solids and S5000 debris wastes. The audit team specifically evaluated compliance with the WAP requirements listed in the C6-2 checklist along with portions of the C6-1 and C6-3 checklists, as well as the requirements of the WIPP WAC, and completed the

associated WIPP WAC checklists. Objective evidence was reviewed and compiled to demonstrate compliance with each of the applicable requirements on these checklists.

The audit team reviewed the latest revision to the AK Summary Report for three distinct waste streams representing the two respective SCGs. The AK Summary Report and waste stream designations are as follows:

- AK Summary Report CCP-AK-LLNL-002, Rev. 2, for CH SCG S5000 debris waste stream LL-M001-S5400-002 and CH SCG S3000 solids waste streams LL-W019-S3900-002 and LL-T004-S3141-002.

The AK Summary Report was reviewed by the audit team with respect to the information that relates to specific WIPP WAP and WIPP WAC requirements including descriptions of waste processing activities, assignment of hazardous waste numbers (HWNs), identification of the two most prevalent radionuclides, waste stream volumes, periods of generation, and projections of future generation. Comparisons were made with information in the latest version of the Annual Transuranic Waste Inventory Report (ATWIR)

The audit team also examined the following completed attachments from CCP-TP-005 for each waste stream: the respective AK Documentation Checklist (Attachment 1); the AK Source Document 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 Container Evaluation documentation that demonstrates that the parameters and properties of containers provided by the generator to be added to a waste stream are examined to assure that the assignment is appropriate. The audit team also examined the current AK Tracking Spreadsheet and reconciled that data with the AK Waste Containers List (Attachment 8) and applicable AK documentation.

The audit team reviewed examples of discrepancies in the AK record, discrepancy resolutions at characterization, and the requisite AK Reevaluation forms. With regard to noncompliant waste containers, the auditors examined NCRs dealing with prohibited items and the requisite disposition. Waste Stream Characterization Checklists and supporting data reconciling the results of the characterization activities with the corresponding information in the AK records were also examined. AK Accuracy Reports were also reviewed and compiled as objective evidence.

The WAP-required container traceability exercise was conducted by the audit team for a total of ten waste containers from the three waste streams examined. The review included both newly generated waste containers and those that had been previously packaged and in some cases repackaged. For the containers selected, the audit team examined BDRs for RTR, VE, and NDA. Additional traceability documentation was collected through IDC database screenshots, AK Tracking Spreadsheet data, AK waste

container lists, and extensive and detailed LLNL generator input including information gathering documents (IGD) and waste disposal requisitions (WDR).

The audit team reviewed training records for four Acceptable Knowledge Experts (AKEs) and five SPMs who have participated or could potentially participate in characterization activities for LLNL/CCP. 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 audit report for internal audit I20-01 performed on November 5, 2019 at LLNL.

A review of enhanced AK products for the waste streams audited were examined. Those enhanced AK products include Interface Waste Management Documents List (IWMDL), AK Assessments (AKAs), Chemical Compatibility Evaluations (CCEs), Basis of Knowledge (BoK), and AK Briefings.

IWMDL

IWMDLs (AK Attachment 9) were developed for each of the three waste streams with the recent issuance of WIPP WAC Rev.10 that reinstated the requirement for this enhanced AK product. Each IWMDL was thoroughly reviewed to verify the relevance of procedures/processes listed, the latest revision and date of issue of the procedure/process, and to verify the date of the “walkdown” performed by the AKE with the site Point of Contact (POC) or SME was listed on the IWMDL. Each process/procedure is assigned an AK Source Document Number. The audit team examined each AK Source Document Summary (AK Attachment 3) to verify that the procedure/process was adequately described, that the verification/walkdown is documented with a date and the individuals involved, and that each revision is reviewed with the site SME/POC with a determination of the impact on waste management operations documented.

AKA

AKAs were examined for sub-populations of waste streams LL-M001-S5400-002 and LL-T004-S3141-002. There was particular focus on an addendum to the AKA for the debris stream that had been developed since the previous audit. Compliance with the requirements in CCP-TP-005 was examined. In addition to the AKA contents including historic and current waste management practices/processes, a list of historic and current absorbents and other information relevant to waste stream ignitability, corrosivity, and reactivity was reviewed. The audit team also examined a detailed description of the contents of each waste container bounded by the AKA. The primary sources for the container specific information came from generator paperwork including IGD and WDRs along with data from RTR quick scans. Finally, the audit team reviewed and compiled as objective evidence, comments from the internal CCP and LLNL site reviews. It was noted that an AKA has been prepared for waste stream LL-W019-S3900-002 but was still undergoing internal review at the time of the audit.

