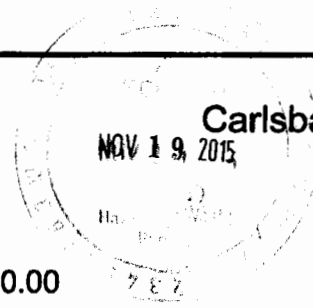




United States Government

Department of Energy

memorandumCarlsbad Field Office
Carlsbad, New Mexico 88221

DATE: NOV 19 2015

**REPLY TO
ATTN OF:** CBFO:OQA:MPN:BA:15-0961:UFC 2300.00

SUBJECT: Interim Audit Report for Recertification Audit A-16-01 of the Advanced Mixed Waste Treatment Project

TO: Mr. Benjamine B. Roberts, DOE-ID

The Carlsbad Field Office (CBFO) conducted Recertification Audit A-16-01 of the Advanced Mixed Waste Treatment Project (AMWTP) October 27 – 29, 2015. The CBFO Interim Audit Report is attached.

The audit team concluded that AMWTP implementing procedures are adequate relative to the flow-down of requirements, and that the AMWTP quality assurance and technical requirements are satisfactorily implemented and effective in all areas evaluated.

The audit team identified ten concerns which were processed as follows: five concerns were classified as corrective action reports; two concerns were observations; and three recommendations were offered for AMWTP Management consideration.

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

Martin P. Navarrete
Senior Quality Assurance Specialist

Attachment

151118



Mr. Benjamin B. Roberts

-2-

cc: w/attachment

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T. Peake, EPA	ED
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Site Documents	ED
WWIS Database Admin	ED

CBFO QA File

CBFO M&RC

*ED denotes electronic distribution

U.S. DEPARTMENT OF ENERGY
CARLSBAD FIELD OFFICE

INTERIM AUDIT REPORT

OF THE

ADVANCED MIXED WASTE TREATMENT PROJECT

TRU WASTE CHARACTERIZATION AND CERTIFICATION ACTIVITIES

IDAHO FALLS, IDAHO

AUDIT NUMBER A-16-01

October 27 - 29, 2015



Prepared by: Cindi Castillo
Cindi Castillo, CTAC
Audit Team Leader

Date: 11/19/15

Approved by: Michael R. Brown
Michael R. Brown, Director
CBFO Office of Quality Assurance

Date: 11/19/15

1.0 EXECUTIVE SUMMARY

U.S. Department of Energy (DOE) Carlsbad Field Office (CBFO) Recertification Audit A-16-01 was conducted to evaluate the adequacy, implementation, and effectiveness of Advanced Mixed Waste Treatment Project (AMWTP) transuranic (TRU) waste characterization and certification activities performed at the Idaho National Laboratory (INL) relative to the requirements detailed in the Waste Isolation Pilot Plant (WIPP) Hazardous Waste Facility Permit (HWFP), the *CBFO Quality Assurance Program Document (QAPD)*, and the *Transuranic Waste Acceptance Criteria for the Waste Isolation Pilot Plant (WAC)*.

The audit was performed at the INL site and the AMWTP Energy Drive Facility (EDF) in Idaho Falls, Idaho, October 27 - 29, 2015. With the exceptions of the concerns identified, overall the audit team concluded that the AMWTP technical and quality assurance (QA) programs, as applicable to the audited activities, were adequate in addressing upper-tier requirements. With the exception of Real-Time Radiography (RTR), the defined AMWTP QA and technical programs for characterizing contact-handled (CH) Summary Category Group (SCG) S3000 homogeneous solids and CH SCG S5000 debris waste were satisfactorily implemented in accordance with the CBFO QAPD, the WIPP HWFP *Waste Analysis Plan (WAP)*, and the WAC, and were effective in achieving the desired results.

The audit team identified ten concerns during the audit. Five of the ten concerns were classified as conditions adverse to quality (CAQs) and were documented on corrective action reports (CARs). There were no CAQs corrected during the audit (CDA). Two observations were identified and are described in section 6.3. Three recommendations were offered for AMWTP management consideration, as described in section 6.4.

2.0 SCOPE AND PURPOSE

2.1 Scope

The audit team evaluated the adequacy, implementation, and effectiveness of the AMWTP TRU waste characterization and certification activities for CH SCG S3000 homogeneous solids and CH SCG S5000 debris waste. In addition, the Nondestructive Assay (NDA) Retrieval Box Assay System (RBAS) was evaluated for initial certification for characterization of SCG S3000 and SCG S5000 wastes. The audit team evaluated the system and batch data reports (BDRs) generated, as well as assessed the process to allow the assembly of CH waste payloads to include some compacted containers (pucks) that cannot be directly measured under AMWTP's currently approved program.

The following general areas, as required by Attachment C6, Section C6-3 of the WIPP HWFP, were audited:

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

The following CBFO QAPD elements were audited:

- Organization/QA Program Implementation and Graded Approach
- Personnel Qualification and Training
- Quality Improvement (Nonconformance Reporting and Corrective Action)
- Document Control
- Records
- Work Processes
- Procurement
- Inspection and Testing
- Audits/Assessments
- Software QA
- Container Management

The following waste characterization technical elements were audited for CH SCG S3000 homogeneous solids and CH SCG S5000 debris waste:

- Acceptable Knowledge (AK) including waste certification (i.e., Waste Stream Profile Forms)
- Project-Level Data Validation and Verification (V&V)
- Real-time Radiography (RTR)
- Visual Examination (VE)
- Nondestructive Assay (NDA), including the initial certification of RBAS
- WIPP Waste Information System/Waste Data System (WWIS/WDS)
- Load Management

Evaluation of adequacy of AMWTP documents was based on the current revisions of the following documents:

- *CBFO Quality Assurance Program Document*, DOE/CBFO-94-1012
- Hazardous Waste Facility Permit, Waste Isolation Pilot Plant, EPA No. NM4890139088-TSDF, the New Mexico Environment Department
- *Transuranic Waste Acceptance Criteria for the Waste Isolation Pilot Plant*, DOE/WIPP-02-3122

Programmatic and technical checklists were developed to evaluate activities associated with the current revisions of the following documents:

- *AMWTP Certification Plan for INL Transuranic Waste*, MP-TRUW-8.1
- *AMWTP Quality Assurance Project Plan*, MP-TRUW-8.2
- Related AMWTP QA and technical implementing procedures

2.2 Purpose

Audit A-16-01 was conducted to assess AMWTP's waste characterization activities related to the certification of CH SCG S3000 homogeneous solids and CH SCG S5000 debris waste for compliance to the WIPP HWFP WAP and the WAC requirements. The audit team also evaluated the AMWTP QA program with regard to the requirements of the CBFO QAPD.

3.0 AUDIT TEAM AND OBSERVERS

AUDITORS/TECHNICAL SPECIALISTS

Martin Navarrete	Management Representative, CBFO Office of Quality Assurance
Dennis Miehl	QA Representative, CBFO
Cindi Castillo	Audit Team Leader, CBFO Technical Assistance Contractor (CTAC)
Tammy Ackman	Auditor, CTAC
Randall Allen	Auditor, CTAC
Bob Boyko	Auditor, CTAC
Harley Kirschenmann	Auditor, CTAC
Greg Knox	Auditor, CTAC
Berry Pace	Auditor, CTAC
Bob Prentiss	Auditor, CTAC
Charlie Riggs	Auditor, CTAC
Jim Schuetz	Auditor, CTAC
Roger Vawter	Auditor, CTAC
Jack Walsh	Auditor, CTAC
Rhett Bradford	Technical Specialist, CTAC
Dick Blauvelt	Technical Specialist, CTAC
Paul Gomez	Technical Specialist, CTAC
Michel Hall	Technical Specialist, CTAC
Porf Martinez	Technical Specialist, CTAC
Jim Oliver	Technical Specialist, CTAC
Judith Stewart	Technical Specialist, CTAC
B. J. Verret	Technical Specialist, CTAC

OBSERVERS

Steven Ross	Office of Standards and Quality Assurance, EM-43
Lindsey Bender	U.S. Environmental Protection Agency (EPA)/Radiation Protection Division
Steve Holmes	New Mexico Environment Department (NMED)
Coleman Smith	NMED
Connie Walker	NMED
J.R. Stroble	CBFO TRU Sites and Transportation Division (TSTD)
Gary Birge	CBFO TSTD
Dale Bignell	CBFO Office of the Manager
Adrian Bergman	DOE Idaho (DOE-ID)
Mary Willcox	DOE-ID
Pete Johansen	Idaho Department of Environmental Quality (IDEQ)
Bruce LaRue	IDEQ

4.0 AUDIT PARTICIPANTS

The individuals at the INL and AMWTP EDF who were contacted during the audit are identified in Attachment 1. A pre-audit meeting was held at the Engineering Research Office Building (EROB), Conference Room 159, in Idaho Falls, Idaho, on October 27, 2015. Daily meetings were held with AMWTP management and staff to discuss the previous day's issues and deficiencies. The audit was concluded with a post-audit meeting held at the EDF, Room 116, in Idaho Falls, Idaho, on October 29, 2015.

5.0 SUMMARY OF AUDIT RESULTS

5.1 Program Adequacy, Implementation, and Effectiveness

This audit was performed to assess the ability of AMWTP to characterize CH SCG S3000 homogeneous solids and CH SCG S5000 debris waste to the requirements specified in the CBFO QAPD, the WIPP HWFP WAP, and the WAC. The related characterization methods assessed were AK, RTR, VE, and NDA (including the RBAS). Other areas evaluated were project-level data V&V, data quality objective (DQO) reconciliation, preparation of waste stream profile forms (WSPFs), WWIS/WDS data entry, container management, load management, and the AMWTP QA program.

With the exceptions of the concerns identified, overall the audit team concluded that the AMWTP technical and quality assurance (QA) programs, as applicable to the audited activities, were adequate in addressing upper-tier requirements. With the exception of RTR, the defined AMWTP QA and technical programs for characterizing contact-handled (CH) Summary Category Group (SCG) S3000 homogeneous solids and CH SCG S5000 debris waste were satisfactorily implemented in accordance with the CBFO QAPD, the WIPP HWFP *Waste Analysis Plan* (WAP), and the WAC, and were effective in achieving the desired results.

Attachment 1 contains a list of personnel contacted during the audit. Attachment 2 contains a summary table of audit results. Attachment 3 contains a table of audited documents. Attachment 4 is a list of processes and equipment reviewed during the audit. Details of audit activities are described below.

