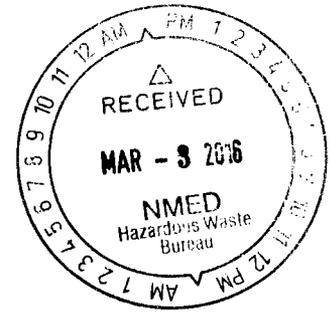




Department of Energy
Carlsbad Field Office
P. O. Box 3090
Carlsbad, New Mexico 88221

ENTERED



MAR - 1 2016

Mr. John E. Kieling, Chief
Hazardous Waste Bureau
New Mexico Environment Department
2905 Rodeo Park Drive East, Building 1
Santa Fe, New Mexico 87505

Subject: Transmittal of Current Revisions of the AMWTP and CCP Transuranic Waste Characterization Quality Assurance Project Plans

Dear Mr. Kieling:

This letter is to transmit the Advanced Mixed Waste Treatment Project (AMWTP) and the Central Characterization Program (CCP) Quality Assurance Project Plans (QAPjPs) that have been revised. This notification is transmitted pursuant to the requirements contained in the Waste Isolation Pilot Plant (WIPP) Hazardous Waste Facility Permit (HWFP), Section C5-2, *Document Review, Approval, and Control*.

The following documents are enclosed:

- MP-TRUW-8.2, Revision 18, *Quality Assurance Project Plan*; and
- CCP-PO-001, Revision 22, *CCP Transuranic Waste Characterization Quality Assurance Project Plan*.

I certify under penalty of law that this document and all attachments were prepared under my direction or supervision according to a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fines and imprisonment for knowing violations.

If you have any questions, please contact Mr. J.R. Stroble, Director of the Carlsbad Field Office (CBFO) TRU Sites and Transportation Division, at (575) 234-7313.

Sincerely,

Todd Shrader, Manager
Carlsbad Field Office

Enclosure



Mr. John E. Kieling

-2-

- 1 2016

cc: w/enclosure

K. Roberts, NMED

*ED

R. Maestas, NMED

ED

C. Smith, NMED

ED

CBFO M&RC

*ED denotes electronic distribution

Effective Date: JAN 13 2016

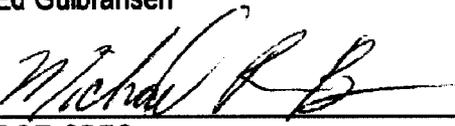
CCP-PO-001
Revision 22

CCP Transuranic Waste
Characterization Quality Assurance
Project Plan

Approved by:  Date: 1/5/2016
CCP Site Project Manager
Mike Ramirez

Approved by:  Date: 1/4/2016
Quality Assurance
Ronald Kuhn

Approved by:  Date: 1/5/2016
CCP Manager
Ed Gulbransen

Approved by:  Date: 1/12/2016
DOE-CBFO
Office of Quality Assurance Director
Michael R. Brown

Approved by:  Date: 1-13-16
DOE-CBFO
TRU Sites and Transportation Division Director
J.R. Stroble

RECORD OF REVISION

Revision Number	Date Approved	Description of Revision
3	01/14/2002	Added Tables B-9, B-10, and B-11; Revised the CCP Organization Chart, Figure A-1; and made numerous editorial corrections.
4	05/31/2002	Revised the CCP Organization Chart, Figure A-1 and added 3 new positions in the responsibilities Section A-4; corrected an error in Table B3-1; revised Section B4-2; revised Sections B3-10, B3-12, B-4, and subsections, and revised Tables B3-11, B3-12, and B3-13 to reflect the current WAP.
5	02/05/2003	Revised the CCP Organization Chart, Figure A-1 and section A-4c to update to the Vice President of National TRU Program Division title. Changes made to implement the Drum Age Criteria (DAC) permit Modification.
6	06/11/2003	Updated to Revision 5 of the QAPD.
7	01/08/2004	Added procedures to Table B-9 and Table B-11.
8	03/15/2004	Added procedures to Table B-9, Table B-10 and Table B-11. Modified Site Project Quality Assurance Officer description and CCP Organization chart. Updated Table B1-2, Table B3-3, Section B3-5 to reflect the WAP. Updated Table B3-6, Table B4, Table B1-4, Section B-3a(2), B-3d(1)(a), Table B-1, and Table B-8 to delete PCBs. Section B-1c, 6 th bullet revised to reflect the language of the WAP.
9	01/14/05	Revised to add procedures to Table B-9, Table B-10, and Table B-11. Incorporated CBFO DRR comments.
10	02/24/05	Revised to add procedure to table B-11, to incorporate LANL Off-Site Recovery Program Project Scope.
11	03/10/2005	Revised to add procedures to Section B1-2a and Table B-11. Added new table, Table B-9A, Solids Sampling Procedures Used by CCP.
12	03/22/2006	Revised procedures tables, Added new Table B-9, Listing of Permitted hazardous waste numbers and updated responsibilities.

RECORD OF REVISION (Continued)

Revision Number	Date Approved	Description of Revision
13	11/16/2006	Revised to implement changes to the Waste Isolation Pilot Plant Hazardous Waste Facility Permit requirements resulting from the Section 311/RH PMR.
14	03/28/2007	Revised procedure tables to add references to sections implemented by the procedure, and to align the wording of Section B7-2 with the wording in the permit.
15	08/10/2007	Revised to remove Visual Examination (VE) Expert decisions and signature and date from Table B3-11, Testing Batch Data Report Contents. Added the Idaho National Laboratory (INL) procedures to Attachment 1, Implementing Procedures.
16	10/31/2007	Revised to incorporate statistical terminology and text changes included in September 2007 Class 1 Permit Notifications and update Attachment 1, Implementing Procedures.
17	06/23/2009	Updated to agree with the Waste Isolation Pilot Plant (WIPP) Hazardous Waste Facility Permit Class 1 Modification dated July 2008.
18	06/30/2010	Revised to incorporate modifications to the Hazardous Waste Facility Permit. To make editorial changes that are needed and to change the Waste Isolation Pilot Plant (WIPP), Waste Information System (WWIS) to WWIS/Waste Data System (WDS).
19	12/29/2010	Revised to include changes from Permit Renewal.
20	06/16/2011	Revised to incorporate Class 2 Permit Modification (Transuranic Package Transporter Model III and Standard Large Box 2).
21	05/31/2013	Revised to clarify hierarchy of documents, adding Nuclear Waste Partnership (NWP) LLC, 13-1, <i>Quality Assurance Program Description</i> , also revised due to the Class 2 permit modification request (PMR) to the Waste Isolation Pilot Plant (WIPP) Permit, and made other administrative changes as needed.

RECORD OF REVISION (Continued)

Revision Number	Date Approved	Description of Revision
22	01/13/2016	Revised procedure to address New Mexico Environment Department (NMED) Compliance Order (CO) HWB-14021 (December 6, 2014). Changes include: strengthening and clarifying the requirements for implementation of characterization methods Acceptable Knowledge (AK), real-time radiography (RTR), and visual examination (VE), to ensure compliance with the Waste Acceptance Criteria (WAC) and to make administrative changes as needed.

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A INTRODUCTION

The Central Characterization Program (CCP) is tasked with characterizing and certifying transuranic (TRU) waste for disposal at the Waste Isolation Pilot Plant (WIPP). Characterization consists of acceptable knowledge (AK), radiography and visual examination (VE). This work is conducted in accordance with the Nuclear Waste Partnership, LLC (NWP), *Quality Assurance Program Description* (QAPD) and this Quality Assurance Project Plan (QAPjP).

This QAPjP describes how waste characterization and certification by the CCP comply with *Waste Isolation Pilot Plant Hazardous Waste Facility Permit* (HWFP), Attachment C - C6, *Waste Analysis Plan* (WAP) (New Mexico Environment Department [NMED]) and WP 13-1, *Nuclear Waste Partnership LLC Quality Assurance Program Description* (QAPD). The format of this QAPjP parallels that of the WAP.

NOTE

Throughout this document, there are references to procedures that implement the requirements. These references appear as a letter and one to three digits in parenthesis where the requirement is stated. Document users should then be able to refer to Attachment 1, *Implementing Procedures*, where these references list the procedure number and title.

A-1 Background

The WAP is organized such that it specifies that the generator/storage sites (hereinafter referred to as "sites") conduct their own TRU waste characterization and certification, including their own data generation level and project level data validation and verification. However, some sites (typically small quantity sites) do not have the resources necessary to characterize and certify their TRU waste. Additionally, other sites have expressed interest in using subcontractors to augment their existing capabilities. The CCP was established to assist these sites as well as to provide cost-effective TRU waste characterization, confirmation, and certification, including data generation level and project level data validation and verification.

The CCP may provide its services to a site by contracting directly with that site. If this is the case, the scope of services provided by CCP are specified in a Statement of Work (SOW) issued by the site. The SOW also specifies health and safety requirements, quality requirements, and other requirements specific to that site. A site-specific interface document may also be prepared which provides more detail on the site-CCP interface.

The site has general management oversight responsibility for work performed by the CCP at the site. The site is responsible for ensuring that CCP conducts its activities in compliance with site requirements.

**Nuclear Waste Partnership
Carlsbad, NM**

A-2 Scope

This QAPjP specifies quality requirements, management activities, and procedures necessary to meet the specific data quality objectives (DQOs) for TRU waste characterization as defined in the WAP and QAPD. Only TRU waste that has been characterized and certified in accordance with the WAP is shipped to the WIPP facility. TRU waste characterization and certification activities conducted by the CCP are performed in accordance with the requirements and implementing procedures identified in this QAPjP. In some cases, some characterization or certification activities are shared between the CCP and the Host site. The applicable implementing site documentation is specified in a SOW and supplemented by a site interface document, if required.

This QAPjP meets WAP characterization and certification requirements for contact-handled (CH) and remote-handled (RH) TRU waste. As used in this document, the term TRU waste includes TRU and TRU-mixed wastes. The term "characterization" is used where applicable to indicate the entire characterization process. Additionally, the WAP allows waste streams to be divided into waste stream lots. Therefore, the term waste stream may be used to indicate waste stream lots.

B PROJECT DESCRIPTION

Consistent with requirements in the WAP, CCP uses AK to initially characterize TRU waste. Section C4 of this QAPjP outlines the process used to characterize TRU waste using AK. AK documentation provides the basis for identifying the TRU waste eligible for WIPP disposal. The characterization process is based on the following:

- Waste considered for characterization is defense-related and has a TRU alpha activity greater than 100 nanocuries (nCi) per gram (g)
- Resource Conservation and Recovery Act (RCRA) hazardous waste determinations are made initially using AK for TRU waste streams

AK information for each waste stream is compiled in AK reports and supporting documentation. Based on AK, waste streams are delineated according to Summary Category Group, and waste matrix codes are assigned to each waste stream.

The CCP evaluates the characterization necessary to certify a particular waste stream. If additional characterization is needed to supplement site capabilities, the CCP uses mobile characterization facilities to perform characterization activities. Mobile characterization support is provided in accordance with this QAPjP. The CCP has the option to use data or transportation services from established TRU waste characterization activities at a U.S. Department of Energy (DOE)-Carlsbad Field Office (CBFO)-certified site.

B-1 Central Characterization Program Organization and Responsibilities

The CCP organization is shown in Figure B-1, CCP Organization, and responsibilities are described in the following sections. Figure B-1 includes generic CCP positions. More specific positions are described in the SOW or site interface plan.

B-2 Central Characterization Program (CCP) Manager

The CCP Manager is responsible for the day-to-day management and direction of CCP activities related to the characterization, certification, transportation, and disposal of TRU waste for DOE-CBFO. The CCP Manager is responsible for the following:

- Ensuring successful CCP/site interface
- Ensuring CCP plans and operations are coordinated, integrated, and consistent with DOE-CBFO programs, policies, and guidance
- Coordinating CCP activities and functioning as principal point of contact with DOE-CBFO and other regulating agencies
- Reviewing and approving this QAPjP

B-3 Site Project Manager

The Site Project Manager (SPM) oversees TRU waste characterization and certification activities and is responsible for the following:

- Developing, maintaining, reviewing, approving, and implementing CCP procedures and plans
- Scheduling revisions and distribution of CCP procedures and plans and forwarding these documents (if significantly revised) to DOE-CBFO for review and approval before implementation
- Reviewing and approving site interface documents (if used)
- Participating in internal audits and assessments
- Assisting quality assurance (QA) in developing project assessment criteria and responses to deficiency reports
- Halting characterization or certification activities if problems affecting the quality of the certification or work processes exist

- Ensuring CCP personnel receive appropriate training and orientation and maintain proficiency in work assignments
- Evaluating AK reports
- Reconciling AK information with characterization data
- Reconciling verified data with DQOs
- Ensuring that conditions adverse to quality are resolved and that corrective actions are implemented in a timely manner
- Preparing and submitting SPM Data Validation Summaries, Waste Stream Profile Forms (WSPFs), Characterization Information Summaries, and Waste Stream Characterization Packages (if requested by DOE-CBFO)
- Reviewing semi-annual QA/Quality Control (QC) summary reports and forwarding them and comments to the DOE-CBFO

Figure B-1. CCP Organization



C WASTE ANALYSIS PLAN

C-0 Introduction and Attachment Highlights

This QAPjP has been prepared for waste characterization activities to be conducted to meet requirements set forth in 20.4.1.500 New Mexico Administrative Code (NMAC) (incorporating 40 Code of Federal Regulation [CFR] §264.13) for waste disposal at the WIPP. This QAPjP includes test methods for complying with the general waste analysis requirements of 20.4.1.500 NMAC (incorporating 40 CFR §264.13), and a description of the QA/QC program. Before the CCP offers waste for shipment to the WIPP, the CCP implements the applicable requirements of this QAPjP.

TRU waste contains TRU radioactive components and may contain hazardous components, as defined in the New Mexico Hazardous Waste Act (HWA) and 20.4.1.200 NMAC (incorporating 40 CFR, §268.35). TRU waste is designated and separately packaged as either CH or RH, based on the radiological dose rate at the surface of the waste container.

The hazardous components of the TRU waste to be managed at the WIPP facility are designated in Table C-5, Listing of Permitted Hazardous Waste Numbers. Some of the waste is also identified by unique state hazardous waste numbers and is certified by the CCP if it meets the conditions of the WIPP Hazardous Waste Permit, Part 2, Table 2.3.4. This document describes the measures that will be taken to ensure that the TRU mixed wastes received at the WIPP facility are within the scope of Table C-5 as established by 20.4.1.500 NMAC (incorporating 40 CFR §264), and that they comply with unit-specific requirements of 20.4.1.500 NMAC (incorporating 40 CFR §264.600), Miscellaneous Units.

The CCP has developed this QAPjP to comply with the requirements of the WAP for characterizing CH/RH TRU wastes. The hazardous components of the TRU waste disposed at the WIPP facility are described on a WSPF for each waste stream (T2). TRU waste that may be certified by the CCP are generated at DOE facilities by defense activities, including the following:

- Production of nuclear products
- Plutonium recovery
- Research and development
- Decontamination and decommissioning

Some TRU waste is retrievably stored at the DOE sites. Additional TRU waste is generated and packaged into containers at these sites. Retrievably stored waste is defined as TRU waste generated after 1970 and before NMED notifies the Permittees, by approval of the final audit report, that the characterization requirements of the WAP

at a site have been implemented. Newly-generated waste is defined as TRU waste generated after NMED approves the final audit report for a site. Waste characterization of retrievably stored TRU waste is performed on an ongoing basis, as the waste is retrieved. AK information is assembled for both the retrievably stored and newly generated waste. Waste characterization of newly generated TRU waste is performed as it is generated, although some characterization occurs post-generation.

Waste characterization is defined in Part 1 as the activities performed by the waste generator to satisfy the general waste analysis requirements of 20.4.1.500 NMAC (incorporating 40 CFR §264.13[a]) before waste containers have been certified for disposal at WIPP. The characterization process for WIPP waste is presented in Figure C-2, Waste Characterization Process. CCP waste characterization programs are first audited by DOE, with the NMED approving the final audit report. After this, CCP determines whether AK alone is sufficient for characterization, or whether a radiography or VE in conjunction with AK is necessary to adequately characterize wastes. If an AK Sufficiency Determination is sought, information is provided to the Permittees for their review and DOE's provisional approval; NMED determination of adequacy of the AK information is required before final approval by DOE. If the radiography or VE route is chosen, sites proceed to perform radiography or VE in conjunction with AK and in accordance with this QAPjP. Once an AK Sufficiency Determination is obtained, or when required radiography or VE data are obtained, sites would then prepare and submit the WSPF for DOE's approval. Once the WSPF is approved, CCP may ship waste to WIPP. The Permittees will perform waste confirmation prior to shipment of the waste from the generator/storage site to WIPP pursuant to Section C7, performing radiography or VE of a representative subpopulation of certified waste containers, to ensure that the wastes meet the applicable requirements of the *Treatment, Storage, and Disposal Facility Waste Acceptance Criteria* (TSDF-WAC).

C-0a Waste Characterization

Characterization requirements for individual containers of TRU waste are specified on a waste stream basis. The WAP defines a waste stream as waste materials that have common physical form, that contain similar hazardous constituents, and that are generated from a single process or activity. Waste streams are grouped by waste matrix code groups related to the physical and chemical properties of the waste. The CCP uses the characterization techniques described in this QAPjP to assign the appropriate waste matrix code groups to waste streams for WIPP disposal. The waste matrix code groups are solidified inorganics, solidified organics, salt waste, soils, lead/cadmium metal, inorganic nonmetal waste, combustible waste, graphite, filters, heterogeneous debris waste, and uncategorized metal. Waste matrix code groups are grouped into three Summary Category Groups: Homogeneous Solids (Summary Category Group S3000), Soil/Gravel (Summary Category Group S4000), and Debris Waste (Summary Category Group S5000).

TRU wastes are initially categorized into the three broad Summary Category Groups that are related to the final physical form of the wastes. This categorization is based on the Summary Category Group constituting the greatest volume of waste for a waste stream. Waste characterization requirements for these groups are specified in Section C-2. Each of the three groups is described below.

S3000 - Homogeneous Solids

Homogeneous solids, are defined as solid materials, excluding soil, that do not meet the NMED criteria for classification as debris (20.4.1.800 NMAC [incorporating 40 CFR §268.2(g) and (h)]). Included in the series of homogeneous solids are inorganic process residues, inorganic sludges, salt waste, and pyrochemical salt waste. Other waste streams are included in this Summary Category Group based on the specific waste stream types and final waste form. This Summary Category Group is expected to contain toxic metals and spent solvents. This category includes wastes that are at least 50 percent by volume homogeneous solids.

S4000 - Soils/Gravel

This Summary Category Group includes S4000 waste streams that are at least 50 percent by volume soil/gravel. This Summary Category Group is expected to contain toxic metals.

S5000 - Debris Wastes

This Summary Category Group includes heterogenous waste that is at least 50 percent by volume materials that meet the criteria specified in 20.4.1.800 NMAC (incorporating 40 CFR §268.2 [g]). Debris means solid material exceeding a 2.36 inch (in.) (60 millimeter [mm]) particle size that is intended for disposal and that is:

1. a manufactured object, or
2. plant or animal matter, or
3. natural geologic material.

Particles smaller than 2.36 inches in size may be considered debris if the debris is a manufactured object and if it is not a particle of S3000 or S4000 material.

The most common hazardous constituents in the TRU waste to be managed in the WIPP facility consist of the following:

Metals

Some of the TRU waste to be emplaced in the WIPP facility contains metals for which 20.4.1.200 NMAC (incorporating 40 CFR §261.24), toxicity characteristics were established (Environmental Protection Agency [EPA] Hazardous Waste Numbers D004 through D011). Cadmium, chromium, lead, mercury, selenium, and silver are present in discarded tools and equipment, solidified sludges, cemented laboratory liquids, and waste from decontamination and decommissioning activities. A large percentage of the waste consists of lead-lined gloveboxes, leaded rubber gloves and aprons, lead bricks and piping, lead tape, and other lead items. Lead, because of its radiation-shielding applications, is the most prevalent toxicity-characteristic metal present.

Halogenated Volatile Organic Compounds

Some of the TRU waste to be emplaced in the WIPP facility contains spent halogenated volatile organic compound (VOC) solvents identified in 20.4.1.200 NMAC (incorporating 40 CFR §261.31) (EPA Hazardous Waste Numbers F001 through F005). Tetrachloroethylene; trichloroethylene; methylene chloride; carbon tetrachloride; 1,1,1-trichloroethane; and 1,1,2-trichloro-1,2,2,-trifluoroethane (EPA Hazardous Waste Numbers F001 and F002) are the most prevalent halogenated organic compounds identified in TRU waste that may be managed at the WIPP facility during the Disposal Phase. These compounds are commonly used to clean metal surfaces prior to plating, polishing, or fabrication; to dissolve other compounds; or as coolants. Because they are highly volatile, only small amounts typically remain on equipment after cleaning or, in the case of treated waste waters, in the sludges after clarification and flocculation. Radiolysis may also generate halogenated volatile organic compounds.

Nonhalogenated Volatile Organic Compounds

Xylene, methanol, and n-butanol are the most prevalent nonhalogenated VOCs in TRU waste that may be managed at the WIPP facility during the Disposal Phase. Like the halogenated VOCs, they are used as degreasers and solvents and are similarly volatile. The same analytical methods that are used for halogenated VOCs are used to detect the presence of nonhalogenated VOCs. Radiolysis may also generate non-halogenated volatile organic compounds.

The CCP will characterize waste in accordance with this QAPjP, and ensure that waste proposed for storage and disposal at WIPP meets the applicable requirements of the

TSDF-WAC in Part 2. The CCP will assemble the AK information in an auditable record¹ for the waste stream as described in Section C4. For those waste streams with an approved AK Sufficiency Determination (see below), radiography or VE per the methods described in Section C1 are not required.

All waste characterization activities specified in this QAPjP and associated attachments shall be carried out at generator/storage sites and DOE approved laboratories in accordance with this QAPjP. The DOE will audit the CCP waste characterization programs and activities as described in Section C-3. Waste characterization activities at the generator/storage sites include the following, although not all these techniques will be used on each container, as discussed in Section C-3:

- Radiography, an x-ray technique used to determine the physical contents of containers.
- VE of the contents of opened containers as an alternative way to determine their physical contents.
- Compilation of AK documentation into an auditable record.

C-0b AK Sufficiency Determination

CCP may submit a request to the Permittees for an AK Sufficiency Determination (Determination Request) to be exempt from the requirement to perform radiography or VE based on AK (T5). The contents of the Determination Request are specified in Section C4-3d.

The Permittees shall evaluate the Determination Request for completeness and technical adequacy. This evaluation shall include, but not be limited to whether the Determination Request is technically sufficient for the following:

- The Determination Request must include all information specified in Section C4-3d.
- The AK Summary must identify relevant hazardous constituents, and must correctly identify all toxicity characteristic and listed hazardous waste numbers.
- All hazardous waste number assignments must be substantiated by supporting data and, if not, whether this lack of substantiation compromises the interpretation.

¹“Auditable records” means those records which allow the Permittees to conduct a systematic assessment, analysis, and evaluation of the Permittees’ compliance with the WAP and the Permit.

- Resolution of data discrepancies between different AK sources must be technically correct and documented.
- The AK Summary must include all the identification of waste material parameter weights by percentage of the material in the waste stream, and determinations must be technically correct and substantiated by supporting information.
- All prohibited items specified in the TSDf-WAC should be addressed and conclusions drawn and must be substantiated by supporting information.
- If the AK record includes process control information specified in Section C4-3b, the information should include procedures, waste manifests, or other documentation demonstrating that the controls were adequate and sufficient.
- The site must provide the supporting information necessary to substantiate technical conclusions within the Determination Request, and this information must be correctly interpreted.

The Permittees will review the Determination Request for technical adequacy and compliance with the requirements of the Permit, using trained and qualified individuals in accordance with standard operating procedures that shall, at a minimum, address all of the technical and procedural requirements listed above. The Permittees shall resolve comments with the CCP.

If DOE determines that the AK is sufficient, it shall inform the public of the Determination Request, the Permittees' evaluation of it, and the date and time of a public meeting to provide information to and solicit comments from interested members of the public regarding the Determination Request. Notice of the meeting and comment period shall be provided by the following methods:

1. Written notice to all individuals on the facility mailing list;
2. Public notice in area newspapers, including the Carlsbad Current-Argus, Albuquerque Journal, and Santa Fe New Mexican;
3. Notice on the WIPP Home Page;
4. E-mail notification as specified in Permit Section 1.11.

DOE shall take written comment on the Determination Request for at least 30 days following the public meeting. DOE shall compile all such comments, including any disagreement between the DOE and commenters.

If DOE provisionally approves the Determination Request, it may forward it along with all relevant information submitted with the Determination Request to NMED for an evaluation that the provisional approval made by the DOE is adequate. DOE shall also provide to NMED, as a separate appendix to the Determination Request, the compilation of all comments and DOE's response to each comment. After submitting a Determination Request to NMED, the Permittees will post a link to the transmittal letter to NMED on the WIPP Home Page and inform those on the e-mail notification list as specified in Permit Section 1.11. Based on the results of NMED's evaluation, the Permittees will notify the CCP whether the AK information is sufficient and the Determination Request is approved. The DOE will not approve a Determination Request that NMED has determined to be inadequate unless the CCP resolves the inadequacies and provides the resolution to NMED for evaluation of adequacy. Should the inadequacies not be resolved to NMED's satisfaction, the DOE shall not submit a Determination Request for the same waste stream at a later date. DOE shall not submit a Determination Request, if a previous Determination Request is pending evaluation by NMED.

In the event the DOE disagrees, in whole or in part, with an evaluation performed by NMED resulting in a determination by NMED that the DOE's provisional approval for a particular waste stream is inadequate, the DOE may seek dispute resolution. The dispute resolution process is specified in Part 1. The Secretary's final decision under Permit Section 1.16.4 shall constitute a final agency action.

By July 1 of each year, the Permittees shall submit to NMED a list of waste streams the Permittees may submit for an AK Sufficiency Determination during the upcoming federal fiscal year. The Permittees will post a link to the transmittal letter to NMED and announce a public meeting to discuss the list with interested members of the public on the WIPP Home Page and inform those on the e-mail notification list as specified in Permit Section 1.11.

If the CCP does not submit a Determination Request, or if the DOE does not approve a Determination Request, or if NMED finds that the DOE's provisional approval of a Determination Request is inadequate, the CCP shall perform radiography or VE on 100 percent of the containers in a waste stream.

If the CCP submits a Determination Request, the DOE provisionally approves the Determination Request and NMED finds that the DOE's provisional approval is adequate, neither radiography nor VE of the waste stream is required.

C-0c Waste Stream Profile Form Completion

After a complete AK record has been compiled and either a Determination Request has been approved by the DOE or the CCP has completed the applicable representative testing requirements specified in Section C1, the CCP will complete a WSPF and

Characterization Information Summary (CIS) (T2). The requirements for the completion of a WSPF and a CIS are specified in Sections C3-6b(1) and C3-6b(2) respectively.

The WSPF and the CIS for the waste stream resulting from waste characterization activities are transmitted to the Permittees, who shall review them for completeness, and screen them for acceptance before the CCP proceeds with payload assembly of TRU waste into the CH or RH Packaging. The review and approval process will ensure that the submitted waste analysis information is sufficient to meet the DQOs for AK in Section C-4a(1) and allow the Permittees to demonstrate compliance with the requirements of the WIPP-WAP. Only TRU waste that meets the characterization requirements of the WAP is certified by the CCP. Only waste certified to meet the TSDF-WAC, specified in the WAP, is accepted at the WIPP facility for disposal in the permitted Underground Hazardous Waste Disposal Unit (HWDU). DOE will approve and provide NMED with copies of the approved WSPF and accompanying CIS prior to waste stream shipment. Upon notification of DOE's approval of the WSPF, the CCP may be authorized to ship waste to WIPP.

In the event that the Permittees request detailed information on a waste stream, the CCP provides a Waste Stream Characterization Package, as described in Section C3-6b(3). For each waste stream, this package will include the WSPF, the CIS, and the AK summary. The Waste Stream Characterization Package will also include specific Batch Data Reports (BDRs), and raw data associated with waste container characterization as requested by the Permittees.

C-0d Waste Confirmation

The Permittees will perform waste confirmation on a representative subpopulation of each waste stream shipment after certification and prior to shipment pursuant to Section C7. The Permittees will use radiography, review of radiography audio/video recordings, VE, or review of VE records (e.g., VE data sheets or packaging logs) to examine at least 7 percent of each waste stream shipment to confirm that the waste does not contain ignitable, corrosive, or reactive waste. Waste confirmation will be performed by the Permittees prior to shipment of the waste from the generator/storage site to WIPP.

C-1 Identification of TRU Waste to be Managed at the WIPP Facility

C-1a Waste Stream Identification

TRU waste destined for disposal at WIPP is characterized on a waste stream basis. The waste streams are delineated using AK. Required AK is specified in Section C-3a and Section C-4 of this QAPjP.

C-1b Waste Summary Category Groups and Hazardous Waste Accepted at the WIPP Facility

Once a waste stream is delineated, a waste matrix code is assigned to the waste stream based on its physical form. Waste streams are then assigned to one of the Summary Category Groups; S3000-Homogeneous Solids, S4000-Soils/Gravel, and S5000-Debris Wastes. These Summary Category Groups are then used to determine further characterization requirements.

The CCP considers only those TRU waste streams that are assigned EPA hazardous waste numbers listed in Table C-5. Waste identified by unique state hazardous waste numbers is acceptable at WIPP provided they meet the requirements of the TSDF-WAC. The CCP performs characterization of all waste streams as required by the WAP. If during the characterization process, new hazardous waste numbers are identified, those wastes are prohibited for disposal at the WIPP facility until a permit modification has been submitted and approved by NMED.

C-1c Waste Prohibited at the WIPP Facility

The following TRU wastes are prohibited for disposal at the WIPP facility:

- Liquid waste is not acceptable at WIPP. Liquid in the quantities delineated below is acceptable.
 - Observable liquid shall be no more than 1 percent by volume of the outermost container at the time of radiography or visual examination
 - Internal containers with more than 60 milliliters or 3 percent by volume observable liquid, whichever is greater, are prohibited
 - Containers with hazardous waste number U134 assigned shall have no observable liquid
 - Overpacking the outermost container that was examined during radiography or VE or redistributing untreated liquid within the container shall not be used to meet the volume limits

- Non-radionuclide pyrophoric materials, such as elemental potassium.
- Hazardous wastes not occurring as co-contaminants with TRU waste (non-mixed hazardous waste).
- Wastes incompatible with backfill, seal and panel closure materials, container and packaging materials, shipping container materials, or other wastes.
- Wastes containing explosives or compressed gases.
- Wastes with polychlorinated biphenyls (PCBs) not authorized under an EPA PCB waste disposal authorization.
- Wastes exhibiting the characteristic of ignitability, corrosivity, or reactivity (Hazardous Waste Numbers D001, D002, or D003).
- Any waste container from a waste stream (or waste stream lot) that has not undergone either radiographic or VE of a statistically representative subpopulation of the waste stream in each shipment, pursuant to Section C7.
- Any waste container from a waste stream which has not been preceded by an appropriate, certified WSPF (see Section C-1d).
- Waste that has ever been managed as high-level waste and waste from tanks specified in Table C-4, Waste Tanks Subject to Exclusion, unless specifically approved through a Class 3 permit modification.

Before accepting a container holding TRU waste, the Permittees will perform waste confirmation activities pursuant to Section C7 on each waste stream shipped to confirm that the waste does not contain ignitable, corrosive, or reactive waste and the assigned EPA hazardous waste numbers are allowed for storage and disposal by this QAPjP. Waste confirmation activities will be performed on at least 7 percent of each waste stream shipment. If a waste stream shipment contains fewer than 14 containers, one container will be examined to satisfy waste confirmation requirements. Section C-4 and Section C7 include descriptions of the waste confirmation processes that the Permittees will conduct prior to receiving a shipment at the WIPP facility.

Containers are vented through filters allowing any gases that are generated by radiolytic and microbial processes within a waste container to escape, thereby preventing over pressurization or development of conditions within the container that would lead to the formation of ignitable, corrosive, reactive, or other characteristic wastes. To ensure the integrity of the WIPP facility, waste streams identified to contain incompatible materials or materials incompatible with waste containers are not shipped to WIPP unless they are treated to remove the incompatibility. The CCP does not certify waste streams

identified to contain incompatible materials or materials incompatible with waste containers or backfill.

C-1d Control of Waste Acceptance

The CCP will provide a WSPF and CIS to the Permittee for each waste stream prior to shipment of the waste (T2). The WSPF and CIS elements are found in Section C3-6b(1) and Section C3-6b(2). The CCP will provide the WSPF to the Permittees for each waste stream prior to its acceptance for disposal at WIPP. The WSPF and the CIS will be transmitted to the Permittees for each waste stream. After WSPF submittal, if continued waste characterization activities reveal discrepancies that identify different hazardous waste numbers or indicate that the waste belongs to a different waste stream, the waste is redefined to a separate waste stream and a new WSPF is submitted.

The Permittees are responsible for the review of the WSPF and CISs to verify compliance with the restrictions on TRU wastes for WIPP disposal. Waste characterization data ensures the absence of prohibited items specified in Section C-1c. CCP determines by procedure the specific circumstances under which a WSPF is to be revised versus when a new WSPF is required.

The CCP provides a Waste Stream Characterization Package (as described in Section C3-6b(3)) to the Permittees upon request. The option for the Permittees to request additional information ensures that the waste being offered for disposal is adequately characterized and accurately described on the WSPF.

C-1e Waste Generating Processes at the WIPP Facility

Not applicable. This section applies to the Permittee.

C-2 Waste Characterization Program Requirements and Waste Characterization Parameters

The CCP has developed the procedures which specify the programmatic waste characterization requirements (Q10). DOE will evaluate the procedures during audits and as part of the review and approve of the WSPF.

CCP must notify the Permittees and obtain DOE approval prior to making data-affecting modifications to procedures (Q10). Program procedures shall address the following minimum elements:

- Waste characterization and certification procedures for retrievably stored and newly generated wastes to be sent to the WIPP facility.

- Methods used to ensure prohibited items are documented and managed. These will include procedures for performing radiography, VE, or treatment, if these methods are used to ensure prohibited items are not present in the waste prior to shipment of the waste to WIPP.
- Identify the organization(s) responsible for compliance with waste characterization and certification procedures.
- Identify the oversight procedures and frequency of actions to verify compliance with waste characterization and certification procedures.
- Develop training specific to waste characterization and certification procedures.
- Ensure that personnel may stop work if noncompliance with waste characterization or certification procedures is identified.
- Develop a nonconformance process that complies with the requirements in Section C3 to document and establish corrective actions.
- As part of the corrective action process, assess the potential time frame of the noncompliance, the potentially affected waste population(s), and the reassessment and recertification of those wastes.
- A listing of all approved hazardous waste numbers which are acceptable at WIPP are included in Table C-5.

For those waste streams or containers that are not amenable to radiography (e.g., RH TRU waste, direct loaded ten-drum overpacks [TDOPs]) for waste confirmation by the Permittees pursuant to Section C7, CCP VE data may be used for waste acceptance. In those cases, the Permittees will review the CCP VE procedures to ensure that data sufficient for the Permittees' waste acceptance activities pursuant to Section C7 will be obtained and the procedures meet the minimum requirements for VE specified in Section C1-2.

