

# memorandum

Carlsbad Field Office  
Carlsbad, New Mexico 88221

DATE: August 8, 2011

REPLY TO  
ATTN OF: CBFO:OQA:DSM:MAG:11-0661:UFC 2300.00

SUBJECT: Interim Audit Report A-11-23, Waste Characterization in Accordance with the  
Hazardous Waste Facility Permit, SNL/CCP

TO: James W. Todd, DOE-SNL



The Carlsbad Field Office (CBFO) conducted Audit A-11-23 of Sandia National Laboratories Central Characterization Project (SNL/CCP) waste characterization activities on July 13-15, 2011. The CBFO Interim Audit Report is attached.

The audit team concluded that the SNL/CCP technical and quality assurance programs for remote-handled (RH) transuranic (TRU) waste characterization activities were adequate in accordance with the Waste Isolation Pilot Plant (WIPP) Hazardous Waste Facility Permit, the CBFO *Quality Assurance Program Document*, the WIPP Waste Acceptance Criteria, and the *RH TRU Waste Characterization Program Implementation Plan* for the containers completed in Process Knowledge Evaluation (PKE) 00044. The audit team determined that requirements for Dose-to-Curie operations were adequate, satisfactorily implemented, and effective with regard to waste covered by PKE00044. Wastes covered by PKE00047 and PKE00027/54 were found to be indeterminate because sampling results were not available for review. Therefore, no final batch data reports for wastes covered by these two PKEs were available for review. The remainder of the containers will be evaluated during a supplemental audit expected to take place in November 2011.

The audit team determined that the SNL/CCP procedures were satisfactorily implemented and the evaluated processes were effective. As a result of the audit, two CBFO Corrective Action Reports were issued and three deficiencies were corrected during the audit. The audit team documented three Observations and offered one Recommendation to SNL/CCP management for consideration.

If you have any questions concerning the attached report, please contact me at (575) 234-7491.



Dennis S. Miehl  
Senior Quality Assurance Specialist

Attachment



James W. Todd

-2-

August 8, 2011

cc: w/attachment

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WIPP Operating Record	ED
CBFO QA File	
CBFO M&RC	

\*ED denotes electronic distribution

U.S. DEPARTMENT OF ENERGY  
CARLSBAD FIELD OFFICE

INTERIM AUDIT REPORT

OF THE

SANDIA NATIONAL LABORATORIES (SNL)  
CENTRAL CHARACTERIZATION PROJECT (CCP)

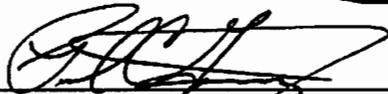
CARLSBAD, NEW MEXICO

AUDIT NUMBER A-11-23

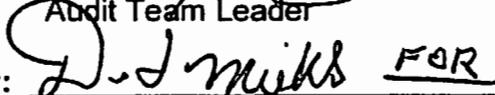
JULY 13 – 15, 2011

WASTE CHARACTERIZATION IN ACCORDANCE WITH THE  
HAZARDOUS WASTE FACILITY PERMIT



Prepared by:  Date: 8/8/2011

Paul C. Gomez, CTAC  
Audit Team Leader

Approved by:  FOR Date: 8-8-11

Randy Unger, CBFO  
Quality Assurance Director

## **1.0 EXECUTIVE SUMMARY**

Carlsbad Field Office (CBFO) initial Certification Audit A-11-23 was conducted to evaluate the adequacy, implementation, and effectiveness of Sandia National Laboratories (SNL) Central Characterization Project (CCP) transuranic (TRU) waste characterization activities performed for remote-handled (RH) Summary Category Group (SCG) S5000 debris waste. Activities were evaluated relative to the requirements of the Waste Isolation Pilot Plant (WIPP) Hazardous Waste Facility Permit (HWFP), the *CBFO Quality Assurance Program Document (QAPD)*, the *Waste Acceptance Criteria for the Waste Isolation Pilot Plant (WAC)*, and the *RH TRU Waste Characterization Program Implementation Plan (WCPIP)*.

Audit A-11-23 was performed in Carlsbad, NM, July 13 through 15, 2011. Overall, the audit team concluded that the SNL/CCP technical and quality assurance (QA) programs, as applicable to the audited activities, were adequate, satisfactorily implemented, and effective for compliance with applicable upper-tier requirements. With regard to Dose-to-Curie (DTC), the audit team determined that requirements for DTC operations were adequate, satisfactorily implemented and effective for waste covered by Process Knowledge Evaluation (PKE) 00044. Wastes covered by PKE00047 and PKE00027/54 were found to be indeterminate because sampling results were not available; therefore, no final batch data reports (BDRs) for wastes covered by these two PKEs were available for review.

Two conditions adverse to quality that resulted in the issuance of CBFO corrective actions reports (CARs) were identified during the audit. Three deficiencies, isolated in nature and requiring only remedial corrective action, were corrected during the audit (CDA). Three Observations were identified during the audit and one Recommendation was offered to CCP management. The CARs, CDAs, Observations and Recommendation are described in section 6.

## **2.0 SCOPE AND PURPOSE**

### **2.1 Scope**

The audit team evaluated the adequacy, implementation, and effectiveness of the programs and requirements controlling SNL/CCP TRU waste characterization activities for RH SCG S5000 debris waste stream SNL-HCF-S5400-RH. This audit, in conjunction with Surveillance S-11-15 (conducted March 30 – 31, 2011) and Surveillance S-11-20 (conducted May 16, 2011), supplemented the evaluation for all the specific TRU waste characterization processes reviewed.