CCE

The audit team reviewed the CCE addressing all three LLNL waste streams, SCG S5000 LL-M001-S5400-002, SCG S3000 LL-T004-S3141-002, and SCG S3000 LL-W019-S3900-002. In addition to a detailed review and discussion of the CCE contents including consolidated material inputs, technical evaluations, Attachment 1 *Chemicals and Materials of Concern* including reactivity group number (RGN) assignment and AKE designated quantities: dominant, minor or trace, and attachment 3 *Insignificant Trace Chemicals and Materials*, the audit team also reviewed and compiled as OE, Document Review Records (DRR) from internal and CBFO reviews and the CBFO approval letter. A revision to the existing CCE is currently under development to address new chemicals primarily identified in the ongoing review of IGDs. There are no new RGNs identified and all chemicals are listed on attachment 3.

Basis of Knowledge (non-WAP-related)

BoK documentation was reviewed for subpopulations of waste streams LL-M001-S5400-002 designated as BOK01 and LL-T004-S3141-002 designated as BOK03. These sub-populations were determined to contain no oxidizing chemicals based upon the examination of specific container contents as noted above in the AKA section. Thus, these sub-populations are exempt from the BoK requirements as detailed in the BoK procedure DOE/WIPP-17-3589 Rev.1, *Basis of Knowledge for Evaluating Oxidizing Chemicals in TRU Waste*. Since the previous audit, an addendum was developed for BOK01 that added 475 containers to the BoK exempt list. In addition, a BoK memo designated as BOK02 was developed to address the requirements of the BoK procedure for containers that are not BoK exempt. A total of 70 containers were included in BOK02.

AK Briefings

When an AK summary report is revised, a presentation is prepared and provided to requisite CCP waste characterization staff and, if applicable, the generator site POC and SME, along with the SMR. AK Summary Report CCP-AK-LLNL-002, Rev.2, was issued on July 21, 2020. The audit team examined copies of the respective briefing presentation and attendance lists to confirm that all appropriate personnel were briefed as required.

The procedures reviewed, and objective evidence assembled, provided evidence that the applicable requirements for AK are adequately established. For the waste stream reviewed by the audit team, all elements of enhanced AK were verified to be implemented. The information provided demonstrated that the AK process was satisfactorily implemented and effective in achieving the desired results. No WAP-affecting or non-WAP-affecting concerns in the area of AK were identified.

5.5.3 Table C6-3, Radiography Checklist

The audit team evaluated the adequacy, implementation, and effectiveness of CCP LLNL RTR characterization process for CH SCG S3000 Homogeneous Solids Waste and S5000 Debris Waste using the RTR 2 Unit (WDS Method ID 13RR1). The LLNL

RTR 2 Unit has been decommissioned, disassembled, and returned to the vendor. There will be no RTR operations at LLNL for the foreseeable future.

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

- CCP-PO-001, Rev. 23, *CCP Transuranic Waste Characterization Quality Assurance Project Plan*
- CCP-PO-005, Rev. 30, *CCP Conduct of Operations*
- CCP-QP-002, Rev. 45, *CCP Training and Qualification Plan*
- CCP-QP-043, Rev. 3, *CCP Operations Level Training and Qualification*
- CCP-TP-028, Rev. 11, *CCP Radiographic Training Container Construction*
- CCP-TP-053, Rev. 18, *CCP Standard Real-Time Radiography (RTR) Inspection Procedure*
- CCP-TP-079, Rev. 1, *CCP Real-Time Radiography RTR #2 Operating Procedure*

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

The audit team did not travel to the LLNL site, due to the potential spread and impact of the acute respiratory illness, COVID-19. Although no field activities were evaluated at the LLNL facilities, verification of compliance was demonstrated through review of RTR BDRs, logbooks, training documents, and interviews conducted with RTR operations personnel.

The audit team examined the following CH RTR BDRs generated from operations performed using the RTR 2 unit to verify implementation and compliance with the requirements for documenting RTR activities, as specified in CCP-TP-053.

LL-RTR2-0044	LL-RTR2-0052	LL-RTR2-0058
LL-RTR2-0061	LL-RTR2-0064	LL-RTR2-0071
LL-RTR2-0075	LL-RTR2-0076	LL-RTR2-0077

The BDRs were verified to be completed and accurate, and found to be in compliance with all applicable procedural requirements.

The audit team also examined the 2019 RTR operational logbook (CCP-CH-LLNL-RTR-UNIT 2-01) and 2020 RTR operational logbook (CCP-CH-LLNL-RTR-Unit 2-02) to verify that logbook entries were logged correctly and reviewed by the VPM as required. Logbook evaluation confirmed the current revision of the associated procedures and the AK Summary Report is verified prior to performing RTR operations.

The audit team examined training records for RTR Operators/Independent Technical Reviewers (ITRs) and SME/OJT. The audit team verified that RTR operators, ITRs, and SME/OJT personnel were appropriately qualified as required.

The audit team verified that RTR operators were appropriately trained and qualified as required by the HWFP WAP, 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 five RTR operators. RTR training and qualification records reviewed included ASNT-SNT-TC-1A NDE certificates; container inventory sheets (as required by CCP-TP-028, Attachment 1); annual eye exams; and waste stream training for the applicable AK Summary Reports.