The following waste characterization parameters are obtained from the CCP prior to waste certification:

- Determination whether TRU waste streams comply with the applicable provisions of the TSDF-WAC.
- Determination whether TRU mixed wastes exhibit a hazardous characteristic (20.4.1.200 NMAC, incorporating 40 CFR §261 Subpart C).

- Determination whether TRU mixed wastes are listed (20.4.1.200 NMAC, incorporating 40 CFR §261 Subpart D).
- Estimation of waste material parameter weights.

Table C-1, Summary of Parameters, Characterization Methods, and Rationale for Transuranic Mixed Waste, provides the parameters of interest for the constituent groupings and testing methodologies.

C-3 Generator Waste Characterization Methods

The characterization techniques used by the CCP include AK and may also include, as necessary, VE, and radiography. Characterization activities are performed in accordance with this QAPjP. Table C-1, provides a summary of the characterization requirements for TRU waste.

C-3a Acceptable Knowledge

AK is used in TRU waste characterization activities in five ways:

- To delineate TRU waste streams
- To assess whether TRU mixed wastes comply with the TSDF-WAC
- To assess whether TRU wastes exhibit a hazardous characteristic (New Mexico Hazardous Waste Management Regulations in 20.4.1.200 NMAC incorporating 40 CFR §261 Subpart C)
- To assess whether TRU wastes are listed (20.4.1.200 NMAC, incorporating 40 CFR §261 Subpart D)
- To estimate waste material parameter weights

AK is discussed in detail in Section C4, which outlines the minimum set of requirements and DQOs met by the CCP in order to use AK.

C-3b Radiography and Visual Examination

Radiography and VE are nondestructive qualitative and quantitative techniques used to identify and verify waste container contents as specified in Section C1. The CCP performs radiography or VE of 100 percent of CH-TRU waste containers in waste streams except for those waste streams for which the DOE approves a Determination Request. No RH-TRU waste will be shipped to WIPP for storage or disposal without documentation of radiography or VE of 100 percent of the containers as specified in

Section C1. VE consists of either observing the filling of waste containers or opening full containers and physically examining their contents. Radiography and/or VE are used, when necessary, to examine a waste container to verify the physical form of the waste matches its waste stream description as determined by AK. These techniques detect observable liquid in excess of TSDF-WAC limits and containerized gases which are prohibited for WIPP disposal. The prohibition of liquid in excess of TSDF-WAC limits and containerized gases prevents the shipment of corrosive, ignitable, or reactive wastes. Radiography and/or VE are also able to verify the physical form of the waste matches its waste stream description (i.e., Homogeneous Solids, Soil/Gravel, or Debris Waste [including uncategorized metals]).

If the physical form does not match the waste stream description, the waste is designated as another waste stream and assigned the preliminary hazardous waste numbers associated with that new waste stream assignment. That is, if radiography and/or VE indicate that the waste does not match the waste stream description produced by AK characterization, a nonconformance report (NCR) is completed and the inconsistency resolved as specified in Section C4 (Q5), and the NCR will be dispositioned as specified in Section C3-7. The proper waste stream assignment is determined (including preparation of a new WSPF), the correct hazardous waste numbers are assigned, and the resolution is documented. The AK verification process is discussed in Section C4.

If CCP uses VE, the detection of any liquid in non-transparent internal containers, detected from shaking the internal container, is handled by assuming that the internal container is filled with liquid and adding this volume to the total liquid in the container being characterized using VE. The container being characterized using VE is then repackaged or rejected to exclude the internal container if it does not meet the requirements of the TSDF-WAC. When radiography is used or VE of transparent containers is performed, if any liquid in internal containers is detected, the volume of liquid is added to the total for the container being characterized using radiography or VE. Radiography, or the equivalent, is used as necessary on the existing or stored waste containers to verify the physical characteristics of the TRU waste corresponding with its waste stream identification and waste matrix code and to identify prohibited items. Radiographic examination protocols and QA/QC methods are provided in Section C1. Radiography and VE shall be subject to the Audit and Surveillance Program.

C-4 Data Verification and Quality Assurance

The CCP ensures that its applicable waste characterization process performance for generator/storage sites sending TRU waste to the WIPP for disposal meets WAP requirements through data validation, verification, usability and reporting controls. Verification occurs at three levels: 1) the CCP data generation level, 2) the CCP project level, which consists of verification and validation by the CCP to ensure that applicable WAP requirements are met and; 3) the Permittee level. The validation and verification process and requirements at each level are described in Section C3-4. The validation verification process at the Permittee Level is also described in C-5.

C-4a Data Generation and Project Level Verification Requirements

C-4a(1) Data Quality Objectives

The waste characterization data obtained through implementation of this QAPjP are used by the Permittees to ensure that the regulatory requirements of the WAP are met with regard to compliance and to ensure that TRU wastes are properly managed during the disposal phase.

To satisfy the RCRA regulatory compliance requirements, the following are DQOs established by the WAP and flowed down to this QAPjP (T2):

Acceptable Knowledge

- To delineate TRU waste streams.
- To assess whether TRU mixed wastes comply with the applicable requirements of the TSDF-WAC.
- To assess whether TRU mixed wastes exhibit a hazardous characteristic (20.4.1.200 NMAC, incorporating 40 CFR §261, Subpart C).
- To assess whether TRU mixed wastes are listed (20.4.1.200 NMAC, incorporating 40 CFR §261, Subpart D).
- To estimate waste material parameter weights.

Radiography and VE

- Verify the TRU mixed waste streams contain no prohibited items and to verify the physical form of the waste matches the waste stream description as to be determined by AK.

Reconciliation of these DQOs by the SPM as applicable, is addressed in Section C3-5a. Reconciliation requires determining whether sufficient types, quality, and quantity of data have been collected to ensure that the DQOs cited above can be achieved.

C-4a(2) Quality Assurance Objectives

The CCP shall demonstrate compliance with each quality assurance objective (QAO) associated with the characterization methods in Section C3. The SPM performs reconciliation of the data with the DQOs established in this QAPjP. The SPM concludes that all of the DQOs have been met for the characterization of the waste stream prior to submitting a WSPF to the DOE for approval (T2).

The following QAO elements are considered for each technique, as a minimum:

- Precision - a measure of the mutual agreement among multiple measurements
- Accuracy - the degree of agreement between a measurement result and the true or known value
- Completeness - a measure of the amount of valid data obtained from a method compared to the total amount of data obtained (expressed as a percentage)
- Comparability - the degree to which one data set can be compared to another
- Representativeness - the degree to which sample data represent characteristics of a population

A more detailed discussion of the QAOs can be found in Section C3, which describes the QAOs associated with each test method.

C-4a(3) Data Generation

BDRs, in a format approved by the DOE, are used by CCP for reporting waste characterization data. The CCP formats for reporting waste characterization data in BDRs are specified in several procedures. These procedures comply with the waste characterization data reporting requirements described in Section C3.

C-4a(4) Data Verification

BDRs document the testing, and on-line results from required characterization activities, and required QA/QC activities. Data validation, review, and verification are performed at the data generation level and the CCP project level before the required data are transmitted to the Permittees (T1). Section C3 discusses the data validation process in

greater detail. NMED may request, through the Permittees, copies of any BDR and/or the raw data validated by the CCP to check the DOE's audit of the validation and verification process.

C-4a(5) Data Transmittal

As part of the waste characterization data submittal, the CCP transmits the data electronically to the Permittees via the WIPP Waste Information System (WWIS)/Waste Data System (WDS) (T30, T530). Data will be entered into the WWIS/WDS in the exact format required by the data base as specified in Section C-5a(1) for WWIS/WDS reporting requirements and the DOE/WIPP-09-3427, *Waste Data System User's Manual* for the WWIS/WDS data fields and format requirements. BDRs include the information required by Section C3-4 and are transmitted by hard copy or electronically (provided a hard copy is available on demand) from the data generation level to the CCP project level.

Once a waste stream is fully characterized the SPM submits a WSPF, accompanied by a CIS for that waste stream to the Permittees, which includes a record of reconciliation with DQOs as described in Sections C3-6b(1) and C3-6b(2).

The WSPF, the CIS, and information from the WWIS/WDS is used as the basis for acceptance of waste characterization information on TRU wastes to be disposed of at WIPP.

C-4a(6) Records Management

Records related to waste characterization activities performed by the generator/storage sites will be maintained in the testing facility files or generator/storage site project files or at the WIPP Records Archive facility. Raw data obtained by testing TRU mixed waste in support of the WAP will be identifiable, legible, and provide documentary evidence of quality. TRU mixed waste characterization records submitted to the Permittees shall be maintained in the WIPP facility operating record and be available for inspection by NMED. A detailed description of CCP site-specific records management activities is provided in Section C7.

Records inventory and disposition schedule (RIDS) or an equivalent system shall be prepared and approved by CCP. All records relevant to an enforcement action under this Permit, regardless of disposition, shall be maintained in CCP Records at the generator/storage site or at the WIPP Records Archive facility until NMED determines they are no longer needed for enforcement action, and then dispositioned as specified in the approved RIDS. All waste characterization data and related QA/QC records for TRU mixed waste to be shipped to the WIPP facility are designated as either Lifetime Records or Non-Permanent Records. Records that are designated as Lifetime Records shall be maintained for the life of the waste characterization program by CCP Records

or generator/storage sites plus six years or transferred for permanent archival storage to the WIPP Records Archive facility.

Waste characterization records include characterization records (i.e., headspace gas sampling and homogeneous solids and soil/gravel sampling/analysis) generated through implementation of previous requirements in this WAP. Those waste characterization records designated as Non-Permanent Records shall be maintained for 10 years from the date of (record) generation by CCP Records or at the participating generator/storage site or at the WIPP Records Archive facility and then dispositioned according to their approved RIDS. If a generator/storage site ceases to operate, all records shall be transferred before closeout to the Permittees for management at the WIPP Records Archive facility. Table C-2, Required Program Records Maintained in Generator/Storage Site Project Files, is a listing of records designated as Lifetime Records and Non-Permanent Records.

Classified information will not be transferred to WIPP. Notations will be provided to the Permittees indicating the absence of classified information. The approved CCP RIDS will identify the appropriate disposition of classified information. Nothing in the WIPP Permit is intended to, nor should it be interpreted to, require disclosure of any DOE classified information to persons without appropriate clearance to view such information.

C-5 Permittee Level Waste Screening and Verification of TRU Mixed Waste

This section is not applicable to CCP. This section applies to the Permittees.

C-5a Phase I Waste Stream Screening and Verification

The first phase of the waste screening and verification process occurs before TRU waste is shipped to the WIPP facility. Before the Permittees begin the process of accepting TRU waste from the CCP, an initial audit is conducted as part of the Audit and Surveillance Program. The audit of CCP provides verification of characterization procedures; BDR preparation; and recordkeeping that ensures that all applicable provisions of the WAP requirements are met. Another portion of the Phase I verification is the WSPF approval process. At the WIPP facility, this process includes verification that all of the required elements of a WSPF and CIS are present and that the summarized waste characterization information meets acceptance criteria required for compliance with the WAP (Section C3-6b(1)).

The CCP has prepared this QAPjP, which includes applicable WAP requirements. This document is submitted to DOE for review and approval. The CCP implements the specific parameters of this QAPjP after Permittee approval. An initial audit is performed after QAPjP implementation and prior to the CCP being certified for shipment of waste to WIPP. Additional audits, focusing on the results of waste characterization, are

performed at least annually. The DOE has the right to conduct unannounced audits and to examine any records that are related to the scope of the audit. See Section C-5a(3) for further information regarding audits.

When the required waste stream characterization data have been collected by the CCP and the initial audit is successfully completed, the SPM will verify that the waste stream characterization meets the applicable WAP requirements as part of the project level verification (T2). If the waste characterization does not meet the applicable requirements of the WAP, the waste stream cannot be managed, stored, or disposed of at the WIPP until those requirements are met. The SPM will then complete the WSPF and submit it to the Permittees, along with the accompanying CIS for that waste stream. All data necessary to check the accuracy of the WSPF is transmitted to the Permittees. This provides notification that the CCP considers that the waste stream (identified by the waste stream identification number) has been adequately characterized for disposal prior to shipment to WIPP. The Permittees then compare radiography and VE data obtained subsequent to submittal and approval of the WSPF (and prior to submittal) with characterization information presented on this form. If the Permittees determine (through the data comparison) that the characterization information is adequate, DOE will approve the WSPF. Prior to the first shipment of containers from the approved waste stream, the approved WSPF and accompanying CIS is provided to NMED. If the data comparison indicates that analyzed containers have hazardous wastes not present on the WSPF, or a different waste matrix code applies, the WSPF is in error and is resubmitted. Ongoing WSPF examination is discussed in detail in Section C-5a(2).

Audits of CCP will be conducted as part of the Audit and Surveillance Program. The RCRA portion of the CCP audit program will provide on-site verification of waste characterization procedures; BDR preparation; and record keeping to ensure that all applicable provisions of the WAP requirements are met. As part of the waste characterization data submittal, the CCP also transmits the data on a container basis via the WWIS/WDS prior to shipment of that container. This data submittal occurs at any time as the data are being collected, but is complete for each container prior to shipment of that container. The WWIS/WDS conducts internal edit/limit checks based on the approved WSPF. The Permittees compare ongoing characterization data obtained and submitted via the WWIS/WDS to the approved WSPF. If this comparison shows that containers have hazardous wastes not reported on the WSPF, or a different waste matrix code applies, the data are rejected and the waste containers are not accepted for shipment until a new or revised WSPF is submitted to Permittees' and approved by the DOE.

If discrepancies regarding hazardous waste number assignment or Waste Matrix Code designation arise as a result of the Phase I review, the CCP is contacted by the Permittees and provides the necessary additional information to resolve the discrepancy before that waste stream is approved for disposal at the WIPP facility. If the discrepancy is not resolved, the waste stream is not approved for shipment.

C-5a(1) WWIS/WDS Description

The CCP supplies the required data to the Permittees via the WWIS/WDS (T30, T530). The WWIS/WDS Data Dictionary includes all of the data fields, the field format and the limits associated with the data as established by the WIPP WAP. These data will be subjected to edit and limit checks that are performed automatically by the database, as defined in the DOE/WIPP-09-3427. The Permittees will coordinate the data transmission with CCP. Actual data transmission will use appropriate technology to ensure the integrity of the data transmissions. The Permittees will require sites with large waste inventories and large databases to populate a data structure provided by the Permittees that contains the required data dictionary fields that are appropriate for the waste stream (or waste streams) at the site. The Permittees will access these data via the Internet to ensure an efficient transfer of this data. Small quantity sites will be given a similar data structure by the Permittees that is tailored to their types of waste. Sites with very small quantities of waste will be provided with the ability to assemble the data interactively to this data structure on the WWIS/WDS.

The Permittees will use the WWIS/WDS to verify that all of the supplied data meet the applicable edit and limit checks prior to the shipment of any TRU waste to WIPP. The WWIS/WDS automatically notifies the CCP if any of the supplied data fails to meet the requirements of the edit and limit checks via an appropriate error message. The CCP corrects the discrepancy with the waste or the waste data and re-transmits the corrected data prior to acceptance of the data by the WWIS/WDS. The Permittees review data reported for each container of each shipment prior to providing notification to the CCP that the shipment is acceptable.

Access to the WWIS/WDS is controlled by the Permittees' Data Administrator (DA) who controls the WWIS/WDS users based on approval from management personnel.

The CCP only has access to CCP data supplied to WWIS/WDS, and only until the data have been formally accepted by the Permittees. After the data have been accepted, the data are protected from indiscriminate change and only changed by an authorized DA.

C-5a(2) Examination of the Waste Stream Profile Form and Container Data Checks

The Permittees verify the completeness and accuracy of the WSPF (Section C3-6b(1)). The assignment of the waste stream description, waste matrix code group, and Summary Category Groups; the AK summary documentation; the methods used for characterization; the DOE certification, and appropriate designation of hazardous waste number(s) are examined by the Permittees. If the WSPF is inaccurate, efforts are made to resolve discrepancies by contacting the CCP in order for the waste stream to be eligible for shipment to the WIPP facility. If discrepancies in the waste stream are detected, the CCP implements a non-conformance action to identify, document, and report discrepancies.

The WSPF shall pass all verification checks by the Permittees in order for the waste stream to be approved by DOE for shipment to the WIPP facility. The WSPF check against waste container data will occur during the initial WSPF process (Section C-5a). Waste data transferred via the WWIS/WDS after WSPF approval is compared with the approved WSPF. Any container from an approved hazardous waste stream with a description different from its WSPF is not shipped to the WIPP for disposal.

The CCP verifies that the three different types of data specified below are available for every container holding TRU waste before that waste is managed, stored, or disposed at WIPP: 1) an assignment of the waste stream's waste description (by waste matrix codes) and waste matrix code group; 2) a determination of ignitability, reactivity, and corrosivity; and 3) a determination of compatibility. The CIS indicates if the waste was checked for the characteristics of ignitability, corrosivity, and reactivity.

Any container with unresolved discrepancies associated with hazardous waste characterization will not be managed, stored, or disposed at the WIPP facility until the discrepancies are resolved. If discrepancies cannot be resolved, the DOE will revoke the approval status of the waste stream and CCP will suspend shipments of the waste stream. Waste stream approval will not be reinstated until the CCP demonstrates all corrective actions have been implemented and the CCP waste characterization program is reassessed by the DOE.

C-5a(3) Audit and Surveillance Program

This section is not applicable to the CCP. It applies to the Permittees.

C-5b Phase II Waste Shipment Screening and Verification

For each container shipped, the CCP provides the following information (T86):

Hazardous Waste Manifest Information:

- Generator/storage site name and EPA Identification Number
- CCP contact name and phone number
- Quantity of waste
- List of up to six state and/or federal hazardous waste numbers in each line item
- Listing of all shipping container identification numbers (IDs) (Shipping Package serial number)

- Signature of authorized generator representative

Specific Waste Container information:

- Waste Stream Identification Number
- List of hazardous Waste Numbers per Container
- Certification Data
- Shipping Data (assembly numbers, ship date, shipping category, etc.)

This information is also supplied electronically to the WWIS/WDS. The container-specific information will be supplied electronically as described in Section C-5a(1), and is supplied prior to shipment.

C-5b(1) Examination of the EPA Uniform Hazardous Waste Manifest and Associated Waste Tracking Information

Manifest discrepancies will be identified during manifest examination and container bar-code WWIS/WDS data comparison. A manifest discrepancy is a difference between the quantity or type of hazardous waste designated on the manifest and the quantity or type of hazardous waste the WIPP facility actually receives. The CCP technical contact (as listed on the manifest) is contacted to resolve the discrepancy. Errors on the manifest are corrected by the WIPP facility with a verbal (followed by a mandatory written) concurrence by the CCP technical contact. If the manifest discrepancies are not resolved in thirty (30) days of waste receipt, the shipment is returned to the facility where the CCP performed the characterization.

C-5b(2) Examination of the Land Disposal Restriction Notice

TRU waste designated by the Secretary of Energy for disposal at WIPP is exempt from the Land Disposal Restrictions (LDRs) by the *WIPP Land Withdrawal Act Amendment* (Public Law 104-201). This amendment states that WIPP "Waste is exempted from treatment standards promulgated pursuant to section 3004(m) of the Solid Waste Disposal Act (42 U.S.C. 6924[m]) and shall not be subjected to the Land Disposal prohibitions in section 3004(d), (e), (f), and (g) of the Solid Waste Disposal Act."

Therefore, with the initial shipment of a TRU waste stream, the CCP provides the Permittees with a onetime written notice. The notice includes the information listed below:

Land Disposal Restriction Notice Information:

- EPA hazardous waste numbers and Manifest Numbers of first shipment of a mixed waste stream
- Statement: this waste is not prohibited from land disposal
- Date the waste is subject to prohibition

This information is the applicable information taken from column "268.7(a)(4)" of the "Generator Paperwork Requirements Table" in 20.4.1.800 NMAC (incorporating 40 CFR §268.7(a)(4)). Note that item "5" from the "Generator Paperwork Requirements Table" is not applicable since waste analysis data are provided electronically via the WWIS/WDS and item "7" is not applicable since waste designated by the Secretary of Energy for disposal at WIPP is exempted from the treatment standards.

The Permittees review the LDR notice for accuracy and completeness. The CCP prepares this notice in accordance with the applicable requirements of 20.4.1.800 NMAC (incorporating 40 CFR §268.7(a)(4)).

C-5b(3) Verification

This section is not applicable to CCP. This section applies to the Permittees.

C-6 Permittees' Waste Shipment Screening QA/QC

This section is not applicable to CCP. This section applies to the Permittees.

C-7 Records Management and Reporting

All waste characterization data for each TRU waste container transmitted to WIPP shall be maintained by the Permittees for the active life of the WIPP facility plus two years (Q8). The active life of the WIPP facility is defined as the period from the initial receipt of TRU waste at the facility until NMED receives certification of final closure of the facility. After their active life, the records shall be retired to the WIPP Records Archive facility and maintained for 30 years. These records will then be offered to the National Archives. However, this disposition requirement does not preclude the inclusion of these records in the permanent marker system or other requirements for institutional control.

Waste characterization and waste confirmation data and documents related to waste characterization that are part of the WIPP facility operating record are managed in accordance with the following guidelines:

C-7a General Requirements

- Records shall be legible
- Corrections shall be made with a single line through the incorrect information, and the date and initial of the person making the correction shall be added
- Black ink is encouraged, unless a copy test has been conducted to ensure the other color ink will copy
- Use of highlighters on records is discouraged
- Records shall be reviewed for completeness
- Records shall be validated by the cognizant manager or designee

C-7b Records Storage

- Active records shall be stored when not in use
- Quality records shall be kept in a one-hour (certified) fire-rated container or a copy of a record shall be stored separately (sufficiently remote from the original) in order to prevent destruction of both copies as a result of a single event such as fire or natural disaster
- Unauthorized access to the records is controlled by locking the storage container or controlling personnel access to the storage area

C-8 Reporting

This section is not applicable to CCP. This section applies to the Permittees.

Table C-1. Summary of Parameters, Characterization Methods, and Rationale for Transuranic Mixed Waste

Waste Matrix Code Summary Categories	Waste Matrix Code Groups	Characterization Parameter	Method	Rationale
S3000-Homogeneous Solids	<ul style="list-style-type: none"> • Solidified inorganics • Salt waste • Solidified organics 	Physical waste form	Acceptable knowledge, radiography and/or visual examination	<ul style="list-style-type: none"> • Determine waste matrix • Demonstrate compliance with waste acceptance criteria (e.g., no liquid in excess of TSDF-WAC limits, no incompatible wastes, no compressed gases) • Determine assignment of EPA hazardous waste numbers
S4000-Soil/Gravel	<ul style="list-style-type: none"> • Contaminated soil/debris 			
S5000-Debris Waste	<ul style="list-style-type: none"> • Uncategorized metal (metal waste other than lead/cadmium) • Lead/cadmium waste • Inorganic nonmetal waste • Combustible waste • Graphite waste • Heterogeneous debris waste • Composite filter waste 	Hazardous constituents <ul style="list-style-type: none"> • Listed • Characteristic 	Acceptable knowledge	

Table C-2. Required Program Records Maintained in Generator/Storage Site Project Files

<u>Lifetime Records</u>
<ul style="list-style-type: none">• Field sampling data forms• Field and laboratory chain-of-custody forms• Test facility and laboratory batch data reports• Waste Stream Characterization Packages• Sampling plans• Data reduction, validation, and reporting documentation• AK documentation• WSPFs and CIS
<u>Non-Permanent Records</u>
<ul style="list-style-type: none">• Nonconformance documentation• Variance documentation• Assessment documentation• Gas canister tags• Methods performance documentation• Performance Demonstration Program documentation• Sampling equipment certifications• Calculations and related software documentation• Training/qualification records• QAPjPs documentation (all revisions)• Calibration documentation• Analytical raw data• Procurement records• QA and technical procedures (all revisions)• Audio/video recordings (radiography, VE)

Table C-3. WIPP Waste Information System Data Fields^a

Characterization Module Data Fields ^b	
Container ID ^c Generator EPA ID Generator Address Generator Name Generator Contact Hazardous Code Layers of Packaging Liner Exists Liner Hole Size Filter Model Number of Filters Installed Item Description Code Haz. Manifest Number NDE Complete ^e	Transporter EPA ID Transporter Name Visual Exam Container ^e Waste Material Parameter ^d Waste Material Weight ^d Waste Matrix Code Waste Matrix Code Group Waste Stream Profile Number
Certification Module Data Fields	
Container ID ^c Container type Container Weight Contact Dose Rate Container Certification date Container Closure Date Handling Code	
Transportation Data Module	
Contact Handled Package Number Assembly Number ^f Container IDs ^{c,d} ICV Closure Date Ship Date Receive Date	
Disposal Module Data	
Container ID ^c Disposal Date Disposal Location	

^a This is not a complete list of the WWIS/WDS data fields.
^b Some of the fields required for characterization are also required for certification and/or transportation.
^c Container ID is the main relational field in the WWIS/WDS Database.
^d This is a multiple occurring field for each waste material parameter, nuclide, etc.
^e These are logical fields requiring only a yes/no.
^f Required for 7-Packs of 55-gallon drums, 4-packs of 85-gallon drums, or 3-packs of 100-gallon drums to tie all of the drums in that assembly together. This facilitates the identification of waste containers in a shipment without need to breakup the assembly.

Table C-4. Waste Tanks Subject to Exclusion

Hanford Site - 177 Tanks	
A-101 through A-106	C-201 through C-204
AN-101 through AN-107	S-101 through S-112
AP-101 through AP-108	SX-101 through SX-115
AW-101 through AW-106	SY-101 through SY-103
AX-101 through AX-104	T-101 through T-112
AY-101 through AY-102	T-201 through T-204
B-101 through B-112	TX-101 through TX-118
B-201 through B-204	TY-101 through TY-106
BX-101 through BX-112	U-101 through U-112
BY-101 through BY-112	U-201 through U-204
C-101 through C-112	
Savannah River Site - 51 Tanks	
Tank 1 through 51	
Idaho National Laboratory - 15 Tanks	
WM-103 through WM-106	WM-180 through WM-190

Table C-5. Listing of Permitted Hazardous Waste Numbers

EPA Hazardous Waste Numbers			
F001	D019	D043	U079
F002	D021	P015	U103
F003	D022	P030	U105
F004	D026	P098	U108
F005	D027	P099	U122
F006	D028	P106	U133*
F007	D029	P120	U134*
F009	D030	U002*	U151
D004	D032	U003*	U154*
D005	D033	U019*	U159*
D006	D034	U037	U196
D007	D035	U043	U209
D008	D036	U044	U210
D009	D037	U052	U220
D010	D038	U070	U226
D011	D039	U072	U228
D018	D040	U078	U239*

* Acceptance of U-numbered wastes listed for reactivity, ignitability, or corrosivity characteristics is contingent upon a demonstration that the wastes no longer exhibit the characteristic of reactivity, ignitability, or corrosivity.

Figure C-1. Waste Stream Profile Form (Example Only)

(1) Waste Stream Profile Number:			
(2) Generator site name:		(3) Generator site EPA ID:	
(4) Technical contact:		(5) Technical contact phone number:	
(6) Date of audit report approval by New Mexico Environment Department (NMED):			
(7) Title, version number, and date of documents used for WIPP-WAP Certification:			
(8) Did your facility generate this waste? YES NO			
(9) If no, provide the name and EPA ID of the original generator:			
Waste Stream Information¹			
(10) WIPP ID:		(11) Summary Category Group:	
(12) Waste Matrix Code Group:		(13) Waste Stream Name:	
(14) Description from the ATWIR:			
(15) Defense TRU Waste:		YES	NO
(16) Check One:		CH	RH
(17) Number of standard waste boxes (SWBs)	(18) Number of Drums	(19) Number of Canisters	
(17a) Number of standard large box 2 (SLB2)			
(20) Batch Data Report numbers supporting this waste stream characterization:			
(21) List applicable EPA Hazardous Waste Numbers: ²			
(22) Applicable TRUCON Content Numbers:			
(23) Acceptable Knowledge Information¹			
(For the following, enter the supporting documentation used [i.e., references and dates])			
Required Program Information			
(23A) Map of site:			
(23B) Facility mission description:			
(23C) Description of operations that generate waste:			
(23D) Waste identification/categorization schemes:			
(23E) Types and quantities of waste generated:			
(23F) Correlation of waste streams generated from the same building and process, as applicable:			
(24) Waste certification procedures:			
(25) Required Waste Stream Information			
(25A) Area(s) and building(s) from which the waste stream was generated:			
(25B) Waste stream volume and time period of generation:			
(25C) Waste generating process description for each building:			
(25D) Waste Process flow diagrams:			
(25E) Material inputs or other information identifying chemical/radionuclide content and physical waste form:			
(25F) Waste Material Parameter Weight Estimates per unit of waste			
(26) Which Defense Activity generated the waste:			
Weapons activities including defense inertial confinement fusion		Naval Reactors development	
Verification and control technology		Defense research and development	
Defense nuclear waste and material by products management		Defense nuclear material production	
Defense nuclear waste and materials security and safeguards and security investigations			

Figure C-1. Waste Stream Profile Form (Example Only) (continued)

(27) Supplemental Documentation:		
(27A) Process design documents:		
(27B) Standard operating procedures:		
(27C) Safety Analysis Reports:		
(27D) Waste packaging logs:		
(27E) Test plans/research project reports:		
(27F) Site databases:		
(27G) Information from site personnel:		
(27H) Standard industry documents:		
(27I) Previous analytical data:		
(27J) Material safety data sheets:		
(27K) Sampling and analysis data from comparable/surrogate Waste:		
(27L) Laboratory notebooks:		
Confirmation Information²		
For the following, when applicable, enter procedure title(s), number(s) and date(s)		
(28)	Radiography:	
	Visual Examination:	
(29) Comments: For a list of the waste characterization procedures used and date of respective procedures see the list of procedures on the attached CIS.		
Reviewed by AK Expert: YES <input type="checkbox"/> Date: _____		
Reviewed by STR (if necessary): YES <input type="checkbox"/> N/A <input type="checkbox"/> Date: _____		
Waste Stream Profile Form Certification:		
I hereby certify that I have reviewed the information in this Waste Stream Profile Form, and it is complete and accurate to the best of my knowledge. I understand that this information will be made available to regulatory agencies and that there are significant penalties for submitting false information, including the possibility of fines and imprisonment for knowing violations.		
Signature of Site Project Manager	Printed Name	Date

Figure C-2. Waste Characterization Process (Reprinted from the WAP, Figure C-2)