5.2 General

5.2.1 Results of Previous Audits

The audit team verified sustained corrective actions for CARs 15-002, 15-003, 15-004, and 15-005 identified during the previous CBFO Audit A-15-01.

5.2.2 Changes in Programs or Operations

No changes in programs or operations have been implemented since the previous audit. No AMWTP procedures have been deactivated since the previous audit.

5.2.3 New Programs or Activities Being Implemented

During the audit, the RBAS was examined for initial certification. This waste characterization method is described in AMWTP Procedure INST-OI-15, Box Assay Operations. See section 5.4.5 for further details.

5.2.4 Changes in Key Personnel

There have been no changes in key personnel since the previous audit.

5.3 Quality Assurance Activities

Each QA element audited is discussed in detail in the following sections. The methods used to select objective evidence are discussed, the objective evidence used to assess compliance with the CBFO QAPD is cited briefly, and the results of the assessment are provided.

5.3.1 Organization/QA Program Implementation and Graded Approach

The audit team reviewed documentation to verify that the AMWTP complies with the requirements of the CBFO QAPD, Section 1.1, Organization and Quality Assurance Program. The audit team reviewed AMWTP procedures MP-TRUW-8.2, Rev. 18, *Quality Assurance Project Plan*; MP-TRUW-8.1, Rev. 26, *Certification Plan for INL Transuranic Waste*; and MP-Q&SI-5.6, Rev. 4, *Graded Approach*, to determine the degree to which the procedures adequately address upper-tier requirements. The results of the review confirmed that the procedures adequately address upper-tier requirements.

The audit team interviewed QA management personnel and reviewed the organizational chart to verify independence of the QA program from TRU waste characterization activities. The audit team evaluated position descriptions, training plans, QA summary reports to management, and lessons learned documents in order to verify compliance to applicable requirements.

The AMWTP QAPP-01, Rev. 15, *Quality Assurance Program Plan (QAPP)*, Section 1.1, identifies that the AMWTP QA Division (QAD) has the authority and overall responsibility to independently audit AMWTP's implementation of the QA program to verify the achievement of quality. Quality is achieved and maintained by those assigned responsibility for performing work, and quality achievement is verified by those not directly responsible for performing the work. The QAD develops, administers, and coordinates implementation of the AMWTP QA program. The QAD reports directly to the AMWTP President and Project Manager. This ensures independence from cost, schedule, and production considerations, along with consistency and objectivity in process and product QA evaluations.

The AMWTP *Quality Assurance Project Plan*, Section B-0, identifies the organization structure, roles, and responsibilities for management of waste characterization and certification. The AMWTP QAPP, Section 2.0, establishes the policy, requirements, and responsibilities for training and qualifying personnel and applies to all aspects of the AMWTP.

The AMWTP QA Orientation (QA Indoctrination) course was reviewed. The course included a description of the basis for the QA program, codes, and standards, along with QA program elements of management, performance, and assessment, related process descriptions, and issues management processes.

The audit team verified procedure MP-Q&SI-5.6, Rev. 4, *Graded Approach*, establishes the methods and processes to define the graded approach for AMWTP. Structures, systems, and components are graded and classified using a Notice to Code Spares Form-1448. These classifications are documented, approved, and maintained in the AMWTP Computerized Maintenance Management System (CMMS). Additionally, procedure MP-PCMT-15.1, Rev. 17, *Acquisition of Material and Services*, defines the graded approach and assigns quality levels for procurement activities based on the CMMS classifications.

Three concerns regarding the QA program and graded approach were identified. The first concern was related to the incorporation of the latest revision of the CBFO QAPD (Revision 12) into the AMWTP program. No evidence was provided to confirm that DOE-ID distributed Revision 12 of the CBFO QAPD to AMWTP/ITG for implementation; therefore, CAR 16-005 was issued to DOE-ID. See CAR 16-005 in section 6.1.

The second concern regarded the existence of two different matrices used to identify procedures that implement the AMWTP QA program for the requirements of several basis documents. The two matrices should be combined into one matrix, as maintaining two could potentially lead to errors and inconsistencies. See Observation 2 in section 6.3.

The third concern was related to the graded approach factors of "the importance of the data to be generated" and "the consequence of failure." These required factors are not listed in MP-Q&SI-5.6, Rev. 4, when determining the level of analysis, documentation, verification, and other controls necessary to comply with QA program requirements. See CAR 16-007 in section 6.1.

Due to the two CAQs identified above, it was determined that the QA program and graded approach are marginally effective in addressing the adequacy, implementation, and effectiveness of the QA program.

5.3.2 Personnel Qualification and Training

The audit team verified that the AMWTP met the requirements of CBFO QAPD Section 1.2, Personnel Qualification and Training. The audit team conducted interviews with responsible personnel in the AMWTP Training Department. The following implementing procedures were reviewed to determine the degree to which the procedures adequately address upper-tier requirements: MP-RTQP-14.4, Rev. 24, *Personnel Qualification and Certification*; MP-RTQP-14.6, Rev. 11, *Job Analysis*; MP-RTQP-14.16, Rev. 9, *Training Program Evaluation*; MP-RTQP-14.19, Rev. 10, *Training Records Administration*; MP-Q&SI-5.8, Rev. 8, *Qualifying Supply Chain Inspectors, Auditors, Lead Auditors, and Technical Specialists*; and LST-RTQP-03-IM, Rev. 3, *WIPP Training Requirements Implementation Matrix*. The results of the review confirmed that the procedures adequately address upper-tier requirements.

Personnel training records associated with VE, RTR, NDA, AK, and site project management were examined to verify implementation of associated requirements and to verify personnel performing characterization activities were appropriately trained and qualified.

The records review provided evidence of AMWTP training program implementation. The audit team evaluated AMWTP qualification/requalification packages (qualification cards) and related individual training files for the various AMWTP positions. The team reviewed job analysis documentation and employee training history documentation from the training database (TRAIN system). The audit team reviewed qualification packages for RTR, VE, and NDA operators, VE experts (VEEs), AK experts (AKEs), and site project managers (SPMs). Documentation of waste stream training required for RTR and VE operators was evaluated, along with RTR operator test drum (capability demonstration) documentation; eye examination forms; and management assessment reports of the AMWTP training program.

The audit team verified sustained corrective actions for CAR 15-005 identified during the previous CBFO Audit A-15-01. No similar instances were noted during this audit.

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

5.3.3 Quality Improvement (Nonconformance Reporting and Corrective Action)

The audit team verified that the AMWTP complies with the requirements of CBFO QAPD Section 1.3, Quality Improvement. The audit team conducted interviews with AMWTP QA personnel. The following implementing procedures were reviewed to determine the degree to which the procedures adequately address upper-tier requirements: MP-Q&SI-5.1, Rev. 9, *Investigation and Root Cause Analysis*; MP-Q&SI-5.3, Rev. 13, *Corrective Action*; and MP-Q&SI-5.4, Rev. 21, *Identification of Nonconforming Conditions*. The results of the review confirmed that the procedures adequately address upper-tier requirements.

The audit team evaluated nonconformance reports (NCRs), CARs, root cause analysis reports, and the TrackWise® computer management system to ensure that CAQs were appropriately identified, documented, dispositioned, and investigated, and that root cause analysis was performed where required, then resolved and tracked through closure. One instance regarding the timeliness of corrective action completion for CBFO CAR 15-005, identified during the previous CBFO Audit A-15-01, was noted by the audit team. Completion of the corrective actions and closure of this CAR exceeded 365 days.

NCRs and CARs were also reviewed to ensure that AMWTP documents and reports WAP-related nonconformances (identified at the project management level) to CBFO, as required. Eight WAP-related NCRs were identified for the past year, and all were reported within the required time frame.

The number of open NCRs was reviewed. Currently, there are 793 open Type 1 (QA program) NCRs and 8954 open Type 3 (characterization) NCRs. All of the Type 3 NCRs are associated with a container(s) and the majority (estimated at 95%) of Type 1 NCRs are also associated with a container(s). In order to assure these NCRs are resolved prior to shipping a container, AMWTP utilizes two linked software systems. TrackWise® is used to manage NCRs and all NCRs are automatically transferred into the Waste Tracking System (WTS) for the container. The audit team reviewed randomly selected NCRs in order to verify they were entered into WTS as required.

With the exception of the instance noted regarding the timeliness in closure of CBFO CAR 15-005, the audit team determined that the AMWTP quality improvement process was adequately established for compliance with upper-tier requirements, satisfactorily implemented, and effective.

5.3.4 Document Control

The audit team verified that the AMWTP complies with the requirements of CBFO QAPD Section 1.4, Documents. The audit team evaluated AMWTP procedures MP-DOCS-18.1, Rev. 14, *Developing Written Work Instructions*; MP-DOCS-18.3, Rev. 8, *Developing Management Procedures*; and MP-DOCS-18.4, Rev. 46, *Document Control*, to determine the degree to which the procedures adequately address upper-tier requirements. The results of the review confirmed that the procedures adequately address upper-tier requirements.

The audit team conducted interviews with document control personnel and observed activities for adherence to approved procedures, and evaluated recently completed Document Change Requests (DCRs) and case files associated with current and revised documents/procedures. Demonstrations of the electronic document control management system (EDMS) allowed for audit team evaluation and verification of document issue, validation, verification, and changes. AMWTP is in the process of implementing an electronic DCR process that follows the existing DCR process.

New procedures and revisions were properly reviewed, approved, and issued. The audit team verified appropriately identified procedural detail for format and content of instructions and procedures, including performer action steps, notes, holds, verification, and independent witness points, warnings, and cautions. Documents are maintained in EDMS and documents issued for use are posted on the AMWTP home page. A limited number of hardcopy documents are maintained as controlled copies. DCR case files were reviewed which verified that documents were evaluated for QA adequacy, effect on data quality, CBFO review and approval, training needs analysis, and comments processing.

The audit team verified sustained corrective actions for CAR 15-002 identified during the previous CBFO Audit A-15-01. No similar instances were noted during this audit.

The audit team identified one concern regarding the training of AMWTP individuals who are Controlled Copy Holders. Of the thirteen named AMWTP Controlled Copy Holders, six were identified as not current on Training 0AWT1091 for updating and maintaining controlled copy documents. See CAR 16-006 in section 6.1.

Although one concern was identified, the procedures reviewed and objective evidence assembled and evaluated during the audit provided evidence that the applicable requirements for document control are adequately established for compliance with upper-tier requirements, satisfactory in the implementation of these requirements, and effective in achieving the desired results.