The procedure and document reviews provided evidence that the applicable requirements for characterizing S5000 debris waste and S3000 homogeneous solids waste using RTR is adequately established for compliance with upper-tier requirements, satisfactory in the implementation of these requirements, and effective in achieving the desired results. No WAP-affecting or non-WAP-affecting concerns in the area of RTR were identified.

5.5.4 Table C6-4, Visual Examination Checklist

The audit team evaluated the adequacy, implementation, and effectiveness of LLNL/CCP activities to characterize and certify newly generated CH SCG S5000 debris waste and CH SCG S3000 using the VE characterization process. The audit team reviewed the following CCP VE procedures to determine the degree to which they adequately address upper-tier requirements:

- CCP-QP-002, Rev. 45, *CCP Training and Qualification Plan*
- CCP-QP-043, Rev. 3 *CCP Operations Level Training and Qualification*
- CCP-QP-041, Rev. 4, *CCP Job Needs Analysis and Design*
- CCP-TP-113, Rev. 23, *CCP Standard Visual Examination*

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

The audit team did not travel to the LLNL site, due to the potential spread and impact of the acute respiratory illness, COVID-19. Although no field activities were evaluated at the LLNL facilities, verification of compliance was demonstrated through review of VE BDRs, logbooks, training documents, and interviews conducted with VE operations personnel.

The team confirmed through interview that the current revision of CCP-TP-113 (Rev. 23) was being used to perform VE and the current revision of the associated AK summary (CCP-AK-LLNL-002, Rev. 2) was available for reference, as needed.

LLNL/CCP uses the two-operator method when performing VE characterization of waste. The audit team interviewed VEOs and VEEs. The logbook for the Super Block

Plutonium facility was reviewed and verified to be in compliance with CCP-PO-005, Rev. 30, *CCP Conduct of Operations*. VE operational logbook (CCP-CH-LLNL-VE-01) was logged correctly and reviewed by the VPM as required. The audit team confirmed by review of documentation that container scale (identification [ID] number B511719843) and torque wrenches (IDs 1003971 and 1021320) used during VE operations were calibrated and maintained on the approved M&TE list.

The audit team examined the following CH VE BDRs generated from operations performed in the Super Block Plutonium facility to verify implementation and compliance with the requirements for documenting VE activities, as specified in CCP-TP-113:

LLVECH0008
LLVECH0012

LLVECH0010
LLVECH0013

LLVECH0011

The BDRs were verified to be complete and accurate, and found to be in compliance with all applicable procedural requirements.

The audit team examined training records for six VEOs/ITRs and confirmed the appointment letter of one LLNL/CCP VEE. The audit team verified that VEOs, ITRs, and the VEE are appropriately trained and qualified as required.

One non-WAP-affecting concern was identified during the audit in the area of VE. During a review of AK briefing CCP-AK-LLNL-002, Rev. 1, the audit team discovered the SPM and/or the AKE did not provide the AK briefing which was held on July 22, 2019. The briefing was given by the VEE (See CAR 20-027 in section 6.1.2). With the exception of the one non-WAP-affecting concern identified, the procedures reviewed and objective evidence assembled provided evidence that the applicable requirements for VE of CH SCG S5000 debris waste and S3000 solids waste are adequately established for compliance with upper-tier requirements, satisfactorily implemented, and effective in achieving the desired results. No WAP-affecting concerns in the area of VE were identified.

5.6 Non-WAP-related Technical Activities

Each non-WAP-related 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 CBFO QAPD, WIPP WAC, or WIPP DSA, as applicable, is cited briefly, and the result of the assessment is provided.

5.6.1 Nondestructive Assay

The audit team evaluated the adequacy, implementation, and effectiveness of the LLNL/CCP NDA characterization process for CH TRU SCGs S3000 solids and S5000 debris wastes. The audit team also conducted interviews with responsible personnel and reviewed the following implementing procedures relative to the NDA process to determine the degree to which the procedures adequately address upper-tier requirements:

- CCP-TP-058, Rev. 6, *CCP NDA Performance Demonstration Program*;
- CCP-TP-076, Rev. 5, *CCP Operating the Mobile ISOCS Large Container Counter Using NDA 2000*;
- CCP-TP-077, Rev. 4, *CCP Calibrating the Mobile ISOCS Large Container Counter Using NDA 2000*;
- CCP-TP-202, Rev. 0, *CCP Operating the Segmented Gamma Scanner Using NDA 2000*; and
- CCP-TP-203, Rev. 0, *CCP Calibrating the Segmented Gamma Scanner Using NDA 2000*.

Results of the review indicated the procedures adequately addressed upper-tier requirements.

The audit team evaluated the following NDA equipment: Segmented Gamma Scanner (SGS) and Mobile ISOCS Large Container Counter (MILCC) unit # 4. The SGS is in the Super Block Plutonium Facility in Room 1013, and the MILCC4 is in Tent 6198 in the 625 Yard.