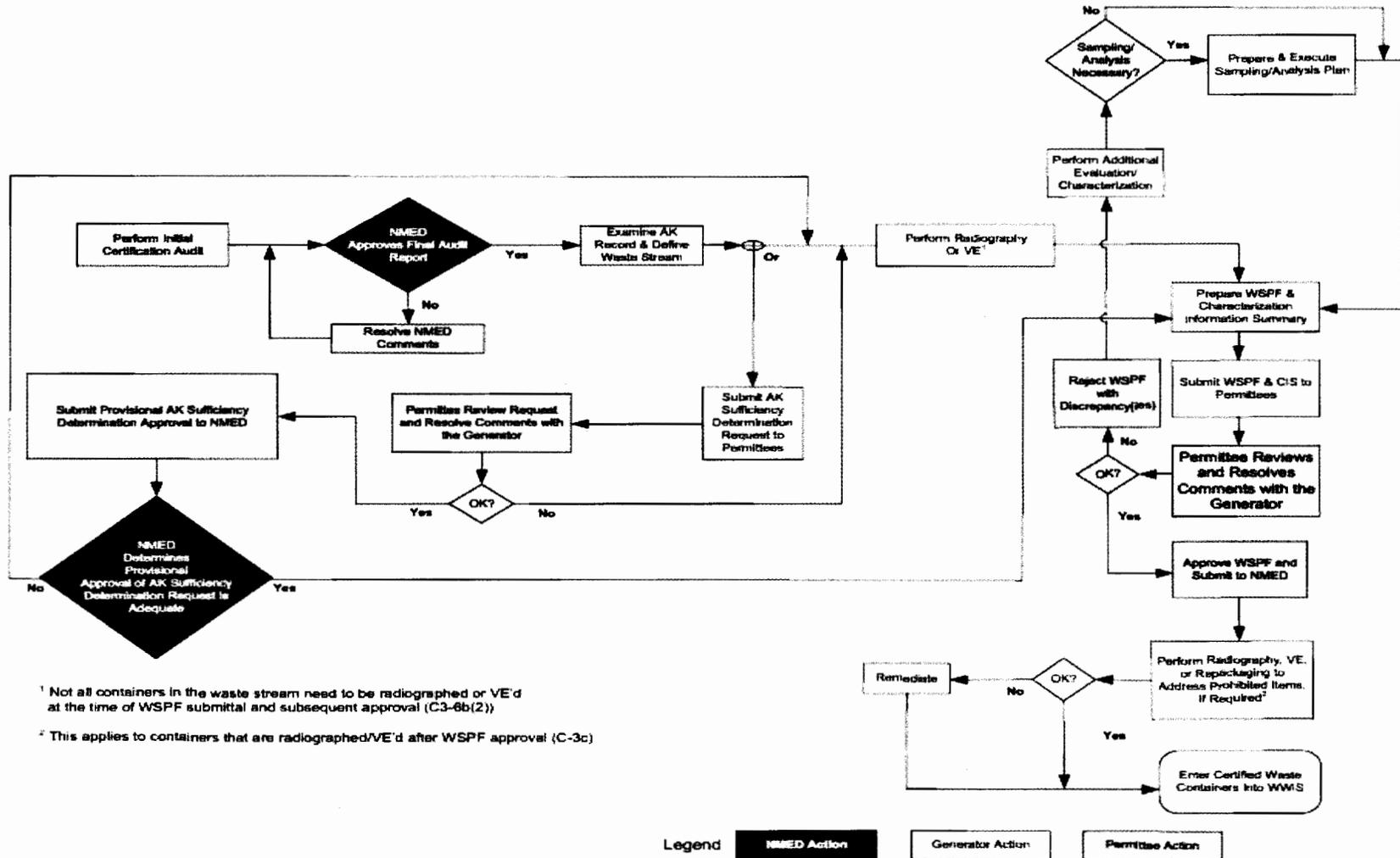


Figure C-3. TRU Mixed Waste Screening and Verification Flow Diagram

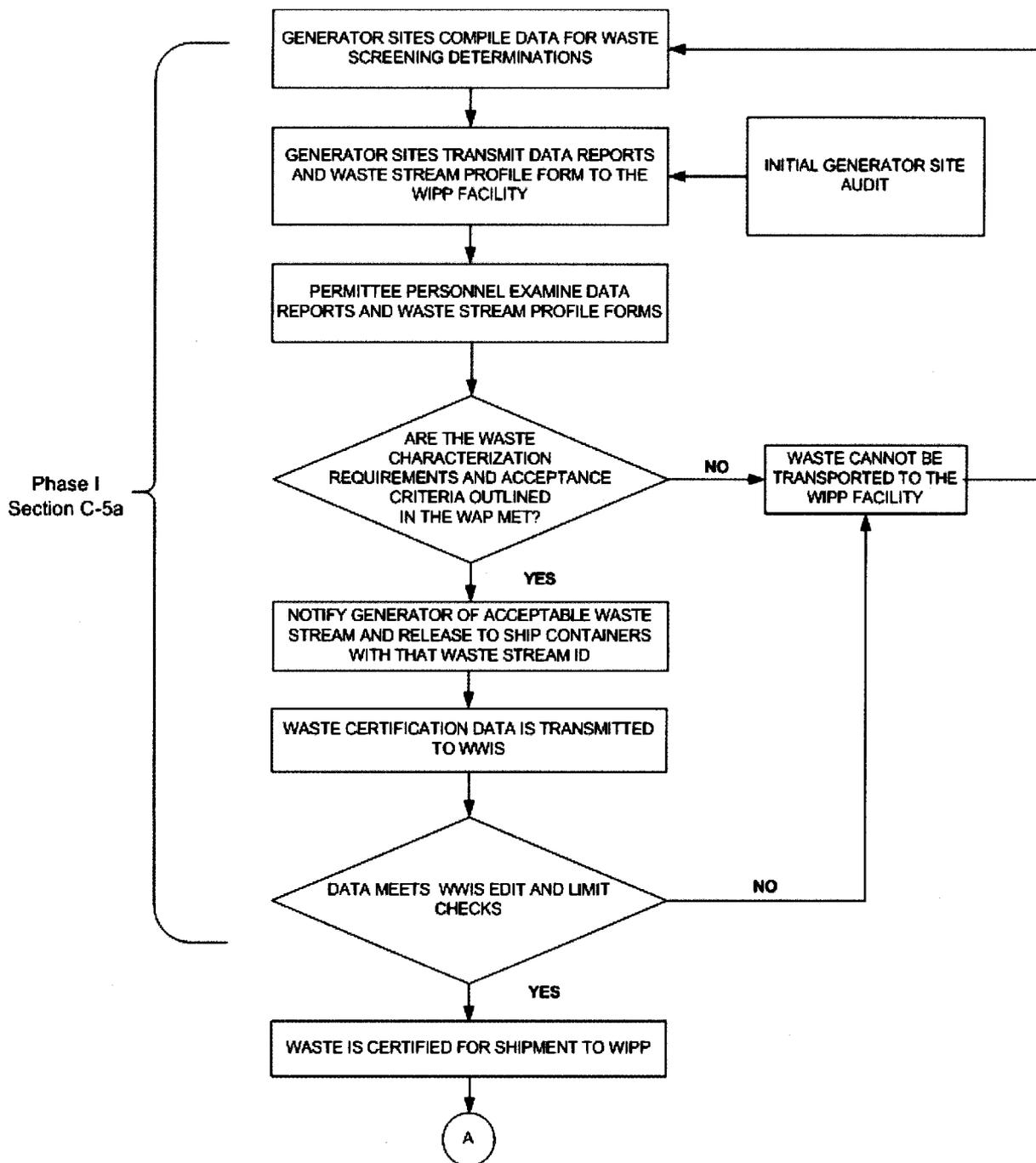
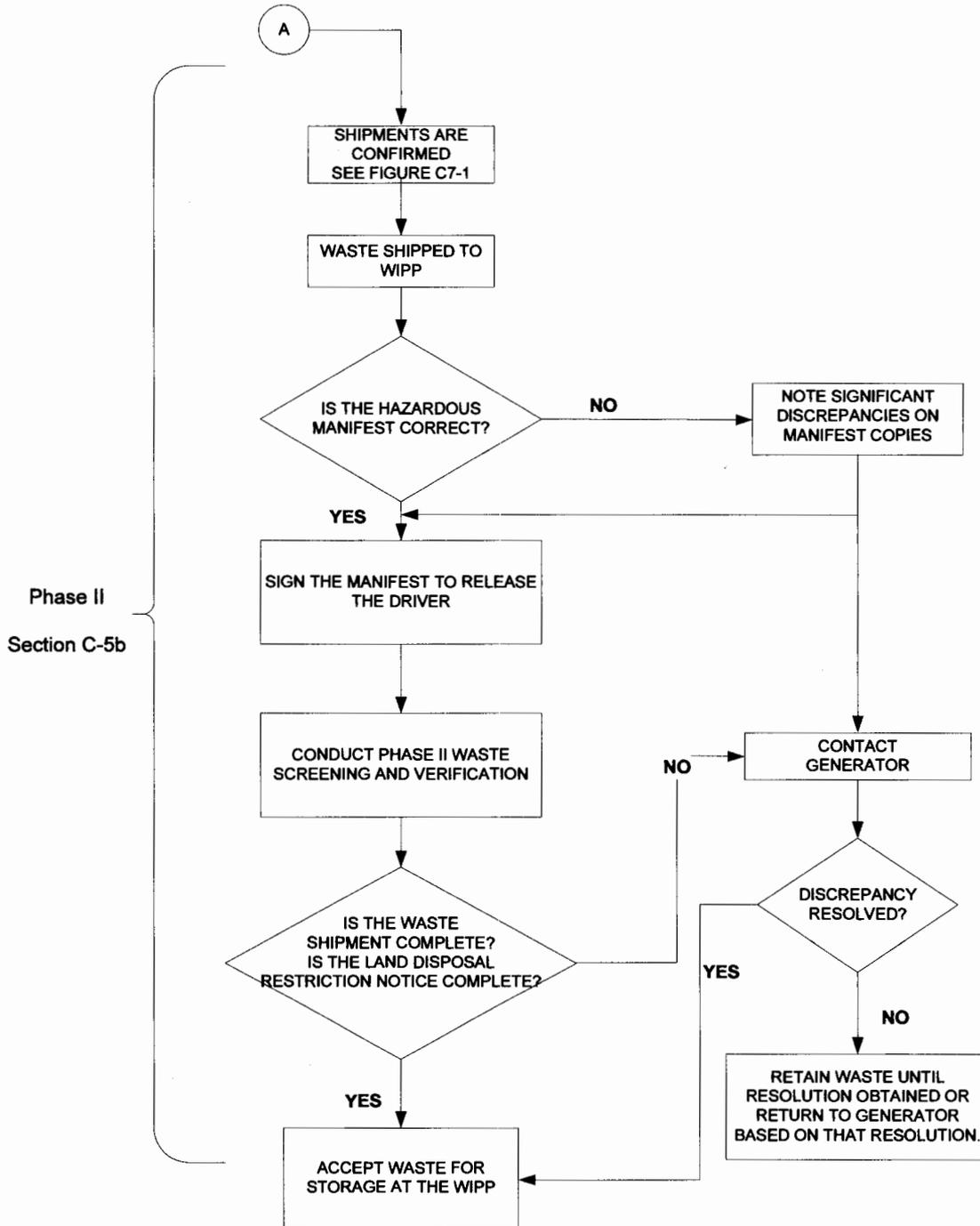


Figure C-3. TRU Mixed Waste Screening and Verification Flow Diagram (continued)



C1 WASTE CHARACTERIZATION TESTING METHODS

CCP characterizes TRU waste for shipment to WIPP by using the following methods, if applicable, for characterization of TRU waste. These methods include requirements for radiography or VE. This section describes these methods, QC requirements.

C1-1 Radiography

Radiography aids in the examination and identification of containerized waste. There is no equivalent EPA method. Personnel perform radiography in accordance with the procedures to meet the WAP requirements described in the following sections (T53, T508). Additionally, these procedures include instructions specific to the radiography method used. For example, details about moving the drum in a specific way in order to detect liquids are included in the radiography procedures. QAOs for radiography are contained in Section C3-2a.

All activities required to achieve the radiography objectives are described in the QAPjP and radiography-related standard operating procedures (SOPs). A radiography system (e.g., real time radiography, digital radiography/computed tomography) normally consists of the following components: x-ray-producing device; imaging system; an enclosure for radiation protection; a waste container handling system; an audio/visual recording system; and an operator control and data acquisition station. The radiography equipment has controls (or an equivalent process) that allow the operator to control image quality for materials of varying density. On some radiography systems, it should be possible to vary the voltage, typically between 150-400 kilovolts (kV), to provide an optimum degree of penetration through the waste. For example, high-density material is examined with the x-ray device set on the maximum voltage. This ensures maximum penetration through the waste container. Low-density material is examined at lower voltage settings to improve contrast and image definition. The imaging system utilizes a fluorescent screen, a low-light television camera, or x-ray detectors to generate the image.

To perform radiography, the waste container is scanned while the operator views the television screen. A video and audio recording is made of the waste container scan and is maintained as a Non-Permanent Record. A radiography data form is also used to document the waste matrix code, to ensure that the waste container contains no ignitable, corrosive, or reactive waste by documenting the absence of liquids in excess of TSDF-WAC limits or compressed gases, and verify that the physical form of the waste is consistent with the waste stream description documented in the AK Summary Report. Containers whose contents prevent full examination of the remaining contents are subject to VE unless the CCP certifies that VE would provide no additional relevant information for that container based on the acceptable knowledge information for the waste stream. Such certification shall be documented in CCP records.

For containers which contain classified shapes and undergo radiography, the radiography video and audio recording will be considered classified. The radiography data forms will not contain classified information.

The radiography system involves qualitative and semi-quantitative evaluations of visual displays. Operator training and experience are the most important considerations for ensuring QC in regard to the operation of the radiography system and for interpretation and disposition of radiography results. Only trained personnel are allowed to operate radiography equipment.

Standardized training requirements for radiographic operators are based on existing industry standard training requirements.

Formal and on-the-job training (OJT) elements are listed below. In addition, radiography personnel are instructed in the specific waste generating practices, typical packaging configurations, and associated waste material parameters expected to be found in the waste matrix code. OJT and apprenticeship of radiography personnel are conducted by experienced, qualified radiography operators prior to qualification of training candidates. Training describes the site equipment, waste configurations, and the level of waste characterization efforts for the CCP. In addition, radiography operators are trained on the types of waste, physical forms, packaging configurations, and QC requirements for site waste characterized by the CCP.

All of the radiography QC requirements specified in the QAPjP shall be incorporated into the CCP training programs and radiography operations, so that data quality and comparability will not be affected (T28). The radiography training program is subject to the audit and surveillance program. The training program includes items required by CCP-QP-002, *CCP Training and Qualification Plan*, and the required elements listed below.

One or more training containers with items (including prohibited items) common to the waste streams to be characterized and internal containers of various sizes is scanned semi-annually by each operator. The audio and video media are then reviewed by a supervisor to ensure that operators' interpretations remain consistent and accurate. Imaging system characteristics are verified on a routine basis.

Independent replicate scans and replicate observations of the video output of the radiography process are performed under uniform conditions and procedures. Independent replicate scans are performed on one waste container per day or once per testing batch, whichever is less frequent by a qualified radiography operator that was not involved in the original scan of the waste container. Independent observations of one scan (not the replicate scan) are made once per day or once per testing batch, whichever is less frequent, by a qualified radiography operator that was not involved in the original scan of the waste container. A testing batch is a suite of waste containers

undergoing radiography using the same testing equipment. A testing batch can be up to 20 waste containers without regard to waste matrix.

Oversight functions include periodic audio/video media reviews of accepted waste containers and are performed by qualified radiography operators that were not involved in the original scans of the waste containers. The results of this independent verification are available to the radiography operators who performed the original scans. The SPM is responsible for monitoring the quality of the radiography data and calling for corrective action, when necessary.

C1-2 Visual Examination

The CCP may use VE to verify container's contents. VE is performed by physically examining the contents of waste containers to verify the Waste Matrix Code and to verify that the container is properly included in the appropriate waste stream (T6, T113, T163, T500).

VE is conducted on a waste container to identify and describe all waste items, packaging materials, and waste material parameters in the waste containers. VE activities are documented on video/audio media or by using a second operator to provide additional verification by reviewing the contents of the waste container to ensure correct reporting. When VE is performed using a second operator, each operator performing the VE will observe for themselves the waste being placed in the waste container or the contents within the examined waste container when waste is not removed. The results of all VE are documented on VE data forms, which are used to document the Waste Matrix Code, ensure that the waste container contains no ignitable, corrosive, or reactive waste by documenting the absence of liquids in excess of TSDF-WAC limits or compressed gases, and verify that the physical form of the waste is consistent with the waste stream description documented in the AK Summary.

VE recorded on video/audio media shall meet the following minimum requirements:

- The video/audio media shall record the waste packaging event for the container such that all waste items placed into the container are recorded in sufficient detail and shall contain an inventory of waste items in sufficient detail that another trained VE operator can identify the associated waste material parameters.
- The video/audio media shall capture the waste container identification number.
- The personnel loading the waste container shall be identified on the video/audio media or on packaging records traceable to the loading of the waste container.

- The date of loading of the waste container will be recorded on the video/audio media or on packaging records traceable to the loading of the waste container.

VE performed using two generator site personnel shall meet the following minimum requirements:

- At least two generator site personnel who witnessed the packaging of the waste shall approve the data forms or packaging records attesting to the contents of the waste container.
- The data forms or packaging records shall contain an inventory of waste items in sufficient detail that another trained VE operator can identify the associated waste material parameters.
- The waste container identification number shall be recorded on the data forms or packaging records.

VE video/audio media of containers which contain classified shapes, shall be considered classified information. VE data forms or packaging records will not contain classified information.

Waste container packaging records may be used to meet the VE DQOs, Sections C-4a(1). These records must meet the minimum requirements listed above for either VE recorded on video/audio media or VE performed by two generator site personnel, and shall be reviewed by operators trained and qualified to the requirements listed below. The operators will prepare data forms based on the VE records. VE BDRs will be prepared, reviewed, and approved as described in Section C-4 and Section C3.

There will be standardized training for VE. VE operators are instructed in the specific waste-generating processes, typical packaging configurations, and waste material parameters expected to be found in each waste matrix code at the site. The training covers the various waste configurations generated/stored at the site. The particular physical forms and packaging configurations will vary at each site, so operators will be trained to examine the types of waste that are generated, stored and/or characterized at that site. Training will include the following regardless of Summary Category Group:

- Identifying and describing the contents of a waste container by examining all items in waste containers of previously packaged waste
- Identifying when VE cannot be used to meet the DQOs

VE personnel are requalified once every two years.

The SPM designates VE experts. Designated VE experts are familiar with the waste-generating processes that have taken place at the site and waste types for wastes being characterized at a particular site. VE experts are responsible for the overall direction and implementation of VE activities for the CCP at that site. VE experts meet the qualification and training requirements specified in CCP-QP-002 and make decisions based on training, previous experience, and knowledge of the waste stream.

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C2 RESERVED

C3 QUALITY ASSURANCE OBJECTIVES AND DATA VALIDATION
TECHNIQUES FOR WASTE CHARACTERIZATION METHODS

C3-1 Validation Methods

The CCP performs validation of qualitative and quantitative data so that characterization data are of known and acceptable quality.

The qualitative data or descriptive information generated by radiography and VE are not amenable to statistical data quality analysis. However, radiography and VE are complementary techniques yielding similar data for determining the waste matrix code. The waste matrix code is determined to ensure that the container is properly included in the appropriate waste stream.

Data validation is used to assess the quality of waste characterization data collected based on project precision, accuracy, completeness, comparability, and representativeness objectives. These objectives are described below:

Precision

Precision is a measure of the mutual agreement among multiple measurements.

Accuracy

Accuracy is the degree of agreement between a measured result and the true or known value.

Completeness

Completeness is a measure of the amount of valid data obtained from a method compared to the total amount of data collected.

Comparability

Comparability is the degree to which one data set can be compared to another.

Representativeness

Representativeness is the degree to which sample data represent a characteristic of a population.

C3-2 Nondestructive Examination Methods

Quality Assurance Objectives

The QAOs for nondestructive examination (NDE) are detailed in this section. NDE can be either radiography or VE. If the QAOs in this section are not met, then corrective actions are taken. NDE is a primary qualitative determination. The objective of NDE for the program is to verify that the physical form of waste matches the waste stream description as determined by AK and the absence of prohibited items. CCP describes all of the activities required to achieve these objectives in this QAPjP and the operating procedures listed in Section C1.

C3-2a Radiography (T53, T508)

Data to meet the QAOs for radiography are obtained from a video and audio recorded scan provided by trained radiography operators at the Host site. Results are also recorded on a radiography data form. The precision, accuracy, completeness, and comparability objectives for radiography data follow.

Precision

Precision is maintained by reconciling any discrepancies between two radiography operators with regard to identification of the waste matrix code, liquids in excess of TSDF-WAC limits, and compressed gases through independent replicate scans and independent observations. The precision of radiography is also verified prior to use by tuning precisely enough to demonstrate compliance with QAOs listed in Section C-4a through viewing an image test pattern.

Accuracy

Accuracy is obtained by using a target to tune the image for maximum sharpness and by requiring operators to successfully identify 100 percent of the items required to meet the DQOs for radiography specified in Section C. Section C-4a(1) in a training container during their initial qualification and subsequent requalification.

Completeness

To ensure completeness, video and audio media recording of the radiography of the radiography examination and a validated radiography data form are obtained for 100 percent of waste containers that are examined by radiography. All video and audio media recordings and radiography data forms are subject to validation as indicated in Section C3-7.

Comparability

The comparability of radiography data from different operators is enhanced by using standardized radiography procedures and operator qualifications.

C3-2b Visual Examination (T6, T113, T163, T500)

Results must be recorded on a VE data form. The precision, accuracy, completeness, and comparability objectives for VE data are presented below.

Precision

Precision is maintained by reconciling any discrepancies between the operator and the independent technical reviewer with regard to identification of waste matrix code, liquids in excess of TSDf-WAC limits, and compressed gases.

Accuracy

Accuracy is maintained by requiring operators to pass a comprehensive examination and demonstrate satisfactory performance in the presence of the VE expert during their initial qualification. VE operators shall be requalified every two years.

Completeness

A validated VE data form will be obtained for 100 percent of the waste containers subject to VE.

Comparability

The comparability of VE data from different operators shall be enhanced by using standardized VE procedures and operator qualifications.

C3-3 Acceptable Knowledge (T5)

AK documentation provides qualitative information that cannot be assessed according to specific data quality goals that may be used for quantitative techniques. To ensure that the AK process is consistently applied, the CCP complies with the following data quality requirements for AK documentation.

- Precision - The qualitative determinations, such as compiling and assessing AK documentation, do not lend themselves to statistical evaluations of precision. However, the AK information is assessed by independent review during internal and external audits.

- Accuracy - The percentage of waste containers which require reassignment to a new waste matrix code and/or designation of a different hazardous waste number, based on testing data and discrepancies identified during waste confirmation is reported as a measure of AK accuracy. The CCP calculates the AK accuracy in accordance with CCP-TP-005, *CCP Acceptable Knowledge Documentation*.
- Completeness - The AK record contains 100 percent of the required information (Section C4-3). The usability of the AK information is assessed for completeness during audits.
- Comparability - The CCP ensures comparability by meeting the training requirements and complying with the minimum standards outlined for procedures that are used to implement the AK process. The CCP assigns hazardous waste numbers in accordance with Section C4-3b and will provide the information regarding the waste being characterized to other sites that store or generate a similar waste stream.
- Representativeness - Representativeness is a qualitative parameter that is satisfied by ensuring that the process of obtaining, evaluating, and documenting AK information is performed in accordance with the minimum standards established in Section C4. The CCP assesses and documents the limitations of the AK information used to assign hazardous waste numbers (e.g., purpose and scope of information, date of publication, type and extent to which waste parameters are addressed).

The CCP complies with the nonconformance notification and reporting requirements of Section C3-7 of this QAPjP if the results of testing specified in this QAPjP are inconsistent with AK documentation.

In addition, performance with regard to the use of AK information is tracked by assessing the frequency of inconsistencies among information, and documenting AK inconsistencies identified through radiography and VE. The AK process and waste stream documentation are evaluated through internal assessments by QA and assessments by auditors external to the organization (i.e. the Permittees).

C3-4 Data Review, Validation, and Verification Requirements

Data review, validation, and verification are performed at the CCP data generation level in accordance with CCP data generation level characterization procedures. Data validation and verification are performed at the project level by the CCP project staff.

Data review determines whether raw data was properly collected and ensures that it was properly reduced. Data validation verifies that the reported data satisfy the

WAP requirements and are accompanied by signature release. Data verification authenticates that the data are presented accurately, represent the testing activities performed, and have been subject to the appropriate level of review. By meeting the requirements in this section, the CCP ensures that records furnish documentary evidence of quality.

The following types of BDRs (as applicable to the characterization process in use) are required for data validation and verification, and quality assurance activities:

- The Testing BDR or equivalent includes all data pertaining to radiography or VE for up to 20 waste containers without regard to waste matrix. Table C3-3, Testing Batch Data Report Contents, lists the information required in Testing BDRs (identified with an "X") and other information necessary for data validation but optional for inclusion in the Testing BDR (identified with an "O")

C3-4a Data Generation Level (T6, T53, T113, T500, T508)

The minimum requirements for raw data collection and management include the following:

- All data are signed and dated in reproducible ink by the individual generating the data, or by use of unalterable electronic signature.
- All data are recorded clearly, legibly, and accurately in field records.
- All changes to original data are lined out, initialed, and dated by the individual making the change. A justification for changing the original data may also be included. Original data are not obliterated or otherwise disfigured so as to be unreadable. Data changes are made only by the individual who originally collected the data, or by an individual authorized to change the data.
- All data are transferred and reduced from field records completely and accurately.
- All field records are maintained as specified in Table C-2.
- All data are organized in standard formats (i.e., BDRs) specified in procedures.
- All electronic and video data are stored appropriately to ensure that waste container and associated QC data are readily retrievable. In the case of classified information, additional security provisions may apply that could restrict retrievability. The additional security provisions will be documented in CCP procedures when required.

Data review, validation, and verification at this level involves scrutiny and signature release from qualified independent technical reviewers not involved in the generation or recording of the data under review as specified below. Individuals conducting the data review, validation, and verification use checklists that address the items in this section. Checklists are forwarded with BDRs to the CCP Project Office.

C3-4a(1) Independent Technical Review (T6, T53, T113, T500, T508)

The independent technical reviewer ensures by review of raw data that data generation and reduction are technically correct, calculations are verified correct, deviations are documented, and QA/QC results are complete, documented correctly, and compared against the criteria specified in this QAPjP. This review is to validate and verify all of the work done by the originator.

One hundred percent of the BDRs must receive an independent technical review. This review is performed by an individual by a trained and qualified individual who was not involved in the generation or recording of the data under review. The independent technical review is performed as soon as practicably possible in order to determine and correct negative quality trends in the testing, process. However at a minimum, the independent technical review must be performed before any waste associated with the data reviewed is managed, stored, or disposed at WIPP. The reviewer(s) must release the data as evidenced by signature, and as a consequence ensure the following:

- Data generation and reduction were conducted in a technically correct manner in accordance with the methods used (procedure revision) and data were reported in the proper units and correct number of significant figures.
- Calculations were verified by a valid calculation program, a spot check of verified calculation programs, and/or 100 percent check of all hand calculations. Values that are not verifiable to within rounding or significant difference discrepancies are rectified prior to completion of independent technical review.
- The data were reviewed for transcription errors.
- The testing, data QA documentation for BDRs is complete and includes, as applicable, raw data, calculation records, calibration records, (or reference to an available calibration package), and corrective action is taken to ensure that all BDRs are complete and include all necessary raw data prior to completion of the independent technical review.
- Radiography tapes were reviewed (independent observation) on a waste container basis at a minimum of once per testing batch or once per day of operation, whichever is less frequent (Section C1-3). The radiography tape was

reviewed against the data reported on the radiography form to ensure that the data are correct and complete.

- QAOs have been met according to the methods outlined in Sections C3-2 and C3-3.

C3-4b Project Level

Data validation and verification at this level involves scrutiny and signature release from the SPM (T1, T500, T508). Any nonconformance identified during this process is documented on an NCR (Section C3-7).

The SPM ensures that a repeat of the data generation level review, verification and validation is performed on the data for a minimum of one randomly chosen waste container quarterly (every three months). This exercise documents that the data generation level review, verification, and validation are being performed in accordance with implementing procedures.

C3-4b(1) Site Project Manager Review

The SPM review is the final validation that all of the data contained in BDRs from the data generation level are complete and are properly reviewed, as evidenced by signature release and completed checklists.

One hundred percent of the BDRs have SPM signature release. At a minimum, the SPM signature release is performed before any waste associated with data reviewed is shipped to the WIPP. This signature release ensures the following (T1, T500, T508):

- Data generation level independent technical review, validation, and verification are performed as evidenced by completed review checklists and by the appropriate signature releases.
- Independent technical reviewers were not involved in the generation or recording of the data under review.
- Batch data review checklists are complete.
- BDRs are complete and data are properly reported (i.e., data are reported in the correct units, with the correct significant figures).
- Data are within established data assessment criteria and meet all applicable QAOs as described in Sections C3-2 through C3-3.

- Testing batch QC checks (e.g., replicate scans, measurement system checks) were properly performed. Radiography data are complete and acceptable based on evidence of videotape review of one waste container per day or once per testing batch, whichever is less frequent, as specified in C1-1.

C3-4b(2) Preparing SPM Summary and Data Validation Summary

To document the project level validation and verification described above, the SPM (or designee) prepares an SPM Summary, and Data Validation Summary (T1). These reports may be combined to eliminate redundancy. The SPM Summary includes a validation checklist for each BDR. Checklists for the SPM Summary are of sufficient detail to validate all aspects of a BDR that affect data quality.

The SPM Data Validation Summary provides verification that, on a per waste container as evidenced by BDR reviews, all data have been validated in accordance with this QAPjP. The SPM Data Validation Summary identifies each BDR data report reviewed (including all waste container numbers), describes how the validation was performed and whether or not problems were detected (e.g., nonconformance reports), and includes a statement indicating that data are acceptable. Summaries must include release signatures.

C3-4b(3) Preparing Waste Stream Characterization Packages

If requested by the Permittee, the SPM provides a Waste Stream Characterization Package. The SPM must ensure that the Waste Stream Characterization Package (described in Section C3-6b(3)) supports the waste characterization determinations.

C3-4c Permittee Level

Not applicable to CCP. This is a Permittee function.

C3-5 Reconciliation with Data Quality Objectives

Reconciling the results of waste testing with DQOs ensures that data are of adequate quality to support regulatory compliance programs. When waste is characterized by CCP, reconciliation with the DQOs is the responsibility of the SPM and occurs prior to waste shipment (T2).

C3-5a Reconciliation at the Project Level

The SPM ensures that all data generated and used in decision making meet the DQOs providing in Section C-4a(1). DQO reconciliation is the responsibility of the SPM, who assesses whether data of sufficient type, quality, and quantity to meet the DQOs (Section C-4a(1)) have been collected.

The SPM determines for each waste stream characterized, whether sufficient data have been collected to determine the following required waste parameters (T2):

- Waste matrix code.
- Waste material parameter weights.
- That each container of waste is transuranic radioactive waste.
- Whether the waste stream exhibits a toxic characteristic or is listed under 20.4.1.200 NMAC incorporating 40 CFR §261, Subpart C.
- Whether the waste stream contains listed waste found in 20.1.4.200 NMAC incorporating 40 CFR §261, Subpart D.
- Whether the waste stream can be classified as hazardous or nonhazardous.
- Whether the overall completeness, comparability, and representativeness QAOs were met for the testing procedures specified in Sections C3-2 and C3-3 prior to submittal of a WSPF for a waste stream or waste stream lot.

If the SPM determines that insufficient data have been collected to make the determinations listed above, additional data collection efforts are undertaken. The reconciliation of a waste stream is performed, as described in Section C4, prior to submittal of the WSPF and CIS to the Permittees for that waste stream. The CCP does not ship TRU waste stream to the WIPP unless the SPM determines that the WAP-required waste parameters listed above are met for that waste stream.

C3-5b Reconciliation at the Permittee Level

Not applicable to the CCP. This is a Permittee function.

C3-6 Data Reporting Requirements

Data reporting requirements define the type of information and the method of transmittal for data transfer from the data generation level to the CCP Project Office and from the CCP Project Office to the Permittee.

C3-6a Data Generation Level

Data are transmitted by hard copy or electronically (with hard copies available on demand) from the data generation level to the CCP Project Office. Transmitted data include all BDRs, and data review checklists. The BDR forms and checklists must contain all the information required by the testing techniques described in Sections C1

through C6, as well as the signature releases to document the review, validation, and verification as described in Section C3-4. BDRs and checklists are on approved forms as provided in procedures.

BDRs are forwarded to the SPM. All BDRs are assigned serial numbers, and each page is numbered. The serial number is the same as the batch number. QA documentation, including raw data, is maintained in either testing facility files, or the CCP files in accordance with CCP-QP-008, *CCP Records Management*.

C3-6b Project Level

The CCP Project Office prepares a WSPF for each waste stream certified for shipment to the WIPP based on information obtained from AK and BDRs, if applicable (T2). The CCP Project Office ensures that the CIS and Waste Stream Characterization Package (when requested by the Permittee) are prepared as appropriate. The SPM verifies these reports are consistent with information found in BDRs. Summarized testing are included in the CIS. The contents of the WSPF, the CIS, and the Waste Stream Characterization Package are discussed in the following sections.

A Waste Stream Characterization Package is submitted only when requested by the Permittee. These reports are reviewed, validated, and verified by the SPM (T2).

After approval of a WSPF and the associated CIS by the DOE, CCP will maintain a cross reference of container identification number to each BDR.

A Waste Stream Characterization Package will be transmitted by hard copy or electronically from the SPM to the Permittees when requested.

C3-6b(1) Waste Stream Profile Form (T2)

The WSPF shall include the following information:

- Site name
- Site EPA ID
- Date of audit report approval by NMED (if obtained)
- Original generator of waste stream
- Whether waste is CH or RH
- The Waste Stream WIPP Identification Number

- Summary category group
- Waste matrix code group
- Waste Material Parameter Weight Estimates per unit of waste
- Waste stream name
- A description of the waste stream
- Applicable U.S. EPA Hazardous Waste Numbers
- Applicable TRUPACT Content (TRUCON) codes
- A listing of AK documentation used to identify the waste stream
- The waste characterization procedures used and the reference and date of the procedure
- Certification signature of SPM, name, title, and date signed

C3-6b(2) Characterization Information Summary (T2)

The CIS shall include the following elements, if applicable:

- Data reconciliation with DQOs.
- Radiography and VE summary to document that prohibited items are not present, and to verify that the physical form of the waste matches the waste stream description as determined by AK.
- A justification for the selection of radiography and/or VE as an appropriate method for characterization of the waste.
- A complete listing of all container identification numbers used to generate the WSPF, cross-referenced to each BDR.
- Complete AK summary, including waste stream name and number, the point of generation, waste stream volume (current or projected), generation dates, TRUCON codes, Summary Category Group, Waste Matrix Code(s) and Waste Matrix Code Group, other DOE/TRU-14-3425, *Annual Transuranic Waste Inventory Report 2014* (ATWIR) information, waste stream description, areas of operation, generation processes, RCRA determinations, radionuclide information,

all references used to generate the AK summary, and any other information required by Section C4-2b.

- Method for determining Waste Material Parameter Weights per unit of waste.
- List of any AK Sufficiency Determinations requested for the waste stream.
- Certification through acceptable knowledge or testing that any waste assigned the Hazardous Waste Number of U134 (hydrofluoric acid) no longer exhibits the characteristic of corrosivity. This is verified by ensuring that no liquid is present in U134 waste.

C3-6b(3) Waste Stream Characterization Package (T2)

The waste stream characterization package is submitted when requested by the Permittee and includes the following information:

- WSPF (Section C3-6b(1))
- Applicable CIS (Section C3-6b(2))
- Complete AK summary (Section C3-6b(2))
- BDRs supporting the characterization of the waste stream and any others requested by the Permittee
- Raw testing data requested by the Permittee

C3-6b(4) WIPP Waste Information System Data Reporting (T30)

The WWIS/WDS data dictionary includes the data, field formats, and limits associated with waste characterization data established by the WAP. These data are subject to edit and limit checks that are performed automatically by the database, as defined in the "DOE/WIPP-09-3427."

C3-7 Nonconformances (Q5)

The status of CCP activities are monitored and controlled by the SPM in accordance with the nonconformance and procurement procedures identified below. This includes nonconformance identification, documentation, and reporting.

Nonconformances

Nonconformances are uncontrolled and unapproved deviations from an approved plan or procedure (e.g., this QAPjP). In the context of this QAPjP, deficiencies and nonconformances are synonymous. Nonconforming items and activities are those that do not meet the CCP requirements, procurement document criteria, or approved work procedures. The CCP personnel are responsible for promptly reporting any nonconformance to management. The CCP reconciles and corrects nonconformance items, as appropriate, in accordance with the DOE-CBFO QAPD. The disposition of nonconforming items is identified and documented and nonconforming items are identified by marking, tagging, or segregating and appropriate notifications are made to the site. When a nonconformance related to the CCP is observed or detected, the QA is notified, and affected management reviews the content of the NCRs and assists the QA in processing the NCR. For each container selected for confirmation pursuant to Section C7, the Permittees will examine the respective NCR documentation to verify NCRs have been dispositioned for the selected container.

The CCP identifies and documents nonconformances as follows:

- The NCR procedure establishes the method for CCP personnel to identify, document, control, and disposition nonconforming activities, processes, items, and materials. NCRs are initiated by any individual identifying a nonconformance during performance of work tasks, random observations, inspections, or any other review of CCP procedures, operations, and activities. The CCP personnel identify deficient items by marking, tagging, or segregating them. This procedure implements the requirements of Section 1.3.2 (Nonconformances) of the DOE-CBFO QAPD.
- Corrective Action Reporting and Control procedures establishes the method for personnel to identify and correct potential problems and conditions adverse to quality, in addition to precluding their recurrence, and if necessary, stopping associated work activities (Q8). Any person may temporarily stop work prior to evaluation of the condition by the responsible CCP supervisor. The CCP supervisor then evaluates and reports the condition, as necessary, in accordance with WP 15-GM1002, *Issues Management Processing of WIPP Forms (WP-1)*. This procedure implements the requirements of Section 1.3.3 (Corrective Action) of the DOE-CBFO QAPD.

Management at all levels fosters a "no-fault" attitude to encourage the identification of nonconforming items and processes within the CCP. Nonconformances may be detected and identified by anyone performing activities in support of this QAPjP, including:

- The CCP project staff - during field operations, supervision of subcontractors, data validation and verification, and self-assessment
- Testing Facility staff - during the preparation for and performance of testing; calibration of equipment; QC activities; data review, validation, and verification; and self-assessment
- QA personnel - during oversight activities or audits

An NCR is prepared for each nonconformance identified. Each NCR is initiated by the individual(s) identifying the nonconformance. The NCR is then processed by knowledgeable and appropriate personnel. The NCR includes or references results of, QC tests, audit reports, internal memoranda, or letters, as appropriate. The NCR provides the following information:

- Identification of the individual(s) identifying or originating the nonconformance
- Description of the nonconformance
- Method(s) or suggestions for correcting the nonconformance (corrective action)
- Schedule for completing the corrective action
- An indication of the potential ramifications and overall usability of the data, if applicable
- Any approval signatures specified in the nonconformance procedures.

The SPM oversees the NCR process for the CCP, identifies and tracks the status of deficiencies, reports this information to the Permittees, and is responsible for verifying the close-out of the NCRs.