5.3.5 Records

The audit team verified that the AMWTP complies with the requirements of CBFO QAPD Section 1.5, Records. The audit team evaluated the adequacy of AMWTP procedure MP-DOCS-18.2, Rev. 18, *Records Management*, with respect to the requirements of the CBFO QAPD and determined that the procedure contains adequate flow-down of upper-tier requirements.

The audit team interviewed records management personnel and observed activities to determine AMWTP record storage methods and records practices were in compliance with procedural and CBFO QAPD requirements. Activities evaluated by the audit team included records custodian training, records receipt, verification, validation, submittal, and records maintenance.

Lifetime and non-permanent WIPP records are categorized and classified in the Record Categories, Classification, Disposition, and Retention Matrix (from procedure MP-DOCS-18.2), also referred to as the Records Inventory and Disposition Schedule (RIDS). The audit team verified that procedures are established to ensure that the generator/storage site maintains records that are designated as WIPP lifetime records for the life of the waste characterization program plus six years, or transfers the records to the WIPP Records Archive (WRA). The team also verified that the generator/storage site maintains records that are designated as WIPP non-permanent records for ten years from the date of record generation and then dispositions them according to the approved RIDS or transfers them to the WRA.

The audit team identified one concern regarding the training of records custodians. The approved records custodians list, maintained on the AMWTP internet home page by the Records Officer, identifies approximately 60 records custodians, 9 of whom are not current on the required Records Custodian Training OAWT1089. See CAR 16-004 in section 6.1.

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

5.3.6 Work Processes

The audit team verified that the AMWTP complies with the requirements of CBFO QAPD Section 2.1, Work Processes. The audit team evaluated the adequacy of AMWTP procedures MP-CD&M-11.1, Rev. 10, *Change Control*, and INST-CD&M-11.1.2, Rev. 16, *Facility Modification Proposal Preparation*, with respect to the CBFO QAPD, and determined that the procedures and instructions contain adequate flow-down of upper-tier requirements.

The results of the review confirmed that the procedures adequately address upper-tier requirements.

The audit team reviewed facility modification proposals (FMPs), test and investigation forms, and conducted interviews with appropriate AMWTP personnel regarding completion of FMP changes and integration of FMPs with associated software change requests (SCRs). The FMP documentation indicated that the appropriate level of review and approvals are completed and the appropriate organizations participate in the completion of individual FMPs as appropriate to the scope stated.

The audit team verified that the processes for documenting unreviewed safety question (USQ) evaluator reviews and USQ determinations are performed in accordance with the procedural requirements. FMPs that identified hardware changes and associated software changes were reviewed. Samples of FMPs reviewed during the audit included changes to the facility to accommodate use of the RBAS equipment and the RBAS WIPP Analysis Reporting Software (RWARS) application to perform WIPP-related analyses. The audit team determined that the RBAS was an existing piece of equipment at AMWTP and that FMPs adequately addressed changes necessary to comply with WIPP requirements for performing and reporting assay analyses. The audit team verified that appropriate SCRs were completed in coordination with hardware changes. Similarly, when a software change required an FMP, an appropriate FMP had been initiated to ensure that hardware modifications would coordinate with software modifications.

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

5.3.7 Procurement

The audit team verified that the AMWTP complies with the requirements of CBFO QAPD Section 2.3, Procurement. The audit team evaluated the adequacy of AMWTP procedures MP-PCMT-15.1, Rev. 17, *Acquisition of Material and Services*, and MP-PCMT-15.21, Rev. 9, *Material Management*, with respect to the CBFO QAPD, and determined that the procedures and instructions contain adequate flow-down of upper-tier requirements. The results of the review confirmed that the procedures adequately address upper-tier requirements.

The audit team interviewed procurement personnel and reviewed a sample of purchase order (PO) transactions. The PO transactions covered purchase requisitions, receiving inspection reports, procurement statements of work, commercial grade item/service dedication plans, and mandatory quality clause implementation. AMWTP uses an electronic system, MAXIMO, to process and revise requisitions, create POs, and receive and track inventory. The audit team observed use of the MAXIMO system relative to requisition/PO and warehouse receiving information.

The audit team evaluated Form-1347, Request for Information. Form-1347 is submitted by the requestor to document a change in requirements and obtain approvals for those

changes. The audit team verified the DOE approval of the record system that allows all documents deemed records to be stored electronically. All records are scanned into MAXIMO and attached to each PO transaction. This includes the PO documentation and all receiving documentation from the warehouse receiving department.

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

5.3.8 Inspection and Testing (Control of Measuring and Test Equipment for Data Collection)

The audit team verified that the AMWTP complies with the requirements of CBFO QAPD Section 2.4, Inspection and Testing. The audit team evaluated the adequacy of AMWTP procedures MP-CMNT-10.5, Rev. 10, *Measuring and Test Equipment Program*; INST-CMNT-10.5.1, Rev. 13, *Calibration and Control of Measuring and Test Equipment*; MP-CMNT-10.14, Rev. 6, *In-Plant and Process Instrumentation Testing Program*; and INST-CMNT-10.14.1, Rev. 8, *Testing In-Plant and Process Instrumentation*, with respect to the CBFO QAPD, and determined that the procedures and instructions contain adequate flow-down of upper-tier requirements. The results of the review confirmed that the procedures adequately address upper-tier requirements.

The audit team interviewed personnel and reviewed the applicable AMWTP procedures for the established methods and processes to calibrate and control both measuring and test equipment (M&TE) and in-plant and process instrumentation. In general, M&TE is calibrated by an approved calibration facility. In-plant and process instruments have calibration and/or functional checks performed using calibrated M&TE at prescribed intervals using approved procedures. Each piece of M&TE is identified with a unique number for identification and accurate tracking.

Records of both M&TE calibrations and in-plant and process instrumentation checks are maintained in in the CMMS. Several records for M&TE and in-plant and process instruments were reviewed using CMMS. A site tour was also conducted to observe the site tool crib and in-plant instrumentation.

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

5.3.9 Audits/Assessments

The audit team verified that the AMWTP complies with the requirements of CBFO QAPD Section 3, Assessment Requirements. The audit team evaluated the adequacy of AMWTP procedures MP-M&IA-17.1, Rev. 11, *Management Assessment*; MP-M&IA-17.2, Rev. 12, *Independent Assessment*; MP-M&IA-17.3, Rev. 9, *Quality Assurance Surveillance*; and MP-

TRUW-8.26, Rev. 6, *Reports to Management*, with respect to the CBFO QAPD, and determined that the procedures contain adequate flow-down of upper-tier requirements. The results of the review confirmed that the procedures adequately address upper-tier requirements.

The audit team verified that assessments are scheduled, planned, performed, and reviewed by appropriate management. Subsequently identified issues or concerns are appropriately tracked and corrected.

The audit team interviewed QA personnel and reviewed documentation including semi-annual reports to management; independent and management assessment schedules; surveillance schedules; lead auditor qualification and certification documentation; and assessment plans and reports. The audit team verified that the electronic system, TrackWise[®], serves as a suitable resource for tracking audit issues and notifications.

The audit team verified that quality trending is performed which requires that a semi-annual report be provided to the SPM by the QA Manager. The audit team reviewed the last two semi-annual reports issued.

The audit team verified that CAQs identified by independent assessments and surveillances are documented on a CAR or NCR, and tracked in TrackWise[®]. Other opportunities for improvement are also entered into TrackWise[®] as action items for evaluation or correction.

The audit team also verified the sustained corrective actions for CAR 15-003 and CAR 15-004 identified in the previous CBFO Audit A-15-01. CAR 15-003 was related to semi-annual reports to management which were lacking a discussion of whether quality assurance objectives (QAOs) had been met; and CAR 15-004 was regarding no objective evidence being provided to demonstrate that an annual QA Surveillance Plan was developed for calendar year (CY) 2013 and CY2014. No similar instances were noted during this.

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

5.3.10 Software Quality Assurance

The audit team verified that the AMWTP complies with the requirements of CBFO QAPD Section 6, Software Requirements. The audit team evaluated the adequacy of AMWTP procedures MP-TRUW-8.5, Rev. 29, *TRU Waste Certification*; MP-CD&M-11.2, Rev. 22, *Software Quality Assurance*; INST-CD&M-11.2.1, Rev. 9, *Software Version Control*; INST-CD&M-11.2.2, Rev. 18, *Software Inventory Classification*; INST-CD&M-11.2.3, Rev. 9, *System Data Change Request*; and INST-CD&M-11.2.6, Rev. 6, *Temporary Software Override*, with respect to the CBFO QAPD, and determined that the procedures contain adequate flow-down of upper-tier requirements. The results of the review confirmed that the procedures adequately address upper-tier requirements.

The audit team evaluated the implementation of the AMWTP software quality assurance (SQA) process. The evaluation included interviews with personnel and examination of a

sample of electronic record documents. Documents reviewed included software build notes, software patch release logs, tests reports, test cases, software data change requests (SDCRs), temporary software overrides (TSOs), software parameter updates (SPUs), software change requests (SCRs), and the list of baseline software applications installed on AMWTP systems. Details of SCRs were reviewed from printed electronic record documents generated from the *TestTrack Pro* software application that is used for generation and management of SCRs. Details of configuration control of software code modules were reviewed from printed electronic record documents generated from the *Polytronic Version Control System* (PVCS) used for control of AMWTP code. Both programs use access permission and assigned user roles to track and manage software changes and check-in or check-out software code modules for modification or installation. Software life-cycle documents and other documents supporting software changes and development are referenced within the *TestTrack Pro* application. These documents may be viewed using the *TestTrack Pro* application. Performance of software configuration management activities is captured within *TestTrack Pro* including dates, notes, and sequence of activities performed. Status of software changes are reported using these programs. Notification of status of changes is adequately distributed and communicated to users and management.

The generation and management of FMPs were reviewed. The audit team determined that review and approval of facility modifications are performed by the appropriate departments including operations, QA, and SQA. These approvals are adequately documented from inception to resolution of a proposed modification. The coordination of software changes with facility modifications was reviewed and determined to be adequately managed and documented.

Involvement of appropriate departments in the generation, review, approval, implementation, and closure of software changes, data changes, parameter updates, facility changes, and temporary software overrides is adequate and is adequately documented.

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

5.4 Technical Activities

Each technical area audited is discussed in detail in the following sections. The methods used to select objective evidence are discussed, the objective evidence used to assess compliance with upper-tier requirements is cited briefly, and the results of the assessment are provided.