Based on a review of the current revisions of LLNL/CCP procedures, checklists were prepared and used to evaluate and verify the following:

- System stability as evidenced by the implementation and effectiveness of quality control measurements and calibration verifications;
- Applicability of each system's calibration and operational range to the matrix, geometry, and radionuclide content of waste being assayed;
- Successful participation in the CBFO-sponsored NDA PDP;
- Completed BDRs to ensure data are reported, analyzed, and reviewed as required;
- Data storage and retrievability;
- Personnel qualification and training for operators, SPMs, and NDA EAs;
- Continued tracking, operability and condition of the SGS and MILCC4; and
- Operational logbooks and current software versions for both systems.

The audit team did not travel to the LLNL site, due to the potential spread and impact of the acute respiratory illness, COVID-19. Although no field activities were evaluated at the LLNL facilities, verification of compliance was demonstrated through review of NDA BDRs, logbooks, training documents, and interviews conducted with NDA operations personnel.

SGS

The SGS unit had completed test measurements for PDP cycles 26A at the time of the audit. The SGS performed assays resulting in the generation of five BDRs. All were selected for review. The following BDRs were reviewed by the audit team:

- BDR LL-SGS1-0008
- BDR LL-SGS1-0009
- BDR LL-SGS1-0010
- BDR LL-SGS1-0011
- BDR LL-SGS1-0014

The BDRs reviewed ranged from one to four containers for a total of 12 containers. The 26A PDP cycle was completed and was found to be valid until November 11, 2020. The 27A cycle measurements have been successfully completed for the SGS by LLNL but documentation has yet to be submitted or scored. One NCR was identified which pertained to the BDR Table of contents Block 3 not being completed. There were no impacts to the 4 assayed containers.

The following SGS calibration documents were reviewed:

- CI-LLNL-NDA-001, Rev. 3, *Calibration, Verification, and Confirmation Report for the Lawrence Livermore National Laboratory (LLNL) Room 1013 Segmented Gamma Scanner (SGS)*, dated August 20, 2019; and
- CI-LLNL-NDA-002, Rev. 0, *Total Measurement Uncertainty Report for the Lawrence Livermore National Laboratory Segmented Gamma Scanner*.

No full calibration has been performed or required on the SGS since the initial calibration in 2014.

The audit team determined that the procedures applied to the SGS and the reports documenting its calibration range, operating parameters, and measurement uncertainty are adequate and address upper-tier requirements.

MILCC4

The MILCC4 successfully participated in PDP cycle 26A for drummed waste. The MILCC4 assayed approximately 608 containers since the last audit. These assays resulted in the generation of 140 BDRs, where twenty four were selected for review:

BDR LL- MILCC4-0043	BDR LL- MILCC4-0046	BDR LL- MILCC4-0058
BDR LL- MILCC4-0067	BDR LL-MILCC4-0072	BDR LL-MILCC4-0082_R1
BDR LL-MILCC4-0083	BDR LL-MILCC4-0117	BDR LL-MILCC4-0119
BDR LL-MILCC4-0122	BDR LL-MILCC4-0132	BDR LL-MILCC4-0133
BDR LL-MILCC4-0136	BDR LL-MILCC4-0104	BDR LL-MILCC4-0112
BDR LL-MILCC4-0113	BDR LL-MILCC4-0128	BDR LL-MILCC4-0134
BDR LL-MILCC4-0056	BDR LL-MILCC4-0079_R1	BDR LL-MILCC4-0086

BDR LL-MILCC4-0089 BDR LL-MILCC4-0122 BDR LL-MILCC4-0131

CCP performed one calibration verification dated February 20, 2020. Detector 1 of the MILCC4 unit had been overheating the LYNX MCA and causing it to shut down as the temperature in the outdoor measurement space rose during the day. After successfully completing measurement operations of February 18, 2020, and shutting down the unit, Detector 1 was replaced. Subsequent quality control and calibration verification measurements verified that the MILCC4 was successfully returned to operation within the approved calibration range on February 19, 2020. Calibration verification measurements were performed using Eu-152/Am-241 line sources loaded in a homasote matrix drum. Gamma results were calculated using the Eu energy lines of 121.78 keV, 344.29 keV, 778.92 keV, 964.11 keV, 1112.07 keV, and 1408 keV. The results verified that the instrument remains functional and the calibration is satisfactory.

The audit team reviewed the following NCRs:

NCR-LLNL-0037-20	NCR-LLNL-0701-19	NCR-LLNL-0697-19
NCR-LLNL-0666-19	NCR-LLNL-0337-19	NCR-LLNL-033-20
NCR-LLNL-034-20		

The following calibration documents were reviewed and provided to the audit team for evaluation:

- MILCC4-NDA-1000, Rev. 0, 2/8/2019, *Lawrence Livermore National Laboratory MILCC4 ISOCS Calibration Report*;
- CI-MILCC4-NDA-1001, Rev. 1, 3/11/2019, *Calibration Confirmation Report for the Mobile ISOCS Large Container Counter (MILCC4) at Lawrence Livermore National Laboratory*;
- CI-MILCC4-TMU-101, Rev. 1, 4/11/2019, *Lawrence Livermore National Laboratory Mobile ISOCS Large Container Counter 4 (MILCC4) Total Measurement Uncertainty Report*;
- CI-MILCC4-NDA-1001, 6/11/19, *Mobile ISOCS Large Container Counter (MILCC4) Calibration Verification Report*, and
- CI-MILCC4-NDA-1001, 2/20/20, *Mobile ISOCS Large Container Counter (MILCC4) Calibration Verification Report*.