Nonconformances are tracked and trended in accordance with procedures (Q5, Q14) that establish the method for evaluating trends in nonconformances and identifying appropriate corrective actions.

The SPM ensures that relevant project personnel are notified of nonconformances and verifying completion of corrective action for nonconformances.

Nonconformance to DQOs

For any non-administrative nonconformance related to applicable requirements specified in this QAPjP which are first identified at the SPM signature release level (i.e., a failure to meet a DQO), the SPM will provide a written notification to the Permittees within seven (7) calendar days of identification and shall also provide a nonconformance report within 30 calendar days of identification of the incident. The CCP implements a corrective action process and resolves identified nonconformances prior to shipment of any affected waste to the WIPP.

DOE Corrective Action Process

This section is not applicable to the CCP.

C3-8 Special Training Requirements and Certifications (Q2)

The SPM is responsible for ensuring that all personnel maintain proficiency in the work performed and identifies additional training if required. The training and qualification process for CCP personnel and subcontracted personnel who perform work to support the CCP is documented and controlled. In accordance with these plans, only personnel trained to applicable CCP-related plans and procedures perform CCP activities. Before performing CCP-related activities, assigned staff receive indoctrination into the scope, purpose, and objectives of the WAP and the specific QAOs of assigned tasks. Personnel assigned to perform activities under this QAPjP have the education, experience, and training applicable to the functions associated with the work.

Evidence of personnel proficiency and demonstration of competence in the task(s) assigned are demonstrated and documented. All personnel designated to work on specific aspects of the WAP maintain qualification (i.e., training and certification) throughout the duration of the work as specified in this QAPjP and applicable procedures. Job performance is evaluated and documented at periodic intervals, as specified in the appropriate implementing procedures.

CCP personnel involved in WAP activities (as flowed down in this QAPjP) receive continuing training to ensure that job proficiency is maintained and documented. The due date for required continuing training courses and requalification shall be the end of the month of the anniversary date when the training was previously completed. Training includes both education in principles and enhancement of skills. Job performance is evaluated and documented at periodic intervals, as specified in the implementing procedures or in CCP-QP-002. Documentation of training, consisting of training records that specify the scope of training, dates of completion, and job proficiency are maintained by the CCP Project Office and/or the site records system as QA records.

The minimum qualifications for certain specified positions for the WAP are summarized see in this document CCP-PO-001, Table C3-2. This QAPjP specifies the titles and minimum training and qualification requirements for personnel performing QAPjP activities.

Evaluation of CCP personnel qualifications includes a comparison of the job description to the skills, training, and experience included in the individual's resume, training records, and other documented bases for job assignment. This evaluation is also performed for personnel who change positions because of a transfer or promotion as well as personnel assigned to short-term or temporary work assignments that may affect the quality of CCP activities. Procedures identify the responsible persons for ensuring all personnel maintain proficiency in the work performed and identify any additional training that may be required.

C3-9 Changes to WAP Related Plans or Procedures

Controlled changes to WAP-related CCP plans or procedures are managed through the document control process (Q10). The SPM reviews all nonadministrative changes and evaluates whether those changes could impact DQOs specified in the WAP. Any changes to the WAP-related plans or procedures that could impact DQOs (i.e., those changes that require prior approval of the DOE as defined in Section C5-2) are reported to the DOE within five days of identification by the project level review.

Table C3-1. Waste Material Parameters and Descriptions

Waste Material Parameter	Description
Iron-Based Metals/Alloys	Iron and steel alloys in the waste; does not include the waste container materials.
Aluminum-Based Metals/Alloys	Aluminum or aluminum-based alloys in the waste materials.
Other Metals	All other metals found in the waste materials (*e.g., copper, lead, lead blankets).
Other Inorganic Materials	Non-metallic inorganic waste, including concrete, glass, firebrick, ceramics, sand, and inorganic sorbents.
Cellulosics	Materials generally derived from high polymer plant carbohydrates (e.g., paper, cardboard, wood, and cloth).
Rubber	Natural or man-made elastic latex materials (e.g., surgeon's gloves and leaded rubber gloves).
Plastics (Waste Materials)	Generally man-made materials, often derived from petroleum feedstock (e.g., polyethylene and polyvinylchloride).
Organic Matrix	Cemented organic resins, solidified organic liquids and sludges.
Inorganic Matrix	Any homogeneous materials consisting of sludge or aqueous-based liquids that are solidified with cement, calcium silicate, or other solidification agents; (e.g., waste water treatment sludge, cemented aqueous liquids, and inorganic particulates).
Soils/Gravel	Generally consists of naturally-occurring soils that have been contaminated with inorganic waste materials.
Steel (Packaging Materials)	208-liter (55-gallon) drums (*e.g., Steel Drums (55- and 85-gallon).
Plastics (Packaging Materials)	90-mil polyethylene drum liner and plastic bags.

* Added for clarity

Table C3-2. Minimum Training and Qualification Requirements

Personnel	Requirements
Radiography Operators ^a	Site-specific training based on waste matrix codes and waste material parameters as described in Section C3-4; requalification every 2 years

^a Operators are responsible for the actual operation of testing equipment.

Table C3-3. Testing Batch Data Report Contents

Required Information	Radiography	VE	Comment
Batch Data Report Date	X	X	
Batch number	X	X	
Waste container number	X	X	
Waste stream name and/or number	O	O	
Waste matrix code	X	X	Summary Category Group included in waste matrix code.
Implementing procedure (specific version used)	X	X	If procedure cited contains more than one method, the method used must also be cited. Can use revision number, date, or other means to track specific version used.
Container type	O	O	Drums, Pipe Overpack, SWB, TDOP, etc.
Video media reference	X	X	Reference to video media applicable to each container. For VE for newly generated waste, video media is not required if two trained operators review the contents of the waste container to ensure correct reporting.
Imaging check	O	N/A	
Camera check	N/A	O	
Audio check	O	O	
QC documentation	X	X	

Table C3-3. Testing Batch Data Report Contents (continued)

Required Information	Radiography	VE	Comment
Verification that the physical form matches the waste stream description and waste matrix code	X	X	Summary Category Group included in waste matrix code.
Comments	X	X	
Reference to or copy of associated NCRs, if any	X	X	Copies of associated NCRs must be available.
Verify absence of prohibited items	X	X	
Operator signature and date of test	X	X	Signatures of both operators required for visual verification of AK.
Data review checklists	X	X	All data review checklists will be identified.

LEGEND:

X = Required in Batch Data Report

O = Information must be documented and traceable; inclusion in Batch Data Report is optional.

C4 ACCEPTABLE KNOWLEDGE

C4-1 Introduction

The RCRA regulations codified in Title 40 Code of Federal Regulations (CFR), *Protection of Environment*, and the New Mexico Hazardous Waste Management Regulations in 20.4.1.200 NMAC, Subparts 100 through 600, Subpart 800, and Subpart 900, authorize the use of AK in appropriate circumstances by waste generators or treatment, storage, or disposal facilities to characterize hazardous waste. AK is described in *Waste Analysis at Facilities that Generate, Treat, Store and Dispose of Hazardous Waste: A Guidance Manual* (EPA 1994a). AK, as an alternative to waste sampling and analysis, is used to meet all or part of RCRA waste characterization requirements (EPA 1994a).

EPA's 1994 Waste Analysis Guidance Manual broadly defines the term "acceptable knowledge" to include process knowledge, whereby detailed information on the wastes is obtained from existing published or documented waste analysis data or studies conducted on hazardous waste generated by processes similar to that which generated the waste; facility records of analysis performed before the effective date of RCRA; and sampling and waste analysis data obtained from generators of similar wastes that send their wastes off-site for treatment, storage, or disposal (EPA 1994a). If it is determined that AK alone is insufficient to accurately characterize a waste, radiography and/or VE, may be used to complete the waste characterization process and satisfy the requirements of the WAP. AK is used in TRU waste characterization activities in five ways:

- To delineate TRU waste streams
- To assess whether TRU mixed wastes comply with the applicable requirements of the Treatment, Storage, and Disposal Facility Waste Acceptance Criteria (TSDF-WAC)
- To assess whether TRU mixed wastes exhibit hazardous characteristic (20 NMAC 4.1.200, incorporating 40 CFR § 261 Subpart C)
- To assess whether TRU mixed wastes are listed wastes (20.4.1.200 NMAC, incorporating 40 CFR § 261 Subpart D)
- To estimate waste material parameter weights

Radiography and/or VE may be performed to augment the characterization of wastes based on AK when an AK Sufficiency Determination has not been requested by the generator/storage site or, if requested, has not been granted by the DOE (see Section C4-3d). TRU waste streams undergo applicable provisions of the AK process prior to shipment of the waste to WIPP.

C4-2 Acceptable Knowledge Documentation

The CCP collects and compiles, in a logical sequence, AK information that progresses from general facility information (TRU waste management program information) to more detailed waste-specific information (TRU waste stream information).

The CCP implements the AK process as specified in the WAP to characterize TRU waste (T5). The AK information is then compiled into the AK report (and supporting documentation), as shown in Figure C4-1, Compilation of Acceptable Knowledge Documentation, in Attachment C-4 of the WAP.

The following sections include the information the Permittee will require for the CCP to characterize TRU waste using AK. Because waste generating processes are site-specific, CCP will, as necessary, augment the required AK records with additional supporting information as discussed in Section C4-2c. If the required information is not available for a particular waste stream, the waste stream is not eligible for an AK Sufficiency Determination as specified in Section C4-3d.

C4-2a Required TRU Waste Management Program Information

TRU waste management program information clearly defines waste categorization schemes and terminology, provides a breakdown of the types and quantities of TRU waste that are generated and stored by the site (and processed by the CCP), and describes how waste is tracked and managed, including historical and current operations. Information related to TRU waste certification procedures and the types of documentation (e.g., WSPFs) used to summarize AK are also provided.

The following information is included as part of the AK written record:

- A map of the site with the areas and facilities involved in TRU waste generation, treatment, and storage identified
- Facility mission description as related to TRU waste generation and management
- Description of the operations that generate TRU waste at the site
- Description of waste identification and characterization schemes used at the site or facility (e.g., content codes, item description codes)
- Types and quantities of TRU waste generated, including historical generation through future projections. Includes time and facility/site of generation
- Description of correlation of waste streams generated from the same building and process (e.g., sludge, combustibles, metals, and glass)
- Waste certification procedures for TRU wastes to be shipped to the WIPP

C4-2b Required TRU Waste Stream Information

The CCP uses AK to delineate site-specific waste streams for shipment to the WIPP. The available process information and data that supports the AK used to characterize waste streams are compiled in AK summary reports and supporting documentation in accordance with CCP-TP-005. The type and quantity of supporting documentation may vary by waste stream, depending on the waste generating process and site specific requirements imposed by the Permittee. At a minimum, the waste process information on each waste stream includes the following written information:

- Areas and buildings from which the waste stream was or is generated
- The waste stream volume and time period of waste generation
- Waste generating process described for each building (e.g., batch waste stream generated during decommissioning operations of glove boxes), including processes associated with U134 waste generation, if applicable
- Documentation regarding how the site has historically managed the waste, including the historical regulatory status of the waste (i.e., TRU mixed versus TRU non-mixed waste)
- Process flow diagrams. In the event that a process flow diagram cannot be created, a description of the waste generating process, rather than a formal process flow diagram, is used to satisfy this requirement. The use of the waste generating process description is justified, and the justification is placed in the AK record
- Material inputs or other information that identify the chemical content of the waste stream and physical waste form (e.g., glove box materials and chemicals handled during glove box operations; events or processes that may have modified the chemical or physical properties of the waste stream after generation; data obtained through VE of newly generated waste that later undergoes radiography; information demonstrating neutralization of U134 [hydrofluoric acid] and waste compatibility)

The AK written record includes a summary that identifies all sources of waste characterization information used to delineate the waste stream. The basis and rationale for delineating each waste stream, based on the parameters of interest, is clearly summarized and traceable to referenced documents. Assumptions made in delineating each waste stream also are identified and justified. If discrepancies exist between required information, then the CCP may consider applying all hazardous waste numbers indicated by the information to the subject waste stream but must assess and evaluate the information to determine the appropriate hazardous waste numbers consistent with RCRA requirements.

Implementing procedures address the following AK processes:

- Identifying and assigning the physical waste form of the waste
- Delineating waste streams and assigning Summary Category Groups and waste matrix codes
- Resolving inconsistencies in AK documentation
- Radiography and VE, if applicable
- For newly generated waste, procedures describing process controls used to ensure prohibited items (specified in Section C) are documented and managed
- Procedures to ensure that radiography and VE include a list of prohibited items that the operator verifies are not present in each container (e.g., liquid exceeding TSDF-WAC limits, corrosives, ignitables, reactives, and incompatible wastes)
- Procedures for documenting how changes to waste matrix code, waste stream assignment, and associated hazardous waste numbers based on material composition are documented for any waste
- Procedures that ensure the assignment of EPA hazardous waste numbers is appropriate, consistent with RCRA requirements, and considers site historical waste management
- Procedures for estimating waste material parameter weights

C4-2c Additional Acceptable Knowledge Information

CCP shall obtain additional acceptable knowledge information. CCP shall collect information as appropriate to augment required information and provide any other information obtained to further delineate waste stream. Adequacy of this information shall be assessed by DOE during audits. CCP will use this information to compile the acceptable knowledge written record.

All additional specific, relevant acceptable knowledge documentation assembled and used in the acceptable knowledge process, whether it supports or contradicts any required acceptable knowledge documentation, shall be identified and an explanation provided for its use (e.g., identification of a toxicity characteristic). Additional documentation may be used to further document the rationale for the hazardous characterization results. The collection and use of additional information shall be assessed by DOE during site audits to ensure that hazardous waste characterization is supported, as necessary, by such information. Similar to required information, if discrepancies exist between additional information and the required information, then

CCP may consider applying all hazardous waste numbers indicated by the additional information to the subject waste stream, but must assess and evaluate the information to determine the appropriate hazardous waste numbers consistent with RCRA requirements. All information considered must be documented and placed in the auditable record, including applicable discrepancy resolution documentation.

Additional AK documentation includes, but is not limited to, the following information:

- Process design documents (e.g., Title II Design)
- Standard operating procedures that may include a list of raw materials or reagents, a description of the process or experiment generating the waste, and a description of wastes generated and how the wastes are managed at the point of generation.
- Preliminary and final safety analysis reports and technical safety requirements
- Waste packaging records
- Test plans or research project reports that describe reagents and other raw materials used in experiments
- Site databases (e.g., chemical inventory database for Superfund Amendments and Reauthorization Act Title III requirements)
- Information from site personnel (e.g., documented interviews)
- Standard industry documents (e.g., vendor information)
- Analytical data relevant to the waste stream, including results from fingerprint analyses, spot checks, routine verification sampling or other processes that collected information pertinent to the waste stream. This may also include new information which augments required information (e.g., VE not performed in compliance with the WAP, radiography screening for prohibited items)
- Material Safety Data Sheet (MSDS), product labels, or other product package information
- Sampling and analysis data from comparable or surrogate waste streams (e.g., residues, equivalent nonradioactive materials)
- Laboratory notebooks that detail the research processes and raw materials used in an experiment

C4-3 Acceptable Knowledge Training, Procedures, and Other Requirements

The CCP uses the following to characterize TRU waste by means of AK information:

- 1) compiling the required and supporting additional AK documentation in an auditable record;
- 2) auditing AK records; and
- 3) WSPF approval and waste confirmation.

C4-3a Qualifications and Training Requirements (Q2)

The CCP and site personnel responsible for compiling AK, assessing AK, and resolving discrepancies associated with AK are qualified and trained in the following areas, at a minimum:

- WAP and TSDF-WAC requirements;
- State and Federal RCRA regulations associated with solid and hazardous waste characterization;
- Discrepancy resolution and reporting; and
- CCP and site-specific procedures associated with waste characterization using AK.

Position-specific qualification and training requirements such as those listed above for functional positions within the CCP are established by the SPM and documented (Q2). The SPM ensures that personnel conducting AK activities are qualified and trained as specified.

C4-3b Acceptable Knowledge Assembly and Compilation

The CCP process allows for the consistent application of the AK process and requirements, and addresses the following requirements (T5):

- Written procedures outlining the specific methodology used to assemble AK records, including the origin of the documentation, how it is used, and any limitations associated with the information (e.g., identify the purpose and scope of a study that included limited sampling and analysis data).
- Written procedures to compile the required AK record.

- Written procedures ensuring that unacceptable wastes (e.g., reactive, ignitable, corrosive) are identified and segregated from TRU waste populations sent to the WIPP.
- Procedures to evaluate AK and resolve discrepancies. For example, if different sources of information indicate hazardous wastes are present in a waste stream, the CCP includes all sources of information in its records and may choose to either conservatively assign hazardous waste numbers or assign only those numbers deemed appropriate and consistent with RCRA requirements. All information used to justify assignment of hazardous waste numbers must be placed in the auditable record. Further the assignment of hazardous waste numbers is traceable in the AK record to required documentation.
- Procedures to identify hazardous wastes and assign the appropriate hazardous waste numbers to each waste stream in accordance with the following minimum baseline requirements:
 - Compiling all of the required information in an auditable AK record.
 - Reviewing the compiled information and delineating waste streams. Delineation of waste streams must comply with the definition in C-0a and justify combining waste historically managed separately as TRU mixed and TRU non-mixed waste streams into a single waste stream.
 - Reviewing the compiled information to determine if the waste stream is compliant with the TSDF-WAC.
 - Reviewing the required information to determine whether the waste is listed under 20.4.1.200 NMAC (incorporating 40 CFR §261), Subpart D. Assigning all the hazardous waste numbers unless the CCP chooses to justify an alternative assignment and documents the justification in an auditable record.
 - Reviewing the required information to determine if the waste exhibits a hazardous characteristic or contains toxicity characteristic hazardous constituents specified in 20.4.1.200 NMAC (incorporating 40 CFR §261), Subpart C. If a toxicity characteristic contaminant is identified and is not included as a listed waste, sites may evaluate available data and assign the toxicity characteristic hazardous waste number consistent with RCRA requirements. All data examined to reach the hazardous waste number determination must be placed in the auditable record and must present a clear justification for the hazardous waste number analyses.

NOTE

The following paragraph has been added to show the enhancement to the AK process due to the Addendum to the Radiological Release Event Correction Plan (i.e., the AIB Report and Judgement of Needs).

- To ensure that the AK documentation relating to the management of potentially reactive, corrosive, ignitable, and incompatible TRU waste materials is adequate, current, and accurately described in existing AK Summary Reports, a onetime AK Assessment (AKA) will be performed for each new waste stream and existing waste streams with unshipped containers. The primary focus of the AKA will be to review and verify the AK documentation associated with the historic and current use of absorbents, immobilization products, and neutralization agents used in the management of potentially corrosive, ignitable, or reactive liquids. In addition the AKA will assess the specific management of other potentially incompatible or reactive materials generated at each site (e.g., reactive metals, nitrate salts).
- Reviewing the compiled information to provide an estimate of material parameter weights for each container to be stored or disposed of at WIPP.
- For newly generated wastes, procedures are developed and implemented to characterize hazardous waste using AK prior to packaging the waste.
- The CCP ensures that results of other audits of the CCP TRU waste characterization activities are available in the CCP files.
- The CCP identifies all process controls (implemented to ensure that the waste contains no prohibited items and to control hazardous waste content and/or physical form) that may have been applied to retrievably stored waste and/or may presently be applied to newly generated waste. Process controls are applied at the time of waste generation/packaging to control waste content, whereas any activities performed after waste generation/packaging to identify prohibited items, hazardous waste content, or physical form are waste characterization activities not process controls. The AK record must contain specific process controls and supporting documentation identifying when these process controls are used to control waste content. See Section C-2 for programmatic requirements related to process controls.

C4-3c Criteria for Assembling an Acceptable Knowledge Record and Delineating the Waste Stream

CCP-TP-005 describes the process for assembling AK documentation into an auditable record. The first step is to assemble the required AK information and any additional

information regarding the materials and processes that generate a specific waste stream. AK records are generated in compliance with the following criteria (T5):

- AK information is compiled in an auditable record, including a road map for applicable information.
- The overview of the facility and TRU waste management operations in the context of the facility's mission is correlated to specific waste stream information.
- Correlations between waste streams, with regard to time of generation, waste generating processes, and site-facilities are described in the AK summary report (Section C4-2b). For newly generated wastes, the rate (or schedule) and quantity of waste to be generated are also maintained in the AK process descriptions compiled in the AK summary report.

NOTE

The following paragraph has been added to show the enhancement to the AK process due to the Addendum to the Radiological Release Event Correction Plan (i.e., the AIB Report and Judgement of Needs).

- An Interface Waste Management Documents List will be initiated and maintained for each waste stream. The purpose of this form is to identify and maintain a current list of generator site plans, procedures, and reports associated with waste management, generation, treatment, packaging, repackaging, remediation, waste stream delineation, and characterization activities to be reviewed before containers are added to the Waste Containers List or Container Tracking Spreadsheet. In addition, the form identifies the point of contacts (POCs) consisting of subject matter experts (SMEs) and/or site representatives from the groups directly involved with the generation, characterization, and management of containers in the waste stream.
- A reference list provided in Section C4-3b that identifies documents, databases, QA protocols, and other sources of information that support AK information.

Container inventories are delineated into waste streams by correlating the container identifications to all of the required AK information and additional information (T5). The CCP assigns a waste matrix code and waste stream description to each container of waste using AK.

C4-3d AK Sufficiency Determination Request Contents (T5)

The CCP may submit an AK Sufficiency Determination Request (Determination Request). The Determination Request shall include, at a minimum.

- A complete AK Summary that addresses the following technical requirements:
 - Executive Summary
 - Waste Stream Identification Summary including a demonstration that the waste stream has been properly delineated and meets the Permit definition of waste stream (Attachment C, Introduction);
 - Mandatory Program Information (including, but not limited to, facility location and description, mission, defense waste assessment, spent nuclear fuel and high-level waste assessment, description of waste generating processes, research/development [as necessary], facility support operations [as applicable], types and quantities of TRU waste generated, correlation of waste streams to buildings/processes, waste identification and categorization, physical form identifiers);
 - Mandatory Waste Stream Information (including, but not limited to, Area and Building of Generation, waste stream volume/period of generation) (including, for newly generated waste, the rate and quantity of waste to be generated), waste generating activities, types of waste generated, material input related to physical form and identification of percentage of each waste material parameter in the waste stream, chemical content information including hazardous constituents and hazardous waste identification, prohibited item content (including documented evidence that the waste meets the TSDF-WAC Permit Sections 2.3.3.1 through 2.3.3.10), waste packaging, presence of filter vents, number of layers of confinement;
 - Types of supporting information gathered;
 - Container specific data (if available and relevant); and
 - A complete reference list including all mandatory and additional information.
- An AK roadmap (defined as a cross reference between mandatory programmatic and mandatory waste stream information, with references supporting these requirements).
- A complete reference list including all mandatory and additional documentation.
- Additional relevant information for the required programmatic and waste stream data addressed in the AK Summary, examples of which are presented in Section C4-2c.

- Identification of any mandatory requirements supported only by upper tier documents (i.e., there is insufficient supporting data).
- Description or other means of demonstrating that the AK process described in the Permit was followed (for example, AK personnel were appropriately trained; discrepancies were documented, etc.).
- Information showing that CCP has developed a written procedure for compiling the AK information and assigning hazardous waste numbers as required in Section C4-3b.
- Information showing that CCP has assessed the AK process (e.g., internal audits, Section C4-3b).

C4-3e Requirements for Re-evaluating Acceptable Knowledge Information (T5)

NOTE

The following next 7 paragraphs and the note below have been added to show the enhancement to the AK process due to the Addendum to the Radiological Release Event Correction Plan (i.e., the AIB Report and Judgement of Needs).

Procedures and documents listed in the Interface Waste Management Documents List, including current revisions of all procedures/documents on the list will be collected and reviewed.

The existing AK documentation associated with the historic and current waste management activities relating specifically to TRU waste generation, packaging, treatment, remediation, and characterization, focusing on the use of absorbents, immobilization products, and neutralization reagents for the waste stream will be reviewed.

The existing AK for the special testing and management activities associated with other suspect materials (e.g., met mount testing, nitrate salts, swarf conditioning, and sodium treatment) or unknown waste (e.g., unknown liquids and unlabeled chemicals) included in each waste stream will be reviewed.

Current revisions of waste management procedures collected to identify any relevant changes associated with these activities described in the AK Summary Report will be assessed.

The AK Record associated with commercial products used during these activities (e.g., MSDSs and other manufactures information), as applicable will be reviewed and updated. If necessary, obtain procurement records to verify products used.

NOTE

Procedure verification will include the review of waste management activities performed under the procedures listed on the Interface Waste Management Documents List. This "walk down" will involve discussing and/or observing the performance of procedural steps implemented by the generator relating to waste stream delineation or packaging with the appropriate site POCs/SMEs.

For the procedures listed on the Interface Waste Management Documents List, these activities will be reviewed with the cognizant POCs/SMEs to confirm procedures accurately reflect the site waste management practices, including:

- Specific products and reagents used for waste management (e.g., absorbent, immobilization, and neutralization reagents),
- Non-routine activities (e.g., unknown items) and management of unanticipated conditions

The Acceptable Knowledge Assessment Memorandum to the SPM will document the AKA. Any documented interviews on Records of Communications, as necessary, will be included.

AK includes information on the waste physical form, base materials composing the waste, and the waste generating process. Waste testing (i.e., radiography/VE) may be used to augment AK information prior to waste shipment. If retrievably stored waste must be repackaged, either VE prior to or during waste packaging or radiography after waste packaging, shall be used to confirm acceptable knowledge information.

The WSPF and CIS (including the AK summary) will be reviewed by the Permittees for each waste stream prior to DOE approval of the WSPF. The Permittees review will ensure that the submitted AK information was collected under procedures that ensure implementation of the WAP, provides data sufficient to meet the DQOs in Section C-4a(1), and allow the Permittees to demonstrate compliance with the waste analysis requirements of the Permit. A detailed discussion of the Permittees' waste stream review and DOE's WSPF approval process is provided in Section C-1d.

Re-Evaluation Based on Visual Examination and Radiography

The CCP has established procedures for re-evaluating AK if the results of waste confirmation indicate that the waste to be shipped does not match the approved waste stream, or if data obtained from VE or radiography for waste streams without an AK Sufficiency Determination exhibit this discrepancy. The CCP procedures describe how waste AK is re-evaluated, the waste is reassigned, and appropriate hazardous waste numbers assigned. If the re-evaluation requires that the waste matrix code be changed

for the waste stream or the waste does not match the approved waste stream, the following minimum steps are taken to re-evaluate AK:

- Existing information is reviewed based on the container identification number and all differences in hazardous waste number assignments are documented
- If differences exist between the hazardous waste numbers that were assigned, the information is re-assessed, and required AK information associated with the new designation is documented
- Reassess and document all testing data associated with the waste
- The reassignment of the waste matrix code is documented and verified (e.g., verification that the waste was generated within the specified time period, area, and building and waste generating process, and that the process material inputs are consistent with the waste material parameters of waste identified during VE or radiography)
- Changes to AK records are recorded
- If discrepancies exist in the AK information for the revised waste matrix code, the discrepancies are documented in an NCR in accordance with CCP-QP-005, *CCP TRU Nonconforming Item Reporting and Control*. The NCR documents the segregation of the affected portion of the waste stream, and defines the corrective actions necessary to fully characterize the waste.

C4-3f Acceptable Knowledge Data Quality Requirements (T5)

DQOs for testing techniques are described in Section C3. Testing results are used to augment the characterization of wastes based on AK. To ensure the process is consistently applied and ensure that AK information is accurate, complete, and is representative of the waste stream being evaluated, the CCP complies with data quality requirements for AK documentation in Section C3.

The CCP addresses quality control by tracking its performance with regard to the use of AK by:

- Assessing the frequency of inconsistencies among information
- Documenting the results of waste discrepancies identified by CCP during waste confirmation using radiography, review of radiography audio/video recordings, VE, or review of VE records

In addition, the AK process and waste stream documentation is evaluated through internal assessments by QA organizations and assessment by auditors or observers external to the CCP (i.e., DOE-CBFO, NMED, EPA).

C4-3g Audits of Acceptable Knowledge

The DOE conducts an initial audit of the CCP prior to certifying the CCP for shipment of waste to the WIPP. This audit establishes an approved baseline that is reassessed annually by the DOE. The CCP does not certify waste for disposal until all corrective actions have been completed.

C5 QUALITY ASSURANCE PROJECT PLAN REQUIREMENTS

C5-1 Quality Assurance Project Plans

The CCP has developed and implemented this QAPjP to address the applicable waste characterization requirements specified in the WAP. This QAPjP includes the qualitative or quantitative criteria to ensure that waste characterization activities are being performed satisfactorily. The organization(s) and position(s) responsible for implementation of this QAPjP are identified in Section B. Throughout this QAPjP, CCP documents are referenced that detail how each of the required elements of the characterization project are performed.

This QAPjP follows the format of the WAP and is implemented by the CCP through procedures that address TRU waste characterization activities. Compliance with CCP documents ensures that tasks are performed in a consistent manner that results in achieving the quality required under the QA program. The organization, format, content, and designation of the CCP procedures is described in the CCP-QP-010, *CCP Document Preparation, Approval, and Control*.

C5-2 Document Review, Approval, and Control (Q10)

Prior to the implementation of characterization activities, the SPM ensures that written procedures have been developed for implementing the requirements of this QAPjP. Procedures ensure that tasks are performed in a consistent manner and achieve the quality required for the quality assurance program. The SPM is responsible for ensuring that the procedures meet the organization, format, content, and designation of standard operating procedures. CCP procedures are written so that they may be implemented at several sites simultaneously. Site-specific issues such as safety policies, technical specification requirements, or organizational necessities, may require the CCP to prepare site-specific procedures to supplement the procedures used to ensure WAP compliance. These procedures are identified in the SOW or site interface document. These procedures are prepared and controlled as are the other existing CCP operating procedures and are subject to site specific review requirements. As a minimum, the following requirements are addressed in CCP procedures:

- Responsibilities of the organizations affected by the document,
- Technical, regulatory, quality assurance, or other program requirements,
- Sequential description of work to be performed,
- Quantitative or qualitative acceptance criteria sufficient for determining that activities were satisfactorily accomplished.

- Prerequisites, limits, precautions, process parameters, and environmental conditions,
- Special qualifications and training requirements,
- Verification points and hold points,
- Methods for demonstrating that the work was performed as required (such as provisions for recording inspection and test results, checklists, or sign-off blocks), and
- Identification and classification of QA records to be generated by the implementing procedure.

Procedures also include examples of data (e.g., reports, forms, and data validation checklists), as appropriate. Internal review and approval requirements are specified. In addition, CCP procedures are formatted, as follows:

- Purpose
- Scope
- Requirements
- Responsibilities
- Procedures
- Records

CCP procedures are reviewed for consistency with the QAPjP in accordance with the above listed requirements. The SPM is responsible for ensuring that the most current version of all procedures is readily available for use as needed by project personnel after procedures have been reviewed and approved for use.

The SPM ensures that the preparation, issuance, and change to documents that specify quality requirements or prescribe activities affecting quality for the CCP program be controlled to assure that correct and current documents are used and referenced. The CCP uses a document control format consisting of a unique document identification number, current revision number, date, and page number, which will be placed in the header on the individual pages of the document. CCP documents are delineated into five areas: quality procedures, denoted by CCP-QP-XXX; technical procedures, denoted by CCP-TP-XXX; health and safety plans denoted by CCP-HSP-XXX; configuration management denoted by CCP-CM-XXX; and CCP Project Office documents (i.e., this QAPjP), denoted by CCP-PO-XXX. "XXX" denotes a sequential number.

Qualified and independent personnel review all CCP documents (including this QAPjP) prior to approval and issuance. Reviews consider the technical adequacy, completeness, and correctness of CCP documents and the inclusion of and compliance

with the requirements established by the WAP. Approval is indicated by a signature and date page included in the front of the document. The SPM ensures that:

- Revisions to site implementing documents are denoted by including the current revision number and date on the document title page and each page of the document.
- Revised pages are marked in redline/strikeout for expeditious review of the entire document.
- A vertical bar, indicating the change to the text, is included along the left-hand margin of the page, except in the case of full document revisions.
- Revised document submittals identify the changes, the reason for the changes, and the justification for concluding that the revised contents continue to satisfy the requirements of the QA program.
- Revisions that affect performance criteria or data quality (e.g., sampling or analytical methods, QAO, calibration requirements), other than editorial or minor changes, undergo the same level of review and approval as the baseline version of each document. These documents are reviewed and approved by the same functional organizations that performed the original review/approval, unless other organizations are specifically designated in accordance with approved procedures. Editorial or minor changes may be made without the same level of review and approval as the original or otherwise changed documents. The following items are considered editorial or minor changes:
 - Correcting grammar or spelling (provided the meaning has not changed),
 - Renumbering sections or attachments,
 - Updating organizational titles (*A change in an organizational title accompanied by a change in responsibilities is not considered an editorial change*),
 - Changes to non-quality-affecting schedules,
 - Revised or reformatted forms, providing the original intent is not altered, and
 - Attachments marked "Example" or exhibits clearly intended to be representative only
- CCP personnel are responsible for reporting any obsolete or superseded information to the SPM

- All CCP changes are evaluated and approved by the SPM, the appropriate personnel are notified before implementation, and the affected documents are revised as necessary
- Changes that affect performance criteria or data quality, and would take the activity out of compliance because they alter a requirement are not made without prior approval by DOE.

In addition, the SPM is responsible for ensuring that non-administrative changes, non-editorial changes, or changes that could affect performance criteria or data quality, such as sample handling and custody requirements, sampling and analytical testing procedures, quality assurance objectives, calibration requirements, or QC sample acceptance criteria (i.e., those changes that require prior approval of DOE as defined in Section C5-2) shall be reported to DOE within five days of identification by the project level review. The SPM ensures that the document control system is implemented to control the process for initiating, revising, modifying, reviewing, and distributing project documents and changes to project documents. As potential changes to project information are identified by the SPM, documents are revised as necessary and distributed to affected organizations in accordance with this procedure.

C6 **AUDIT AND SURVEILLANCE PROGRAM**

C6-1 **Introduction**

The WIPP audit and surveillance program ensures that the CCP conducts testing of wastes in accordance with the current WAP and that waste certification information is being managed properly. The CCP addresses deficiencies identified during the audits. A deficiency is any failure to comply with an applicable requirement of the WAP.

C6-2 **Audit Procedures**

This section does not apply to the CCP.

C6-3 **Audit Position Functions**

This section does not apply to the CCP.

C6-4 **Audit Conduct**

During audit interviews or audit meetings, CCP may be advised of deficiencies identified within their areas of responsibility to establish a clear understanding of the identified condition.

The personnel will be given the opportunity to correct any deficiency that can be corrected during the audit period.

When a deficiency is identified by the DOE audit team, a Corrective Action Report (CAR) is issued to the CCP. The CCP reviews the CAR which is used to evaluate the extent and cause of the deficiency, and submits an approved response to the Permittees indicating remedial actions and actions taken to preclude recurrence. If these responses to the CAR are acceptable, DOE communicates the acceptance to the CCP.