5.4.1 Table C6-1, WAP Checklist

The audit was performed to assess AMWTP's ability to manage and perform TRU waste characterization and certification activities for CH SCG S3000 homogeneous solids and CH SCG S5000 debris waste. The C6-1 WAP checklist addresses general program requirements from an overall management perspective. The general requirements checklist addresses both technical requirements and QA programmatic requirements that, when

collectively implemented, ensure effective overall management of TRU waste characterization and certification activities. Requirements are integrated into controlled documents that will ensure the waste characterization strategy, as defined in the WAP, is accomplished and documented in accordance with controlled processes and procedures.

The audit team evaluated the QA program, including aspects of the C6-1 checklist, and the technical activities defined in the remaining C6 checklists. The following items related to QA program implementation were evaluated by the audit team:

- **Personnel Qualification and Training:** The audit team conducted interviews with responsible personnel and reviewed AMWTP implementing procedures MP-RTQP-14.4, Rev. 24, *Personnel Qualification and Certification*; MP-RTQP-14.6, Rev. 11, *Job Analysis*; MP-RTQP-14.16, Rev. 9, *Training Program Evaluation*; MP-RTQP-14.19, Rev. 10, *Training Records Administration*; MP-Q&SI-5.8, Rev. 8, *Qualifying Supply Chain Inspectors, Auditors, Lead Auditors, and Technical Specialists*; and LST-RTQP-03-IM, Rev. 3, *WIPP Training Requirements Implementation Matrix*, relative to the training and qualification of personnel, to determine the degree to which the procedures adequately address the WIPP HWFP WAP training requirements. The results of the review confirmed that the procedures adequately address HWFP WAP requirements.

Personnel training records associated with RTR, VE, NDA, AK, and site project management were examined to verify implementation of associated requirements and to verify that personnel performing characterization activities are appropriately qualified. Record reviews included individual training plans, qualification and requalification checklists/packages, training course reports, and required reading documentation.

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

- **Records:** The audit team conducted interviews and reviewed AMWTP implementing procedure MP-DOCS-18.2, Rev. 18, *Records Management*, relative to the control and administration of QA records, to determine the degree to which the procedure adequately addresses WIPP HWFP WAP records requirements. The results of the review confirmed that the procedure adequately addresses HWFP WAP requirements.

The audit team interviewed records management personnel and observed activities to determine if AMWTP record storage methods were in compliance with procedural and WAP requirements. Documents such as record coordinator designation and training, records transmittals, and records indexes were reviewed during the evaluation. The audit team observed records management activities at the records center.

No WAP deficiencies regarding records were identified during the audit. The procedure reviewed and objective evidence assembled and evaluated during the audit provided evidence that the applicable requirements for records are adequately established for compliance with WIPP HWFP WAP records requirements, satisfactory in the implementation of these requirements, and effective in achieving the desired results.

- **Nonconformances:** The audit team conducted interviews with responsible personnel and reviewed AMWTP implementing procedure MP-Q&SI-5.4, Rev. 21, *Identification of Nonconforming Conditions*, relative to nonconformances, to determine the degree to which the procedure adequately addresses WIPP HWFP WAP nonconformance requirements. The results of the review confirmed that the procedure adequately addresses the WIPP HWFP WAP requirements.

Randomly selected NCRs, CARs, and root cause analysis reports were evaluated to ensure that CAQs were appropriately identified, documented, dispositioned, investigated, and that root cause analysis was performed where required then resolved and tracked through closure. Review of the selected NCRs included verifications to ensure that AMWTP appropriately documents and reports WAP-related nonconformances identified at the site project management level to the CBFO, as required.

No WAP deficiencies regarding nonconformances were identified during the audit. The procedure reviewed and objective evidence assembled and evaluated during the audit provided evidence that the applicable requirements for nonconformances are adequately established for compliance with WIPP HWFP WAP nonconformance requirements, satisfactory in the implementation of these requirements, and effective in achieving the desired results.

- **Transportation:** The audit team conducted interviews with AMWTP waste certification officials (WCOs) and reviewed AMWTP implementing procedure MP-TRUW-8.12, Rev. 25, *Waste Receipt and Shipping Inspection*, relative to transportation requirements, to determine the degree to which the procedure adequately addresses WIPP HWFP WAP transportation requirements. The results of the review confirmed that the procedure adequately addresses the WIPP HWFP WAP requirements.

No new waste manifests have been completed since the suspension of waste shipments to WIPP as a result of the fire event experienced on February 5, 2014.

No WAP deficiencies regarding transportation were identified during the audit. The procedure reviewed and objective evidence assembled and evaluated during the audit provided evidence that the applicable requirements for transportation are adequately established for compliance with WIPP HWFP WAP transportation requirements, satisfactory in the implementation of these requirements, and effective in achieving the desired results.

- **WWIS/WDS:** The audit team conducted interviews with responsible personnel and reviewed AMWTP implementing procedure MP-TRUW-8.5, Rev. 29, *TRU Waste Certification*, relative to WWIS/WDS data entry, to determine the degree to which the procedure adequately addresses HWFP WAP WWIS/WDS requirements. The results of the review confirmed that the procedure adequately addresses WIPP HWFP WAP requirements.

Record reviews included the Waste Container Data Entry Form (WCDEF) and Offsite Shipping Module (OSM) data reports; WWIS/WDS Container Data Reports; electronic container information summaries; and electronic BDRs that presented waste characterization analytical values used in the data entry and verification process.

Data entry, container characterization, and container certification using the WCDEF method is a combination of manual and electronic data entry and electronic submittal to WWIS/WDS. Data collection, container characterization, and container certification using the OSM method is a fully electronic system. BDRs and characterization and certification data forms are viewed and compared electronically. The AMWTP WTS is used to electronically manage and track NCRs associated with containers being characterized and certified. Verification of resolution of NCRs associated with specific containers is performed electronically within the AMWTP WTS. The OSM characterization and certification method is the primary method in use. The WCDEF characterization and certification method is only used for containers that do not have electronic BDRs, and will be discontinued when all containers in the inventory are analyzed using equipment that generates electronic data reports.

The team reviewed a sample of WWIS/WDS waste certification packages for CH waste containers. The packages were for the 85-gallon overpack container 10529755; standard waste box (SWB) BN 10523717; 100-gallon overpack containers 10562556, BN10556467, BN10565825, BN 10551216, and BN10528597; and 55-gallon container 10011852.

The audit team determined that the certification of containers (where the Central Characterization Program [CCP] is providing flammable gas analysis) is currently on hold as the contract with CCP for this analytical service has expired and is being negotiated for re-award. AMWTP is continuing to characterize containers awaiting flammable gas data to complete the certification process. The audit team determined that waste certification and documentation of characterization and certification activities for both the WCDEF and OSM methods are adequately performed, including data entry, data entry review, and certification of waste containers.

No WAP deficiencies regarding WWIS/WDS data entry or waste characterization or certification were identified during the audit. The procedure reviewed and objective evidence assembled and evaluated during the audit provided evidence that the applicable requirements for WWIS/WDS are adequately established for compliance with WIPP HWFP WAP requirements, satisfactory in the implementation of these requirements, and effective in achieving the desired results.

- **Container Management:** The audit team conducted interviews with responsible personnel and reviewed AMWTP implementing procedures MP-TRUW-8.12, Rev. 25, *Waste Receipt and Shipping Inspection*; INST-OI-09, Rev. 61, *Retrieval Inspection Station Operations*; INST-OI-11, Rev. 61, *Waste Container Handling*; MP-PRPL-22.1, Rev. 39, *Production Planning*; INST-OI-45, Rev. 22, *Drum Filter Installation*; and INST-OI-50, Rev. 19, *WMF-615 Filter Insertion Operations*, to determine the degree to which procedures adequately address upper-tier requirements. The results of the review confirmed that the procedures adequately address upper-tier requirements.

The audit team conducted interviews, performed record reviews, and evaluated operations for container management, filter installation, and retrieval inspections. Container management activities were evaluated by a walkthrough of AMWTP storage areas in Buildings WMF-634, WMF-635, and WMF-636. Container status and location are tracked using the WTS and TrackWise® system. Daily checks are performed to verify location of acceptable containers and reported to management via email.

Storage of containers ready for shipment was verified to be satisfactory to preclude non-eligible containers from being shipped to the WIPP. Storage of non-INL containers was verified to be separate from INL containers. Separate storage of containers with NCRs from containers without NCRs was also verified. Rows were labeled "Contains NCRs" or "Ready to Ship." Labelling of containers was verified to be compliant and tracking of the drums using the labels was acceptable.

Containers were chosen from a list of containers from the Electronic Inventory Analysis dated October 15, 2015, and located in the appropriate recorded locations in Buildings WMF-634, WMF-635, and WMF-636.

Waste retrieval operations performed in Building WMF-636 were observed and evaluated. Retrieval personnel worked in protective gear inside a radiation area. The procedure for retrieval is maintained in the control room, accessible to the retrieval personnel via radio contact with the control room manager. Waste containers are surveyed out through an air lock chamber, labeled, and then sent for characterization.

Filter installation on TRU drums was observed in Building WMF-634. The Drum Vent System (DVS) is used to remotely insert an approved filter through the lid of a drum and through the liner lid, if present. The system is controlled by an operator who loads the DVS with the appropriate filter and then initiates and controls the operation of the DVS using a dedicated computer. When filter installation operations are completed, the operator then uploads the drum information into the WTS and sends the drum out for further characterization. Although no drum filters have been installed in the last year using the DVS, the procedure remains active and personnel continue to be trained, as required.

In Building WMF-615, the unvented drums enter the venting chamber via a conveyor and filters are remotely installed by operators who view the drum and venting operations through a glass viewing port. The drums have filters installed and then,

using the conveyor, the drums are removed from the filter installation chamber and stored until characterization operations begin.

No WAP deficiencies regarding container management were identified during the audit. The procedures reviewed and objective evidence assembled and evaluated during the audit provided evidence that the applicable requirements for container management are adequately established for compliance with WIPP HWFP WAP container management requirements, satisfactory in the implementation of these requirements, and effective in achieving the desired results.

- **Project Level Data V&V:** Technical activities evaluated, including both characterization and certification activities, consisted of data-generation and project-level data V&V, AK, RTR, VE, and NDA (including the RBAS and participation in the Performance Demonstration Program [PDP]), and preparation of WSPFs for CH SCG S3000 homogeneous solids and CH SCG S5000 debris waste. Objective evidence was selected and reviewed to evaluate the implementation of the associated characterization activities. BDRs and personnel training documentation were included in the evaluation. The audit included direct observation of actual waste characterization activities. Each process involves:
 - Collecting raw data
 - Collecting quality assurance/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 WIPP

The flow of data from the point of generation to inclusion in the WSPF 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 are described in the following sections.