The audit team interviews of MILCC4 NDA staff adequately verified the calibration range, operating parameters, and measurement uncertainty in accordance with upper-tier requirements.

The audit team examined training records for NDA personnel and confirmed they were appropriately trained and qualified as required, and the equipment software versions installed and used to perform NDA operations were appropriately identified and

consistent with the versions listed in the CCP-QP-022, Rev. 19, *CCP Software Quality Assurance Plan*.

The procedures reviewed and objective evidence assembled provided evidence that the applicable requirements for NDA characterization of CH SCGs S3000 solids and S5000 debris wastes using the two NDA systems (SGS and MILCC4) were adequately established for compliance with upper-tier requirements. The processes for characterizing CH SCGs S3000 solids and S5000 debris wastes were satisfactorily implemented and effective in achieving the desired results. No non-WAP-affecting concerns in the area of NDA were identified.

5.6.2 Container Management

The audit team reviewed the implementing procedure for CM activities conducted at LLNL 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*. Results of the review indicate that the procedure adequately addresses upper-tier requirements.

The audit team did not travel to the LLNL site, due to the potential spread and impact of the acute respiratory illness, COVID-19. Although no field activities were evaluated at the LLNL facilities, verification of compliance was demonstrated through review of CM documentation, training documents, and interviews conducted with CM personnel.

The audit team verified the VPM verifies the container IDs are in the AK tracking spreadsheet and recorded on Attachment 2. The audit team confirmed through interview that the container integrity checks are performed. The container traveler is placed in an attached plastic pocket on the drum. The audit team confirmed container management personnel use a certified scale and check weights for all waste containers. The calibration certificate for scale LLNL-0009219-6CE was verified to be accurate and current.

The audit team reviewed three container travelers and three container inspection/weight reports. All documents were complete as required and entered into the CCP records system.

The audit team examined training and qualification documentation for CM personnel and determined the operators were qualified and able to perform CM operations.

The procedure reviewed and objective evidence assembled 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 non-WAP-affecting concerns in the area of container management were identified.

5.6.3 Flammable Gas Analysis

The audit team conducted interviews with responsible personnel and reviewed the following implementing procedure relative to the FGA process to determine the degree to which the procedure addresses upper-tier requirements: DOE/WIPP-06-3345, Rev. 10, *Waste Isolation Pilot Plant Flammable Gas Analysis*. Results of the review indicate that the procedure adequately addresses upper-tier requirements.

The audit team did not travel to the LLNL site, due to the potential spread and impact of the acute respiratory illness, COVID-19. Although no field activities were evaluated at the LLNL facilities, verification of compliance was demonstrated through review of FGA BDRs, logbooks, training documents, and interviews conducted with FGA operations personnel.

The audit team interviewed LLNL/CCP representatives to verify compliance with the implementing procedures applicable to FGA. The audit team examined training records for FGA operators and determined that the FGA operators were appropriately trained and qualified, as required.

The audit team examined the following CH FGA BDRs to verify implementation and compliance with the requirements for documenting FGA activities, as specified in DOE/WIPP-06-3345:

- LL19FG7085_ICAL (Initial Calibration Report)
- LL19FG7001_ICAL reported in A-19-29
- LL19FG7002_MDL (Minimum Detection Limit Level Report) reported in A-19-29
- LL19FG7047
- LL19FG7084
- LL20FG7005
- LL20FG7009
- LL20FG7011
- LL20FG7017

All reports were complete, reviewed as required, and maintained by CCP Records. There were two NCRs associated with the FGA BDRs: NCR-LLNL-0032-20 and NCR-LLNL-0035-20, which were properly prepared, satisfactorily completed, and maintained by CCP Records.

The audit team examined training and qualification documentation dated August 20, 2020, for FGA operators and determined the operators were qualified and able to perform FGA operations.

The audit team verified the results contained in the BDRs and analytical operations records utilizing an Agilent Technologies Gas Chromatograph 7890A series Gas Chromatograph (GC) for CH waste containers as reported in the BDRs, immediately followed by sample analysis. The team also verified the use of the procedure to determine the sampling scenario, determination of the drum age criteria, recording of

the filter number, and all information properly documented on the procedure attachments. All samplings were performed in accordance with the procedure. No discrepancies were identified for either sampling or analysis of CH containers.

The audit team verified that an ITR was performed following analytical BDR completion, that any discrepancies were noted and returned to the analyst for correction, and that the completed and reviewed BDR was submitted to CCP Records in accordance with CCP procedures.

NorLab Certificates of Accuracy were examined for Internal Standards and Bromofluorobenzene (BFB), Initial Calibration Standards, and for Continuing Calibration Standards. All standards were within their expiration dates and contained the required number of volatile compounds including hydrogen.