### **2.2 Purpose**

Audit A-11-23 was conducted to evaluate the degree to which SNL/CCP waste characterization and certification activities for RH SCG S5000 debris waste stream SNL-HCF-S5400-RH are compliant with the HWFP, the CBFO QAPD, the WAC, and the WCPIP.

### 3.0 REFERENCES

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

Waste Isolation Pilot Plant Hazardous Waste Facility Permit Number  
NM4890139088-TSDF

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

*Transuranic Waste Acceptance Criteria for the Waste Isolation Pilot Plant,  
DOEWIPP-02-3122*

*RH TRU Waste Characterization Program Implementation Plan (WCPiP),  
DOEWIPP-02-3214*

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

*CCP Transuranic Waste Certification Plan, CCP-PO-002*

Related technical and QA implementing procedures

### 4.0 AUDIT TEAM AND OBSERVERS

#### AUDITORS/TECHNICAL SPECIALISTS

Dennis S. Miehls	Management Representative, CBFO QA
Lea Chism	Auditor, CBFO QA
Paul C. Gomez	Audit Team Leader, CBFO Technical Assistance Contractor (CTAC)
Laurie Smith	Auditor, Los Alamos National Laboratory Carlsbad Operations (LANL/CO)
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Jim Oliver	Technical Specialist, CTAC
Dick Blauvelt	Technical Specialist, CTAC

#### OBSERVERS

Steve Holmes	New Mexico Environment Department (NMED)
J.R. Stroble	CBFO Office of the National TRU Program (NTP)
Court Fesmire	CBFO NTP

The individuals who were contacted during the SNL/CCP audit are identified in Attachment 1. A pre-audit meeting was held in the Skeen-Whitlock Building QA

conference room, in Carlsbad, NM, on July 13, 2011. Daily meetings were held with SNL/CCP management and staff to discuss audit progress, issues, and potential deficiencies. The audit concluded with a post-audit meeting held in the Skeen-Whitlock Building QA conference room, in Carlsbad, NM, on July 15, 2011.

## **5.0 SUMMARY OF AUDIT RESULTS**

The following programmatic and technical elements were evaluated.

### Quality Assurance Activities

- Personnel Qualifications and Training
- Nonconformances
- Records
- Software Quality Assurance

### Technical Activities

- Acceptable Knowledge (AK), including waste certification
- Project-level Data Validation and Verification (V&V)
- Headspace Gas (HSG) Sampling
- Visual Examination (VE)
- Radiological Characterization/Dose-to-Curie (DTC)
- WIPP Waste Information System (WWIS)/Waste Data System (WDS)

This audit was performed to assess the ability of SNL/CCP to characterize RH SCG S5000 debris waste for compliance with the requirements specified in the WIPP HWFP Waste Analysis Plan (WAP), the WAC, the RH TRU WCPIP, and the CBFO QAPD. Evaluations of program elements for personnel qualifications and training, nonconformance reporting, records, and software QA were performed. The characterization methods assessed were AK, VE, HSG sample collection, and radiological characterization/DTC. Processes evaluated included data-generation and project-level data V&V, preparation of Waste Stream Profile Forms (WSPFs), data quality objective (DQO) reconciliation, and WWIS/WDS data entry.

The audit team concluded that the SNL/CCP TRU waste characterization program is adequate, satisfactorily implemented, and effective for containers from waste stream SNL-HCF-S5400-RH as related to sample PKE00044. The remainder of the samples from waste stream SNL-HCF-S5400-RH completed through analysis and certification processes (PKE00047 and PKE00027/54) will be evaluated at a later date. A table-top review surveillance is scheduled to be conducted in November 2011.

Audit activities are described below. Attachment 2 contains the Summary Table of Audit Results. Attachment 3 contains the Table of Audited Documents evaluated during the audit. Attachment 4 contains the List of Processes and Equipment reviewed during the audit.

## 5.1 Quality Assurance Activities

The following C6-1 checklist items related to QA program implementation were evaluated by the audit team. Additionally, aspects of the QA program governing the WWIS/WDS were evaluated. Each QA element evaluated is discussed in detail below. The objective evidence used to assess compliance and the conclusions reached for each area are briefly cited.

### 5.1.1 Personnel Qualifications and Training

The audit team conducted interviews with responsible personnel and reviewed implementing Procedure CCP-QP-002, Rev. 31, *CCP Training and Qualification Plan*, to determine the degree to which the procedure adequately addresses upper-tier requirements. Personnel training records associated with VE, DTC, HSG Sampling/Operations, AK, and Site Project Management were examined to verify implementation of associated requirements and to verify that personnel performing characterization activities are appropriately qualified. Records reviewed included qualification cards, appointment letters, and other pertinent qualification documentation, including attendance sheets for briefings on AK summaries for VE operators.

One concern was identified during the audit. No objective evidence was provided to show that the required letter from the SNL Site Technical Representative (STR) was sent to the CCP Site Project Manager (SPM) listing site-specific training required for each CCP position. This requirement is cited in CCP-PO-510, Rev. 0, section 4.1.3. Furthermore, the VE operating procedure (CCP-TP-500, Rev. 11, section 2.4.1 [C]) cites facility training requirements for knowledge/training on the applicable health and safety plan. Objective evidence provided during the audit only documented that one out of the six qualified VE personnel had read the applicable health and safety plan prior to performing work (see CBFO CAR 11-044, section 6.1).