During the audit, AMWTP demonstrated compliance with the waste characterization requirements of the WIPP HWFP WAP through documentation and by performing characterization activities.

Objective evidence was reviewed to ensure project-level activities were adequately performed to support waste characterization. The audit team reviewed AMWTP procedures MP-TRUW-8.14, Rev. 16, *Preparation of Waste Stream Profile Forms*; MP-TRUW-8.8, Rev. 44, *Level I Data Validation*; and MP-TRUW-8.9, Rev. 26, *Level II Data Validation*, to determine the degree to which the procedures adequately address WIPP HWFP WAP requirements. The results of the review confirmed that the procedures adequately address the HWFP WAP requirements.

BDRs were evaluated based on project-level requirements for RTR, VE, and NDA for CH SCG S3000 homogeneous solids and CH SCG S5000 debris waste.

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

Real-time Radiography (RTR)

RTR14-00339	RTR14-00381	RTR15-00106
RTR15-00163	RTR15-00264	

Visual Examination (VE)

VEB14-00390	VEB14-00515	VEB15-00227
VEB15-00601	VNC15-00002	

Nondestructive Assay (NDA)

ASY14-03325	ASY14-03508	ASY15-00104
ASY15-02359	BSY15-00001	

The audit team verified the required quarterly re-reviews from the data-generation level were performed. These reviews were documented in AMWTP Surveillance Reports 87998, 87999, 94435, and 94436.

Procedures and objective evidence were reviewed to ensure that AMWTP adequately performs data reconciliation and properly prepares WSPFs. Data review was performed on the CH SCG S3000 homogeneous solids and CH SCG S5000 debris waste. The results of the review of the above referenced documents indicate that AMWTP is completing WSPFs and characterization information summaries in accordance with applicable requirements.

No WAP deficiencies were identified during the audit regarding project-level V&V. The audit team verified that AMWTP is satisfactorily implementing the program requirements from an overall management perspective, including the project-level data V&V process, to characterize and certify waste for disposal in accordance with WIPP HWFP WAP requirements.

5.4.2 Table C6-2, Acceptable Knowledge Checklist

The audit team evaluated the following AMWTP implementing procedures: MP-TRUW-8.1, Rev. 26, *Certification Plan for INL Transuranic Waste*; MP-TRUW-8.2, Rev. 18, *Quality Assurance Project Plan*; MP-TRUW-8.11, Rev. 27, *Data Reconciliation*; MP-TRUW-8.13, Rev. 26, *Collection, Review, and Management of Acceptable Knowledge Documentation*; and MP-TRUW-8.14, Rev. 16, *Preparation of Waste Stream Profile Forms*, relative to AK activities, to determine the degree to which procedures adequately address upper-tier requirements. The results of the review confirmed that the procedures adequately address WIPP HWFP WAP requirements.

The audit team evaluated the AK process for characterizing SCG S3000 homogeneous solids and SCG S5000 debris wastes. The audit team used the WAP C6 checklists, primarily checklist C6-2, as a guide for demonstration of WIPP HWFP compliance and also examined compliance with the WAC. Two waste streams were examined during the audit. The first waste stream examined was the S5000 mixed waste debris stream BN510.4 described in RPT-TRUW-83, Rev. 11, *Acceptable Knowledge Summary for Supercompacted Debris*

Waste. The second waste stream examined was an S3000 mixed waste solids stream generated at the Rocky Flats Plant designated as BN222, as described in RPT-TRUW-77 Rev. 1, *Acceptable Knowledge Summary for Solidified Plutonium Recovery Incinerator Waste*.

Numerous documents from the AK record that demonstrate adherence to the applicable requirements were reviewed and compiled as objective evidence, including the relevant AK summary reports, WSPFs and attachments with applicable change notices, AK source document summaries, and BDRs from RTR, VE, and NDA characterization testing, augmenting the AK record. Data reconciliation packages that compare the results of the characterization testing with the AK record were also compiled and examined. In addition, the audit team examined AK discrepancy resolution documentation for discrepancies in the AK record, and the resolution of discrepancies identified during characterization processes. The audit team reviewed NCRs dealing with the identification and disposition of prohibited items.

In addition to the respective AK summary reports mentioned above, the following supporting documents were utilized by the audit team: RPT-TRUW-12, Rev. 24, *AMWTP Waste Stream Designations*; RPT-TRUW-05, Rev. 39, *Waste Matrix Code Reference Manual*; and RPT-TRUW-07, Rev. 22, *Determination of Radioisotopic Content in TRU Waste Based on AK*. The audit team examined the latest WAP-compliant AK Accuracy Report and the most recent internal surveillance related to the AK process.

A total of five drums were tracked for the WAP-required traceability exercise including three drums from the BN510.4 waste stream and two drums from BN222. In addition to reviewing the relevant characterization BDRs, the audit team also compiled traceability screenshot data from the WTS, along with waste container input forms where applicable.

The audit team examined training records for six AKEs and an SPM associated with the AK process. The handling of NCRs and AK discrepancy reports, including the segregation of non-conforming items/containers, were reviewed. In addition, the handling of AK records was examined for compliance with preparation, legibility, accuracy, review, approval, and maintenance. The distribution, control, and use of appropriate AK procedures were also reviewed. The audit team verified the AK information gathering process is evaluated through independent internal assessments.

The audit team identified three concerns in the area of AK. The first concern recommended that the AKEs update the list of active AMWTP processes/procedures that could impact the characterization and certification of TRU waste. See Recommendation 1 in section 6.4.

The second concern recommended editorial changes to specific referenced AK source documents in RPT-TRUW-83, Rev. 11. In addition, changes were recommended for the upper-tier AK document RPT-TRUW-06, Rev. 17, *Acceptable Knowledge Document for AMWTP Waste*, to reflect the most recent changes to some activities related to the use of the special case waste glovebox and the collection of supercompactor squeezants. See Recommendation 2 in section 6.4.

The third concern recommended that INST-FOI-17, *Facility Visual Examination Operations*, Section 3.1.4, be revised to better clarify who is responsible for performing verification of waste for incompatibles and how the verification will be accomplished. See Recommendation 3 in section 6.4

No WAP deficiencies regarding AK were identified during the audit. Although three concerns were identified, the procedure reviews, field observations, and document reviews provided evidence that the applicable requirements for characterizing CH SCG S3000 homogeneous solids and CH SCG S5000 debris waste using the AK process are adequately established for compliance with upper-tier requirements, satisfactory in the implementation of these requirements, and effective in achieving the desired results.

5.4.3 Table C6-3, Radiography Checklist

The audit team evaluated the adequacy, implementation, and effectiveness of AMWTP characterization and certification of CH SCG S3000 homogeneous solids waste and SCG S5000 debris waste using the RTR characterization process.

The audit team reviewed procedures INST-OI-12, Rev. 57, *Real-Time Radiography Examinations (Certification Scans)*, MP-TRUW-8.8, Rev. 44, *Level I Data Validation*, MP-TRUW-8.2, Rev. 18, *Quality Assurance Project Plan*, MP-TRUW-8.1, Rev. 26, *Certification Plan for INL Transuranic Waste*, to determine the degree of adequacy in addressing upper-tier requirements. The results of the review indicate that the procedures adequately address upper-tier requirements.

In addition to the documents mentioned above, the audit team utilized supporting document RPT-TRUW-05, Rev. 39, *Waste Matrix Code Reference Manual*, during the audit.

The audit team evaluated RTR operator-required test and training drum audio/video media and supporting documentation for three operators. The audit team reviewed training and qualification records to verify that RTR operators were trained and qualified, as required.

The audit team evaluated RTR operations in Building WMF-634 for RTR Units 101 and 106. RTR operations were observed for the certification scans of container 10563430, waste matrix code S3121 solids sludge from Item Description Code (IDC) RF-001, and container 10563396, waste matrix code S3900 homogeneous solids from IDC BN-511.

The audit team also examined RTR operational logbook entries in the electronic login system (eSOMS) for both RTR units.

AMWTP is not currently utilizing RTR Unit 1001 in Building WMF-610 to perform certification scans of TRU waste; however, the audit team inspected the unit and verified the unit consisted of the components required to perform RTR.

The audit team examined the following RTR BDRs and reviewed audio/video media for selected containers:

RTR14-00330	RTR15-00009	RTR15-00089
RTR15-00174	RTR15-00081	RTR15-00086
RTR15-00113	RTR15-00171	RTR15-00062
RTR15-00222		

Two concerns were identified during field evaluations of RTR in Building WMF-634. The first concern was related to pre-printed forms being utilized in the operations room for RTR Unit 106. The practice of using pre-printed forms could lead to the use of an obsolete version of the form, if a change is made and the operator is not aware of the change. See Observation 1 in section 6.3.

The second concern was related to RTR operators not generating NCRs for containers with impenetrable objects. (RTR operators are answering the question for the presence of Impenetrable Dense Objects as “no” when in fact the waste cannot be penetrated.) See CAR 16-008 in section 6.1.

The procedure reviews, field observations, and document and audio/video reviews provided evidence that the applicable requirements for characterizing SCGs S3000 solids and S5000 debris waste using the RTR process are adequately established for compliance with upper-tier requirements, however; due to the nature and issuance of CBFO CAR 16-008 (a WAP deficiency), the implementation and effectiveness of the associated requirements were deemed unsatisfactory.

5.4.4 Table C6-4, Visual Examination Checklist

The audit team evaluated the adequacy, implementation, and effectiveness of the AMWTP VE characterization process for SCG S5000 debris waste. AMWTP is performing VE in Building WMF-676.

The audit team reviewed procedures MP-TRUW-8.8, Rev. 44, *Level I Data Validation*; INST-OI-34, Rev. 30, *Non-Facility Visual Examination Operations*; INST-FOI-17, Rev. 30, *Facility Visual Examination Operations*; INST-FOI-20, Rev. 46, *Supercompactor and Post-Compaction Operations*; and LST-RTQP-03-IM, Rev. 3, *WIPP Training Requirements Implementation Matrix*, relative to VE activities, to determine the degree to which procedures adequately address upper-tier requirements. The results of the review confirmed that the procedures adequately address WAP requirements.

In addition to the documents mentioned above, the audit team utilized supporting document, RPT-TRUW-05, Rev. 39, *Waste Matrix Code Reference Manual*, during the audit.

AMWTP uses the two-operator VE characterization method in which VE is performed by two qualified operators who examine the waste and place it into containers. The audit team conducted interviews with VE personnel, toured Building WMF-676 Box Line, and observed VE characterization of S5000 debris waste in the North Box Line. Interviews with VE operators were conducted and electronic VE operational logbook entries for the North Box

Line were also verified and found to be correctly entered and subsequently reviewed by the facility shift supervisor, as required.