The procedures reviewed and objective evidence assembled provided evidence that the applicable requirements for FGA characterization of CH SCGs S3000 solids and S5000 debris wastes are adequately established for compliance with upper-tier requirements. The processes for characterizing CH SCGs S3000 solids and S5000 debris wastes were satisfactorily implemented and effective. No non-WAP-affecting concerns in the area of FGA were identified.

5.6.4 Gas Generation Testing

There have been no GGT activities performed at LLNL by CCP. As a result, the GGT process was deemed indeterminate.

6.0 CARs, CDAs, OBSERVATIONS, AND RECOMMENDATIONS

6.1 Corrective Action Reports

During the audit, the audit team may identify CAQs, as defined below, and document such conditions on CARs.

Condition Adverse to Quality (CAQ) – An all-inclusive term used in reference to any of the following: failures, malfunctions, deficiencies, defective items, nonconformances, and technical inadequacies.

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

6.1.1 WAP-Affecting Corrective Action Reports

No WAP-affecting CARs were identified during the audit.

6.1.2 Non-WAP-Affecting Corrective Action Reports

One non-WAP-affecting CAR was identified during the audit.

CAR 20-027

CAQ:

The SPM or AKE did not provide the AK briefing training for CCP-AK-LLNL-002, Rev 1 on July 22, 2019. The briefing was given by the VEE.

Requirements:

CCP-QP-043, Rev 3, CCP Operations Level Training and Qualification, Section 6.0, Waste Stream Summary Training, 6.4, "SPM or AKE, provide the briefing to the required RTR and VE personnel."

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 Management 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 Management 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 Management 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 Management Representative categorizes the condition as CDA according to the definition below.

CDA – 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.

6.2.1 WAP-Affecting Deficiencies Corrected During the Audit

No WAP-affecting CAQs were identified and corrected during this audit.

6.2.2 Non-WAP-Affecting Deficiencies Corrected During the Audit

No non-WAP-affecting CAQs were identified and 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.

6.3.1 WAP-Affecting Observations

No WAP-affecting Observations were identified during the audit.

6.3.2 Non-WAP-Affecting Observations

No non-WAP-affecting Observations were identified during the 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.

No Recommendations were identified during the audit.

7.0 LIST OF ATTACHMENTS

- Attachment 1: Meeting Attendees and Personnel Contacted During Audit A-20-18
- Attachment 2: Personnel Contacted During the Audit by Subject Area
- Attachment 3: Summary Table of Audit Results
- Attachment 4: WAP-Related Objective Evidence Reviewed During the Audit
- Attachment 5: Table of Audited Procedures
- Attachment 6: List of Processes and Equipment Evaluated

MEETING ATTENDEES AND PERSONNEL CONTACTED DURING AUDIT A-20-18				
NAME	TITLE/ORG	PRE-AUDIT MEETING	CONTACTED DURING AUDIT	POST-AUDIT MEETING
Ballew, Veronica	QA Program/Project Integration Mgr./NWP	X		X
Bearden, Tom	RES/Amentum			X
Biswell, David	Observer/NMED	X		X
Calder, Lisa	SPM/NWP-CCP	X	X	X
Carver, Tom	NTP Waste Certification Manager, CBFO			X
Conrad, Clint	TRU Project Lead/RHWM	X		
Daniels, Brian	LLNS/VE Operator		X	
Davis, James	PM/NNSA-LFO	X		X
Ellis, Jerry	Observer/EPA	X		
Fell, Clifford	NWP/CCP Configuration Management Engineer		X	
Gallegos, Adam	NDA EA/CCP (Mirion)	X		
Haar, Kevin	NDA Cog Engineer/NWP-CCP	X	X	X
Harvill, Joe	NDA Tech. Advisor/NWP-CCP	X	X	X
Hernandez, Jennifer	CCP Training Coordinator TFE/CCP	X	X	X
Hoggatt, Kyle	CCP-AKE/Tech Specs	X	X	
Hollister, Rod	SME/RHWM	X		
Hulse, Jackie	VEE-VPM/NWP-CCP	X	X	X
Ivey, Dennis	NWP QA Manager			X
Kantrowitz, Richard	NWP/CCP Technical Support	X		X
Kirkes, Creta	WCO-WCA/NWP-CCP	X	X	
Kleckner, John	CCP-AKE/Tech Specs	X	X	X
Lee, Ronnie	CCP Manager/NWP-CCP	X	X	X
Machado, Richard	Mirion Technologies, Expert Analyst		X	
Maestas, Ricardo	Observer/NMED	X		
Moody, Dave	SPM/NWP-CCP	X	X	X
Pace, Berry	NWP/CCP Waste Characterization Advisory	X		X
Pellegrini, William	Site Manager/Mirion	X	X	