Objective evidence provided only documented that one out of the six qualified VE personnel had read the applicable health and safety plan prior to performing work.

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

### 5.1.2 Nonconformances

The audit team interviewed the resident QA engineer and randomly selected a sampling of nonconformance reports (NCRs) (NCR-RHSNL-2350-11, NCR-RHSNL-2351-11, NCR-RHSNL-2352-11, NCR-RHSNL-2345-11, NCR-RHSNL-2346-11, NCR-RHSNL-2347-11, and NCR-RHSNL-2348-11) to confirm that deficiencies are appropriately documented and tracked through resolution as required. There were no NCRs which required reporting to the Permittee within the 7-day requirement at the time of the audit.

All NCRs were verified as being managed and tracked in the CCP data center and the CCP NCR Logs. A correction to block 10 of NCR-RHSNL-2351-11 was made during the audit (see CDA 1, section 6.2).

Overall, nonconformance reporting activities were 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.

### 5.1.3 Records

The audit team conducted interviews and reviewed implementing procedures relative to the control and administration of QA records to determine the degree to which the procedures adequately address upper-tier requirements. The audit team reviewed CCP-PO-001, Rev. 18, *CCP Transuranic Waste Characterization Quality Assurance Project Plan*; CCP-QP-008, Rev. 17, *CCP Records Management*; and CCP-QP-028, Rev. 12, *CCP Records Filing, Inventorying, Scheduling, and Dispositioning*. Control of QA records was verified through review of the CCP RH Records Inventory and Disposition Schedule (RIDS) dated 3/15/11. One concern was identified concerning citations of obsolete references and forms found in two of the three procedures reviewed (see Observation 1, section 6.3).

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

### 5.1.4 Software Quality Assurance

The audit team reviewed the development of radiological characterization/DTC for PKE00044 used for calculating DTC for waste stream SNL-HCF-S5400-RH. DTC for PKE00044 is an application developed in Microsoft Excel<sup>®</sup>. The complete record package required by CCP-QP-022 was available in CCP Records and was reviewed in detail during the audit. One concern was identified: the software identifier included in the coding and printed on DTC BDR SNLRHDTC11001 did not include the version number that was recorded on the Software Inventory List (SIL). In stepping through the procedure, when a Software Problem Reporting and Change Request (SPRCR) is determined to be a "minor" change, no Software Change Order (SCO) Addendum is prepared and the procedure does not directly require that the version be changed to indicate the software has been changed. This unique identity could be lost through a minor change (see Observation 2, section 6.3). No minor changes had been issued for this software.

The SIL included only DTC for PKE00044. No other software was identified as being used for SNL/CCP.

The audit team verified that the current revision was available on both the .ftp site and the Quality and Manufacturing Integrated System (Q&MIS). The software control

procedure, CCP-QP-022, was determined to be adequate, appropriately implemented, and effective.

## 5.2 Technical Activities

Technical activities that were evaluated included the following: data generation-level and project-level V&V, AK including waste certification, HSG sampling and analysis, VE, and DTC activities. Objective evidence was selected and reviewed to evaluate implementation of requirements for characterization activities. This included, but was not limited to, source documents, summaries, BDRs, and sampling records. Evaluations from Surveillances S-11-15 and S-11-20 included direct observation of actual waste characterization activities such as VE, HSG sampling and DTC radiological survey. Each characterization process involves:

- Collecting raw data
- Collecting quality assurance/quality control (QA/QC) 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 WIPP

The flow of data for each characterization technique was reviewed to ensure that all applicable requirements were captured in the site operating procedures. Specific procedures audited and the objective evidence reviewed is described in the following sections. Objective evidence was assembled and used to assess compliance and the conclusions reached for each area is briefly cited.

### 5.2.1 Acceptable Knowledge

During the week of July 11, 2011, the audit team participated in a certification audit of RH S5000 TRU debris waste stream SNL-HCF-S5400-RH, generated in the SNL Hot Cell Facility (HCF). A primary document used in the review process was AK Summary Report, CCP-AK-SNL-500 Rev. 2, *CCP AK Summary Report for Sandia National Laboratories RH Hot Cell Facility TRU Waste (Debris)*. This certification audit was based on the requirements contained in the recently revised WIPP HWFP and described in the WAP, as well as the requirements of the RH TRU WCPIP and the WIPP WAC. The audit team reviewed documentation to support all AK requirements, completion of WCPIP checklists and WAP C6-3 and C6-1 checklists, and compiling and reviewing objective evidence to demonstrate compliance.

The objective evidence reviewed and compiled included the AK Summary Report referenced above, numerous AK source documents, a draft WAP-compliant WSPF and attachments, and BDRs for HSG, VE, and DTC characterization activities. The audit team made one Observation regarding the draft WSPF, which had errors in the Hazardous Waste Number (HWN), waste stream identification number, and the AK Summary Report (see Observation 3, section 6.3). The random container selection memo for HSG sampling and analysis was also examined, along with the corresponding

HSG Analysis Summary Report. Additional supporting documentation for the WCPIP requirements included a draft Characterization Reconciliation Report and supporting documentation, a WCPIP AK Accuracy Report, and the CCP RH TRU Radiological Characterization Report for waste stream, CCP-AK-SNL-501 Rev. 0. Examples from the AK record were reviewed to assure that all of the DQOs cited in the WCPIP were met. In addition, the auditors examined the AK record regarding the methods for qualification of AK information as required by the WCPIP. The DTC BDR was examined for the ten drums in the current population. It should be noted that these radiological data are only valid for the six drums whose contents are part of PKE00044 since this is the only population for which the scaling factors needed for the DTC have been established.