The audit team examined the following VE BDRs:

VEB14-00515	VEB15-00002	VEB15-00278
VEB15-00454	VEB15-00623	VNC15-00002
VNC15-00005	VNC15-00009	

The audit team examined training records for VE operators, Independent Technical Reviewers (ITRs), and VEEs, and confirmed the appointment of AMWTP VEEs. The audit team verified that VE operators, ITRs, and VEEs were appropriately trained and qualified, as required.

No concerns regarding VE were identified. The procedure reviews, field observations, and document reviews provided evidence that the applicable requirements for characterizing SCG S5000 debris waste using the VE process are adequately established for compliance with upper-tier requirements, satisfactory in the implementation of these requirements, and effective in achieving the desired results.

5.4.5 Nondestructive Assay

The audit team evaluated the continued adequacy, implementation, and effectiveness of the Z-390-100 and Z-390-101 NDA systems in Building WMF-676, and the Z-211-102 and Z-211-103 NDA systems in Building WMF-634 on-site. Additionally, the audit team evaluated the RBAS, designated Z-212-105, and located in Building WMF-634 for initial WIPP certification. The Z-390-100 and Z-390-101 systems are capable of assaying waste in 55-gallon drums, while the Z-211-102 and Z-211-103 systems are capable of assaying waste in both 55- and 83/85-gallon drums. The RBAS is capable of assaying boxes with a maximum dimension of 98" X 58.5" X 78". Boxes assayed may include Standard Waste Boxes (SWB's), Standard Large Box II's (SLB II's), and fiber reinforced plastic boxes, or their custom equivalents.

The audit team reviewed procedures MP-TRUW-8.8, Rev. 44, *Level I Data Validation*; INST-TRUW-8.1.1, Rev. 12, *Drum Assay Post-Maintenance Calibration & Verification*; RPT-TRUW-03, Rev. 9, *Drum Assay Technical Review Report*; CI-IDA-NDA-0035, Rev. 3, *Calibration Verification & Confirmation Procedure for the Integrated Waste Assay System (IWAS) at AMWTP*, Canberra Industries; CI-IDA-NDA-0055, Rev. 1, *Total Measurement Uncertainty for the AMWTP Integrated Waste Assay Systems*, Canberra Industries; INST-OI-14, Rev. 37, *Drum Assay Operations*; INST-FOI-01, Rev. 31, *In-Plant Drum Assay Operations*; INST-OI-15, Rev. 39, *Box Assay Operations*; INST-TRUW-8.1.3, Rev. 0, *Box Assay Post-Maintenance Calibration and Verification*; BII-5112-TMU-001, Rev.2, *AMWTP Retrieval Box Assay System (RBAS) Total Measurement Uncertainty Report*, and PSC-5431-CCR-001, Rev. 0, *Calibration Confirmation Report for the AMWTP RBAS System*, relative to NDA activities, to determine the degree to which procedures adequately address upper-tier requirements. The results of the review confirmed that the procedures adequately address upper-tier requirements.

In addition to the documents mentioned above, the audit team utilized supporting documents PSC-5431-SADD-001, Rev. 10, *System and Algorithm Definition Document*, and PSC-5431-SADD-002, Rev. 3, *System and Algorithm Definition Document*.

The NDA systems are Canberra multi-mode hybrid systems that run NDA 2000 and incorporate Canberra's Genie 2000, Multi-Group Analysis, as well as Multi-Group Analysis-Uranium, when sufficient quantities of uranium are detected. Each system consists of the following components:

- Two broad energy germanium gamma detectors mounted one over the other in the assay chamber wall, perpendicular to, and pointing toward the vertical axis of the drum.
- An array of 122 Helium-3 proportional tubes is arranged in a 4π geometry about the assay chamber. These tubes are divided into 16 detector banks currently only used in the passive neutron coincidence counting mode. These systems have the capability (both qualified and maintained) to assay in the active neutron differential die-away (DDA) mode. Active mode was not used for WIPP assay purposes in the year since the last audit.
- A Cf-252 (Californium)/Cs-137(Cesium) Add-A-Source correction source, mounted in a retractable housing external to the assay cavity, with an intensity of approximately 10^5 neutrons per second is used, in part, for the determination of matrix correction factors.
- A 14 million electron volt (MeV) neutron generator with a capability of producing 10^8 14-MeV neutrons per second can be used, along with cavity and barrel flux monitors and four Fast Neutron Detector Packs, in the active neutron DDA mode.

The RBAS is an imaging passive/active neutron system supplemented with a High Purity Germanium (HPGe) gamma system. The measurement techniques used with the box assay system are passive neutron multiplicity counting, imaging active neutron counting using thermal and epithermal DDA techniques, and high-resolution gamma isotopic analysis. The integrated information from the neutron measurements, gamma-ray measurements, and AK are used to determine the isotopic distribution, quantify the radionuclide masses, and compute the associated derived quantities (Plutonium Equivalent Curies [PECi], the Plutonium equivalent Fissile Gram Equivalents [FGEs], the total TRU Alpha Activity, and the decay heat) for each waste box.

Once a box is loaded onto the RBAS loader/turntable, the system feeds the box fully into the RBAS where the gamma measurement is taken. The box is then conveyed to the middle section of the unit where banks of Helium-3 detectors count the passive neutrons emitted by the waste and a neutron source is directed through the box to allow for the measurement of moderating and absorbing characteristics of the waste. The neutron detectors also count the neutrons that are emitted actively in response to the source to perform the DDA analysis. The box is measured in segments as it passes through the area of detectors and the interrogating source. Once the full length of the box has passed through this region, the loader/turntable unloads the box, rotates it 180 degrees and repeats the entire measurement.

The RBAS uses PC-FRAM (Fixed-energy Response function Analysis with Multiple efficiencies) for the isotopic analysis of the gamma spectra. Integration of FRAM results and

RBAS neutron results is performed using off-line software known as RBAS WIPP Analysis Reporting Software for Expert Analysis (RWARS-EA).

Based on a review of the current revisions of AMWTP procedures and reports provided, a checklist was prepared and used to evaluate the following:

- System stability as evidenced by the implementation and effectiveness of daily and weekly measurement controls and calibration verifications.
- Applicability of each system's calibration and operational range to the matrix, geometry, and radionuclide content of waste assayed since previous CBFO Audit A-15-01, conducted October 2014.
- Successful participation in the CBFO-sponsored NDA PDP Cycle 22A and B14B
- Completed BDRs to ensure data are reported and reviewed as required.
- Data storage and retrievability.
- Personnel qualification and training.
- Continued operability and condition of the NDA systems since CBFO Audit A-15-01, conducted October 2014.

The audit team interviewed AMWTP NDA personnel and operations staff, observed equipment and practices, and examined electronic and paper copies of records, including BDRs, control charts, NCRs, and work orders. The audit team also verified that NDA operators were appropriately qualified as required for compliance with training requirements.

System performance checks have been performed requiring no recalibrations. AMWTP successfully participated in PDP Cycle 22A for all four drum systems and supplemental box cycle B14B for the RBAS.

The following drum assay BDRs were reviewed during the audit:

ASY14-03842	ASY15-00112	ASY15-00670	ASY15-00733
ASY15-01147	ASY15-01153	ASY15-01597	ASY15-01766
ASY15-01771	ASY15-01779	ASY15-01978	ASY15-02099
ASY15-02138	ASY15-02156	ASY15-02227	ASY15-02235
ASY15-02292	ASY15-02297	ASY15-02416	ASY15-02437
ASY15-02477	ASY15-02614	ASY15-02737	ASY15-02824
ASY15-02878	ASY15-02879	ASY15-02925	ASY15-02970
ASY15-03103	ASY15-03374	ASY15-03499	ASY15-03562
ASY15-03645	ASY15-03760	ASY15-03790	ASY15-03878
ASY15-03901	ASY15-03996	ASY15-04107	

The following box assay BDRs were reviewed during the audit:

BSY15-00001 BSY15-00002 BSY15-00003.

No concerns regarding NDA were identified during the audit. The procedure reviews, field observations, and document reviews provided evidence that the applicable requirements for

characterizing CH SCG S3000 homogeneous solids and CH SCG S5000 debris waste using the NDA process are adequately established for compliance with upper-tier requirements, satisfactory in the implementation of these requirements, and effective in achieving the desired results.

5.4.6 Load Management

The audit team conducted interviews with responsible personnel and reviewed AMWTP implementing procedure MP-TRUW-8.1, Rev. 26, *Certification Plan for INL Transuranic Waste*, to determine the degree to which the procedure adequately addresses upper-tier requirements. The results of the review confirmed that the procedure adequately addresses upper-tier requirements.

AMWTP practices load management on CH TRU waste streams, as appropriate, following the guidance and requirements in procedure MP-TRUW-8.1. The audit team examined two AK summary reports: RPT-TRUW-83, Rev. 11, *Acceptable Knowledge Summary for Supercompacted Debris Waste*, which documents the AK for waste stream BN510.4 (a load managed waste stream), and RPT-TRUW-77, Rev. 1, *Acceptable Knowledge Summary for Solidified Plutonium Recovery Incinerator Waste (BN222)*. The containers in the S3000 (BN222) waste stream examined, as described in RPT-TRUW-77, nearly all assay greater than 100 nanocuries per gram (nCi/g) of waste and therefore this stream is not load managed. Estimates of the amount of waste assaying at greater than and less than 100 nCi/g are provided as required with supporting documentation available in RPT-TRUW-07, Rev. 22, *Determination of Radioisotopic Content in TRU Waste Based on AK*. For the feed drums to the Supercompactor, BN508, the current estimate is that 35% of the silvers assay less than 100 nCi/g of waste.

For supercompacted waste stream BN510.4, pucks that assay at slightly less than 100 nCi/g of waste are loaded in 100-gallon waste containers with pucks assaying at greater than 100 nCi/g such that the assay for the 100-gallon drum is compliant at greater than 100 nCi/g. Pucks that assay well below the 100 nCi/g are also placed into 100-gallon containers but are then managed as mixed low level waste. These containers are treated to meet Land Disposal Restriction standards and are shipped to the Nevada National Security Site, formerly the Nevada Test Site, as appropriate.

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

6.0 CORRECTIVE ACTIONS, OBSERVATIONS, AND RECOMMENDATIONS

The audit team identified ten concerns during the audit. These concerns were classified by CBFO QA, as documented in the following subsections.

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) – 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.