The CCP completes the remedial actions and actions to preclude recurrence and requests DOE to close the CAR. Following the completion of corrective actions, the Permittees may schedule and perform a verification visit to assure that corrective actions have been completed and are effective.

The corrective action response includes a discussion of the investigation performed to determine the extent and impact of the deficiency, a description of the remedial actions taken, determination of root cause, and action taken to preclude recurrence.

The CCP responds to any deficiencies and observations within thirty (30) days of receipt of any CARs and indicates the corrective action taken or to be taken. If the corrective action has not been completed, the response indicates the expected date the action will be completed. CARs applicable to WAP requirements are resolved prior to waste shipment.

C7 TRU WASTE CONFIRMATION

Introduction

This section of the QAPjP describes the actions that the Permittees will take to approve and accept waste for and disposal at the WIPP, including waste confirmation activities. Discussion of the Permittees' actions that are relevant to CCP will be included here. The Permittees demonstrate compliance with the WIPP-WAP by ensuring that the waste characterization processes performed by CCP produce data compliant with the WIPP-WAP and through the waste screening and verification processes. Verification occurs at three levels: 1) the data generation level, 2) the project level, and 3) the Permittee level. The Permittees also examine a representative subpopulation of waste prior to shipment to confirm that the waste contains no ignitable, corrosive, or reactive waste; and that assigned EPA Hazardous Waste Numbers are allowed by the WIPP RCRA Permit. The waste confirmation activities described herein occur prior to shipment of the waste from the CCP to WIPP.

C7-1 Permittee Confirmation of TRU Mixed Waste

This section does not apply to CCP.

C7-1a Permittee Confirmation of a Representative Subpopulation of the Waste

The Permittees will confirm that the waste contains no ignitable, corrosive, or reactive waste through radiography or the use of VE of a statistically representative subpopulation of the waste. Prior to shipment to WIPP, waste confirmation will be performed on randomly selected containers from each CH- and RH-TRU waste stream shipment.

C7-1b Radiography Methods Requirements

This section describes the portion of the Permittees' confirmation program that applies to CCP.

For containers that have been characterized using radiography by CCP in accordance with the method in Section C1-1, the Permittees may perform confirmation by review of CCP's radiography audio/video recordings.

When confirmation is performed by review of audio/video recorded scans produced by CCP as specified in Section C1-1, independent observations will be performed on two waste containers per shipment or two containers per day, whichever is less frequent.

C7-1c Visual Examination Methods Requirements

This section describes the portion of the Permittees' confirmation program that applies to CCP.

VE may also be used as a waste confirmation method by the Permittees. VE shall be conducted by the Permittees in accordance with written standard operating procedures to describe the contents of a waste container. VE shall be conducted to identify and describe all waste items, packaging materials, and waste material parameters. VE may be used by the Permittees to examine a statistically representative subpopulation of the waste certified for shipment to WIPP to confirm that the waste contains no ignitable, corrosive, or reactive waste. This is achieved by confirming that the waste contains no liquid in excess of TSDf-WAC limits or compressed gases, and that the physical form of the waste matches the waste stream description documented on the WSPF. During packaging, the waste container contents are directly examined by trained personnel. This form of waste confirmation may be performed by the Permittees at the waste generator/storage site. VE may be documented on video and audio media, or by using a second operator to provide additional verification by reviewing the contents of the waste container to ensure correct reporting. When VE is performed using a second operator, each operator performing the VE shall observe for themselves the waste being placed in the waste container or the contents within the examined waste container when waste is not removed. The results of all VE shall be documented on data forms.

In order to keep radiation doses as low as reasonably achievable, the Permittees may use their own trained VE operators to perform VE for waste confirmation by reviewing CCP VE data, which includes VE data forms, waste packaging records, and may also include audio/video media. If the Permittees perform waste confirmation by review of video media, the video record of the VE must be sufficiently complete for the Permittees to confirm the Waste Matrix Code and waste stream description, and verify the waste contains no liquid in excess of TSDf-WAC limits or compressed gases. CCP VE video/audio media subject to review by the Permittees shall meet the following minimum requirements:

- The video/audio media shall record the waste packaging event for the container such that all waste items placed into the container are recorded in sufficient detail and shall contain an inventory of waste items in sufficient detail that a trained Permittee VE operator can identify the associated waste material parameters.
- The video/audio media shall capture the waste container identification number.
- The personnel loading the waste container shall be identified on the video/audio media or on packaging records traceable to the loading of the waste container.
- The date of loading of the waste container will be recorded on the video/audio media or on packaging records traceable to the loading of the waste container.

The Permittees may also use their own trained VE operators to perform VE for waste confirmation by reviewing VE data forms or packaging logs prepared by the generator during their packaging of the waste. To be acceptable, the CCP VE data must be signed by two CCP personnel who witnessed the packaging of the waste and must provide sufficient information for the Permittees to determine that the waste container contents match the waste stream description on the WSPF and the waste contains no liquid in excess of TSDf-WAC limits or compressed gases. The Permittees will document their review of CCP VE data on Permittee VE data forms. CCP VE forms or packaging records subject to review by the Permittees shall meet the following minimum requirements:

- At least two generator site personnel shall approve the data forms or packaging records attesting to the contents of the waste container.
- The data forms or packaging records shall contain an inventory of waste items in sufficient detail that a trained Permittee VE operator can identify the associated waste material parameters.
- The waste container identification number shall be recorded on the data forms or packaging records.

VE video media of containers which contain classified shapes shall be considered classified information. VE data forms will not contain classified information.

C7-2 Noncompliant Waste Identified During Waste Confirmation

This section describes the portion of the Permittees' confirmation program that applies to CCP.

If the Permittee identifies noncompliant waste during waste confirmation at a CCP site, (i.e., the waste does not match the waste stream description documented in the WSPF or there is liquid in excess of TSDf-WAC limits or compressed gases) the waste will not be shipped.

The DOE will suspend further shipments of the affected waste stream and issue a CAR to CCP. Shipments of affected waste streams will not resume until the CAR has been closed.

As part of the corrective action plan in response to the CAR, CCP will evaluate whether the waste characterization information documented in the CIS or WSPF for the waste stream must be updated because the results of waste confirmation for the waste stream indicated that the TRU waste being examined did not match the waste stream description. CCP will thoroughly evaluate the potential impacts on waste that has been shipped to WIPP. The DOE will evaluate the potential that prohibited items were shipped to WIPP and what remedial actions should occur, if any. The results of these

evaluations will be provided to NMED before shipments of affected waste stream resume. If the CIS and/or WSPF requires revision, shipments of the affected waste stream shall not resume until the revised waste stream waste characterization information has been reviewed and approved by the DOE. If CCP certifies noncompliant waste at a site more than once during a running 90-day period, the DOE will suspend acceptance of CCP's waste from that CCP site until the DOE finds that all corrective actions have been implemented and the site complies with all applicable requirements of the WIPP-WAP.

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15. CCP-QP-005, *CCP TRU Nonconforming Item Reporting and Control*
16. CCP-QP-008, *CCP Records Management*
17. CCP-QP-010, *CCP Document Preparation, Approval, and Control*
18. CCP-TP-005, *CCP Acceptable Knowledge Documentation*

ACRONYMS AND ABBREVIATIONS

AK	Acceptable Knowledge
AKA	Acceptable Knowledge Assessment
ATWIR	<i>Annual Transuranic Waste Inventory Report</i>
BDR	Batch Data Report
CAR	Corrective Action Report
CBFO	Carlsbad Field Office
CCP	Central Characterization Program
CFR	Code of Federal Regulations
CH	contact-handled
CIS	Characterization Information Summary
DA	data administrator
DOE	U.S. Department of Energy
DQO	data quality objective
EPA	U.S. Environmental Protection Agency
g	gram
HWA	New Mexico Hazardous Waste Act
HWDU	Hazardous Waste Disposal Unit
HWFP	<i>WIPP Hazardous Waste Facility Permit</i>
ID	identification number
in	inches
INL	Idaho National Laboratory
kV	kilovolts
LDR	Land Disposal Restrictions
Mm	millimeter
nCi	nanocuries
NCR	nonconformance report
NDE	nondestructive examination
NMAC	New Mexico Administrative Code
NMED	New Mexico Environment Department
NWP	Nuclear Waste Partnership
OJT	on-the-job training
PCB	polychlorinated biphenyls
PDP	Performance Demonstration Program
POC	point of contact
QA	quality assurance
QAO	quality assurance objective
QAPD	Quality Assurance Program Description
QAPjP	quality assurance project plan
QC	quality control
RCRA	Resource Conservation and Recovery Act
RH	remote-handled
RIDS	records inventory and disposition schedule
SLB2	standard large box 2
SME	Subject Matter Expert

ACRONYMS AND ABBREVIATIONS (Continued)

SOP	standard operating procedure
SOW	Statement of Work
SPM	Site Project Manager
SRS	Savannah River Site
SWB	standard waste box
TDOP	ten-drum overpack
TRU	transuranic
TRUCON	<i>TRUPACT Content Code</i>
TSDf-WAC	<i>Treatment, Storage, and Disposal Facility Waste Acceptance Criteria</i>
VE	visual examination
VOC	volatile organic compound
WAP	Waste Analysis Plan
WDS	Waste Data System
WIPP	Waste Isolation Pilot Plant
WSPF	Waste Stream Profile Form
WWIS	WIPP Waste Information System

Attachment 1 – Implementing Procedures

Reference Number	Procedure Number	Procedure Title
Q1	CCP-QP-001	CCP Graded Approach
Q2	CCP-QP-002	CCP Training and Qualification Plan
Q5	CCP-QP-005	CCP TRU Nonconforming Item Reporting and Control
Q8	CCP-QP-008	CCP Records Management
Q10	CCP-QP-010	CCP Document Preparation, Approval, and Control
Q14	CCP-QP-014	CCP Quality Assurance Trend Analysis and Reporting
Q15	CCP-QP-015	CCP Procurement
Q16	CCP-QP-016	CCP Control of Measuring and Testing Equipment
Q17	CCP-QP-017	CCP Identification and Control of Items
Q18	CCP-QP-018	CCP Management Assessment
Q19	CCP-QP-019	CCP Quality Assurance Reporting to Management
Q22	CCP-QP-022	CCP Software Quality Assurance Plan
Q23	CCP-QP-023	CCP Handling, Storage and Shipping
Q26	CCP-QP-026	CCP Inspection Control
Q27	CCP-QP-027	CCP Test Control
Q28	CCP-QP-028	CCP Records Filing, Inventorying, Scheduling, and Dispositioning
Q30	CCP-QP-030	CCP Written Practice for the Qualification of CCP Helium Leak Detection Personnel
Q40	CCP-QP-040	Support Training
T1	CCP-TP-001	CCP Project Level Data Validation and Verification

Attachment 1 – Implementing Procedures (Continued)

Reference Number	Procedure Number	Procedure Title
T2	CCP-TP-002	CCP Reconciliation of DQOs and Reporting Characterization Data
T5	CCP-TP-005	CCP Acceptable Knowledge Documentation
T6	CCP-TP-006	CCP Visual Examination Technique for Idaho National Laboratory (INL) Newly Generated TRU Waste
T28	CCP-TP-028	CCP Radiographic Test Drum and Training Container Construction
T30	CCP-TP-030	CCP CH TRU Waste Certification and WWIS/WDS Data Entry
T53	CCP-TP-053	CCP Standard Real-Time Radiography (RTR) Inspection Procedure
T86	CCP-TP-086	CCP CH Packaging Payload Assembly
T113	CCP-TP-113	CCP Standard Contact-Handled Waste Visual Examination
T163	CCP-TP-163	CCP Evaluation of Waste Packaging Records for Visual Examination of Records
T500	CCP-TP-500	CCP Remote-Handled Waste Visual Examination
T508	CCP-TP-508	CCP RH Standard Real-Time Radiography Inspection Procedure
T512	CCP-TP-512	CCP Remote-Handled Waste Sampling
T530	CCP-TP-530	CCP RH TRU Waste Certification and WWIS/WDS Data Entry
WP1	WP 15-GM1002	Issues Management Processing of WIPP Forms
WP2	WP 13-QA.03	Quality Assurance Independent Assessment Program

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Advanced Mixed Waste Treatment Project

(Signature on file. See DCR-20511.)

09/16/15

Date

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REVISION LOG

Revision Number	Date Approved	Pages Affected	Description of Revision
0	08/29/02	All	Initial issue. DCR-2002-1171. Document issue date was 08/29/02. DOE/WIPP approval was received 09/09/02 thus the change in effective date to 09/12/02.
1	02/26/03	Various	DCR-1821. Correct procedure titles and numbers. Added DOE-ID to the Document Approval Sheet in accordance with MP-DOCS-18.4. Document issue date was 12/19/02. DOE/WIPP approval was received 02/25/03 thus the change in effective date to 02/26/03.
2	03/10/03	12, 153	DCR-2094. Added changes to the training sections A-7 & B3-14. Document issue date was 03/10/03. DOE/WIPP approval was received 03/17/03. The change in effective date is 03/31/03.
3	08/19/04	Various	DCR-2895: Revised to reflect the addition of new headspace gas sampling system, references to facility procedures and updates to NMED's WAP. Incorporation of CBFO review comments
4	04/18/05	P69	DCR-3280. Add text to P.69, B1-1a(5): "This Section is applicable to the AMWTP such that sampling and analysis may be performed by other contractors. Level I validation will be performed by a subcontractor. Level II validation will be performed by the AMWTP PLV&V group."
5	06/09/05	54, 55	DCR-4365 Incorporation of Class 1 Permit Modification Notification to Revise Language for Compacted 55-Gallon Drums With Rigid Liners, April 27, 2005 and WIPP Memorandum CBFO:OCT:KWW:VW:05-1164-UFC:5822. Incorporated the procedure to implement the UFGTP long-term objective.
6	02/03/06	All	DCR-4640. Periodic Review. Added carbon disulfide to the target analyte list in Table B3-2. Various editorial changes.

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7	06/01/06	Various	DCR-5039. Change reference to reflect change in contractor. Editorial. BBWI address change. Optional headspace system configuration.
8	01/04/2007	All	DCR-5381. Implementation of the NMED 311 Permit modification. Incorporate CBFO DRR comments, AMWTP organization, OI-34 title change (global), and effective date to 1/24/07
9	08/09/07	Various	DCR-6104. Incorporate WIPP Class 1 Permit modifications, update procedural titles and references, and editorial changes.
10	10/24/07	Various	DCR-6307. Incorporate August 2007 WIPP Class 1 permit modifications.
11	08/29/08	Various	DCR-6887. Incorporate the Class 1 Permit Notifications, July, 2008. Add references to INST-OI-75, INST-OI-81, and CCP procedures. Update organization chart in Figure B5-1.
12	12/22/09	Various	DCR-8769. Annual review: updated the overview, description of the site, project description, and AMWTP organizations and responsibilities, WDS implementation; added characterization and AK of off-site waste, and update analytical lab name and location. Editorial changes consistent with MP-DOCS-18.3.
13	05/27/10	Various	DCR-9164. Incorporate Class 2 PMR change for liquid, VE, and NCRs.
14	12/17/10	Various	DCR-9605. Incorporate the new WIPP Hazardous Waste Permit Renewal structure (attachments and sections from B to C and modules to parts/subparts), revise the definitions of <i>waste stream</i> and <i>ITR</i> , delete (cis) 1, 2-dichloroethylene, clarify the RTR training drum VEE training, RTR independent replicate scan and oversight functions, and AK.

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A. INTRODUCTION

The Advanced Mixed Waste Treatment Project (AMWTP) characterizes and certifies contact-handled (CH) transuranic (TRU) waste for disposal at the Waste Isolation Pilot Plant (WIPP). The AMWTP has developed this Quality Assurance Project Plan (QAPjP) to comply with the *WIPP Hazardous Waste Facility Permit* (NMED 1999); *Attachment C, Waste Analysis Plan* (WIPP-WAP). The format of this document parallels that of the WIPP-WAP.

A-0 Scope

This QAPjP describes how the characterization and certification requirements of the WIPP-WAP are met at the AMWTP. The Site Project Manager (SPM) will ensure any conflicts between this QAPjP and any existing WIPP-WAP requirements are resolved.

This QAPjP implements the applicable requirements of United States (U.S.) Department of Energy (DOE)/Carlsbad Field Office (CBFO)-94-1012, Quality Assurance Program Document, which identifies the quality of data necessary to maintain quality.

A-1 Overview

The AMWTP is operated under a non-commercial contract with the DOE and is located at the Idaho National Laboratory's (INL) Radioactive Waste Management Complex (RWMC).

The AMWTP plans to dispose of approximately 65,000 m³ of contact-handled transuranic (CH-TRU) waste at the WIPP. The AMWTP retrievably-stored waste was generated by multiple DOE sites (i.e., Rocky Flats Plant, Mound, Battelle Columbus, Hanford and the AMWTP) through defense program activities, or commingled with non-defense waste that cannot be segregated. The waste was generated during plutonium operations, depleted uranium component fabrication; enriched uranium processing; support operations including radionuclide recovery, waste treatment, maintenance, laboratory analysis, and machining of non-nuclear weapon components; research and development (R&D); special order work; fabrication of ²³⁸Pu heat sources and manufacture of radioisotopic thermoelectric generators; decontaminating and decommissioning activities; and materials development. The newly generated debris waste stream is generated from supercompaction of 55-gallon containers of debris waste. TRU mixed waste processed at the AMWTP is currently stored in drums, boxes, and bins in the Transuranic Storage Area (TSA) Retrieval Enclosure (RE) and in Type II storage modules.

Each waste stream is assigned to a waste category summary to facilitate Resource Conservation and Recovery Act (RCRA) waste characterization and reflect the final waste forms acceptable for WIPP disposal. The majority of TRU mixed waste is CH-TRU. Although some remote-handled (RH) TRU waste will be encountered during the retrieval operations, the RH-TRU waste will be segregated from the CH-TRU and will not be shipped to the WIPP by the AMWTP.

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Approximately 95% of the TRU waste stored at the RWMC contains hazardous waste regulated under the RCRA. Mixed waste refers to waste that is both radioactive and contaminated by hazardous constituents, and is regulated by both the Atomic Energy Act and RCRA. Some of the waste may also contain Toxic Substance Control Act-regulated material such as polychlorinated biphenyls (PCBs) and asbestos.

Capabilities established to support the TRU waste management mission include: storage, characterization (nondestructive examination [NDE], nondestructive assay, and treatment), as appropriate. Transportation is performed by the Central Characterization Project (CCP).

A-2 Description of the Site

The AMWTP is located in the southwest corner of the INL. The INL, located approximately 30 miles west of Idaho Falls, encompasses 900 square miles. Facilities supporting characterization, treatment, certification, and transportation activities are located within the INL at the RWMC.

B. PROJECT DESCRIPTION

Consistent with requirements in the WIPP-WAP, AMWTP uses acceptable knowledge (AK) to initially characterize TRU waste which provides the basis for identifying TRU waste streams eligible for WIPP disposal. A waste stream is defined as waste materials that have common physical form, that contain similar hazardous constituents, and that are generated from a single process or activity. Once a waste stream has been identified, characterization information must be collected in order to complete and submit the WIPP Waste Stream Profile Form (WSPF) to the CBFO for approval. Waste characterization activities include the following, although not all of these techniques are used on each container: AK, radioassay (RA), real-time radiography (RTR), and visual examination (VE). RA characterization is addressed in MP-TRUW-8.1, *Certification Plan for INL Transuranic Waste*. Data generated by these methods are assessed on a waste stream basis. For each waste stream characterized, the SPM determines if sufficient data have been collected to determine the waste parameters required for completion of the WSPF. After a WSPF has been submitted to and approved by CBFO, characterization activities continue until an AK Sufficiency Determination is submitted and approved by CBFO.

B-0 AMWTP Organization and Responsibilities

The AMWTP organization and responsibilities for implementation of the requirements of this QAPjP are described in the following sections. Figure B-1 provides the organization structure.

President and Project Manager has overall responsibility for all aspects of the AMWTP, which includes permitting, operations, characterization, and certification.

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Plant Manager is responsible for the production, maintenance, and implementation necessary to support waste treatment and disposal.

TRU Programs Manager is responsible for the management and direction of activities related to the characterization, certification, transportation, and disposal of TRU waste destined for WIPP. The TRU Programs Manager's responsibilities include the following:

- Providing the necessary planning, organization, direction, control, resources, and support to achieve the defined objectives
- Ensuring compliance with all applicable regulations, DOE orders and requirements, and applicable Federal, state, and local laws
- Developing, implementing, and maintaining plans, policies, and procedures that implement WIPP requirements
- Ensuring that adequate technical and quality assurance (QA) training are provided for personnel performing WIPP activities
- Ensuring that personnel adhere to procedures for the generation, identification, control, and protection of QA records
- Identifying, investigating, reporting, and correcting quality problems.

Site Project Manager has overall responsibility for TRU waste characterization and certification activities and is responsible for the following:

- Development, maintenance, review, and implementation of procedures and reports
- Review and approval of the QAPjP and subsequent revisions
- Waste selection and tracking
- Validation/verification of data
- Reconciliation of data with data quality objectives (DQOs)
- Assignment of EPA hazardous waste numbers (HWNs)
- Preparation and submission of SPM Data Validation Summaries, WSPFs, Characterization Information Summaries, and Waste Stream Characterization Packages (if requested by CBFO)

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- Review of the QA/semiannual report, commenting if appropriate, and forwarding a copy of the report with comments to DOE-ID.

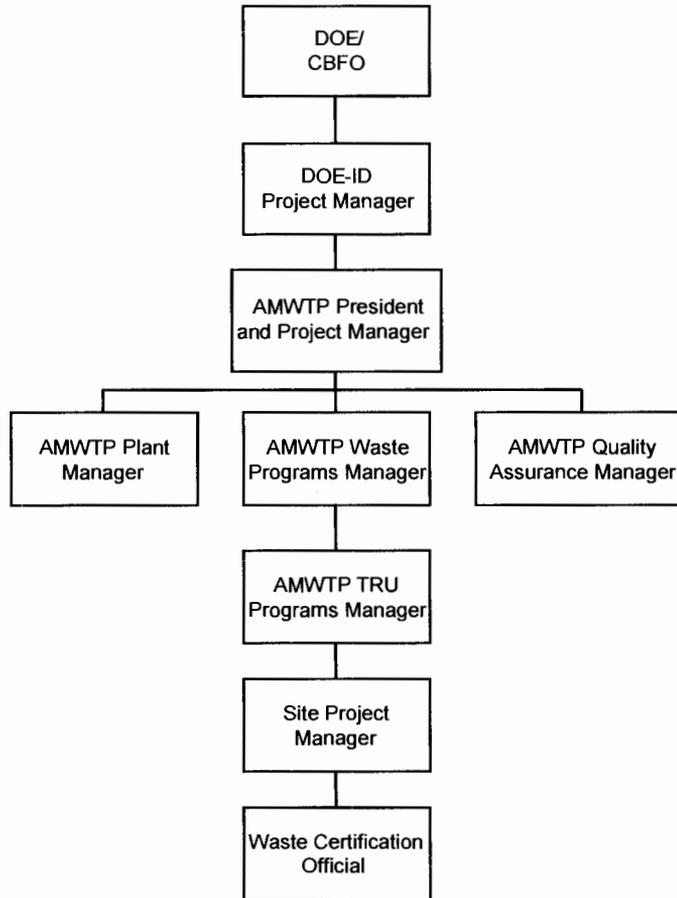


Figure B-1. AMWTP Organization.

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C. WASTE ANALYSIS PLAN

C-0 Introduction and Highlights

This QAPjP has been prepared for the management, storage, or disposal activities to be conducted at the WIPP facility to meet the requirements set forth in 20.4.1.500 New Mexico Administrative Code (NMAC; incorporating 40 Code of Federal Regulations [CFR] §264.13). Guidance in the most recent U.S. Environmental Protection Agency (EPA) manual on waste analysis has been incorporated into the preparation of the WIPP-WAP (EPA 1994). This QAPjP includes test methods, details of planned waste analysis for complying with the general waste analysis requirements of 20.4.1.500 NMAC (incorporating 40 CFR §264.13), a description of the waste shipment screening and verification process, and a description of the quality assurance/quality control (QA/QC) program. The AMWTP will implement the requirements of the WIPP-WAP prior to offering waste for shipment and disposal at WIPP.

TRU mixed wastes stored at the AMWTP were generated by DOE generator/storage sites by various specific processes and activities. Examples of the major types of operations that generated these wastes include:

- **Production of Nuclear Products** – Production of nuclear products includes reactor operation, radionuclide separation/finishing, and weapons fabrication and radionuclide separation/finishing processes. More specifically, wastes consist of residues from chemical processes, air and liquid filtration, casting, machining, cleaning, product quality sampling, analytical activities, and maintenance and refurbishment of equipment and facilities.
- **Plutonium Recovery** – Plutonium recovery wastes are residues from the recovery of plutonium-contaminated molds, metals, glass, plastic, rags, and salts used in electro refining, precipitates, firebrick, soot, and filters.
- **Research and Development** – R&D projects include a variety of hot cell or glovebox activities that often simulate full-scale operations described above, producing similar TRU mixed wastes. Other types of R&D projects include metallurgical research, actinide separations, process demonstrations, and chemical and physical properties determinations.
- **Decontamination and Decommissioning** – Facilities and equipment that are no longer needed or usable are decontaminated and decommissioned, resulting in TRU mixed wastes consisting of scrap materials, cleaning agents, tools, piping, filters, Plexiglas, gloveboxes, concrete rubble, asphalt, cinder blocks, and other building materials.

TRU mixed waste contains both TRU radioactive and hazardous components, as defined in Permit Section 1.5.7. TRU and TRU mixed waste are designated and separately packaged as either CH or RH based on the radiological dose rate at the surface of the waste container.

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The hazardous components of the TRU mixed waste to be managed at the WIPP are designated in Table C-6. Some of the waste may also be identified by unique state hazardous waste codes or numbers. These wastes are acceptable at WIPP as long as the WIPP Hazardous Waste Permit Treatment, Storage, and Disposal Facility (TSDF) Waste Acceptance Criteria (WAC) in Part 2 are met. This QAPjP describes the measures that will be taken to ensure that the TRU mixed wastes received at the WIPP facility are within the scope of Table C-6 as established by 20.4.1.500 NMAC (incorporating 40 CFR §264), and that they comply with unit-specific requirements of 20.4.1.500 NMAC (incorporating 40 CFR §264.600, Miscellaneous Units.)

Some TRU waste is retrievably stored at the AMWTP. Additional TRU waste is generated and packaged into containers. Retrievably stored waste is defined as TRU mixed waste generated after 1970 and before the New Mexico Environment Department (NMED) notifies the CBFO, by approval of the final audit report, that the characterization requirements of the WAP have been implemented. Newly-generated waste is defined as TRU mixed waste generated after NMED approves the final audit report. Acceptable Knowledge information is assembled for both retrievably stored and newly generated waste. Waste characterization of retrievably stored TRU mixed waste will be performed on an ongoing basis, as the waste is retrieved. Waste characterization of newly-generated TRU mixed waste is typically performed as it is generated, although some characterization occurs post-generation. Waste characterization is defined in Part 1 of the WIPP RCRA Permit as the activities performed by the waste generator to satisfy the general waste analysis requirements of 20.4.1.500 NMAC (incorporating 40 CFR §240.13[a]) before waste containers have been certified for disposal at WIPP. The characterization process for WIPP waste is presented in Figure C-2. AMWTP's waste characterization program was first audited by CBFO in August 2003, with NMED approving the final audit report. After this, AMWTP determines whether AK alone is sufficient for characterization, or whether radiography or VE in conjunction with AK is necessary to adequately characterize wastes. If an AK Sufficiency Determination is sought, information is provided to the CBFO for their review and provisional approval. NMED determination of adequacy of the AK information is required before final approval by the CBFO. If the radiography or VE route is chosen, the AMWTP will proceed to perform radiography or VE in conjunction with AK and in accordance with this QAPjP. Once an AK Sufficiency Determination is obtained, or when required, radiography or VE data are obtained, the AMWTP would then prepare and submit the WSPF for CBFO approval. Once the WSPF is approved, AMWTP may ship waste to WIPP. AMWTP will provide sufficient data to allow CBFO to perform waste confirmation prior to shipment of the waste from AMWTP to WIPP pursuant to Section C7 by performing RTR or VE of a representative subpopulation of certified waste containers, to ensure that the wastes meet the applicable requirements of the TSDF-WAC.

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C-0a Waste Characterization

Characterization requirements for individual containers of TRU mixed waste are specified on a waste stream basis. A waste stream is defined as waste materials that have common physical form, that contain similar hazardous constituents, and that are generated from a single process or activity. Waste streams are grouped by Waste Matrix Code Groups that relate to the physical and chemical properties of the waste. The AMWTP uses the characterization techniques described in the WIPP-WAP to assign appropriate Waste Matrix Code Groups to waste streams for WIPP disposal. The Waste Matrix Code Groups are solidified inorganics, solidified organics, salt waste, soils, lead/cadmium metal, inorganic nonmetal waste, combustible waste, graphite, filters, heterogeneous debris waste, and uncategorized metal. Waste Matrix Code Groups can be grouped into three Summary Category Groups: Homogeneous Solids (Summary Category S3000), Soil/Gravel (Summary Category S4000), and Debris Waste (Summary Category S5000).

TRU mixed waste are initially categorized into the three broad Summary Category Groups that are related to the final physical form of the waste. This categorization is based on the summary category group constituting the greatest volume of waste for a waste stream. Waste characterization requirements for these Summary Category Groups are specified in Section C-2 of this document. Each of the three broad groups is described below.

- S3000 – Homogeneous Solids

Homogeneous solids are defined as solid materials, excluding soil, that do not meet the NMED criteria for classification as debris (20 NMAC 4.1.800, incorporating 40 CFR §268.2[g] and [h]). Included in the series of homogeneous solids are inorganic process residues, inorganic sludges, salt waste, and pyrochemical salt waste. Other waste streams are included in this Summary Category Group based on the specific waste stream types and final waste form. This Summary Category Group is expected to contain toxic metals and spent solvents. This category includes wastes that are at least 50 percent by volume homogeneous solids.

- S4000 – Soils/Gravel

This Summary Category Group includes S4000 waste streams that are at least 50 percent by volume soil/gravel. This Summary Category Group is expected to contain toxic metals.

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- S5000 – Debris Wastes

This Summary Category Group includes heterogeneous waste that is at least 50 percent by volume materials that meet the criteria specified in 20 NMAC 4.1.800 (incorporating 40 CFR §268.2[g]). Debris means solid material exceeding a 2.36-inch (60 millimeter [mm]) particle size that is intended for disposal and that is:

1. A manufactured object, or
2. Plant or animal matter, or
3. Natural geologic material.

Particles smaller than 2.36 inches in size may be considered debris if the debris is a manufactured object and if it is not a particle of S3000 or S4000 material.

The AMWTP characterizes waste in accordance with this QAPjP and ensures that waste proposed for storage and disposal at WIPP meets the applicable requirements of the WIPP Hazardous Waste Permit TSDF-WAC. The AMWTP assembles the AK information into an auditable record^a for the waste stream as described in Attachment C4. For those waste streams with an approved AK Sufficiency Determination, radiography or VE per the methods described in Attachment C1 is not required.

All waste characterization activities specified in this QAPjP are carried out at the AMWTP and, as applicable, at the WIPP approved laboratories in accordance with the WIPP-WAP. CBFO will audit generator/storage site waste characterization programs and activities as described in Section C-3. Waste characterization activities at the AMWTP include the following, as discussed in Section C-3:

- Real-time radiography, which is an x-ray technique to determine physical contents of containers
- Visual examination of opened containers as an alternative way to determine their physical contents
- Compilation of AK documentation into an auditable record.

a. "Auditable Records" are those records which allow the CBFO to conduct a systematic assessment, analysis, and evaluation of the site's compliance with the QAPjP and the WIPP RCRA Permit.

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C-0b AK Sufficiency Determination

AMWTP may submit a request to the CBFO for an AK Sufficiency Determination (Determination Request) to be exempt from the requirement to perform radiography or VE based on AK. The contents of the Determination Request are specified in Permit Attachment C4, Section C4-3d.

The CBFO shall evaluate the Determination Request for completeness and technical adequacy. This evaluation shall include, but be limited to whether the Determination Request is technically sufficient for the following:

- The Determination Request must include all information specified in Attachment C4, Section C4-3d.
- The AK Summary must identify relevant hazardous constituents and must correctly identify all TC and listed EPA HWNs.
- All EPA HWN assignments must be substantiated by supporting data and, if not, whether this lack of substantiation compromises the interpretation.
- Resolution of data discrepancies between different AK sources must be technically correct and documented.
- The AK Summary must include all the identification of waste material parameter weights by percentage of the material in the waste stream and determinations must be technically correct.
- All prohibited items specified in the WIPP Hazardous Waste Permit TSDF-WAC should be addressed and conclusion drawn must be technically adequate and substantiated by supporting information.
- If the AK record includes process control information specified in Attachment C4, Section C4-3b, the information should include procedures, waste manifests, or other documentation demonstrating that the controls were adequate and sufficient.
- The AMWTP must provide the supporting information necessary to substantiate technical conclusions within the Determination Request and this information must be correctly interpreted.

The CBFO will review the Determination Request for technical adequacy and compliance with the requirements of the WIPP-WAP, using trained and qualified individuals in accordance with the standard operating procedures that, at a minimum, address all of the technical and procedural requirements listed above. CBFO shall resolve comments with AMWTP.

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If CBFO determines that the AK is sufficient, they will inform the public of the Determination Request, the CBFO evaluation of it, and the date and time of a public meeting to provide information to and solicit comments from interested members of the public hearing regarding the Determination Request. Notice of the meeting and comment period shall be provided by the following:

1. Written notice to all individuals on the facility mailing list
2. Public notice in area newspapers, including the *Carlsbad Current-Argus*, *Albuquerque Journal*, and *Santa Fe New Mexican*
3. Notice on the WIPP home page
4. E-mail notification as specified in Permit Section 1.11.

CBFO will take written comment of the Determination Request for at least 30 days following the public meeting. CBFO will compile all comments, including any disagreement between the CBFO and commenters.

If CBFO provisionally approves the Determination Request, they may forward it along with all relevant information submitted with the Determination Request to NMED for an evaluation that the provisional approval made by the CBFO is adequate. CBFO will also provide NMED with a separate appendix to the Determination Request, the compilation of all comments, and CBFO's response to each comment. After submitting a Determination Request to NMED, the CBFO will post a link to the transmittal letter to NMED on the WIPP Home Page and inform those on the e-mail notification list as specified in Permit Section 1.11. Based on the results of NMED's evaluation, the CBFO will notify the AMWTP whether the AK information is sufficient and the Determination Request is approved. The CBFO will not approve a Determination Request that NMED has determined to be inadequate unless the AMWTP resolves the inadequacies and provides the resolution to NMED for evaluation of adequacy. Should the inadequacies not be resolved to NMED's satisfaction, the CBFO shall not submit a Determination Request for the same waste stream at a later date. CBFO shall not submit a Determination Request if a previous Determination Request is pending evaluation by NMED.