With regard to the WAP requirements, in addition to the AK Summary Report, AK Source Document Summaries and other relevant AK records cited above, the audit team reviewed the AK Documentation Checklist, attachment 1; the AK Source Document Information List, attachment 4; the AK Hazardous Constituents List, attachment 5; the AK Waste Form, Waste Material Parameters, Prohibited Items and Package, attachment 6 along with the applicable justification memo for waste material parameter weight estimates; and the AK Container List, attachment 8.

Examples of the resolution of AK discrepancies in the AK record, a WAP-compliant AK Accuracy Report, and the most recent internal surveillance were collected and examined along with screenshots from the Item Description Code (IDC) database and a copy of the AK Tracking Spreadsheet. Requisite training records were reviewed by the designated QA auditor for AK experts (AKEs) and SPMs based on names provided by the AK auditors. The audit team evaluated WAP-required container traceability for four waste containers from the total available population of 10, all of which were part of lot 1 of the HSG sampling batch. Original container input forms were compiled as available.

The WAP Compliance Tracking Spreadsheet documenting compliance with the new WAP requirements for AK had been completed prior to the audit, referencing appropriate sections of the AK Summary Report. It was judged to be satisfactory and will be appended to the AK Summary Report in the final audit report objective evidence.

The audit resulted in one recommendation concerning changes to be made to the AK Summary Report for the purposes of clarification and consistency (see Recommendation 1, section 6.4). These changes were incorporated in an existing freeze file that will be included in the next revision.

The audit team reviewed the availability of AK documentation in the controlled records files. All documents surveyed were present; however, one AK Source Document was incorrectly titled and dated in the AK Summary Report Listing of Source Documents. A concern was written and the error was corrected during the audit (see CDA 3, section 6.2).

Overall, the AK Program was judged to be adequate in addressing the requirements of the WCPIP, the WAC and the WAP, satisfactory in the implementation of these requirements, and effective in achieving the desired results.

#### 5.2.2 Project Level Data Validation and Verification

The audit team conducted interviews with responsible personnel and reviewed implementing procedures CCP-TP-001, Rev. 19, *CCP Project Level Data Validation and Verification*; CCP-TP-003, *CCP Data Analysis for S3000, S4000, and S5000 Characterization*; CCP-TP-500, *CCP Remote-Handled Waste Visual Examination*; CCP-TP-162, Rev. 1, *CCP Random Selection of Containers for Solids and Headspace Gas Sampling and Analysis*; and CCP-TP-504, Rev. 11, *CCP Dose-to-Curie Survey Procedure for Remote-Handled Transuranic Waste*, relative to project-level V&V activities, to determine the degree to which procedures adequately address upper-tier requirements.

Objective evidence was reviewed to ensure project-level activities were adequately performed to support waste characterization. BDRs were evaluated based on project-level requirements for VE, and HSG sampling and analysis for the SCG S5000 waste. Random selection requirements for HSG were evaluated. The quarterly repeat data-generation-level requirement has been evaluated.

A review of the draft WSPF/Characterization Information Summary for SNL/CCP (not approved until SNL/CCP is certified to ship) was performed. The characterization data performed on this stream are VE, HSG sampling and analysis, and DTC.

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

#### VE

RHSNLVE100001  
RHSNLVE110001  
RHSNLVE110002

#### HSG

SNHSG1101  
ECL11019G  
ECL11019M

#### Dose-to-Curie

SNLRHDTTC1101

No concerns were identified during the audit for V&V. The procedures reviews, field observations, and document reviews provided evidence that the applicable requirements for the Project-level Data Validation and Verification process are

adequately established for compliance with upper-tier requirements, satisfactory in the implementation of these requirements, and effective in achieving the desired results.

### 5.2.3 Headspace Gas Sampling

The audit team reviewed implementing procedures CCP-TP-093, Rev. 15, *CCP Sampling of TRU Waste Containers*; CCP-TP-106, Rev. 7, *CCP Headspace Gas Sampling Batch Data Report Preparation*; and CCP-TP-003, *CCP Data Analysis for S3000, S4000, and S5000 Characterization*, relative to HSG sampling activities, to determine the degree to which procedures adequately address upper-tier requirements. The audit team assessed the ability of SNL/CCP to characterize RH waste from SCG S5000 debris using HSG sampling. SNL/CCP operations for HSG sampling is performed using SUMMA<sup>®</sup> canisters.

Documentation and activities examined were recorded in BDR SNHSG1101. The BDR contained copies of the chain-of-custody (COC) form, sample tags, needle blank results, container data, temperature equilibration information and an Independent Technical Reviewer (ITR) form, which were reviewed during this audit. There were three instances of incorrect information recorded on the COC and two instances of incorrect review information recorded in the ITR review, which resulted in CBFO CAR-11-045 (see section 6.1).

The audit team reviewed training for personnel performing sampling activities and initiating and maintaining custody; this was verified to be current and acceptable.

With the exception of the condition adverse to quality described above, the audit team determined that overall, the SNL/CCP procedures reviewed, field observations, and documents reviewed provided evidence that the applicable requirements for HSG sampling are adequately established for compliance with upper-tier requirements, satisfactory in the implementation of these requirements, and effective in achieving the desired results.