Five CAQs were identified during the audit and were classified as CARs.

CAR 16-004

Condition:

The approved list of records custodians (RCs) that is maintained by the Records Officer contains names of RCs who are not current on the required Record Custodian Training 0AWT1089. Of the approximately 60 RCs named in the list, 9 are not current on the required training.

Requirement:

MP-DOCS-18.2, Rev 18, *Records Management*, Section 3.2.3 states: "RC: Complete required custodian training 0AWT1089, Records Custodian Training, as requested by the RO". Also, Sections 3.2.5, 3.2.5.1, and 3.2.5.2 state: "RO: Update approved list of RCs...(3.2.5.1) Ensure list is available on the approved AMWTP home page (Electronic Document Management System [EDMS] records search page)....(3.2.5.2) Coordinate with the training organization to ensure that all appointed RCs have been trained."

CAR 16-005

Condition:

Through interviewing QA Management personnel, the audit team identified that the CBFO QAPD, Rev. 12, had not been implemented. Revision 12 was effective on August 3, 2015. AMWTP/ITG personnel performed a database search for incoming correspondence from DOE-ID and no records related to the transmittal of the CBFO QAPD, Rev. 12, were found. This CAR was issued to DOE-ID.

Requirement:

AMWTP QAPP-01, Rev. 15, *Quality Assurance Program Plan*, Introduction section, states: "ASME NQA-1-2008, Quality Assurance Requirements for Nuclear Facility Applications with

NQA-1a-2009 addenda is the QA standard for AMWTP along with ASME NQA-1-1989 to support the DOE Carlsbad Field Office (CBFO) Quality Assurance Program Document (DOE/CBFO-94-1012).” Also, Section 4.2.8 states: “The Document Control system shall

require that end-users verify that documents are the current revision, and that only the currently approved documents are in use at the location where work is performed.”

CAR 16-006

Condition:

AMWTP individuals who are Controlled Copy Holders are not current on the required Training (OAWT1091) for updating and maintaining controlled copy documents. Thirteen AMWTP individuals are assigned controlled copy documents. Six of these individuals are not current on Training OAWT1091.

Requirement:

MP-DOCS-18.4, Rev. 46, *Document Control*, Section 3.17.8 states: “Controlled Copy Holder: Ensure training for updating and maintaining controlled copies is current.”

CAR 16-007

Condition:

The graded approach factors of “the importance of the data to be generated” and “the consequence of failure” are not listed in MP-Q&SI-5.6, Rev. 4, *Graded Approach*, when determining the level of analysis, documentation, verification, and other controls necessary to comply with QA program requirements.

Requirement:

CBFO QAPD, Rev. 12, Section 1.1.2.3A states: “The graded approach is the process by which the level of analysis, documentation, verification, and other controls necessary to comply with QA program requirements are developed commensurate with the following factors:

1. The importance of an item or activity with respect to safety, waste isolation, security, and regulatory compliance
2. The importance of the data to be generated
3. The need to demonstrate compliance with specific regulatory design and QA requirements
4. The impact on the results of performance assessments and engineering analyses
5. The magnitude of a hazard or the consequences of failure
6. The life-cycle stage of a facility or item
7. The programmatic mission of a facility
8. The particular characteristics of a facility, item, or activity (e.g., complexity, uniqueness, history, or the necessity for special controls or processes)
9. The relative importance of radiological and non-radiological hazards”

CAR 16-008

Condition:

During the RTR process, no NCRs are being generated for containers with impenetrable objects. RTR operators are answering the question for the presence of impenetrable dense objects as "no" when in fact the waste cannot be penetrated.

There are several IDCs (approx. 23) with containers of bulk loaded sludges that have enough AK information to satisfy the WAP requirement in section C1-1 that states: "Containers whose contents prevent full examination of the remaining contents shall be subject to visual examination unless the site certifies that visual examination would provide no additional relevant information for that container based on the acceptable knowledge information for the waste stream." For this reason, RTR operators have been instructed to enter "no" for the presence of impenetrable dense objects for containers with impenetrable waste from the applicable waste streams.

Requirement:

INST-OI-12, Rev. 57, *Real-Time Radiography Examinations (Certification Scans)*, Section 4.6.36.1 states: "If a container has impenetrable objects that prevent full examination, THEN initiate NCR in accordance with MP-Q&SI-5.4."

6.2 Deficiencies Corrected During the Audit

During the audit, the audit team may identify CAQs. Audit team members, the audit team leader (ATL), and the CBFO QA representative evaluate the CAQs to determine if they are significant. Once a determination is made that the CAQ is not significant, the audit team member, in conjunction with the ATL and the CBFO QA representative, determines if the CAQ is an isolated case requiring only remedial action and therefore can be corrected during the audit. Upon determination that the CAQ is isolated, the audit team member, in conjunction with the ATL and the CBFO QA representative, evaluates/verifies any objective evidence/actions submitted or taken by the audited organization and determines if the condition was corrected in an acceptable manner. Once it has been determined that the CAQ has been corrected, the CBFO QA representative categorizes the condition as corrected during audit (CDA) according to the definition below.

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

No CAQs were corrected during the audit.

6.3 Observations

During the audit, the audit team may identify potential problems that should be communicated to the audited organization. The audit team 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.

Two observations were identified during the audit.

Observation 1

During field evaluations of RTR in Building WMF-634, a number of preprinted copies of Form 1578 (titled "Imaging Quality Indicator"), used to document the results of daily image system checks, were observed in the operations room for RTR Unit 106. The same condition was observed for Form 1218, "Daily RTR Safety Checks." The practice of preprinting forms could lead to the use of an obsolete version of the form, should a change occur and the operator was not made aware of the change.

The audit team confirmed that the forms were current within EDMS, so the instances observed did not represent a CAQ. Software Change Request (SCR) #4295 has been submitted to convert this form to an electronic accessible form.

Observation 2

Two different matrices exist which identify the procedures that implement the AMWTP QA program for the requirements of several basis documents. One matrix is included in QAPP-01, *Quality Assurance Program Plan*, Table 13.2, while the other is in LST-Q&SI-01-IM, *Quality Assurance Program Requirements*, Appendix A. The two matrices should be combined into one matrix, as maintaining two could potentially lead to errors and inconsistencies.

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.

Three recommendations were provided to AMWTP management as a result of the audit.

Recommendation 1

The audit team recommended that the AMWTP AKEs update the list of active AMWTP processes/procedures that could impact the characterization and certification of TRU waste. The list should contain the latest revisions of the procedures and a point of contact should be identified. Also, the AKEs should be advised of proposed revisions to procedures such as the addition of a new absorbent material.

Recommendation 2

The audit team recommended that the following changes be made to the AK documents listed below to provide clarification or consistency:

RPT-TRUW-83, Rev. 11, *AK Summary for Supercompacted Debris Waste:*

At the next revision, make the following changes to the Reference Section 3.0:

1. Change the date on document P859S (RPT-82) from 10/19/11 to 6/2/09
2. Determine whether document P859S (RPT-82) should be revised, left as is, or suspended
3. List the latest revision for the waste material parameter weight estimate calculations in document C1381A

RPT-TRUW-06, Rev. 17, *AK Document for AMWTP Waste:*

At the next revision, this report should be modified to reflect current practices in the WMF-676 treatment facility, with respect to the collection of supercompactor squeezants; the inactivity of the special case waste glovebox; and other changes.

Recommendation 3

The audit team recommended that INST-FOI-17, *Facility Visual Examination Operations*, Section 3.1.4, be revised to better clarify who is responsible for performing verification of waste for incompatibles and how the verification will be accomplished.

7.0 LIST OF ATTACHMENTS

Attachment 1: Personnel Contacted During the Audit

Attachment 2: Summary Table of Audit Results

Attachment 3: Table of Audited Documents

Attachment 4: List of Processes and Equipment Reviewed

PERSONNEL CONTACTED DURING THE AUDIT				
NAME	ORG/TITLE	PRE-AUDIT MEETING	CONTACTED DURING AUDIT	POST-AUDIT MEETING
Jade Anderson	ITG Software Engineering Manager		X	X
Travis Anderson	ITG WCO		X	
Kevin Bake	ITG Systems Engineer		X	
Lindsey Bender	U.S. EPA QA	X	X	X
Adrian Bergman	DOE-ID Observer	X	X	X
Dale Bignell	CBFO/CTAC Observer	X	X	
Gary Birge	CBFO Observer	X	X	X
Shane Boudreau	ITG NDA Ops.	X		
George Byram	ITG TRU Programs Manager	X	X	X
Steve Carpenter	ITG AK Expert		X	
Norma Castaneda	CBFO Observer	X		
Julie Conner	DOE-ID Management			X
Derek Cox	ITG Waste Handling Lead		X	
Clay Dennert	ITG AKE Trainee		X	
Doug Dineen	ITG NDA Ops.		X	
Rebecca Escott	ITG M&TE Specialist	X	X	
Aaron Fenn	ITG VE Ops.		X	
David Haar	ITG Waste Programs Manager	X	X	X
Linda Harper	ITG QA Engineer	X		
Rod Harrison	ITG Procurement Manager	X	X	X
Shane High	ITG VE Ops.		X	
Steve Holmes	NMED Observer	X	X	X
Rachelle Hubler	ITG Transportation Manager		X	
Jeremy Hult	ITG PAIT Software Development Support		X	

PERSONNEL CONTACTED DURING THE AUDIT				
NAME	ORG/TITLE	PRE-AUDIT MEETING	CONTACTED DURING AUDIT	POST-AUDIT MEETING
Pete Johansen	IDEQ Observer	X	X	
Mike Keeton	ITG QA Engineer	X	X	X
Bruce LaRue	IDEQ Observer			X
Marti McKean	ITG Doc. Control/Records Management Supervisor		X	X
Randall Morris	ITG AK Expert		X	
Angie Morse	ITG QA Manager	X	X	X
Casey Nielson	ITG Procurement/Warehouse		X	
Jerry Patterson	ITG/ICS Supervisor		X	
Shirley Perez	ITG VE Ops.		X	
Loren Peterson	ITG Training Manager	X	X	X
David Richardson	ITG President/Project Manager	X		X
Mike Ricks	ITG RTR Operator		X	
Ben Roberts	DOE-ID, AMWTP Operations Activity Manager		X	
Steven Ross	DOE-HQ EM-43 Observer	X	X	X
Adam Schenck	ITG Waste Retrieval Specialist		X	
Fran Schofield	ITG Procurement Specialist		X	
James Seamans	ITG TRU Programs NDA SME	X	X	X
Michelle Sharp	ITG QA Engineer	X	X	X
Jake Shuman	ITG Procurement/Warehouse		X	
Coleman Smith	NMED Observer	X	X	
Mark Sorenson	ITG RTR ITR	X	X	
Cameron Stamos	ITG Sr. Training Coordinator	X	X	
Chuck Stepzinski	ITG Characterization & Storage Manager	X	X	X
J.R. Stroble	CBFO Observer	X	X	
Dave Summors	ITG NDA Ops.		X	
Paul Swassing	ITG NDA Ops.		X	