In the event CBFO disagrees, in whole or in part, with an evaluation performed by NMED resulting in a determination by NMED that CBFO's provisional approval for a particular waste stream is inadequate, CBFO may seek dispute resolution. The dispute resolution process is specified in Part 1. The Secretary's final decision under Permit Section 1.16.4 shall constitute a final agency action.

By July 1 of each year, the CBFO will submit to NMED a list of waste streams that CBFO may submit for an AK Sufficiency Determination during the upcoming federal fiscal year. The CBFO will post a link to the transmittal letter to NMED and announce a public meeting to discuss the

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list with interested members of the public on the WIPP Home Page and inform those on the e-mail notification list as specified in Permit Section 1.11.

If AMWTP does not submit a Determination Request, or if the CBFO does not approve a Determination Request, or if NMED finds that the CBFO's provisional approval of a Determination Request is inadequate, the AMWTP shall perform RTR or VE on 100% of the containers in a waste stream.

If the AMWTP submits a Determination Request, CBFO provisionally approves the Determination Request and NMED finds that CBFO's provisional approval is adequate, neither radiography nor VE of the waste stream is required.

C-0c Waste Stream Profile Form Completion

After a complete AK record has been compiled and either a Determination Request has been approved by the CBFO or the AMWTP has completed, the applicable testing requirements specified in Attachments C1, AMWTP will complete a WSPF and Characterization Information Summary (CIS). The requirements for the completion of a WSPF and a CIS are specified in Attachment C3, Sections C3-6b(1) and C3-6b(2), respectively.

The WSPF and CIS for the waste stream resulting from waste characterization activities are transmitted to the CBFO, who reviews them for completeness and screens them for acceptance prior to loading any TRU mixed waste into the CH or RH packaging, as described in Section C-4. The review and approval process will ensure the submitted waste analysis information is sufficient to meet the DQOs for AK in Section C-4a(1) and allow the CBFO to demonstrate compliance with the requirements of this QAPjP. Only TRU mixed waste and TRU waste that has been characterized in accordance with the WIPP-WAP and that meets the WIPP Hazardous Waste Permit TSDF-WAC will be accepted at the WIPP facility for disposal. Upon notification of DOE's approval of the WSPF by the CBFO, the AMWTP may be authorized to ship waste to WIPP.

In the event CBFO requests detailed information on a waste stream, the AMWTP will provide a Waste Stream Characterization Package (Section C3-6b[2]). For each waste stream, this package will include the WSPF, the CIS, and the complete AK summary. The Waste Stream Characterization Package will also include specific BDRs and raw data associated with waste container characterization as requested by CBFO.

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C-0d Waste Confirmation

The CBFO will perform waste confirmation on a representative subpopulation of each waste stream shipment after certification and prior to shipment pursuant to Attachment C7. The CBFO will use radiography, review of radiography audio/video recordings, VE, or review of VE records (e.g., VE data sheets or packaging logs), to examine at least 7 percent of each waste stream shipment to confirm that the waste does not contain ignitable, corrosive, or reactive waste. Waste confirmation will be performed by the CBFO prior to shipment of the waste from AMWTP to WIPP.

C-1 Identification of TRU Mixed Waste to be Managed at the WIPP Facility

C-1a Waste Stream Identification

TRU mixed waste destined for disposal at WIPP is characterized on a waste stream basis. The AMWTP delineates waste streams using AK. Required AK is specified in Section C-3a and C4.

C-1b Waste Summary Category Groups and Hazardous Waste Accepted at the WIPP Facility

Once a waste stream has been delineated, a Waste Matrix Code is assigned to the waste stream based on the physical form of the waste. Waste streams are then assigned to one of three broad Summary Category Groups: S3000-Homogeneous Solids, S4000-Soils/Gravel, and S5000-Debris Wastes. These Summary Category Groups are used to determine further characterization requirements.

The AMWTP ships only those TRU mixed waste streams which have EPA HWNs already listed in Table C-6. Some of the waste may also be identified by unique state hazardous waste codes or numbers. These wastes are acceptable at the WIPP as long as the WIPP Hazardous Waste Permit TSDF-WAC is met. The AMWTP will perform characterization of all waste streams as required by the WIPP-WAP. If during the characterization process, new EPA HWNs are identified; those wastes will not be shipped for disposal to the WIPP facility until the EPA HWN has been added to the WIPP Hazardous Waste permit and AMWTP WSPF.

C-1c Waste Prohibited at the WIPP Facility

The following TRU mixed wastes are prohibited at WIPP and therefore will not be shipped to the WIPP facility for disposal:

- Liquid waste is not acceptable at WIPP. Liquid in the quantities delineated below is acceptable.
 - Observable liquid shall be no more than 1 percent by volume of the outermost container at the time of RTR or VE.

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- Internal containers with more than 60 (mL) or 3% by volume observable liquid, whichever is greater, are prohibited.
- Containers with EPA HWN U134 assigned shall have no observable liquid.
- Overpacking the outermost container that was examined during radiography or VE or redistributing untreated liquid within the container shall not be used to meet the liquid volume limits.
- Non-radionuclide pyrophoric materials, such as elemental potassium.
- Hazardous wastes not occurring as co-contaminants with TRU mixed waste (non-mixed hazardous waste).
- Wastes incompatible with backfill, seal and panel closures materials, container and packaging materials, shipping container materials, or other wastes.
- Wastes containing explosives or compressed gases.
- Wastes with PCBs not authorized under an EPA PCB waste disposal authorization.
- Wastes exhibiting the characteristic of ignitability, corrosivity, or reactivity (EPA HWNs D001, D002, or D003).
- Waste that has ever been managed as high-level waste and waste from tanks specified in Table C-5, unless specifically approved through a WIPP RCRA Permit Modification.
- Any waste container from a waste stream (or waste stream lot), which has not undergone either RTR or VE of a statistically representative subpopulation of the waste stream in each shipment, pursuant to Attachment C7.
- Any waste container from a waste stream, which has not been preceded by an appropriate, certified WSPF (refer to Section C-1d of this document).

Before shipping a container holding TRU mixed waste to the WIPP facility, CBFO will perform waste confirmation activities pursuant to Attachment C7 on each waste stream shipment to confirm that the waste does not contain ignitable, corrosive, or reactive waste and the assigned EPA HWNs are allowed for storage and disposal by the WIPP RCRA Permit. Section C-4 and Attachment C7 include descriptions of the waste confirmation processes that are conducted prior to shipping waste to the WIPP facility.

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Containers are vented through filters allowing any gases that are generated by radiolytic and microbial processes within a waste container to escape, thereby preventing over pressurization or development of conditions within the container that would lead to the development of ignitable, corrosive, reactive, or other characteristic wastes.

To ensure the integrity of the WIPP facility, waste streams identified to contain incompatible materials or materials incompatible with waste containers are not shipped to the WIPP until after they have been treated to remove the incompatibility. Only those waste streams that are compatible or have been treated to remove incompatibilities are shipped to the WIPP.

C-1d Control of Waste Acceptance

Every waste stream shipped to WIPP shall be preceded by a WSPF (Figure C-1) and a CIS. The required WSPF information and the CIS elements are discussed in Section C3-6(1) and Section C3-6(2).

The AMWTP provides the WSPF for each waste stream to CBFO for acceptance prior to shipping the waste (refer to MP-TRUW-8.14, *Preparation of Waste Stream Profile Forms*) to the WIPP. The WSPF and CIS will be transmitted to CBFO for each waste stream. If continued waste characterization reveals discrepancies that identify different EPA HWNs or indicates that the waste belongs to a different waste stream, the waste is redefined to a separate waste stream, and a new WSPF is submitted. The AMWTP will develop criteria to determine the specific circumstances under which a WSPF is revised, versus when a new WSPF is required. These criteria will be evaluated during site audits (Attachment C6). Any time CBFO requests additional information concerning a waste stream, the AMWTP will provide a Waste Stream Characterization Package. The option to request additional information ensures that waste being offered for disposal is adequately characterized and accurately described in the WSPF.

C-1e Waste Generating Processes at the WIPP Facility

The requirements contained in this section are specific to the WIPP facility. Therefore, these requirements have not been addressed in this document.

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C-2 Waste Characterization Program Requirements and Waste Characterization Parameters

AMWTP has developed procedures which specify programmatic waste characterization requirements. CBFO evaluates the procedures during audits conducted under the CBFO Audit and Surveillance Program (Section C-5a[3]), and may also evaluate the procedures as part of the review and approval process of the WSPF. AMWTP must notify CBFO and obtain approval prior to making data-affecting modifications to procedures (Attachment C3, Section C3-9). Program procedures shall address the following minimum elements:

- Waste characterization and certification procedures for retrievably stored and newly generated wastes to be sent to the WIPP facility.
- Methods used to ensure prohibited items are documented and managed. These will include procedures for performing RTR, VE, or treatment, if these methods are used to ensure prohibited items are not present in the waste prior to shipment of the waste to WIPP.
- Identify the organizations responsible for compliance with waste characterization and certification procedures.
- Identify the oversight procedures and frequency of actions to verify compliance with waste characterization and certification procedures.
- Develop training specific to waste characterization and certification procedures.
- Ensure that personnel may stop work if noncompliance with waste characterization or certification procedures is identified.
- Develop a nonconformance process that complies with the requirements in Attachment C3 of this QAPjP to document and establish corrective actions.
- As part of the corrective action process, assess the potential time frame of the noncompliance, the potentially affected waste populations, and the reassessment and recertification of those wastes.
- A list of all approved EPA HWNs, which are acceptable at WIPP, is included in Table C-6.

For those waste streams or containers that are not amenable to RTR (e.g., RH TRU mixed waste, direct loaded ten-drum overpacks) for waste confirmation by CBFO pursuant to Attachment C7, AMWTP VE data may be used for waste acceptance. In those cases, the CBFO will review the AMWTP VE procedures to ensure that data sufficient for the CBFO's waste acceptance activities pursuant to Attachment C7 will be obtained and the procedures meet the minimum requirements for VE specified in Attachment C1, Section C1-4.

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The following waste characterization parameters are obtained at the AMWTP:

- Determination whether TRU mixed waste streams comply with the applicable provisions of the WIPP Hazardous Waste Permit TSDF-WAC
- Determination whether TRU mixed wastes exhibit a hazardous characteristic (20.4.1.200 NMAC incorporating 40 CFR, §261, Subpart C)
- Determination whether TRU mixed waste are listed (20.4.1.200 NMAC incorporating 40 CFR §261, Subpart D)
- Estimation of waste material parameter weights.

Table C-1 provides the parameters of interest for the various constituent groupings and testing methodologies. The following sections provide a description of the acceptable methods to evaluate these parameters for each Summary Category Group.

C-3 Generator Waste Characterization Methods

The characterization techniques used by the AMWTP includes AK and may also include, as necessary, RTR and VE. AMWTP receives offsite DOE CH-TRU waste that may require generator requested characterization or characterization, profiling, and certification by AMWTP for disposal at WIPP. All characterization activities are performed in accordance with this QAPjP. Table C-1 provides a summary of the characterization requirements for TRU mixed waste.

C-3a Acceptable Knowledge

AK is used in TRU mixed waste characterization activities in five ways:

- To delineate TRU mixed waste streams
- To assess whether TRU mixed wastes comply with the WIPP Hazardous Waste Permit TSDF-WAC
- To assess whether TRU-mixed wastes exhibit a hazardous characteristic (20.4.1.200 NMAC, incorporating 40 CFR §261, Subpart C)
- To assess whether TRU mixed wastes are listed (20 NMAC 4.1.200, incorporating 40 CFR §261, Subpart D)
- To estimate waste material parameter weights.

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AK is discussed in detail in Section C4, which outlines the minimum set of requirements and DQOs that are met by the AMWTP in order to use AK. In addition, Section C-5a(3) of this QAPjP describes the assessment of AK through the CBFO's Audit and Surveillance Program.

C-3b Radiography and Visual Examination

Radiography and VE are nondestructive qualitative and quantitative techniques used to identify and verify waste container contents as specified in Attachment C1. AMWTP performs RTR or VE on 100 percent of CH-TRU mixed waste containers in waste streams except for those waste streams for which the CBFO approves a Determination Request. No RH-TRU mixed waste will be shipped to WIPP for storage or disposal without documentation of RTR or VE of 100 percent of the containers as specified in Attachment C1.

Radiography and/or VE are used, when necessary, to examine a waste container to verify the physical form of the waste matches its waste stream description as determined by AK. These techniques can detect observable liquid in excess of TSDF-WAC limits and containerized gases, which are prohibited for WIPP disposal. The prohibition of liquid in excess of TSDF-WAC limits and containerized gases prevents the shipment of corrosive, ignitable, or reactive wastes.

Radiography and/or VE are also used to verify that the physical form of the waste matches its waste stream description (i.e., homogeneous solids, soil/gravel, or debris waste [including unclassified metals]). If the physical form does not match the waste stream description, the waste is designated as another waste stream and assigned the preliminary EPA HWNs associated with that new waste stream assignment. That is, if RTR and/or VE indicate that the waste does not match the waste stream description arrived at by AK characterization, a nonconformance report (NCR) is completed, the inconsistency is resolved as specified in Section C4, and the NCR will be dispositioned as specified in Section C3-7 of this document. The proper waste stream assignment is determined (including preparation of a new WSPF), the correct EPA HWNs are assigned, and the resolution is documented. Refer to Attachment C4 for a discussion of AK and its verification process.

When VE is used, the detection of any liquid in non-transparent internal containers, detected from shaking the internal container, will be handled by assuming that the internal container is filled with liquid and adding this volume to the total liquid in the container being characterized using VE. The container being characterized using VE will be rejected and/or repackaged to exclude the internal container if it is over the WIPP Hazardous Waste Permit TSDF-WAC limits. When RTR is used, or VE of transparent containers is performed, if any liquid in internal containers is detected, the volume of liquid is added to the total for the container being characterized using RTR or VE.

Radiography, or the equivalent, will be used, as necessary, on the existing/stored waste containers to verify the physical characteristics of the TRU mixed waste correspond with its waste stream identification/waste stream Waste Matrix Code and to identify prohibited items.

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Radiographic examination protocols and QA/QC methods are provided in Section C1. Radiography and VE shall be subjected to the CBFO's Audit and Surveillance Program (Attachment C6).

C-4 Data Verification and Quality Assurance

Data validation, usability, and reporting controls are used to ensure that the TRU mixed waste shipped to the WIPP facility for disposal meets WIPP-WAP requirements. Verification steps are taken at three levels: (1) the AMWTP data generation level, (2) the AMWTP project level, and (3) the CBFO level. The validation and verification process and requirements at each level are described in Section C3-4. The verification process at the CBFO level is also described in Section C-5.

C-4a Data Generation and Project Level Verification Requirements

C-4a(1) Data Quality Objectives

The waste characterization data obtained through implementation of the QAPjP will be used to ensure that the waste meets regulatory requirements and to ensure that TRU mixed waste is properly managed during the disposal phase. To satisfy the RCRA regulatory compliance requirements, the following DQOs are established in the WIPP-WAP:

- Acceptable Knowledge
 - To delineate TRU mixed waste streams
 - To assess whether TRU mixed wastes comply with the applicable requirements of the WIPP Hazardous Waste Permit TSDF-WAC
 - To assess whether TRU mixed wastes exhibit a hazardous characteristic (20.4.1.200 NMAC, incorporating 40 CFR §261, Subpart C)
 - To assess whether TRU mixed wastes are listed (20.4.1.200 NMAC, incorporating 40 CFR §261, Subpart D)
 - To estimate waste material parameters weights.
- Radiography and VE
 - To verify the TRU mixed waste streams contain no prohibited items and to verify the physical form of the waste matches the waste stream description as determined by AK.

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Reconciliation of these DQOs by the SPM is addressed in Attachment C3. Reconciliation requires determining whether sufficient type, quality, and quantity of data have been collected to ensure the DQOs cited above can be achieved (refer to MP-TRUW-8.11, *Data Reconciliation*).

C-4a(2) Quality Assurance Objectives

The AMWTP shall demonstrate compliance with each QAO associated with the characterization methods as presented in Attachment C3. The SPM shall perform a reconciliation of the data with the DQOs established in the WIPP-WAP. The SPM shall conclude that all of the DQOs have been met for the characterization of the waste stream prior to submitting a WSPF to the WIPP facility for approval (refer to Attachment C3). The following QAO elements are considered for each technique, as a minimum:

- Precision
 - Precision is a measure of the mutual agreement among multiple measurements.
- Accuracy
 - Accuracy is the degree of agreement between a measurement result and the true or known value.
- Completeness
 - Completeness is a measure of the amount of valid data obtained from a method compared to the total amount of data obtained that is expressed as a percentage.
- Comparability
 - Comparability is the degree to which one data set can be compared to another.
- Representativeness
 - Representativeness expresses the degree to which data represent characteristics of a population.

A more detailed discussion of the QAOs, can be found in Attachment C3, which describes the QAOs associated with each test method.

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C-4a(3) Data Generation

Batch Data Reports, in a format approved by the CBFO, are used by the AMWTP for reporting waste characterization data. This format is included in the AMWTP QAPjPs, as applicable, controlled electronic databases, and MP-TRUW-8.8, *Level 1 Data Validation*, which includes all of the elements required by this QAPjP for BDRs (refer to Attachment C3).

The CBFO performs audits of the AMWTP waste characterization program, as implemented by the AMWTP QAPjP, to verify compliance with the WAP and the DQOs in this QAPjP (See Attachment C6 for a discussion of the content of the audit program). The primary functions of these audits are to review AMWTP adherence to the requirements of this QAPjP and ensure adherence to the WAP characterization program. CBFO shall provide the results of the audit to NMED. If audit results indicate that the AMWTP is not in compliance with the requirements of this QAPjP, the CBFO will take appropriate action as specified in Attachment C6.

C-4a(4) Data Verification

Batch Data Reports document the testing results from the required characterization activities, and include documentation of required QA/QC activities. Data validation and verification at both the data generation level and the project level are performed before the required data are transmitted to the WIPP facility. Attachment C3 discusses the data validation process in more detail. NMED may request, through the CBFO, copies of any BDR, and/or the raw data validated by the AMWTP, to check the CBFO audit of the validation process.

C-4a(5) Data Transmittal

Batch Data Reports include information required by Section C3-4 and are transmitted by hard copy or electronically (provided a hard copy is available on demand) from the data generation level to the project level. The AMWTP transmits waste container information electronically via the Waste Data System (WDS)/WIPP Waste Information System (WWIS) in accordance with MP-TRUW-8.5, *TRU Waste Certification*. Data is entered into the WDS/WWIS in the exact format required by the database. Refer to Section C-5a(1) for WDS/WWIS reporting requirements and DOE/WIPP-09-3427, *Waste Data System User's Manual*, for WDS/WWIS data fields and format requirements.

Once a waste stream is characterized, the SPM also submits to the WIPP facility a WSPF (Figure C-1) accompanied by the CIS for the waste stream which includes reconciliation with DQOs (refer to Sections C3-6b[1] and C3-6b[2]). The WSPF, the CIS, and information from the WDS/WWIS are used as the basis for acceptance of waste characterization information on TRU mixed waste disposed at WIPP.

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C-4a(6) Records Management

Records related to waste characterization activities performed by the AMWTP are maintained in the AMWTP site project files or at the WIPP Records Archive facility. Raw data obtained by testing TRU mixed waste in support of this QAPjP will be identifiable, legible, and provide documentary evidence of quality.

An electronic records system, (the equivalent of a CBFO required Records Inventory and Disposition Schedule [RIDS]) has been prepared, approved, and implemented by the AMWTP. All records relevant to an enforcement action under the WIPP Permit, regardless of disposition, are maintained at the AMWTP until NMED determines that the records are no longer needed for enforcement action. The records will then be dispositioned as specified in the approved implementing procedure. All waste characterization data and related QA/QC records for TRU mixed waste to be shipped to the WIPP facility are designated as either Lifetime Records or Non-Permanent Records. Records that are designated as Lifetime Records are maintained for the life of the AMWTP waste characterization program plus six years or transferred for permanent archival storage to the WIPP Records Archive facility.

Waste characterization records include historical characterization records (i.e., headspace gas sampling/analysis and homogeneous solids and soil/gravel sampling/analysis) generated through implementation of previous requirements in the WAP. Those waste characterization records designated as Non-Permanent Records are maintained for ten years from the date of (record) generation either at AMWTP or at the WIPP Records Archive facility and then dispositioned according to the requirements defined in MP-DOCS-18.2, *Records Management*. If the AMWTP ceases to operate, all records will be transferred before closeout for management at the WIPP Records Archive facility. Table C-3 provides a listing of records designated as Lifetime Records and Non-Permanent Records. Classified information will not be transferred to WIPP. Although the AMWTP expects no classified information, a notation will be provided to CBFO indicating the absence of classified information. The AMWTP will identify appropriate disposition of classified information. Nothing in this QAPjP is intended to, nor should it be interpreted to, require the disclosure of any DOE classified information to persons without appropriate clearance to view such information.

C-5 CBFO Level Waste Stream Screening and Verification of TRU Mixed Waste

CBFO waste screening is a two-phased process. Phase 1 occurs prior to configuring shipments of TRU mixed waste. Phase II occurs after configuration of shipments of TRU mixed waste but before it is disposed at the WIPP facility. Figure C-3 presents Phase I and a portion of Phase II of the TRU mixed waste screening process. Attachment C7 presents the TRU mixed waste confirmation portion of Phase II activities.

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C-5a Phase 1 Waste Stream Screening and Verification

The first phase of the waste screening and verification process occurs before TRU mixed waste is shipped to the WIPP facility. Before CBFO begins the process of accepting TRU mixed waste from the AMWTP, an initial audit of the AMWTP is conducted as part of the CBFO Audit and Surveillance Program. The RCRA portion of the AMWTP audit provides onsite verification of characterization procedures; BDR preparation; and recordkeeping to ensure that all applicable provisions of the WAP requirements are met. Another portion of the Phase 1 verification is the WSPF approval process. At the WIPP facility, this process includes verification that all of the required elements of the WSPF and the CIS are present and that the waste characterization information meet the acceptance criteria required for compliance with this QAPjP (Section C3-6b[1]).

After the AMWTP has prepared this QAPjP, which includes applicable WAP requirements, it is submitted to CBFO for review and approval. Once approved, a copy is provided to NMED for examination. The AMWTP will implement the specific parameters of the QAPjP after it is approved. An initial audit was performed after QAPjP implementation and prior to AMWTP being certified for shipment of waste to WIPP. Additional audits, focusing on the results of waste characterization, will be performed at least annually. CBFO has the right to conduct unannounced audits and to examine any records that are related to the scope of the audit. See Section C-5a(3) and Attachment C6 for further information regarding audits.

When the required waste stream characterization data have been collected by the AMWTP and the initial AMWTP audit has been successfully completed, the SPM will verify that the waste stream characterization meets the applicable QAPjP requirements as part of the project level verification (Section C3-4b). If the waste characterization does not meet the applicable requirements of the QAPjP, the mixed waste stream cannot be shipped until those requirements are met. The SPM will then complete a WSPF and submit it to CBFO, along with the accompanying CIS for that waste stream (Section C3-6b[1]). All data necessary to check the accuracy of the WSPF will be transmitted to CBFO for verification. This provides notification that the AMWTP considers that the waste stream (identified by the waste stream identification number) has been adequately characterized for disposal prior to shipment to WIPP. The CBFO compares, RTR and VE data obtained subsequent to submittal and approval of the WSPF (and prior to submittal) with characterization information presented on this form. If CBFO determines (through the data comparison) that the characterization information is adequate, the WSPF will be approved. Prior to the first shipment of containers from the approved waste stream, the approved WSPF and accompanying CIS is provided to the NMED. If the data comparison indicates that analyzed containers have hazardous wastes not present on the WSPF, or a different Waste Matrix Code applies, the WSPF is in error and shall be resubmitted. Ongoing WSPF examination is discussed in detail in Section C-5a(2).

Audits of AMWTP are conducted as part of the CBFO's Audit and Surveillance Program (Attachment C6). The RCRA portion of the AMWTP site audit program provides onsite

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verification of waste characterization procedure; BDR preparation; and record keeping ensuring that all applicable provisions of the WIPP-WAP requirements are met. As part of the waste characterization data submittal, the AMWTP also transmits the data on a container-by-container basis via the WDS/WWIS. This data submittal can occur at any time as the data are being collected, but will be complete for each container prior to shipment of that container. The WDS/WWIS will conduct internal edit/limit checks as the data is entered and made available to CBFO as supporting information for WSPF review. The initial WSPF check performed by CBFO will include WDS/WWIS data submitted by AMWTP for each waste container submitted for the WSPF review and the CIS. The CBFO will compare ongoing characterization data obtained and submitted via the WDS/WWIS to the approved WSPF. If this comparison shows that containers have hazardous wastes not reported on the WSPF, or a different Waste Matrix Code applies, the data are rejected and the waste containers are not accepted for shipment until a new or revised WSPF is submitted to and approved by the CBFO.

If discrepancies regarding EPA HWN assignment or Waste Matrix Code designation arise as a result of the Phase 1 review, the AMWTP will be contacted and required to provide the necessary additional information to resolve the discrepancy before the waste stream is approved for disposal at the WIPP facility. If the discrepancy is not resolved, the waste stream will not be approved.

C-5a(1) WDS/WWIS Description

All generator/storage sites planning to ship TRU mixed waste to WIPP will supply the required data to the WDS/WWIS. The WDS/WWIS Data Dictionary includes all of the data fields, the field format, and the limits associated with the data as established by this QAPjP. The data will be subjected to edit and limit checks that are performed automatically by the database as defined in the Waste Data System User's Manual. (DOE 2009)

The CBFO will coordinate the data transmission with AMWTP. Actual data transmission will use appropriate technology to ensure the integrity of the data transmissions. The CBFO requires the AMWTP to populate a data structure provided by the CBFO that contains the required data dictionary fields that are appropriate for the waste streams at the site. The CBFO will access the data via the Internet to ensure an efficient transfer of this data.

CBFO uses the WDS/WWIS to verify that all supplied data meet the edit and limit checks prior to shipment of TRU mixed waste to WIPP. The WDS/WWIS notifies the AMWTP if any of the supplied data fails to meet the requirements of the edit and limit checks via an appropriate error message. The AMWTP corrects the discrepancy with the waste or the waste data and re-transmit the corrected data prior to acceptance of the data by the WDS/WWIS. CBFO will review data reported for each container of each shipment prior to providing notification to the AMWTP that the shipment is acceptable. Read-only access is provided to NMED. Table C-4 contains a listing of the data fields contained in the WDS/WWIS that is required as part of this QAPjP.

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The WDS/WWIS generates a Waste Emplacement Report, Shipment Summary Report, Waste Container Data Report, and a Change Log Report.

Access to the WDS/WWIS is controlled by CBFO based on approval from management. All data formally accepted by CBFO are protected from indiscriminate change and can only be changed by an authorized Data Administrator.

C-5a(2) Examination of the Waste Stream Profile Form and Container Data Checks

CBFO verifies the completeness and accuracy of the WSPF (Section C3-6b[1]). Figure C-2 includes the waste characterization and waste stream approval process. The assignment of the waste stream description, Waste Matrix Code Group, and Summary Category Groups; the AK summary documentation; the method used for characterization; CBFO certification; and appropriate designation of EPA HWN(s) will be examined by CBFO. If the WSPF is inaccurate, efforts will be made to resolve discrepancies by contacting the AMWTP in order for the waste stream to be eligible for shipment to the WIPP facility. If discrepancies in the waste stream are detected at the AMWTP, the AMWTP will implement a nonconformance program in accordance with MP-Q&SI-5.4, *Identification of Nonconforming Conditions*, to identify, document, and report discrepancies (Attachment C3).

The WSPF will pass all verification checks by CBFO in order for the waste to be approved by CBFO for shipment to the WIPP facility. The WSPF check against waste container data will occur during the initial WSPF approval process (Section C-5a).

The EPA HWNs for the waste that appear on the WSPF will be compared to those in Table C-5 to ensure that only approved wastes are accepted for management, storage, or disposal at WIPP. Some of the waste may also be identified by unique state hazardous waste codes or numbers. These wastes are acceptable at WIPP as long as the WIPP Hazardous Waste Permit TSDF-WAC is met. The CIS will be reviewed by the CBFO to verify that the waste has been classified correctly with respect to the assigned EPA HWNs. CBFO verifies that the applicable requirements of the WIPP Hazardous Waste Permit TSDF-WAC have been met.

Waste data transferred via the WDS/WWIS after WSPF approval will be compared with the approved WSPF. Any container from an approved hazardous waste stream with a description different from its WSPF will not be managed, stored, or disposed at WIPP.

CBFO will also verify that three different types of data specified below are available for every container holding TRU mixed waste before that waste is managed, stored, or disposed at WIPP.

1. An assignment of the waste stream's waste description (by Waste Matrix Codes) and Waste Matrix Code Group;
2. A determination of ignitability, reactivity, and corrosivity; and

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3. A determination of compatibility.

The verification of waste stream description will be performed by reviewing the WDS/WWIS for consistency in the waste stream description and WSPF. The CIS will indicate if the waste has been checked for the characteristics of ignitability, corrosivity, and reactivity. The final verification of waste compatibility is performed using Appendix C1 of the WIPP RCRA Part B Permit Application, the compatibility study.

Any container with unresolved discrepancies associated with hazardous waste characterization will not be managed, stored, or disposed at the WIPP facility until the discrepancies are resolved. If the discrepancies cannot be resolved, the CBFO will revoke the approval status of the waste stream, suspend shipments of the waste stream, and notify NMED. Waste stream approval will not be reinstated until the AMWTP demonstrates all corrective actions have been implemented and the AMWTP program is reassessed by CBFO.

C-5a(3) CBFO's Audit and Surveillance Program

An important part of CBFO's verification process is the CBFO's Audit and Surveillance Program. The focus of this audit program is compliance with the QAPjP and the WIPP Permit. This audit program addresses all AK implementation and testing activities, from waste stream classification assignment through waste container certification, and ensures compliance with standard operating procedures and the QAPjP. Audits will ensure that containers and their associated documentation are adequately tracked throughout the waste handling process. Operator qualifications will be verified, and implementation of QA/QC procedures will be surveyed. A final report that includes AMWTP audit results and applicable WIPP-WAP-related corrective action report (CAR) resolution will be provided to NMED for approval.

Audits will be performed at least annually, including the possibility of unannounced audits (i.e., not a regularly scheduled audit).

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C-5b Phase II Waste Shipment Screening and Verification

As presented in Figure C-3, Phase II of the waste screening and verification process begins with confirmation of the waste pursuant to Attachment C7 after waste shipments are configured. After the waste shipment has arrived at WIPP, CBFO screens the shipments to determine the completeness and accuracy of the EPA Hazardous Waste Manifest and land disposal restriction notice completeness. CBFO will verify there are no waste shipment irregularities and the waste containers are in good condition. Only those waste containers that are from shipments that have been confirmed pursuant to Attachment C7 and that pass all Phase II waste screening and verification determinations will be emplaced at WIPP. For each container shipped, the AMWTP provides the following information:

Hazardous Waste Manifest Information

- Generator/storage site name and EPA ID
- Generator/storage site contact name and phone number
- Quantity of waste
- List of up to six state and/or EPA HWNs in each line item
- List of all container IDs (Shipping Package serial number)
- Signature of authorized generator representative.

Specific Waste Container Information

- Waste Stream Identification Number
- List of EPA HWNs per container
- Certification date
- Shipping data (Assembly numbers, ship date, shipping category, etc.).

This information is also supplied electronically to the WDS/WWIS. The container-specific information is supplied as described in Section C-5a(1), and is supplied prior to shipment.

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C-5b(1) Examination of the EPA Uniform Hazardous Waste Manifest and Associated Waste Tracking Information

Upon receipt of a TRU mixed waste shipment, CBFO will make a determination of EPA Uniform Hazardous Waste Manifest completeness. For CH-TRU mixed waste, the CBFO will then make a determination of waste shipment completeness by checking the unique, barcode identification number found on each container holding TRU mixed waste against the WDS/WWIS database after opening the Shipping Package.

For shipments in the RH-TRU 72B cask, the identification number of the single payload container is read during cask-to-cask transfer in the Transfer Cell and then checked against the WDS/WWIS database. For shipments in the CNS 10-160B cask, CBFO will make a determination of waste shipment completeness by checking the unique identification number found on each container holding TRU mixed waste in the Hot Cell against the WDS/WWIS database after unloading the cask.

Manifest discrepancies may be identified during manifest examination and container barcode WDS/WWIS data comparison. A manifest discrepancy is a difference between the quantity or type of hazardous waste designated on the manifest and the quantity or type of hazardous waste the WIPP facility actually receives. The AMWTP technical contact (as listed on the manifest) will be contacted to resolve the discrepancy. Errors on the manifest can be corrected by the WIPP facility with a verbal (followed by a mandatory written) concurrence by the AMWTP technical contact. All discrepancies that are unresolved within fifteen days of receiving the waste at the WIPP facility will be immediately reported to the NMED in writing by CBFO. If the manifest discrepancies have not been resolved within 30 days of waste receipt, the shipment will be returned to the AMWTP.

C-5b(2) Examination of the Land Disposal Restriction Notice

With the initial shipment of a TRU mixed waste stream, AMWTP will provide WIPP with a notice that the waste is not prohibited from land disposal (The Land Disposal Restriction [LDR] Notice). The Notice will be prepared per the requirements of 20 NMAC 4.1.800 (incorporating 40 CFR 268.7[a][4]). The LDR Notice information includes:

- EPA HWN(s) and manifest number of first shipment of a mixed waste stream
- Date the waste is subject to prohibition
- Statement that the waste is not prohibited from land disposal at WIPP.

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This information is the applicable information taken from column “268.7(a)(4)” of the “Generator Paperwork Requirements Table” in 20.4.1.800 NMAC (incorporating 40 CFR 268.7[a][4]). Note that item “5” from the “Generator Paperwork Requirements Table” is not applicable since waste analysis data are provided electronically via WDS/WWIS and item “7” is not applicable, since waste designated by the Secretary of Energy for disposal at WIPP is exempted from the treatment standards.

CBFO will review the LDR notice for accuracy and completeness. The AMWTP will prepare this notice in accordance with the applicable requirements of 20.4.1.800 NMAC (incorporating 40 CFR 268.7[a][4]).

C-5b(3) Verification

This is a CBFO function.

C-6 CBFO’s Waste Shipment Screening QA/QC

This is a CBFO function.

C-7 Records Management and Reporting

As part of the WIPP facility’s operating record, data and documents associated with waste characterization and waste confirmation activity records are managed in accordance with MP-DOCS-18.2.

The storage of the AMWTP’s copy of the manifest, LDR information, waste characterization data, WSPFs, waste confirmation activity records, and other related records are identified on an electronic records system, (the equivalent of a CBFO-required RIDS).

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C-7a General Requirements

- Records are legible.
- Corrections are made with a single line through the incorrect information, and the date and initial of the person making the correction are added.
- Black ink is encouraged, unless a copy test has been conducted to ensure the other color ink will copy.
- Use of highlighters on records is discouraged.
- Records are reviewed for completeness.
- Records are validated by the cognizant manager or designee.

C-7b Records Storage

- Active records are stored when not in use
- Quality records are kept in one-hour (certified) fire-rated container or a copy of a record is stored separately (sufficiently remote from the original) in order to prevent destruction of both copies as a result of a single event such as fire or natural disaster
- Unauthorized access to the records is controlled by locking the storage container or controlling personnel access to the storage area.