### 5.2.4 Visual Examination

The audit team evaluated the adequacy, implementation and effectiveness of the ability of SNL/CCP to characterize and certify RH S5000 debris waste using the VE characterization process.

The audit team evaluated VE procedures CCP-TP-500, *CCP Remote-Handled Waste Visual Examination*, Rev. 10 (the revision used during the VE process), CCP-TP-163, Rev. 2, *CCP Evaluation of Waste Packaging Records for Visual Examination of Records*, and training qualification records for VE operators and the VE Expert (VEE).

The audit team examined the following RH VE BDRs:

RHSNLVE100001  
RHSNLVE110001  
RHSNLVE110002  
RHSNLVE110003  
RHSNLVE110004  
RHSNLVE110006

These BDRs were for containers in waste stream SNL-HCF-S5400-RH. SNL/CCP uses the two-operator method when performing VE characterization activities. Two qualified operators visually examine the waste as it is removed from the parent container and placed into 30-gallon drums, which in turn are packaged into 55-gallon drums. The actual observations of the VE operations performed were completed during Surveillance S-11-20.

During the audit, training files for six VE Operators and Appointment Letters for five VEEs were reviewed. All VE personnel were determined to be qualified to perform VE processes at SNL.

During the review of the VE BDRs, the audit team identified the following concern. The ITR inconsistently answered the "Comparability" section of question #13 for QAOs in Attachment 2 of BDR RHSNLVE110002. The VE Operator corrected the section of concern in Attachment 2 of the BDR, and the appropriate signatures and dates were obtained. The VE records have also been changed to reflect these corrective actions. It was determined that this VE concern was corrected during the audit (see CDA 2, section 6.2). The procedural requirements are found in procedure CCP-TP-500, Rev. 10, section 4.3.6.

Overall, the RH VE activities were determined to be adequate in addressing upper-tier requirements as applicable, satisfactory in the implementation of these requirements, effective in achieving the desired results.

#### 5.2.5 Radiological Characterization/Dose-to-Curie

The audit team assessed the adequacy, implementation, and effectiveness of the radiological characterization/DTC methodology used at SNL/CCP to characterize waste stream SNL-HCF-S5400-RH, consisting of approximately 32 parcels contained in 29 canisters of RH TRU debris waste. Inventory information to support development of DTC scaling factors was presented for waste generated in the SNL HCF. This waste was derived from three different areas within the HCF and was addressed in three separate SNL PKEs designated PKE00044, PKE00047, and PKE00027/54. The audit team evaluated the collection and analysis of samples from the HCF during CBFO Surveillance S-11-15 conducted March 30 – 31, 2011. Details from the sampling and subsequent analysis are documented in a CBFO memorandum from J. Holderness, CCP consultant to I. Quintana, CCP RH Project Manager, dated April 26, 2011. The

only portion of the waste stream for which sampling, analysis, and subsequent scaling factor development is complete is waste covered by PKE00044. Sampling, analysis, and scaling factor development was not complete for the portions of the waste stream covered by PKE00047 and PKE00027/54. The development of scaling factors that relate the measured dose rate (as witnessed during CBFO Surveillance S-11-15) to the average activity and the actual measurement of the dose rate of the radionuclides in the RH waste was for DTC; the dose rate is defined as the external exposure rate from gamma-ray emitting radionuclides within the waste matrix, predominantly cesium-137 (Cs-137).

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

- Development of average radionuclide ratios through examination of swipe sample data
- 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 containers
- Calculation of the radionuclide activities and other derived radiological quantities and associated uncertainties
- Results of applying the DTC methodology to characterize waste as evidenced in BDR SNLRHDTTC1101
- Determination of the number of containers examined, completed BDRs, and BDRs that had been through project-level review that were generated prior to this audit
- Completed BDRs to ensure data are reported and reviewed as required
- Data storage and retrievability
- Personnel qualification and training

Based on sample data collected for the swipe samples, scaling factors were developed to establish ratios of the isotopes of interest to Cs-137.

The source of the RH waste at the SNL HCF that gave rise to the waste generation were a variety of experiments on reactor fuels, both light water reactor fuel and fast breeder mixed oxide fuels, including the effect on fuel of reactor accident conditions. Based on sample data collected for the swipe samples, scaling factors were developed to establish ratios of the isotopes of interest to Cs-137.

Measurements of the external dose or exposure rates of the waste are made in a high-bay area outfitted with the SNL Auxiliary Hot Cell (AHC). The exposure rate, attributed

entirely to Cs-137, is measured four times at a distance of 1 meter from the waste containers. Auditors examined the apparatus for performing DTC during CBFO Surveillance S-11-15. A Thermo Scientific Model FHZ-612 (Probe XC-0676) survey meter is used to measure the dose rate. Each container is rotated 90 degrees successively between each of the four measurements. The average measured dose or exposure rate for each 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, observed equipment and practices during CBFO Surveillance S-11-15, and examined electronic and paper copies of reports and records. The audit team identified no concerns.

The audit team determined that requirements for DTC operations were adequate, satisfactorily implemented and effective with regard to waste covered by PKE00044. Wastes covered by PKE00047 and PKE00027/54 were found to be indeterminate because sampling results were not available for review; therefore, no final BDRs for wastes covered by these two PKEs were available for review.

#### 5.2.6 WIPP Waste Information System/Waste Data System

The audit team conducted interviews and reviewed procedure CCP-TP-530, Rev. 9, *CCP RH 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.