MEETING ATTENDEES AND PERSONNEL CONTACTED DURING AUDIT A-20-18				
NAME	TITLE/ORG	PRE-AUDIT MEETING	CONTACTED DURING AUDIT	POST-AUDIT MEETING
Pyeatt, Brandye	QA-NCR Coordinator/NWP	X	X	X
Saiz, Sheri	QA/NWP	X		X
Tilmon, Pat	NDE Cog Eng NWP/CCP		X	X
Verlanic, Bill	VPM/NWP-CCP	X	X	X
Wade, Daniel	CCP Project Manager/NWP-CCP	X	X	X
Walker, Andy	NWP Transportation Mgr			X
Webb, Jessica	TFE/CCP Document Services	X		X
Wilson, Jeff	LLNS/VE Operator		X	
Yturralde, Jewell	CCP Records Manager, TFE/CCP	X	X	X

**PERSONNEL CONTACTED DURING THE AUDIT BY SUBJECT AREA
(WAP-RELATED)**

Personnel Qualification and Training	Jennifer Hernandez
Control of Nonconforming Items	Brandye Pyeatt
Records	Jewell Yturralde
WIPP Waste Information System (WWIS Data Entry)	Creta Kirkes
Waste Certification/Project-Level Data V&V	Lisa Calder David Moody
Acceptable Knowledge	Kyle Hoggatt John Kleckner
Real-Time Radiography	Pat Tilmon
Visual Examination	Jackie Hulse Jeff Wilson Bill Verlanic David Moody Brian Daniels Daniel Wade Ronnie Lee

**Audit A-20-18
Summary Table of Audit Results**

QA / Technical Elements	Concern Classification				QA Evaluation		Technical Evaluation
	CARs	CDAs	Obs	Rec	Adequacy	Implementation	Effectiveness
Program Status/ Program Changes/ Interface					A	S	E
C6 General QA Elements (NCRs, Qual. & Training, Records)					A	S	E
C6 General QA Elements (WWIS/WDS)					A	S	E
Acceptable Knowledge & Waste Certification					A	S	E
Project Level Data V&V					A	S	E
Visual Examination	1				A	S	E
Gas Generation Testing					I	I	I
Real-time Radiography					A	S	E
Nondestructive Assay					A	S	E
Container Mgmt./FGA					A	S	E
TOTALS	1	0	0	0	A	S	E

Definitions

E = Effective

S = Satisfactory

I = Indeterminate

M = Marginal

U = Unsatisfactory

CAR = Corrective Action Report

CDA = Corrected During Audit

NE = Not Effective

Obs – Observation

Rec = Recommendation

A = Adequate

NA = Not Adequate

WAP-Related Objective Evidence Reviewed During the Audit

The WAP-related objective evidence supporting the Audit A-20-18 will be included in the shipping box(es) submitted with the final audit report. Included in the shipping box(es) will be a “Content Map” describing the location (using color-coding) and identity of all required objective evidence supporting the performance of the audit.

Audit A-20-18
TABLE OF AUDITED PROCEDURES

	Procedure No.	Rev.	Procedure Title
1.	CCP-PO-001	23	CCP Transuranic Waste Characterization Quality Assurance Project Plan
2.	CCP-PO-002	30	CCP Transuranic Waste Certification Plan
3.	CCP-PO-005	30	CCP Conduct of Operations
4.	CCP-PO-016	6	CCP Gas Generation Testing Quality Assurance Project Plan
5.	CCP-PO-043	0	CCP Interface Document Preparation
6.	CCP-PO-045	3	CCP Waste Management Field Observation
7.	CCP-PO-047	3	CCP Training and Qualification Program Document
8.	CCP-PO-048	2	CCP/LLNL Interface Document
9.	CCP-QP-002	45	CCP Training and Qualification Plan
10.	CCP-QP-005	26	CCP TRU Nonconforming Item Reporting and Control
11.	CCP-QP-008	27	CCP Records Management
12.	CCP-QP-010	31	CCP Document Preparation, Approval, and Control
13.	CCP-QP-016	25	CCP Control of Measuring and Testing Equipment
14.	CCP-QP-017	4	CCP Identification and Control of Items
15.	CCP-QP-022	19	CCP Software Quality Assurance Plan
16.	CCP-QP-028	17	CCP Records Filing, Inventorying, Scheduling, and Dispositioning
17.	CCP-QP-041	4	CCP Job Needs Analysis and Design
18.	CCP-QP-042	2	CCP Project Level Training and Qualification
19.	CCP-QP-043	3	CCP Operations Level Training and Qualification
20.	CCP-TP-001	22	CCP Project Level Data Validation and Verification
21.	CCP-TP-002	29	CCP Reconciliation of DQOs and Reporting Characterization Data
22.	CCP-TP-005	32	CCP Acceptable Knowledge Documentation
23.	CCP-TP-030	38	CCP CH TRU Waste Certification and WWIS/WDS Data Entry
24.	CCP-TP-033	25	CCP Shipping of CH TRU Waste
25.	CCP-TP-048	18	CCP NDA System Data Reviewing, Validating, and Reporting Procedure
26.	CCP-TP-053	18	CCP Standard Real-Time Radiography (RTR) Inspection Procedure
27.	CCP-TP-058	6	CCP NDA Performance Demonstration Program
28.	CCP-TP-068	12	CCP Standardized Container Management
29.	CCP-TP-076	5	CCP Operating the Mobile ISOCS Large Container Counter Using NDA 2000
30.	CCP-TP-077	4	CCP Calibrating the Mobile ISOCS Large Container Counter Using NDA 2000
31.	CCP-TP-079	1	CCP Real-Time Radiography #2 Operating Procedure
32.	CCP-TP-083	8	CCP Gas Generation Testing
33.	CCP-TP-113	23	CCP Standard Visual Examination
34.	CCP-TP-200	6	Enhanced Acceptable Knowledge Review
35.	CCP-TP-202	0	CCP Operating the Segmented Gamma Scanner using NDA 2000
36.	CCP-TP-203	0	CCP Calibrating the Segmented Gamma Scanner Using NDA 2000
37.	DOE/WIPP-06-3345	10	Waste Isolation Pilot Plant Flammable Gas Analysis
38.	WP 13-QA.03	30	Quality Assurance Independent Assessment Program
The following procedures were not evaluated during LLNL/CCP Certification Audit A-20-18, but were included in the 2020 NTP Scope Memorandum for the LLNL/CCP Certification Audit (CBFO:ONTP:KEP:VV:20-1246:UFC 5900.00, dated July 10, 2020).			
	Procedure No.	Rev.	Procedure Title
39.	CCP-QP-001	10	CCP Graded Approach
40.	CCP-QP-014	8	CCP Quality Assurance Trend Analysis and Reporting