PERSONNEL CONTACTED DURING THE AUDIT				
NAME	ORG/TITLE	PRE-AUDIT MEETING	CONTACTED DURING AUDIT	POST-AUDIT MEETING
Steve Tallman	ITG RTR SME	X	X	
Gina Tedford	ITG SPM Audit Lead	X	X	X
Alice Terramorse	ITG Procurement Specialist		X	
Cindy Tiegs	ITG RTR Operator		X	
Matt Thompson	ITG/PAIT Software Engineering Manager		X	X
Ron Todd	ITG Engineering Manager	X	X	
Delisa Tucson	ITG Document Services Sr. Business Specialist	X	X	X
Steve Turner	ITG Systems Engineer		X	
Joe Velasquez	ITG AKE		X	
Connie Walker	NMED/Trinity Observer	X	X	X
LJ Walker	ITG VE Expert	X	X	X
Travis Walker	ITG NDA Ops.		X	
Brian Warner	ITG Characterization & Storage Lead		X	
Mary Willcox	DOE-ID Observer	X		X
Stormie Winterbottom	ITG WCO	X	X	X

SUMMARY TABLE OF AUDIT RESULTS

QA/ Technical Elements	Concern Classification				QA Evaluation		Technical
	CARs	CDAs	Obs	Rec	Adequacy	Implementation	Effectiveness
Acceptable Knowledge				3	A	S	E
Reconciliation of DQOs/WSPFs					A	S	E
Project Level Data V & V					A	S	E
Real-Time Radiography	1		1		A	U	U
Visual Examination					A	S	E
Nondestructive Assay					A	S	E
Container Management/ C6-1 Transportation					A	S	E
Personnel Qualification & Training including Training Records Administration					A	S	E
Corrective Actions					A	S	E
NCRs					A	S	E
M&TE					A	S	E
Work Processes					A	S	E
TRU Reports (Reports to Management)					A	S	E
Assessments/Records/ Document Control	2				A	S	E
Software QA / WWIS/WDS Procurement					A	S	E
Organization					A	S	E
QA Program/Graded Approach	2		1		M	M	M
Load Management					A	S	E
TOTALS	5	0	2	3	A	S	E

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

TABLE OF AUDITED DOCUMENTS			
NUMBER	PROCEDURE NUMBER	REVISION NUMBER	PROCEDURE TITLE
1.	BII-5112-TMU-001	2	AMWTP Retrieval Box Assay System (RBAS) Total Measurement Uncertainty Report
2.	CI-IDA-NDA-0035	3	Calibration Verification & Confirmation Procedure for the Integrated Waste Assay System (IWAS) at AMWTP
3.	CI-IDA-NDA-0055	1	Total Measurement Uncertainty for the AMWTP Integrated Waste Assay Systems
4.	RPT-TRUW-03	9	Drum Assay Technical Review Report
5.	INST-CD&M-11.1.2	16	Facility Modification Proposal Preparation
6.	INST-CD&M-11.2.1	9	Software Version Control
7.	INST-CD&M-11.2.2	18	Software Inventory Classification
8.	INST-CD&M-11.2.3	9	System Data Change Request
9.	INST-CD&M-11.2.6	6	Temporary Software Override
10.	INST-CMNT-10.5.1	13	Calibration and Control of Measuring and Test Equipment
11.	INST-CMNT-10.14.1	8	Testing In-Plant and Process Instrumentation
12.	INST-FOI-01	31	In-Plant Drum Assay Operations
13.	INST-FOI-17	30	Facility Visual Examination Operations
14.	INST-FOI-20	46	Supercompactor and Post-Compaction Operations
15.	INST-OI-09	61	Retrieval Inspection Station Operations
16.	INST-OI-11	61	Waste Container Handling
17.	INST-OI-12	57	Real-Time Radiography Examinations (Certification Scans)
18.	INST-OI-14	37	Drum Assay Operations
19.	INST-OI-15	39	Box Assay Operations
20.	INST-OI-34	30	Non-Facility Visual Examination Operations
21.	INST-OI-45	22	Drum Filter Installation
22.	INST-OI-50	19	WMF-615 Filter Insertion Operations
23.	INST-TRUW-8.1.1	12	Drum Assay Post-Maintenance Calibration and Verification
24.	INST-TRUW-8.1.3	0	Box Assay Post-Maintenance Calibration and Verification
25.	LST-RTQP-03-IM	3	WIPP Training Requirements Implementation Matrix
26.	MP-CD&M-11.1	10	Change Control
27.	MP-CD&M-11.2	22	Software Quality Assurance
28.	MP-CMNT-10.5	10	Measuring and Test Equipment Program
29.	MP-CMNT-10.14	6	In-Plant and Process Instrumentation Testing Program
30.	MP-DOCS-18.1	14	Developing Written Work Instructions
31.	MP-DOCS-18.2	18	Records Management
32.	MP-DOCS-18.3	8	Developing Management Procedures
33.	MP-DOCS-18.4	46	Document Control
34.	MP-M&IA-17.1	11	Management Assessment
35.	MP-M&IA-17.2	12	Independent Assessment
36.	MP-M&IA-17.3	9	Quality Assurance Surveillance
37.	MP-PCMT-15.1	17	Acquisition of Material and Services
38.	MP-PCMT-15.21	9	Material Management
39.	MP-PRPL-22.1	39	Production Planning
40.	MP-Q&SI-5.1	9	Investigation and Root Cause Analysis
41.	MP-Q&SI-5.3	13	Corrective Action
42.	MP-Q&SI-5.4	21	Identification of Nonconforming Conditions
43.	MP-Q&SI-5.6	4	Graded Approach
44.	MP-Q&SI-5.8	8	Qualifying Supply Chain Inspectors, Auditors, Lead Auditors and Technical Specialists

TABLE OF AUDITED DOCUMENTS			
NUMBER	PROCEDURE NUMBER	REVISION NUMBER	PROCEDURE TITLE
45.	MP-RTQP-14.16	9	Training Program Evaluation
46.	MP-RTQP-14.19	10	Training Records Administration
47.	MP-RTQP-14.4	24	Personnel Qualification and Certification
48.	MP-RTQP-14.6	11	Job Analysis
49.	MP-TRUW-8.1	26	Certification Plan for INL Transuranic Waste
50.	MP-TRUW-8.2	18	Quality Assurance Project Plan
51.	MP-TRUW-8.5	29	TRU Waste Certification [Includes Offsite Shipping Module (OSM)]
52.	MP-TRUW-8.8	44	Level I Data Validation
53.	MP-TRUW-8.9	26	Level II Data Validation
54.	MP-TRUW-8.11	27	Data Reconciliation
55.	MP-TRUW-8.12	25	Waste Receipt and Shipping Inspection
56.	MP-TRUW-8.13	26	Collection, Review, and Management of Acceptable Knowledge Documentation
57.	MP-TRUW-8.14	16	Preparation of Waste Stream Profile Forms
58.	MP-TRUW-8.26	6	Reports to Management
59.	PSC-5431-CRR-001	0	Calibration Confirmation Report for the AMWTP RBAS System

Processes and Equipment Reviewed

WIPP #	Process/Equipment Description	Applicable to the Following Waste Streams/Groups of Waste Streams	Currently Approved by NMED	Currently Approved by EPA
NEW PROCESSES OR EQUIPMENT				
9RBAS1	Procedure – INST-OI-15 Description – Retrieval Box Assay System (RBAS) Z-212-105	Solids (S3000) Debris (S5000)	N/A	YES
PREVIOUSLY APPROVED PROCESSES OR EQUIPMENT				
Evaluated During A-16-01 Audit				
Nondestructive Assay (NDA)				
9DA1	Procedure – INST-OI-14 Description – Canberra Drum Assay System Z-211-102	Solids (S3000) Debris (S5000)	N/A	YES
9DA2	Procedure – INST-OI-14 Description – Canberra Drum Assay System Z-211-103	Solids (S3000) Debris (S5000)	N/A	YES
9DA3	Procedure – INST-FOI-01 Description – Canberra Drum Assay System Z-390-100	Debris (S5000)	N/A	YES
9DA4	Procedure – INST-FOI-01 Description – Canberra Drum Assay System Z-390-101	Debris (S5000)	N/A	YES
Nondestructive Examination (NDE)				
9RR1	Procedure – INST-OI-12 Description – Real-Time Radiography System Z-213-101	Solids (S3000) Debris (S5000)	YES	YES
9RR2	Procedure – INST-OI-12 Description – Real-Time Radiography System Z-213-106	Solids (S3000) Debris (S5000)	YES	YES

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
9RR3	Procedure – INST-OI-12 Description – Real-Time Radiography System RTR-1001	Solids (S3000) Debris (S5000)	YES	YES
Visual Examination				
9VE2	Visual Examination Procedure – INST-OI-34 Description – Visual Examination (in lieu of RTR) (VEC)	Solids (S3000) Debris (S5000)	YES	YES
9VE3	Visual Examination Procedure – INST-OI-34 Description – Newly Generated Waste Visual Examination Closure (VNC)	Solids (S3000) Debris (S5000)	YES	YES
9VE5	Visual Examination Procedure – INST-FOI-17 Description – Visual Examination (in lieu of RTR) (VEC)	Debris (S5000)	YES	YES
9VE6	Visual Examination Procedure – INST-FOI-17 Description – Newly Generated Waste Visual Examination Closure (VNC)	Debris (S5000)	YES	YES
9VE7	Visual Examination Procedure – INST-FOI-17 Description – Box Line Visual Examination (VEB) – Box to drum repackaging	Debris (S5000)	YES	YES
9VE8	Visual Examination Procedure – INST-FOI-17 Description – Box Line Visual Examination (VEB) – Drum to new drum repackaging	Debris (S5000)	YES	YES

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
9VE10	Visual Examination Procedure – INST-OI-34 Description – Box Line Visual Examination (VEB) – Drum to new drum repackaging	Solids (S3000) Debris (S5000)	YES	YES
DEACTIVATED PROCESSES OR EQUIPMENT				
*No processes or equipment have been deactivated since the previous Audit A-15-01				