The audit team evaluated implementation of the CCP TRU Waste Certification and WWIS/WDS data entry procedure for data entry using the WWIS/WDS Data Entry Spreadsheet. The evaluation included data population of the spreadsheet, a review of data entry by a Waste Certification Assistant, and waste certification by the Waste Certification Official.

Draft entry documentation for this process was provided due to the low volume of data available and initial certification for this site. The characterization data used are valid data for only one container, SNLNM007010. The other simulated data used for two containers, SNLNM007011 and SNLNM007012, and canister SNL0001 are "mock" data. The WDS Data Entry Spreadsheet and the WDS Waste Container Data Report are draft, per procedure; CCP is not allowed to enter data from a noncertified site onto the WDS Data Entry Spreadsheet. The WDS Data Entry Spreadsheet was uploaded into the TEST instance (TST01) of WDS in order to test the accuracy of the data transfer from the WDS Data Entry Spreadsheet into WDS. Record reviews included pages from BDRs showing analysis values, draft WWIS/WDS Container Data Reports, and submittals for WWIS review/approval.

The audit team reviewed one WWIS/WDS waste certification package for canister SNL0001, which had three internal containers for RH waste (SNLNM007010, SNLNM007011, and SNLNM007012).

One observation related to WWIS/WDS was identified during the audit concerning minor changes to the DTC spreadsheet tracking (see Observation 2, section 6.3). The audit team determined that requirements for WWIS/WDS were adequate, satisfactorily implemented, and effective.

## **6.0 CORRECTIVE ACTION REPORTS, FINDINGS CORRECTED DURING THE AUDIT, OBSERVATIONS, AND RECOMMENDATIONS**

### **6.1 Corrective Action Reports**

During the audit, the audit team may identify conditions adverse to quality (CAQs) and document such conditions on a corrective action report. CAQs are defined below.

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

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

The following CARs were issued as a result of CBFO Audit A-11-23.

#### **CBFO CAR 11-044**

No objective evidence was provided to show that the required letter from the SNL Site Technical Representative (STR) was sent to the CCP SPM listing site-specific training required for each CCP position.

The VE operating procedure (CCP-TP-500) cites facility training requirements for the health and safety plan. The objective evidence provided only documented that one out of the six qualified VE personnel had read the applicable health and safety plan prior to performing work.

CCP-PO-510, Rev. 0, section 4.1.3: "...The STR will provide the CCP SPM, in writing, a listing of the site-specific training required for each CCP position."

CCP-TP-500, Rev. 11, section 2.4.1 [C]: "CCP Remote-Handled Waste Visual Examination Personnel will have read and understand the applicable health and safety plan prior to performing work."

CCP-QP-002, Rev. 31, section 3.1.2: "CCP Lead Site Project Manager (SPM) ensures that CCP personnel are qualified and trained to perform their assigned functions."

#### **CBFO CAR 11-045**

On the HSG sampling COC form, the ambient pressure was reported to 1/10<sup>th</sup> of an inch of mercury (Hg) and not rounded up to the nearest whole number; the location of

the sample was reported as the building where the sample was taken (same as the point of origin) and not specific to the location within the waste container where the sample was taken; the waste stream ID for the field blank was not entered as "NA," but contained the waste stream ID for the sampled containers.

The ITR did not verify that there were three instances of information incorrectly entered by the sampler on the COC form; specifically, the number of significant figures reported for the ambient pressure on the COC form; the location in the container where the sample was taken; and the waste stream ID reported for the field blank. The ITR did not contact the HSG sampler to resolve the incorrect data entries.

CCP-TP-093, *CCP Sampling of TRU Waste Containers*, Rev. 15, section 4.4.4[A.5](b): "Pressure reported to the nearest whole number inches Hg of pound per square inch gauge (psig)." Section 4.5.1[A.6](b): "Pressure reported to nearest whole number inches Hg or psig." Section 4.5, NOTE #2: "Point of origin is to be specific as to the location where sample was taken (e.g., Bldg. No., Room). Location is to be specific as to the location within the waste container where sample is taken (e.g., under lid)." Section 4.5.3[L.6]: "Waste Stream ID (NA for Field Blank)."

CCP-TP-106, *CCP Headspace Gas Sampling Batch Data Report Preparation*, Rev. 7, Section 4.1.4[A]: "Resolve any discrepancies with the HSG Drum Samplers, as necessary, before approving the Sampling BDR." Attachment 3, #13: "Was the data reported in proper units and with the correct number of significant figures?" Attachment 3, #18: "Verify all the data is signed, dated, and the data is recorded clearly, legibly, and accurately."

## 6.2 Findings 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 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 definition below.

*Corrected During the Audit – 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.*

Three CDAs were identified and corrected during Audit A-11-23.

### **CDA 1**

Objective evidence was not provided to show that an initial determination as to whether or not a significant condition adverse to quality exists for NCR-RHSNL-2351-11. Furthermore, that determination was not recorded in Block 10 of the NCR.

Corrections were documented to show that an initial determination as to whether or not a significant condition adverse to quality exists for NCR-RHSNL-2351-11, and that determination was recorded in Block 10 of the NCR with initial and date. The audit team verified actions were completed prior to the end of the audit.

### **CDA 2**

The ITR is inconsistently answering the "Comparability" section of question #13 for QAOs in Attachment 2. The question is answered as "yes" and "n/a" in various BDRs. For example, the "Comparability" question in BDR RHSNLVE110002 was answered "n/a," and the same question in BDR RHSNLVE110006 was answered "yes."