41.	CCP-QP-015	15	CCP Procurement
42.	CCP-QP-018	12	CCP Management Assessment
43.	CCP-QP-019	8	CCP Quality Assurance Reporting to Management
44.	CCP-QP-023	4	CCP Handling, Storage, and Shipping
45.	CCP-QP-026	16	CCP Inspection Control
46.	CCP-QP-027	6	CCP Test Control
47.	CCP-QP-037	5	CCP Calculations

NOTE: Procedures were not reviewed during the audit due to the following condition:

Numbers 39-47: Procedures not applicable to the waste characterization activities evaluated during the A-20-18 LLNL/CCP Certification Audit for the certification process, and in most instances, are evaluated during a separate CCP QA All-Sites Audit or other respective assessment annually.

List of Processes and Equipment Evaluated

WIPP #	Process/Equipment Description	Applicable to the Following Waste Streams/Groups of Waste Streams
PROCESSES OR EQUIPMENT EVALUATED		
N/A	Acceptable Knowledge (AK) Procedures: CCP-TP-005, CCP-TP-200 <ul style="list-style-type: none"> ❖ Enhanced AK ❖ Enhanced Chemical Compatibility Evaluation ❖ Basis of Knowledge Evaluation Oxidizing Chemicals in TRU Waste 	Solids (S3000) Debris (S5000)
N/A	Load Management	N/A
N/A	Data Validation & Verification Procedures: CCP-TP-001, CCP-TP-002, CCP-TP-048	Solids (S3000) Debris (S5000)
13VE1	Visual Examination Procedure: CCP-TP-113 Description: Characterization performed utilizing Visual Examination (VE) and AK	Solids (S3000) Debris (S5000)
13MILCC4	Nondestructive Assay, including Performance Demonstration Program (PDP) Procedures: CCP-TP-076, CCP-TP-077, CCP-TP-048; CCP-TP-058 (relative to PDP) Description: Mobile In-Situ Object Counting System (ISOCS) Large Container Counter (MILCC) calibrated for 55-gallon drums, "12" Pipe Overpack Containers, and Standard Waste Boxes	Solids (S3000) Debris (S5000)
13SG1	Nondestructive Assay, including PDP Procedures: CCP-TP-202, CCP-TP-203, CCP-TP-048, CCP-TP-058 (relative to PDP) Description: Segmented Gamma Scanner (SGS) calibrated for 55-gallon drums	Solids (S3000) Debris (S5000)
13RR1	Real-Time Radiography Procedures: CCP-TP-053, CCP-TP-079	Solids (S3000) Debris (S5000)
13HG7	Flammable Gas Analysis Procedure: DOE/WIPP-06-3345	Solids (S3000) Debris (S5000)
N/A	Gas Generation Testing Procedure: CCP-TP-083	Solids (S3000) Debris (S5000)
N/A	WIPP Waste Information System/Waste Data System (WWIS/WDS) Procedure: CCP-TP-030 Description: CH TRU Waste Characterization and WWIS Data Entry	Solids (S3000) Debris (S5000)
N/A	Quality Assurance (QA)	Solids (S3000) Debris (S5000)

List of Processes and Equipment Evaluated

WIPP #	Process/Equipment Description	Applicable to the Following Waste Streams/Groups of Waste Streams
NEW PROCESSES OR EQUIPMENT		
N/A	N/A	N/A
DEACTIVATED PROCESSES OR EQUIPMENT		
13RR1	Real-Time Radiography 2 Unit	Solids (S3000) Debris (S5000)