C-8 Reporting

This is a CBFO function.

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Table C-2. Summary of Parameters, Characterization Methods, and Rationale for Transuranic Waste.

WASTE MATRIX CODE SUMMARY CATEGORIES	WASTE MATRIX CODE GROUPS	CHARACTERIZATION PARAMETER	METHOD	RATIONALE
S3000-Homogeneous Solids	<ul style="list-style-type: none"> • Solidified inorganics • Salt waste • Solidified organics 	Physical waste form	Acceptable Knowledge, Radiography, and/or Visual Examination	<ul style="list-style-type: none"> • Determine waste matrix • Demonstrate compliance with waste acceptance criteria (e.g., no liquid in excess of TSDF-WAC limits, no incompatible wastes, no compressed gases) • Determine assignment of EPA HWNs
S4000-Soil/Gravel	Contaminated soil/debris	Hazardous constituents		
S5000-Debris Waste	<ul style="list-style-type: none"> • Uncategorized metal (metal waste other than lead/cadmium) • Lead/cadmium waste • Inorganic nonmetal waste • Combustible waste • Graphite waste • Heterogeneous debris waste • Composite filter waste 	<ul style="list-style-type: none"> • Listed • Characteristic 		

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Table C-3. Required Program Records Maintained in AMWTP Project Files.

<p>LIFETIME RECORDS</p> <ul style="list-style-type: none"> • Field sampling data forms • Field and laboratory COC forms • Test facility and laboratory batch data reports • Waste Stream Characterization Package • Sampling plans • Data reduction, validation, and reporting documentation • AK documentation • Waste Stream Profile Form and Characterization Information Summary
<p>NON-PERMANENT RECORDS</p> <ul style="list-style-type: none"> • Nonconformance documentation • Variance documentation • Assessment documentation • Gas canister tags • Methods performance documentation • PDP documentation • Sampling equipment certifications • Calculations and related software documentation • Training/qualification documentation • QAPjPs (generator/storage sites) documentation (all revisions) • Calibration documentation • Analytical raw data • Procurement documentation • QA procedures (all revisions) • Technical implementing procedures (all revisions) • Audio/video recording (radiography, visual, etc.)

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Table C-4. Waste Data System/WIPP Waste Information System Data Fields^a.

CHARACTERIZATION MODULE DATA FIELDS^b	
Container ID ^c	Transporter EPA ID
Generator EPA ID	Transporter Name
Generator Address	Visual Exam Container ^e
Generator Name	Waste Material Parameter ^d
Generator Contact	Waste Material Weight ^d
Hazardous Code	Waste Matrix Code
Layers of Packaging	Waste Matrix Code Group
Liner Exists	Waste Stream Profile Number
Liner Hole Size	
Filter Model	
Number of Filters Installed	
Item Description Code	
Haz. Manifest Number	
NDE Complete ^e	
CERTIFICATION MODULE DATA FIELDS	
Container ID ^c	Handling Code
Container type	
Container Weight	
Contact Dose Rate	
Container Certification date	
Container Closure Date	
TRANSPORTATION MODULE DATA	
Contact Handled Package Number	Ship Date
Assembly Number ^f	Receive Date
Container IDs ^{c, d}	
Inner Containment Vessel Closure Date	
DISPOSAL MODULE DATA	
Container ID ^c	
Disposal Date	
Disposal Location	
<p>a. This is not a complete list of the WDS/WWIS data fields.</p> <p>b. Some of the fields required for characterization are also required for certification and/or transportation.</p> <p>c. Container ID is the main relational field in the WDS/WWIS Database.</p> <p>d. This is a multiple occurring field for each waste material parameter, nuclide, etc.</p> <p>e. These are logical fields requiring only a yes/no.</p> <p>f. Required for 7 packs of 55-gal. drums, 4-packs of 85-gal drums, or 3-packs of 100-gal drums to tie all of the drums in that assembly together. This facilitates the identification of waste containers in a shipment without need to break up the assembly.</p>	

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Table C-5. Waste Tanks Subject to Exclusion.

Hanford Site – 177 Tanks	
A-101 through A-106	C-201 through C-204
AN-101 through AN-107	S-101 through S-112
AP-101 through AP-108	SX-101 through SX-115
AW-101 through AW-106	SY-101 through SY-103
AX-101 through AX-104	T-101 through T-112
AY-101 through AY-102	T-201 through T-204
B-101 through B-112	TX-101 through TX-118
B-201 through B-204	TY-101 through TY-106
BX-101 through BX-112	U-101 through U-112
BY-101 through BY-112	U-201 through U-204
C-101 through C-112	
Savannah River Site – 51 Tanks	
Tank 1 through 51	
Idaho National Laboratory – 15 Tanks	
WM-103 through WM-106	WM-180 through 190

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Table C-6. Listing of Permitted EPA Hazardous Waste Numbers.

EPA Hazardous Waste Numbers			
F001	D019	D043	U079
F002	D021	P015	U103
F003	D022	P030	U105
F004	D026	P098	U108
F005	D027	P099	U122
F006	D028	P106	U133*
F007	D029	P120	U134*
F009	D030	U002*	U151
D004	D032	U003*	U154*
D005	D033	U019*	U159*
D006	D034	U037	U196
D007	D035	U043	U209
D008	D036	U044	U210
D009	D037	U052	U220
D010	D038	U070	U226
D011	D039	U072	U228
D018	D040	U078	U239*

* Acceptance of U-numbered wastes listed for reactivity, ignitability, or corrosivity characteristics is contingent upon a demonstration that the wastes no longer exhibit the characteristic of reactivity, ignitability, or corrosivity.

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WASTE STREAM PROFILE FORM

Waste Stream Profile Number: _____
 Generator Site Name: _____ Technical Contract: _____
 Generator Site EPA ID: _____ Technical Contact Phone Number: _____
 Date of audit report approval by NMED: _____
 Title, version number and date of documents used for WAP Certification: _____

Did your facility generate this waste? Yes No
 If no, provide the name and EPA ID of the original generator: _____

WIPP ID: _____ Summary Category Group: _____
 Waste Stream Name: _____
 Description from the WTWBIR: _____

Defense Waste: Yes No Check one: CH RH
 Number of SWBs _____ Number of Drums _____ Number of Canisters _____
 Batch Data Report numbers supporting this waste stream characterization: _____
 List applicable EPA Hazardous Waste Numbers ⁽²⁾ _____
 Applicable TRUCON Content Numbers: _____

Acceptable Knowledge Information⁽¹⁾
(For the following, write supporting documentation used (i.e., references and dates))

Required Program Information

- Map of site: _____
- Facility mission description: _____
- Description of operations that generate waste: _____
- Waste identification/categorization schemes: _____
- Types and quantities of waste generated: _____
- Correlation of waste streams generated from the same building and process, as applicable: _____

• Waste certification procedures: _____

Required Waste Stream Information

- Area(s) and building(s) from which waste stream was generated: _____
- Waste stream volume and time period of generation: _____
- Waste generating process description for each building: _____
- Waste process flow diagrams: _____
- Material inputs or other information identifying chemical/radionuclide content and physical waste form: _____
- Waste material parameter estimates per unit of waste: _____
- Which Defense Activity generated the waste: (check one)

- Weapons activities including defense inertial confinement fusion
- Naval reactors development
- Verification and control technology
- Defense research and development
- Defense nuclear waste and material by products management
- Defense nuclear material production
- Defense nuclear waste and materials security and safeguards and security investigations

Figure B-1 (Example Only)
WASTE STREAM PROFILE FORM

Figure C-1. WIPP waste stream profile form (example only).

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WASTE STREAM PROFILE FORM

Supplemental Documentation

Process design documents: _____

Standard operating procedures: _____

Safety Analysis Reports: _____

Waste packaging logs: _____

Test plans/research project reports: _____

Site data bases: _____

Information from site personnel: _____

Standard industry documents: _____

Previous analytical data: _____

Material safety data sheets: _____

Sampling and analysis data from comparable/surrogate waste: _____

Laboratory notebooks: _____

Confirmation Information⁽²⁾

(For the following, when applicable, enter procedure title(s), number(s), and date(s))

Radiography: _____

Visual Examination: _____

EXAMPLE

Waste Stream Profile Form Certification

I hereby certify that I have reviewed the information in this Waste Stream Profile Form, and it is complete and accurate to the best of my knowledge. I understand that this information will be made available to regulatory agencies and that there are significant penalties for submitting false information, including the possibility of fines and imprisonment for knowing violations.

Signature of Site Project Manager

Printed Name and Title

Date

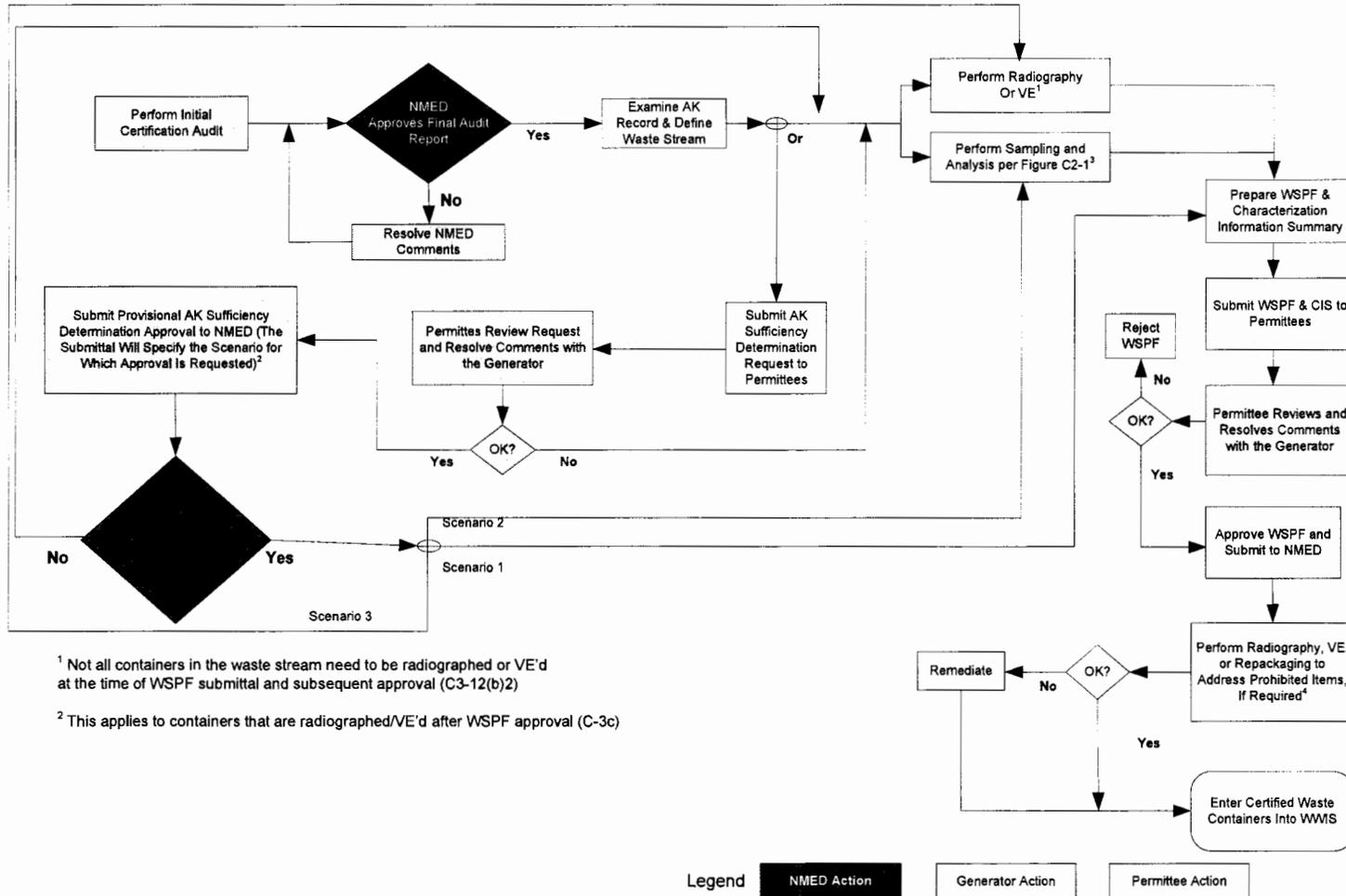
NOTE:

- (1) Use back of sheet or continuation sheets, if required.
- (2) If, radiography, visual examination were used to confirm EPA Hazardous Waste Numbers, attach signed Characterization Information Summary documenting this determination.

Figure B-1 (Example Only) (Continued)
WASTE STREAM PROFILE FORM

Figure C-1. (continued)

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¹ Not all containers in the waste stream need to be radiographed or VE'd at the time of WSPF submittal and subsequent approval (C3-12(b)2)
² This applies to containers that are radiographed/VE'd after WSPF approval (C-3c)

Figure C-2. Waste characterization process.

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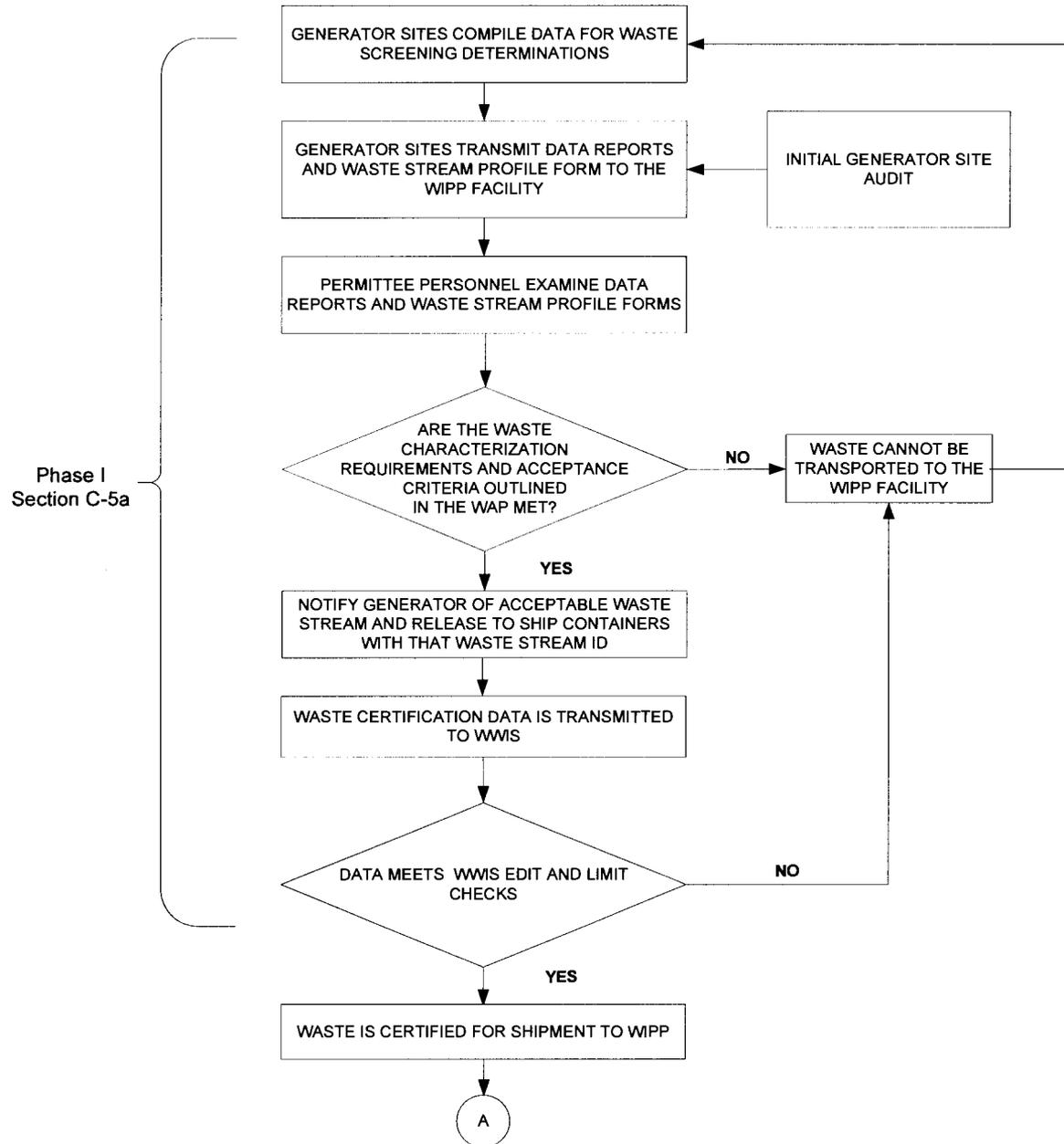


Figure C-3. TRU mixed waste screening and verification flow diagram.

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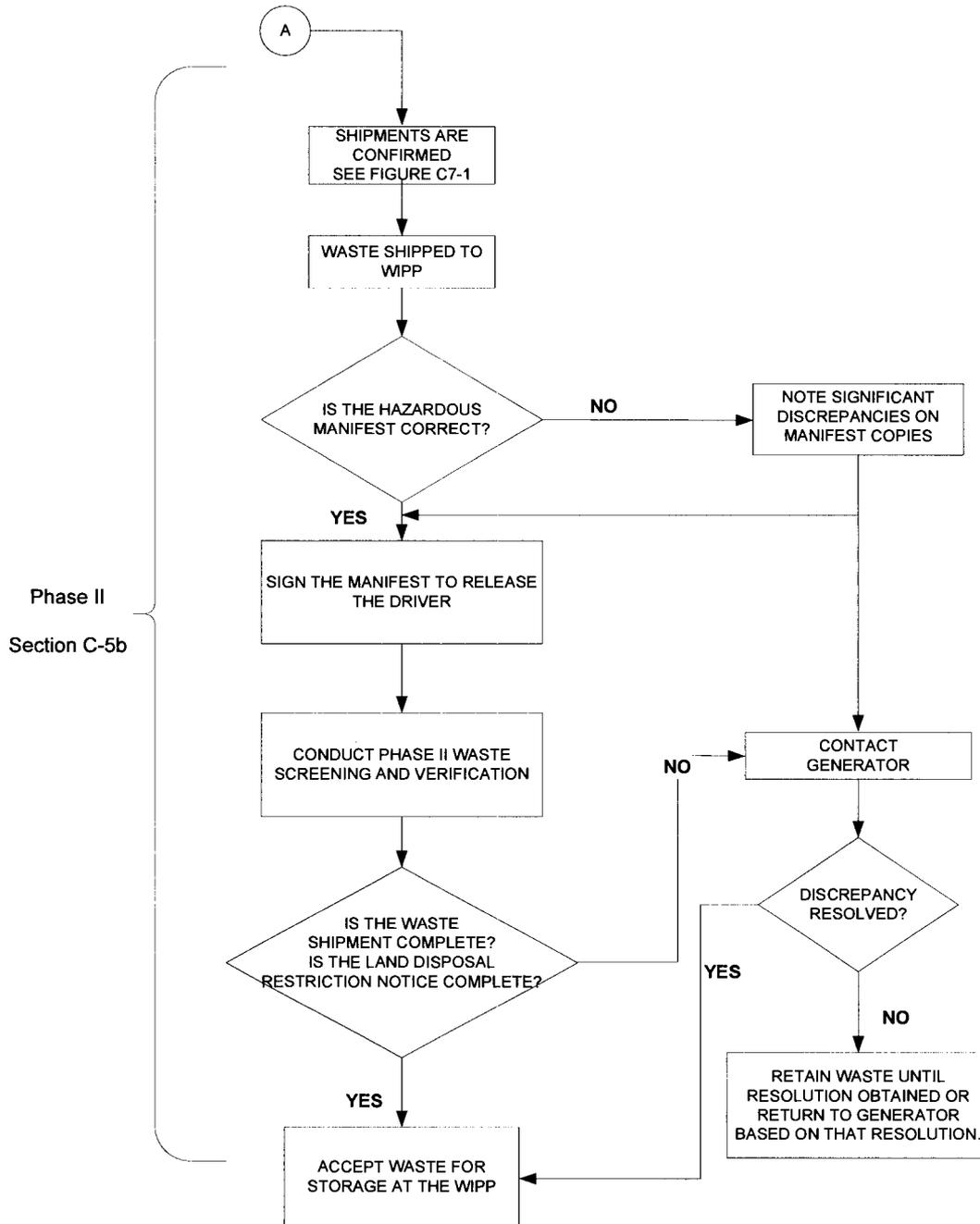


Figure C-3. (continued)

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Attachment C1. Waste Characterization Testing Methods

Introduction

The CBFO requires the AMWTP to use the following testing methods, as applicable, for characterization of TRU mixed waste which is managed, stored, or disposed at WIPP. These methods include requirements for radiography and visual examination. Additionally, this attachment provides quality control requirements.

C1-1 Radiography

Radiography has been developed to aid in the examination and identification of containerized waste. INST-OI-12 describes all activities required to achieve the radiography objectives in this QAPjP. INST-OI-12 provides instructions specific to the radiography systems used at the site. For example, to detect liquids, some systems require the container to be rotated back and forth while other systems require the container to be tilted.

A radiography system (e.g., RTR digital, digital radiography/computed tomography) normally consists of an X-ray producing device, an imaging system, an enclosure for radiation protection, a waste container handling system, an audio/video recording system, and an operator control and data acquisition station. Although these six components are required, it is expected there will be some variation within a given component between sites. The RTR system has controls or an equivalent process, which allow the operator to control image quality. On some radiography systems, it should be possible to vary the voltage, typically between 150 and 400 kilovolts to provide an optimum degree of penetration through the waste. The imaging system typically uses either a fluorescent screen or a low-light television camera or x-ray detectors to generate the image.

To perform RTR, the waste container is scanned while the operator views the television screen. A video and audio recording is made of the waste container scan and is maintained as a non-permanent record. A radiography data form is also used to document the Waste Matrix Code, to ensure that the waste container contains no ignitable, corrosive, or reactive waste by documenting the absence of liquids in excess of WIPP Hazardous Waste Permit TSDF-WAC limits or compressed gases, and verify that the physical form of the waste is consistent with the waste stream description documented in the AK summary. Containers whose contents prevent full examination of the remaining contents shall be subject to VE unless the AMWTP certifies that VE would provide no additional relevant information for that container based on the AK information for the waste stream. Such certification will be documented in the AMWTP record.

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For containers which contain classified shapes and undergo RTR, the RTR video and audio recording will be considered classified. The radiography data forms will not contain classified information.

The RTR system involves qualitative and semiquantitative evaluations of visual displays. Operator training and experience are the most important considerations for ensuring QCs in regard to the operation of the RTR system and for interpretation and disposition of radiography results. Only trained personnel are allowed to operate RTR equipment.

Standardized training requirements for RTR operators are based upon existing industry standard training requirements as detailed in the RTR qualification package in accordance with LST-RTQP-03-IM, WIPP Training Requirements Implementation Matrix and MP-RTQP-14.4, *Personnel Qualification and Certification*.

The AMWTP has developed a training program that provides RTR operators with both formal and on-the-job training (OJT). Radiography operators are instructed in the specific waste generating practices, typical packaging configurations, and associated waste material parameters expected to be found in each Waste Matrix Code at the site. The OJT and apprenticeship is conducted by an experienced, qualified RTR operator prior to qualification of the training candidate. Radiography operators are trained on the types of waste that are generated, stored, and characterized at the AMWTP. All of the radiography QC requirements specified in the WIPP-WAP are incorporated into the AMWTP training program and RTR operations to ensure data quality and comparability.

Radiography training programs are subject to the CBFO Audit and Surveillance Program.

One or more training containers with items (including prohibited items) common to the waste streams to be characterized and internal containers of various sizes are scanned semiannually by each operator. The audio and video media is then reviewed by a supervisor to ensure that operator's interpretations remain consistent and accurate. Imaging system characteristics are verified on a routine basis.

Independent replicate scans and replicate observations of the video output of the RTR process are performed under uniform conditions and procedures. Independent replicate scans are performed on one waste container per day or once per testing batch, whichever is less frequent, by a qualified radiography operator that was not involved in the original scan of the waste container. Independent observation of one scan (not the replicate scan) are also made once per day or once per testing batch, whichever is less frequent, by a qualified RTR operator that was not involved in the original scan of the waste container. A testing batch is a suite of waste containers undergoing RTR using the same testing equipment. A testing batch can be up to 20 waste containers without regard to waste matrix.

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Oversight functions include periodic audio/video media reviews of accepted waste containers and shall be performed by qualified RTR operators that were not involved in the original scan of the waste containers. The results of this independent verification are available to the RTR operators who performed the original scans. The AMWTP SPM is responsible for monitoring the quality of the RTR data and calling for corrective action, when necessary.

C1-2 Visual Examination

The waste container contents may be verified directly by performing VE on the waste container contents. VE may be performed by physically examining the contents of waste containers to verify the Waste Matrix Code and to verify that the container is properly included in the appropriate waste stream.

VE is conducted on a waste container to identify and describe all waste items, packaging materials, and waste material parameters in the waste container.

VE activities are documented on video/audio media, or by using a second operator to provide additional verification by reviewing the contents of the waste container to ensure correct reporting as specified in INST-OI-34, INST-FOI-17 and INST-TRUW-8.13.4. When VE is performed using a second operator, each operator performing the VE will observe for themselves the waste being placed in the waste container or the contents within the examined waste container when waste is not removed. The results of all VE are documented on manual VE data forms or electronically in the Waste Tracking System (WTS) which are used to document the Waste Matrix Code, ensure that the waste container contains no ignitable, corrosive, or reactive waste by documenting the absence of liquids in excess of TSDf-WAC limits or compressed gases, and verify that the physical form of the waste is consistent with the waste stream description documented in the AK summary.

VE recorded on video/audio media shall meet the following minimum requirements:

- The video/audio media shall record the waste packaging event for the container such that all waste items placed into the container are recorded in sufficient detail and contain an inventory of waste items in sufficient detail that another trained VE operator can identify the associated waste material parameters.
- The video/audio media shall capture the waste container identification number.
- The personnel loading the waste container shall be identified on the video/audio media or on packaging records traceable to the loading of the waste container.
- The date of loading of the waste container will be recorded on the video/audio media or on packaging records traceable to the loading of the waste container.

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VE performed using two generator site personnel shall meet the following minimum requirements:

- At least two generator site personnel who witnessed the packaging of the waste shall approve the data forms or packaging records attesting to the contents of the waste container.
- The data forms or packaging records shall contain an inventory of waste items in sufficient detail that another trained VE operator can identify the associated waste material parameters.
- The waste container identification number shall be recorded on the data forms or packaging records.

Although the AMWTP does not expect classified materials, VE video/audio media of containers which contain classified shapes are considered classified information. VE data forms or packaging records will not contain classified information.

Waste container packaging records may be used to meet the VE DQOs in Section C-4a(1). These records must meet the minimum requirements listed above for either VE recorded on video/audio media or VE performed by two operators, and shall be reviewed by operators trained and qualified to the requirements listed below. The operators will prepare data forms based on the VE records. Visual examination BDRs will be prepared, reviewed, and approved as described in Section C-4, and Attachment C-3.

Standardized training for VE has been developed. Personnel performing VE are instructed in the specific waste generating processes, typical packaging configurations, and the waste material parameters expected to be found in each Waste Matrix Code at the AMWTP. The training is site specific to include the various waste configurations at the AMWTP. For example, the particular physical forms and packaging configurations vary so operators are trained to examine the types of waste that are generated, stored, and characterized at the site. Training will include the following regardless of Summary Category Group:

- Identifying and describing the contents of a waste container by examining all items in waste containers of previously packaged waste
- Identifying when VE cannot be used to meet the DQOs.

| VE personnel are requalified once every two years in accordance with LST-RTQP-03-IM and MP-RTQP-14.4.

The AMWTP designates visual examination experts (VEE). The VEE will be familiar with the waste generating processes that have taken place at the AMWTP and will also be familiar with all types of waste being characterized at the AMWTP. The VEE is responsible for the overall direction and implementation of the VE at the AMWTP. The VEE is selected based on experience and training in the types of waste being characterized. The VEE will receive training in the same elements as the VE

User is responsible to use the correct revision.

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personnel with both formal training and OJT. Qualification of a VEE is based on familiarity with waste generating processes, familiarity with the types of waste being characterized, and meeting the training requirements discussed above. The SPM evaluates personnel, using the above criteria, and designates VEEs accordingly. Consistent with other VE personnel, the VEE will be requalified once every two years. VEE training requirements are detailed in the VEE qualification package in accordance with LST-RTQP-03-IM and MP-RTQP-14.4.

User is responsible to use the correct revision.

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**Attachment C2.
Reserved**

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**Attachment C3.
Quality Assurance Objectives and Data Validation Techniques
for Waste Characterization Methods**

C3-1 Validation Methods

Validation of all data is performed so that data used for WIPP compliance activities are of known and acceptable quality.

The qualitative data or descriptive information generated by RTR and VE is not amenable to statistical data quality analysis. However, RTR and VE are complementary techniques yielding similar data to determine the waste matrix code. The waste matrix code is determined to ensure the container is properly included in the appropriate waste stream.

Data validation will be used to assess the quality of waste characterization data collected based upon project precision, accuracy, completeness, comparability, and representativeness objectives described below:

Precision

Precision is a measure of the mutual agreement among multiple measurements.

Accuracy

Accuracy is the degree of agreement between a measured result and the true or known value.

Completeness

Completeness is a measure of the amount of valid data obtained from a method compared to the total amount of data obtained.

Comparability

Comparability is the degree to which one data set can be compared to another.

Representativeness

Representativeness is the degree to which data represent a characteristic of a population.

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C3-2 Non-Destructive Examination Methods

Quality Assurance Objectives

The QAOs for non-destructive examination (NDE) are detailed in this section. NDE can be either RTR or VE. In the event QAOs are not met, then corrective action is taken in accordance with MP-Q&SI-5.4. It should be noted that NDE is primarily a qualitative determination. The objective of NDE is to verify the physical form of the waste matches the waste stream description as determined by AK and the absence of prohibited items.

C3-2a Radiography

Data to meet these objectives are obtained from a video and audio recorded scan provided by trained and qualified RTR operators. Results are also recorded on a radiography data form. The precision, accuracy, completeness, and comparability objectives for RTR data are presented below.

Precision

Precision is maintained by reconciling any discrepancies between two RTR operators with regard to identification of the waste matrix code, liquids in excess of TSDF-WAC limits, and compressed gases through independent replicate scans and independent observations.

Additionally, the precision of RTR is verified prior to use by tuning precisely enough to demonstrate compliance with QAOs through viewing an image test pattern.

Accuracy

Accuracy is obtained by using a target to tune the image for maximum sharpness and by requiring operators to successfully identify 100 percent of the items required to meet the DQOs for radiography specified in Section C-4a(1) in a training container during their initial qualifications and subsequent requalification.

Completeness

A video and audio media recording of the RTR examination and a validated radiography data form is obtained for 100 percent of the waste containers subject to RTR. All video and audio recording and radiography data forms are subject to validation as indicated in Sections C3-4.

Comparability

The comparability of RTR data from different operators is enhanced by using standardized RTR procedures and operator qualification. Operator training requirements are detailed in the RTR qualification package in accordance with LST-RTQP-03-IM and MP-RTQP-14.4.

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C3-2b Visual Examination

Results are recorded on a VE data form. The precision, accuracy, completeness, and comparability objectives for VE data are presented below.

Precision

Precision is maintained by reconciling any discrepancies between the operator and the independent technical reviewer (ITR) with regard to identification of the waste matrix code, liquids in excess of TSDF-WAC limits, and compressed gases.

Accuracy

Accuracy is maintained by requiring operators to pass a comprehensive examination and demonstrate satisfactory performance in the presence of the VEE during their initial qualification. VE operators shall be requalified every two years.

Completeness

A validated VE data form is obtained for 100 percent of the waste containers subject to VE.

Comparability

The comparability of VE data from different operators is enhanced by using standardized VE procedures and operator qualification. Operator training requirements are detailed in the VE qualification package in accordance with LST-RTQP-03-IM and MP-RTQP-14.4.

C3-3 Acceptable Knowledge

AK documentation provides primarily qualitative information that cannot be assessed according to specific data quality goals used for quantitative techniques. To ensure the AK process is consistently applied, the AMWTP complies with the following data quality requirements for AK documentation:

- *Precision* - The qualitative determinations, such as compiling and assessing AK documentation, do not lend themselves to statistical evaluations of precision. However, the AK information is addressed by the independent review of AK information during internal and external audits.
- *Accuracy* - The percentage of waste containers that require reassignment to a new waste matrix code and/or designation of different EPA HWNs based on testing data and discrepancies identified by the CBFO during waste confirmation are reported as a measure of AK accuracy.

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- *Completeness* - The AK record must contain 100 percent of the required information (Section C4-3). The usability of AK information is assessed for completeness during audits.
- *Comparability* - Comparability is ensured through sites meeting the training requirements and complying with the minimum standards outlined for procedures that are used to implement the AK process. Assignment of EPA HWNs will be made in accordance with Section C4-3b. This information will be provided to other sites that store or generate a similar waste stream.
- *Representativeness* - Representativeness is a qualitative parameter that will be satisfied by ensuring the process of obtaining, evaluating, and documenting AK information is performed in accordance with the minimum standards established in Attachment C4. The AMWTP also assesses and documents the limitations of the AK information used to assign EPA HWNs (for example, purpose and scope of information, date of publication, type and extent to which waste parameters are addressed).

The AMWTP complies with the nonconformance notification and reporting requirements of Section C3-7 if the results of testing specified in Attachment C are inconsistent with AK documentation.

The AMWTP addresses QC by tracking its performance with regard to the use of AK by: (1) assessing the frequency of inconsistencies among information, and (2) documenting AK inconsistencies identified through RTR and VE. In addition, the AK process and waste stream documentation are evaluated through internal assessments by QA organizations and assessments by auditors external to the organization.

C3-4 Data Review, Validation, and Verification Requirements

Procedures have been developed for the review, validation, and verification of data at the data generation level and the validation and verification of data at the project level. Data review determines if raw data is properly collected and ensures raw data are properly reduced. Data validation verifies that the data reported satisfies the requirements of the WIPP-WAP and is accompanied by signature release. Data verification authenticates that data as presented represent the testing activities as performed and have been subject to the appropriate levels of data review. These requirements ensure that QAPjP records furnish documentary evidence of quality.

Data are collected by the operator, entered into the WTS (automated or key entry), signed electronically, and promoted for data generation level review and validation. The data are progressively reviewed (on a batch basis) at the data generation level using paper/electronic data validation checklists. The reviews are performed in the sequence specified. If data are approved, the data are manually/automatically promoted to the next reviewer. If the data are rejected, the data are manually/automatically demoted to the data generator for problem resolution.

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The following BDRs are used for data validation, verification, and QA activities:

- A Testing BDR or equivalent includes all data pertaining to RTR or VE for up to 20 waste containers without regard to waste matrix. Table C3-3 lists all of the information required in Testing BDRs (identified with an “X”) and other information that is necessary for data validation, but is optional in Testing Batch Data Reports (identified with an “O”).