The VE Operator corrected the "Comparability" section of question #13 for QAOs in Attachment 2 in BDR RHSNLVE110002 to reflect the correct response of "yes." After the correction was made, the appropriate signatures and dates were obtained, and records reflect the changes. The error contained in this BDR was determined to be an isolated incident among a population of five additional BDRs. The audit team verified actions were completed prior to the end of the audit.

### **CDA 3**

AK Source Document P1105 has the wrong Title, Document Number, and Date listed in CCP-AK-SNL-500, Rev. 2, *CCP Acceptable Knowledge Summary Report*. The record copy of P1105 was reviewed and was found to have the correct information for this source document.

A freeze file for CCP-AK-SNL-500 was submitted to the audit team to verify the changes that will take place to resolve this concern. The audit team verified actions were completed prior to the end of the audit.

## **6.3 Observations**

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

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

*Recommendation – Suggestion that is 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.

Three observations were provided to SNL/CCP management as a result of the audit.

#### **Observation 1**

CCP-QP-028, Rev. 12, *CCP Records Filing, Inventorying, Scheduling, and Dispositioning*, references CAO-94-1001, *CAO Information Management Plan*, DOE F 1324.10, *Records Inventory and Disposition Schedule (RIDS)*, and DOE F 1324.9, *Records Inventory and Disposition Schedule (RIDS) – Continued*, in section 2.1, References. These are references to an obsolete procedure and forms.

CCP-QP-008, Rev. 8, *CCP Records Management*, step 2.3.36, references DOE Form F-1324.10, *Records Inventory and Disposition Schedule*. This form is obsolete.

#### **Observation 2**

The Excel spreadsheet DTC for PKE00044 used for calculating the DTC for waste stream SNL-HCF-S5400-RH had the following identifier on the spreadsheet and printed on the calculations included in DTC BDR SNLRHDTC11001:

- SCO 1162 DTC for PKE00044 Rev. Addendum 1 Microsoft Excel 2003 and 2007; Microsoft Windows XP Professional 2002 and 2003

This statement does not include the version number. The SIL includes a "Version 1" for this software.

Walking through the procedure revealed that when a SPRCR is determined to be a "minor" change, then no SCO Addendum is prepared and the procedure does not directly require that the version be changed to indicate the software has been changed. Thus, unique identity could be lost through a minor change (see steps 4.3.5[B] and [F]). No minor changes have been made to the DTC for PKE00044 software.

#### **Observation 3**

The draft WSPF reviewed for the SNL RH S5000 debris waste stream SNL-HCF-S5400-RH should be revised to reflect the correct HWNs, WIPP Waste Stream Identification Number, and current revision of the AK Summary Report. In addition, the draft CIS should be revised to correct errors on the HSG UCL<sub>90</sub> Evaluation Form dealing with the number of samples above the minimum detection level (MDL).

### **6.4 Recommendations**

One Recommendation, described below, was presented to SNL/CCP management as a result of this audit.

## **Recommendation 1**

It is recommended that the changes noted below be made to the AK Summary CCP-AK-SNL-500 Rev. 2 to address clarity and/or consistency and to correct significant editorial issues:

- P16 – Remove paragraph 3, which is misplaced and relevant only for the CH portion of this SNL waste stream.
- P 19 S4.4.1 paragraph 1 – Remove the phrase “the repackaging of” to clarify and make consistent the waste generation activities.
- P30 – Add the PK Summary Report discussed on page 30 to this AK Summary Report as reference 22.
- P34 S5.3.2 – Remove duplicative words in title of CCP-AK-SNL-501 and correctly identify MICROSIELD modeling software.
- P36 Table 4 – Correct the “Measured Activity Ratio to AM-241” value for Pu-238. These numbers are not relevant to the radiological characterization of the waste stream, but only indicate historical SNL activities.
- P52 Table 10 – Remove and correct artifact information from a previous report.
- P57 – Add reference 22 to section 8.0.

These changes are documented in a redline-strikeout freeze file, which includes other changes initiated by the CCP AKEs.

## **7.0 ATTACHMENTS**

**Attachment 1: Personnel Contacted During the Audit**

**Attachment 2: Summary Table of Audit Results**

**Attachment 3: Table of Audited Documents**

**Attachment 4: List of Processes and Equipment Reviewed**

**PERSONNEL CONTACTED DURING THE AUDIT**

<b>PERSONNEL CONTACTED DURING AUDIT A-11-23</b>				
<b>NAME</b>	<b>ORG/TITLE</b>	<b>PREAUDIT MEETING</b>	<b>CONTACTED DURING AUDIT</b>	<b>POST-AUDIT MEETING</b>
Billet, M.	CCP/ Training - Stoller		X	
Burns, S.	CCP/Engineering		X	
Cannon, V.	CCP QA/Manager	X		X
Doherty, M.	CCP/Acceptable Knowledge Expert	X	X	
Fesmire, C.	CBFO NTP/Observer	X		X
Fisher, A. J.	CCP/ Sr. Tech. Advisor Training	X		X
Gomez, C.	CCP QA/NCR Coordinator	X	X	X
Holmes, S.	NMED/Hazardous Waste Bureau/Observer	X	X	X
Kirkes, C.	CCP/ WCO		X	
Kleckner, J.	CCP/Tech Specs/AKE		X	
Martin, R.	CCP/Training/Records Analyst		X	
Nelson, L	CCP/RCT	X	X	X
Offner, S.	Waste Information Tracking System (WITS)		X	
Pearcy, S.	CCP/Stoller/Records Manager	X	X	X
Punchios, S	CCP/Stolleer/Records Clerk		X	
Quintana, I.	CCP/Site Project Manager	X	X	X
Schaefer, S.	CCP/Tech. Specs/AKE		X	
Strum, M.	WITS		X	
Vance, J.	CCP/Consultant	X	X	
Watson, L.	CCP/Tech. Specs/AKE		X	

**AUDIT A-11-23, SNL/CCP  
 SUMMARY TABLE OF AUDIT RESULTS**

Area/Activity	Concern Classification					QA Evaluation		Technical
	CARs	CDAs	Obs	Rec	EP	Adequacy	Implementation	Effectiveness
Headspace Gas (HSG)	1					A	S	E
Visual Examination (VE)		1				A	S	E
Project Level Data Validation and Verification (PL V&V)						A	S	E
Quality Assurance – C6 Training/Records/WWIS/ WDS/SQA	1	1	2			A	S	E
Dose-to-Curie (DTC)						A	I	I
Acceptable Knowledge (AK)		1		1		A	S	E
Reconciliation of DQOs/WSPF			1					
<b>TOTALS</b>	<b>2</b>	<b>3</b>	<b>3</b>	<b>1</b>	<b>0</b>	<b>A</b>	<b>S</b>	<b>E</b>

**Definitions**

E = Effective

S = Satisfactory

I = Indeterminate

M = Marginal

U = Unsatisfactory

CAR = Corrective Action Report

CDA = Corrected During Audit

EP = Exemplary Practice

NE = Not Effective

Obs - Observation

Rec = Recommendation

A = Adequate

NA = Not Adequate

**AUDIT A-11-23, SNL/CCP  
TABLE OF AUDITED DOCUMENTS**

No.	Procedure Number	Rev	DOCUMENT TITLE
1.	CCP-PO-001	18	CCP Transuranic Waste Characterization Quality Assurance Project Plan
2.	CCP-PO-002	25	CCP Transuranic Waste Certification Plan
3.	CCP-PO-005	21	CCP Conduct of Operations
4.	CCP-PO-008	9	CCP Quality Assurance Interface with the WTS Quality Assurance Program
5.	CCP-PO-505	0	CCP Remote-Handled Transuranic Waste Authorized Methods for Payload Control (CCP RH-TRAMPAC)
6.	CCP-PO-510	0	CCP/SNL RH TRU Waste Interface Document
7.	CCP-QP-002	31	CCP Training and Qualification Plan
8.	CCP-QP-005	20	CCP TRU Nonconforming Item Reporting and Control
9.	CCP-QP-008	18	CCP Records Management
10.	CCP-QP-028	12	CCP Records Filing, Inventorying, Scheduling, and Dispositioning
11.	CCP-TP-001	19	CCP Project Level Data Validation and Verification
12.	CCP-TP-002	23	CCP Reconciliation of DQOs and Reporting Characterization Data
13.	CCP-TP-003	18	CCP Data Analysis for S3000, S4000, and S5000 Characterization
14.	CCP-TP-005	22	CCP Acceptable Knowledge Documentation
15.	CCP-TP-082	8	CCP Waste Container Filter Vent Operation
16.	CCP-TP-093	15	CCP Sampling of TRU Waste Containers
17.	CCP-TP-106	7	CCP Headspace Gas Sampling Batch Data Report Preparation
18.	CCP-TP-162	1	CCP Random Selection of Containers for Solids and Headspace Gas Sampling and Analysis
19.	CCP-TP-163	2	CCP Evaluation of Waste Packaging Records for Visual Examination of Records
20.	CCP-TP-500	11	CCP Remote-Handled Waste Visual Examination
21.	CCP-TP-504	11	CCP Dose-to-Curie Survey Procedure for Remote-Handled Transuranic Waste
22.	CCP-TP-506	2	CCP Preparation of the Remote-Handled Transuranic Waste Acceptable Knowledge Characterization Reconciliation Report
23.	CCP-TP-512	5	CCP Remote-Handled Waste Sampling
24.	CCP-TP-530	10	CCP RH TRU Waste Certification and WWIS/WDS Data Entry

**List of Processes and Equipment Reviewed**

WIPP #	Process/Equipment Description	Applicable to the Following Waste Streams/Groups of Waste Streams	Currently Approved by NMED	Currently Approved by EPA
<b>NEW PROCESSES OR EQUIPMENT</b>				
SNL/CCP Audit A-11-23 Remote-Handled (RH) S5000 Debris Waste				
N/A	Acceptable Knowledge (AK) Procedure – CCP-TP-002 & CCP-TP-005	Debris (S5000)	No	No
20RHVE1	Visual Examination (VE) Procedure – CCP-TP-500	Debris (S5000)	No	No
20DTC1	Radiological Characterization (DTC) Procedure – CCP-TP-504	Debris (S5000)	N/A	No
N/A	Headspace Gas Sampling Procedure – CCP-TP-093	Debris (S5000)	No	N/A
N/A	Data Generation and Project Level Validation & Verification (V&V) Procedure – CCP-TP-001	Debris (S5000)	No	No
N/A	WIPP Waste Information System (WWIS) Waste Data System (WDS) Procedure – CCP-TP-530	Debris (S5000)	No	No
N/A	Quality Assurance	N/A	N/A	Yes