C3-4a Data Generation Level

The following are the minimum requirements for raw data collection and management:

- All raw data are signed and dated in reproducible ink by the person generating it. Alternately, unalterable electronic signatures are used.
- All data are recorded clearly, legibly, and accurately in the field records.
- Any changes to original data are lined out, initialed, and dated by the individual making the change. A justification for changing the original data is also included. The original data are not obliterated or otherwise disfigured so as not to be readable. Data changes are made by the individual who originally collected the data or an individual authorized to change the data.
- All data are transferred and reduced from field records completely and accurately.
- All field records are maintained as specified in Table C-2.
- Data are organized into a standard format for reporting purposes (BDR), as outlined in specific testing procedures.
- All electronic and video data must be stored appropriately to ensure that waste container and associated QC data are readily retrievable. In the case of classified information, additional security provisions may apply that could restrict retrievability. The additional security provision will be documented in site procedures as outlined in the QAPjP in accordance with prevailing classified information security standards. AMWTP does not anticipate dealing with classified information, so no procedures have been developed.

Data review, validation, and verification at this level involve scrutiny and signature release from qualified independent technical reviewer(s) not involved in the generation or recording of the data under review, as specified below. Individuals conducting this data review, validation, and verification must use checklists that address all items included in this section. Completed checklists must be forwarded with Batch Data Reports to the project level.

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C3-4a(1) Independent Technical Review

The ITR ensures by review of raw data that data generation and reduction are technically correct; calculations are verified correct; deviations are documented; and QA/QC results are complete, documented correctly, and compared against WIPP-WAP criteria. This review validates and verifies the work done by the originator.

One hundred percent of the BDRs receive an ITR. This review is performed by a trained and qualified individual who was not involved in the generation or recording of the data under review. This review shall be performed by an individual other than the data generator who is qualified to have performed the initial work. This review is performed as soon as practicably possible to determine and correct negative quality trends in the testing process. However, at a minimum, the ITR is performed before any waste associated with data is shipped to WIPP. The reviewers release the data as evidenced by signature, and as a consequence ensure the following:

- Data generation and reduction were conducted in a technically correct manner per the method used (procedure with revision). Data were reported in the proper units and correct number of significant figures.
- Calculations have been verified by a valid calculation program, a spot check of verified calculation programs, and/or 100% check of all hand calculations. Values not verified to within rounding or significant difference discrepancies are rectified prior to completion of the ITR.
- The data were reviewed for transcription errors.
- The testing data QA documentation for BDRs is complete and includes, as applicable, raw data, calculation records, and/or calibration records (or references to an available package). Corrective action is taken to ensure all BDRs are complete and include all necessary raw data prior to completion of the ITR.
- Radiography tapes have been reviewed (independent observation) on a waste container basis once per testing batch, or once per day of operation, whichever is less frequent (Section C1-1). The RTR tapes are reviewed against the reported data on the radiography form to ensure the data are correct and complete.
- QAOs have been met according to the methods outlined in Sections C3-2 through C3-3.

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C3-4b Project Level

Data review, validation, and verification at this level involves scrutiny and signature release from the SPM or designee. MP-TRUW-8.9 defines the project level validation and verification process. Any nonconformance identified during this process shall be documented on an NCR (Section C3-7).

The SPM shall ensure that a repeat of the data generation level review, validation, and verification is performed on the data for a minimum of one randomly chosen waste container quarterly (every three months). This exercise will document that the data generation level review, validation, and verification is being performed according to procedures.

C3-4b(1) Site Project Manager Review

The SPM review is the final validation that all of the data contained in BDRs from the data generation level are complete and have been properly reviewed as evidenced by signature release and completed checklists.

One hundred percent of the BDRs have an SPM or designee signature release. At a minimum, the SPM signature release is performed before any waste associated with data reviewed is shipped to WIPP. This signature release ensures the following:

- Testing batch QC checks (e.g., replicate scans, measurement system checks) were properly performed. Radiography data are complete and acceptable based on evidence of videotape review of one waste container per day or once per testing batch, whichever is less frequent, as specified in C1-1.
- Data generation level ITR, validation, and verification have been performed as evidenced by completed review checklists and by the appropriate signature releases.
- ITRs were not involved in the generation or recording of the data under review.
- Batch data review checklists are complete.
- Batch Data Reports are complete and data are properly reported (e.g., data are reported in the correct units, and with the correct number of significant figures).
- Verification that data are within established data assessment criteria and meet the applicable QAOs (Section C3-2 and C3-3).

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C3-4b(2) Prepare SPM Summary and Data Validation Summary

To document the project level validation and verification described above, the SPM (or designee) prepares the Site Project Manager Summary and Data Validation Summary. These reports may be combined to eliminate redundancy. The SPM Summary includes a validation checklist for each BDR. Checklists for the SPM Summary are sufficiently detailed to validate all aspects of a BDR that affect data quality.

The Data Validation Summary provides verification that, on a per waste container basis as evidenced by BDR, all data have been validated per this QAPjP. The Data Validation Summary must identify each BDR reviewed (including all waste container numbers), describe how the validation was performed and whether or not problems were detected (e.g., NCRs), and include a statement indicating all data are acceptable. Summaries include release signatures.

C3-4b(3) Prepare Waste Stream Characterization Package

In the event the CBFO request detailed information on a waste stream, the SPM will provide a Waste Stream Characterization Package. The SPM will ensure the Waste Stream Characterization Package (Section C3-6b[3]) will support waste characterization determinations.

C3-4c CBFO Level

Not applicable to the AMWTP; this section refers to WIPP.

C3-5 Reconciliation with Data Quality Objectives

Reconciling the results of waste testing with the DQOs provides a way to ensure data are of adequate quality to support the regulatory compliance programs. Reconciliation with the DQOs takes place at both the project and the CBFO levels. At the project level, reconciliation is performed by the SPM, and submitted to CBFO for review and approval. Reconciliation is performed as described in MP-TRUW-8.11.

C3-5a Reconciliation at the Project Level

The SPM ensures all data generated and used in decision making meet the DQOs provided in Section C-4a(1). The SPM assesses whether data of sufficient type, quality, and quantity have been collected.

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For each waste stream characterized, the SPM determines if sufficient data have been collected to determine the following WIPP-WAP-required waste parameters, as applicable:

- Waste Matrix Code
- Waste material parameter weights
- If each container of waste contains TRU radioactive waste
- Whether the waste stream exhibits a TC (TCs) under 40 CFR Part 261, Subpart C
- Whether the waste stream contains listed waste found in 20.4.1.200 NMAC incorporating 40 CFR Part §261, Subpart D
- Whether the waste stream is classified as hazardous or nonhazardous
- Whether the overall completeness, comparability, and representativeness QAOs were met for each of the testing procedures as specified in Sections C3-2 through C3-3 before submittal of a WSPF for a waste stream or waste stream lot.

If the SPM determines insufficient data have been collected to make the determinations listed above, additional data collection efforts must be undertaken. The reconciliation of a waste stream is performed as described in Attachment C4, prior to submittal of the WSPF and CIS to CBFO for that waste stream. The AMWTP will not ship containers from a TRU waste stream for disposal until the SPM determines that the required waste parameters listed above have been met for the waste stream.

C3-5b Reconciliation at the CBFO Level

Not applicable to the AMWTP.

C3-6 Data Reporting Requirements

Data reporting requirements define the type of information and the method of transmittal for data transfer from the data generation level to the project level and from the project level to WIPP.

C3-6a Data Generation Level

Data are transmitted by hardcopy or electronically with WTS (a hardcopy is available on demand) from the data generation level to the project level. Transmitted data includes all BDRs and data review checklists. The BDRs and checklists contain all information required by the testing techniques described in Attachments C1 through C6, as well as the signature releases to document the review, validation, and verification described in Section C3-4. All BDRs and checklists are in approved formats, as provided in approved procedures.

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Hard copy and/or electronic BDRs are forwarded to the SPM. All BDRs are assigned serial numbers and each page is numbered. The serial number used may be the same as the batch number.

QA documentation , including raw data, are maintained in testing files or site project files in accordance with the document storage requirements identified in MP-DOCS-18.2.

C3-6b Project Level

The SPM prepares a WSPF in accordance with MP-TRUW-8.14 for each waste stream certified for shipment to WIPP based on information obtained from AK and BDRs, if applicable. In addition, the CIS and Waste Stream Characterization Package (when requested by the CBFO) are prepared as appropriate. The SPM verifies these reports are consistent with information found in batch reports. Summarized testing data are included with the CIS. The contents of the WSPF, the CIS, and the Waste Stream Characterization Package are discussed in the following sections.

After approval of a WSPF and the associated CIS, the AMWTP maintains a cross-reference of container identification numbers to each BDR.

A Waste Stream Characterization package must be submitted by hard copy or electronically from the SPM to CBFO when requested.

C3-6b(1) Waste Stream Profile Form

The WSPF is prepared in accordance with MP-TRUW-8.14. The WSPF (Figure C-1) includes the following information:

- Generator/storage site name
- Generator/storage site EPA ID
- Date of audit report approval by NMED (if obtained)
- Original generator of waste stream
- Whether waste is CH or remote-handled
- The waste stream WIPP identification number
- Summary Category Group
- Waste Matrix Code Group
- Waste Material Parameter Weight Estimates per unit of waste
- Waste stream name
- Description of the waste stream

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- Applicable EPA HWNs
- Applicable TRUCON codes
- A listing of AK documentation used to identify the waste stream
- The waste characterization procedures used and the reference and date of the procedure
- Certification signature of SPM, name, title, and date signed.

C3-6b(2) Characterization Information Summary

The CIS is prepared in accordance with MP-TRUW-8.14. The CIS includes the following elements:

- Data reconciliation with DQOs.
- Radiography and VE summary to document that all prohibited items are absent in the waste and to verify that the physical form of the waste matches the waste stream description as determined by AK (if applicable).
- A justification for the selection of RTR and/or VE as an appropriate method for characterizing the waste.
- A complete listing of container identification numbers used to generate the WSPF, cross referenced to each BDR.
- Complete AK summary including waste stream name and number, point of generation, waste stream volume (current and projected), generation dates, TRUCON codes, Summary Category Group, Waste Matrix Code(s), and Waste Matrix Code Group, other TRU Waste Baseline Inventory Report information, waste stream description, areas of operation, generating processes, RCRA determinations (including determination for ignitability, corrosivity, and reactivity), and radionuclide information, all references used to generate the AK summary, and any other information required by Section C4-2b.
- Method for determining Waste Material Parameter Weights per unit of waste.
- List of any AK Sufficiency Determination requested for the waste stream.
- Certification through AK or testing that any waste assigned the HWN of U134 (hydrofluoric acid) no longer exhibits the characteristic of corrosivity. This is verified by ensuring that no liquid is present in U134 waste.

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C3-6b(3) Waste Stream Characterization Package

The Waste Stream Characterization Package, which is prepared in accordance with MP-TRUW-8.14, consists of the following elements:

- Waste Stream Profile Form (Section C3-6[1])
- Accompanying CIS (Section C3-6[2])
- Complete AK summary (C3-6[2])
- BDRs supporting the characterization of the waste stream and any others requested by the CBFO
- Raw testing data requested by the CBFO.

C3-6b(4) Waste Data System/WIPP Waste Information System (WDS/WWIS) Data Reporting

The WDS/WWIS Data Dictionary contains all of the data fields, the field format, and the limits associated with the data as established by the WIPP-WAP. These data are subject to edit and limit checks performed automatically by the database, as defined in the *Waste Data System User's Manual* (DOE 2009).

C3-7 Nonconformances

The status of work and the QAPjP activities are monitored and controlled by the SPM, including nonconformance identification, documentation, and reporting. MP-TRUW-8.1 discusses specific nonconformance procedures and corrective action processes.

Nonconformances

Nonconformances are uncontrolled and unapproved deviations from an approved plan or procedure. Nonconforming items and activities are those that do not meet the WIPP-WAP requirements, procurement document criteria, or approved procedures and are addressed in MP-Q&SI-5.4. Nonconforming items are marked, tagged, or segregated and the affected personnel notified. Any waste container for which an NCR has been written will not be shipped to the WIPP facility unless the condition that led to the NCR for that container has been dispositioned in accordance with the CBFO Quality Assurance Program Document (QAPD).

Disposition of nonconforming items shall be identified and documented. MP-Q&SI-5.4 identifies the person(s) responsible for evaluating and dispositioning nonconforming items.

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For each container selected for confirmation pursuant to Attachment C7, the confirmation team will examine the respective NCR documentation to verify NCRs have been dispositioned for the selected container.

Management at all levels will foster a “no-fault” attitude to encourage the identification of nonconforming items and processes. Nonconformances may be detected and identified by anyone performing WIPP-WAP activities, including:

- Project staff – during field operations, supervision of subcontractors, data validation and verification, and self-assessment
- Testing Facility staff – during the preparation for and performance of laboratory testing; calibration of equipment; QC activities; data review, validation, and verification; and self-assessment
- QA personnel – during oversight activities or audits.

An NCR shall be prepared for each nonconformance identified. Each NCR shall be initiated by the individual(s) identifying the nonconformance. The NCR shall then be processed by knowledgeable and appropriate personnel. For this purpose, an NCR including, or referencing as appropriate, results of laboratory analysis, QC rests, audit reports, internal memoranda, or letters shall be prepared. The NCR must provide the following information:

- Identification of the individual(s) identifying or originating the nonconformance
- Description of the nonconformance
- Method(s) or suggestions for correcting the nonconformance (corrective action)
- Schedule for completing the corrective action
- An indication of the potential ramifications and overall usability of the data, if applicable
- Any approval signature specified in the site nonconformance procedures.

The SPM oversees the NCR process and is responsible for identifying and tracking all nonconformances and reports this information to CBFO. The SPM is also responsible for notifying project personnel of the nonconformance and verifying completion of the corrective action for nonconformances.

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Nonconformance to DQOs

For any non-administrative nonconformance related to applicable requirements specified in this QAPjP, which are first identified at the SPM signature release level (i.e., a failure to meet a DQO), AMWTP will submit to CBFO a written notification within seven calendar days of identification and submit an NCR within thirty (30) calendar days of identification of the incident. The AMWTP will issue an NCR and implement corrective actions, which will be resolved prior to shipment.

C3-8 Special Training Requirements and Certifications

Before performing activities that affect QAPjP quality, all personnel receive indoctrination into the applicable scope, purpose, and objectives of the QAPjP and the specific QAOs of the assigned task. Personnel assigned to perform activities for the QAPjP have the education, experience, and training applicable to the functions associated with the work. Evidence of personnel proficiency and demonstration of competence in the task(s) assigned is demonstrated and documented. All personnel designated to work on specific aspects of the QAPjP maintain qualification (that is, training and certification) throughout the duration of the work.

Qualification requirements for personnel are documented in Individual Training Plans or qualification packages. Job performance is evaluated and documented at periodic intervals to ensure personnel maintain proficiency and record additions to training, as necessary per LST-RTQP-03-IM and MP-RTQP-14.4.

Personnel involved in QAPjP activities receive continuing training to ensure job proficiency is maintained. The due date for required continued training courses and requalification shall be the end of the month of the anniversary date when the training was previously completed. Training includes both education in principles and enhancement of skills. Training records that specify the scope of the training, the date of completion, and documentation of job proficiency are maintained as QA Records. Maintenance of training records is addressed in MP-RTQP-14.19, *Training Records Administration*.

The minimum qualifications for certain specified positions are summarized in Table C3-2. MP-RTQP 14.4 identifies the site-specific titles and minimum training and qualification requirements for personnel performing WAP activities.

An evaluation of personnel qualifications includes comparing and evaluating the requirements specified in the job/position description and the skills, training, and experience included in the person's current resume. This evaluation, done in accordance with MP-RTQP-14.1, Preparation and Administration of Training Plans, and MP-RTQP-14.4, is also performed for personnel who change positions because of a transfer or promotion as well as personnel assigned to short-term or temporary work assignments that may affect the quality of the WIPP-WAP.

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C3-9 Changes to Plans and Procedures

Controlled changes to WIPP-WAP related plans or procedures are made in accordance with the WIPP QAPD and managed through MP-DOCS-18.4, *Document Control*. The SPM shall review all non-administrative changes and evaluate whether those changes could impact DQOs specified in the permit. After AMWTP certification, any changes to WIPP-WAP related plans or procedures that could positively or negatively impact DQOs (i.e., those changes that require prior approval of the CBFO as defined in Section C5-2) shall be reported to the CBFO within five (5) days of identification by the project level review.

Table C3-1. Waste Material Parameters and Descriptions.

Waste Material Parameter	Description
Iron-based Metal/Alloys	Iron and steel alloys in the waste excluding the waste container materials.
Aluminum-based Metals/Alloys	Aluminum or aluminum-based alloys in the waste materials.
Other Metals	All other metals found in the waste materials (for example, copper, lead, zirconium, tantalum, etc.).
Other Inorganic Materials	Nonmetallic inorganic waste, including concrete, glass, firebrick, ceramics, sand, and inorganic sorbents.
Cellulosics	Materials generally derived from high polymer plant carbohydrates, for example, paper, cardboard, wood, cloth, etc.
Rubber	Natural or man-made elastic latex materials, for example, surgeon gloves, leaded rubber gloves, etc.
Plastics (Waste Materials)	Generally man-made materials, often derived from petroleum feedstock, for example, polyethylene, polyvinylchloride, etc.
Organic Matrix	Cemented organic resins, solidified organic liquids, and sludges.
Inorganic Matrix	Any homogeneous materials consisting of sludge, or aqueous-based liquids solidified with cement, calcium silicate, or other solidification agents; for example, waste water treatment sludge, cemented aqueous liquids, and inorganic particulates, etc.
Soils/gravel	Generally consists of naturally occurring soils which have been contaminated with inorganic waste materials.
Steel (Packaging Materials)	208-L (55-gal) drums.
Plastics (Packaging Materials)	90 mil polyethylene drum liner and plastic bags.

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Table C3-2. Minimum Training and Qualification.

Personnel	Requirements^a
Radiography Operators ^a	Site-specific training based on waste matrix codes and waste material parameters; requalification every two years.

a. Operators are those persons responsible for the actual operation of analytical testing equipment. QAPjPs shall include the site-specific title for this position.

Table C3-3. Testing Batch Data Report Contents.

Required Information	Radiography	Visual Examination	Comment
Batch Data Report Date	X	X	
Batch number	X	X	
Waste container number	X	X	
Waste stream name and/or number	O	O	
Waste Matrix Code	X	X	Summary Category Group included in waste matrix code
Implementing procedure (specific version used)	X	X	If procedure cited contains more than one method, the method used must also be cited. Can use revision number, date, or other means to track specific version used.
Container type	O	O	Drums, standard waste box, ten drum overpack, etc.
Video media reference	X	X	Reference to video media applicable to each container. For VE of newly generated waste, video media not required if two trained operators review the contents of the waste container to ensure correct reporting.
Imaging check	O		
Camera check		O	
Audio check	O	O	
QC documentation	X	X	
Verification that the physical form matches the waste stream description and Waste Matrix Code.	X	X	Summary Category Group included in Waste Matrix Code.
Comments	X	X	Comments

User is responsible to use the correct revision.

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Required Information	Radiography	Visual Examination	Comment
Reference to or copy of associated NCRs, if any	X	X	Copies of associated NCRs must be available.
Verify absence of prohibited items	X	X	
Operator signature and date of test	X	X	Two signatures required for Visual Verification of Acceptable Knowledge
Data review checklists	X	X	All data checklists will be identified
Legend:			
X – Required in batch data report			
O – Information must be documented and traceable; inclusion in batch data report is optional			

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Attachment C4. TRU Waste Characterization Using Acceptable Knowledge

C4-1 Introduction

The RCRA regulations codified in 40 CFR Parts 260 through 265, 268, and 270, and the New Mexico Hazardous Waste Management Regulations in 20 NMAC 4.1 Subparts 100 through 600, Subpart 800, and Subpart 900, authorize the use of AK in appropriate circumstances by waste generators, or treatment, storage, or disposal facilities to characterize hazardous waste. AK is described in Waste Analysis: *EPA Guidance Manual for Facilities That Generate, Treat, Store and Dispose of Hazardous Waste*. AK, as an alternative to sampling and analysis, can be used to meet all or part of the waste characterization requirements under the RCRA.

EPA's 1994 Waste Analysis Guidance Manual broadly defines the term "acceptable knowledge" to include process knowledge, whereby detailed information on the waste is obtained from existing published or documented waste analysis data or studies conducted on hazardous waste generated by processes similar to that which generated the waste, facility records of analysis performed before the effective date of RCRA, and waste analysis data obtained from generators of similar waste that send their wastes offsite for treatment, storage, or disposal (EPA 1994). If AMWTP determines that AK alone is insufficient to accurately characterize a waste, AMWTP may use RTR and/or VE (specified in Attachment C1) to complete the waste characterization process and satisfy the requirements of the QAPjP. Acceptable Knowledge is used in TRU mixed waste characterization activities in five ways:

- To delineate TRU mixed waste streams
- To assess whether TRU mixed wastes comply with the applicable requirements of WIPP Hazardous Waste Permit TSDF-WAC
- To assess whether TRU mixed wastes exhibit a hazardous characteristic (20 NMAC 4.1.200, incorporating 40 CFR §261, Subpart C)
- To assess whether TRU mixed wastes are listed (20 NMAC 4.1.200, incorporating 40 CFR §261, Subpart D)
- To estimate waste material parameter weights.

Radiography and VE may be performed to augment the characterization of wastes based on AK when an AK Sufficiency Determination has not been requested by AMWTP or, if requested, has not been granted by CBFO (see Section C4-3d). TRU mixed waste streams undergo applicable provisions of the AK process prior to management, storage, or disposal of the waste at WIPP.

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C4-2 Acceptable Knowledge Documentation

The AMWTP AK information is presented in a logical sequence which progresses from general facility information (TRU mixed waste management program information) to the more detailed waste-specific information (TRU mixed waste stream information). Traceability of AK information for a selected container in the audited Waste Summary Category Group(s) will be examined during the CBFO audit of AMWTP. The consistent presentation of AK documentation among sites in auditable records^b will allow the CBFO to verify the completeness and adequacy of AK for TRU mixed waste characterization during the audit process. AMWTP will implement the AK process as specified in this QAPjP to characterize TRU mixed waste and obtain sufficient waste characterization data to demonstrate compliance with the WIPP-WAP. This AK information applies at AMWTP to both the retrievably stored and newly generated waste streams. The AK process is described in MP-TRUW-8.13. The AMWTP does not develop AK baseline documents for offsite DOE CH-TRU wastes that are characterized and certified by another certified program, such as the CCP. AMWTP also does not develop AK baseline documents for waste that is received for characterization only.

The following sections include the information required to characterize TRU mixed waste using AK. The AMWTP will augment the required AK records with additional supporting information. If the required information is not available for a particular waste, the waste stream is not eligible for an AK Sufficiency Determination as specified in Section C4-3d.

C4-2a Required TRU Mixed Waste Management Program Information

TRU mixed waste management program information clearly defines waste categorization schemes and terminology, provides a breakdown of the types and quantities of TRU mixed waste that are generated and stored at the AMWTP, and describes how waste is tracked and managed at the AMWTP, including historical and current operations. Information related to TRU mixed waste certification procedures and the types of documentation (e.g., waste profile forms) used to summarize AK is also provided.

The AMWTP will be involved in characterizing stored waste generated at multiple facilities and creating newly generated TRU mixed waste in the AMWTP processing facility. For each generator of waste the following general facility information shall be included as part of the AK written record:

- A map of the site with the areas and facilities involved in TRU mixed waste generation, treatment, and storage identified

b. "Auditable Records" are those records which allow the CBFO to conduct a systematic assessment, analysis, and evaluation of the CBFO compliance with the WAP and the WIPP RCRA Permit.

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- Facility mission description as related to TRU mixed waste generation and management (e.g., nuclear weapons research may involve metallurgy, radiochemistry, and nuclear physics operations that result in specific waste streams)
- Description of the operations that generated TRU mixed waste at the site (e.g., plutonium recovery, weapons design, or weapons fabrication)
- Waste identification and category schemes used at the site (e.g., item description code, content codes)
- Types and quantities of TRU mixed waste generated, including historical generation through future projections
- Correlation of waste streams generated for the same building and process, as appropriate (e.g., sludge, combustibles, metals, and glass)
- Waste certification procedures for retrievably stored and newly generated wastes to be sent to the WIPP facility.

C4-2b Required TRU Mixed Waste Stream Information

AK will be used to delineate waste streams. For each TRU mixed waste stream, the AMWTP compiles all process information and data that support the AK used to characterize that waste stream. The type and quantity of supporting documentation varies by waste stream depending on the process that generated the waste and the site-specific requirements. At a minimum, the waste process information on each waste stream includes the following written information:

- Area(s) and building(s) from which the waste stream was or is generated.
- The waste stream volume and period of waste generation (e.g., 100 standard waste boxes of retrievable stored waste generated from June 1977 through December 1977).
- Waste generating process for each building (e.g., batch waste stream generated during decommissioning operations of glove boxes), including processes associated with U134 waste generation, if applicable.
- Documentation regarding how the site has historically managed the waste, including the historical regulatory status of the waste (i.e., TRU mixed versus TRU non-mixed waste).
- Process flow diagrams (e.g., a diagram illustrating glove boxes from a specific building to a size reduction facility to a container storage area). In the case of research/development, analytical laboratory waste, or other similar processes where a process flow diagram cannot be created, a description of the waste generating process, rather than a formal process flow diagram, may be included if this modification is justified and the justification placed in the auditable record.

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- Material inputs or other information that identifies the chemical content of the waste stream and the physical waste form (e.g., glove box materials and chemicals handled during glove box operations; events or processes that may have modified the chemical or physical properties of the waste stream after generation, data obtained through VE of newly generated waste that later undergoes RTR; information demonstrating neutralization of U134 [hydrofluoric acid] and waste compatibility).

The AK written record includes a summary that identifies all sources of waste characterization information used to delineate the waste stream. The basis and rationale for delineating each waste stream, based on the parameters of interest, is clearly summarized and traceable to referenced documents. Assumptions made in delineating each waste stream also are identified and justified.

If discrepancies exist between required information, the AMWTP may consider applying all EPA HWNs indicated by the information to the subject waste stream, but must assess and evaluate the information to determine the appropriate EPA HWNs consistent with RCRA requirements. Discrepancy resolution for the AK is described in MP-TRUW-8.13.

CBFO will obtain, at a minimum, procedures that comply with the following AK requirements:

- Procedures for identifying and assigning the physical waste form of the waste
- Procedures for delineating waste streams and assigning Waste Matrix Codes
- Procedures for resolving inconsistencies in AK documentation
- Procedures for VE and/or RTR, if applicable
- For newly generated waste, procedures describing process controls used to ensure prohibited items (specified in the WIPP-WAP, Permit Attachment C) are documented and managed
- Procedures to ensure RTR and VE include a list of prohibited items that the operator shall verify are not present in each container (e.g., liquid exceeding WIPP Hazardous Waste Permit TSDF-WAC limits, corrosives, ignitable, reactives, and incompatible wastes)
- Procedures to document how changes to Waste Matrix Codes, waste stream assignment, and associated EPA HWNs based on material composition are documented for any waste
- Procedures that ensure the assignment of EPA HWNs is appropriate, consistent with RCRA requirements, and considers site historical waste management
- Procedures for estimating waste material parameter weights.

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C4-2c Additional Acceptable Knowledge Documentation

Additional AK information, as appropriate, is collected to augment required information and provide any other information obtained to further delineate waste streams. Adequacy of this information is assessed during audits (Section C4-3g). This information is included in the AK written record.

All additional specific, relevant AK documentation assembled and used in the AK process, whether it supports or contradicts any required AK documentation shall be identified and an explanation provided for its use (e.g., identification of a TC). Additional documentation may be used to further document the rationale for the hazardous characterization results. The collection and use of additional information shall be assessed during site audits to ensure that hazardous waste characterization is supported, as necessary, by such information. Similar to required information, if discrepancies exist between additional information and the required information, then the AMWTP may consider applying all EPA HWNs indicated by the additional information to the subject waste stream, but must assess and evaluate the information to determine the appropriate EPA HWNs consistent with RCRA requirements. All information considered must be documented and placed in the auditable record, including applicable discrepancy resolution documentation. Discrepancy resolution for the AK is described in MP-TRUW-8.13.

Additional AK documentation includes, but is not limited to, the following information:

- Process design documents (e.g., Title II Design).
- Standard operating procedures that may include a list of raw materials or reagents, a description of the process or experiment generating the waste, and a description of waste generated and how the wastes are managed at the point of generation.
- Preliminary and final safety analysis reports and technical safety requirements.
- Waste packaging records.
- Test plans or research project reports that describe reagents and other raw materials used in experiments.
- Site databases (e.g., chemical inventory database for Superfund Amendments and Reauthorization Act Title III requirements).
- Information from site personnel (e.g., documented interviews).
- Standard industry documents (e.g., vendor information).

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- Analytical data relevant to the waste stream, including results from fingerprint analyses, spot checks, routine verification sampling, or other processes that collect information pertinent to the waste stream. This may also include new information which augments required information (e.g., VE not performed in compliance with the WIPP-WAP, radiography screening for prohibited items).
- Material Safety Data Sheets, product labels, or other product package information.
- Sampling and analysis data from comparable or surrogate waste streams (e.g., equivalent nonradioactive materials).
- Laboratory notebooks that detail the research processes and raw materials used in an experiment.

C4-3 Acceptable Knowledge Training, Procedures, and Other Requirements

Consistency in using AK information to characterize TRU mixed waste is provided by use of the following: (1) compiling the required and additional AK documentation in an auditable record, (2) auditing AK records, and (3) WSPF approval and waste confirmation. This section specifies the qualification and training requirements, describes each phase of the process, specifies the procedures that AMWTP is required to develop to implement the requirements for using AK, and specifies the data quality requirements for AK.

C4-3a Qualifications and Training Requirements

To ensure compliance with the requirements for compiling assembling, evaluating, assessing and resolving discrepancies associated with AK, AMWTP AK personnel shall be trained in accordance with LST-RTQP-03-IM and MP-RTQP-14.4.

The training requirements shall include the following subjects:

- WIPP-WAP in Permit Attachment C and the WIPP Hazardous Waste Permit TSDF-WAC specified in this QAPjP
- State and Federal RCRA regulations associated with solid and hazardous waste characterization
- Discrepancy resolution and reporting processes
- Site-specific procedures associated with waste characterization using AK.

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C4-3b Acceptable Knowledge Assembly and Compilation

Site-specific AK procedures address the following:

- A written procedure(s) outlining the specific methodology used to assemble AK records, including the origin of the documentation, how it will be used, and any limitations associated with the information (e.g., identify the purpose and scope of a study that included limited sampling and analysis data).
- A written procedure(s) to compile the required AK record.
- A written procedure(s) that ensures unacceptable wastes (e.g., reactive, ignitable, corrosive) are identified and segregated from TRU mixed waste populations sent to WIPP.
- A written procedure(s) to evaluate AK and resolve discrepancies. For example, if different sources of information indicate different hazardous wastes are present, then AMWTP includes all sources of information in its records and may choose to either conservatively assign EPA HWNs or assign only those numbers deemed appropriate and consistent with RCRA requirements. All information used to justify assignment of EPA HWNs must be placed in the auditable record. Further, the assignment of EPA HWNs is tracked in the auditable record to all required documentation.
- A written procedure(s) to identify hazardous wastes and assign the appropriate EPA HWNs to each waste stream. The following are minimum baseline requirements/standards that site-specific procedures include to ensure comparable and consistent characterization of hazardous waste:
 - Compilation of all of the required information in an auditable record.
 - Review of the compiled information and delineate waste streams. Delineation of waste streams must comply with the definition in Section C-0a and justify combining waste historically managed separately as TRU mixed and TRU non-mixed waste streams into a single waste stream.
 - Review of the compiled information to determine if the waste stream is compliant with the WIPP Hazardous Waste Permit TSDF-WAC.
 - Review of the required information to determine if the waste is listed under 20 NMAC 4.1.200 (incorporating 40 CFR §261), Subpart D. All listed EPA HWNs are assigned unless AMWTP chooses to justify an alternative assignment and document the justification in the auditable record.

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- Review of the required information to determine if the waste exhibits a hazardous characteristic or may contain hazardous constituents included in the TCs specified in 20 NMAC 4.1.200 (incorporating 40 CFR §261), Subpart C. If a TC contaminant is identified and is not included as a listed waste, the AMWTP may evaluate available data and assign TC HWN consistent with RCRA requirements. All data examined to reach the HWN determination must be placed in the auditable record and must present a clear justification for the EPA HWN analyses.
- Review the compiled information to provide an estimate of material parameter weights for each container to be stored or disposed of at WIPP.

For newly generated wastes, procedures are implemented to characterize hazardous waste using AK prior to packaging the waste.

- Ensure that results of audits of the TRU mixed waste characterization programs at the site are available in the records.
- AMWTP will identify all process controls (implemented to ensure that the waste contains no prohibited items and to control hazardous waste content and/or physical form) that may have been applied to retrievably stored waste and/or may presently be applied to newly generated waste. Process controls are applied at the time of waste generation/packaging to control waste content, whereas any activities performed after waste generation/packaging to identify prohibited items, hazardous waste content, or physical form are waste characterization activities, not process controls. The AK record must contain specific process controls and supporting documentation identifying when these process controls are used to control waste content. See Section C-2 for programmatic requirements related to process controls.

C4-3c Criteria for Assembling an Acceptable Knowledge Record and Delineating the Waste Stream

MP-TRUW-8.13 provides an overview of the process for assembling AK documentation into an auditable record. The first step is to assemble all of the required AK information and any additional information regarding the materials and processes that generate a specific waste stream.

Procedures are implemented to establish AK records in compliance with the following criteria:

- AK information is compiled in an auditable record, including a road map for all applicable information.
- The overview of the facility and TRU mixed waste management operations in the context of the facility's mission is correlated to specific waste stream information.

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- The method for documenting correlations between waste streams, with regard to time of generation, waste generating processes, and site-specific facilities are described in MP-TRUW-8.13. For newly generated waste, the rate (or schedule) and quantity of waste to be generated will be defined.
- A reference list shall be provided that identifies documents, databases, QA protocols, and other sources of information that support the AK information.

Container inventories for TRU mixed waste currently in retrievable storage can be found in the WTS. These container inventories will be delineated into waste streams by correlating the container identification to all of the required AK information and any additional AK information.

C4-3d AK Sufficiency Determination Request Contents

AMWTP may submit an AK Sufficiency Determination Request to meet all or part of the waste characterization requirements. The Determination Request shall include, at a minimum:

- A complete AK Summary that addresses the following technical requirements:
 - Executive Summary
 - Waste Stream Identification Summary; including a demonstration that the waste stream has been properly delineated and meets the QAPjP definition of waste stream (Attachment C, Introduction)
 - Mandatory Program Information (including, but not limited to, facility location and description, mission, defense waste assessment, spent nuclear fuel and high-level waste assessment, description of waste generating processes, research/development [as necessary], facility support operations [as applicable], types and quantities of TRU waste generated, correlation of waste streams to buildings/processes, waste identification and categorization, physical form identifiers)
 - Mandatory Waste Stream Information (including, but not limited to, Area and Building of Generation, waste stream volume/period of generation (including, for newly generated waste, the rate and quantity of waste to be generated), waste generating activities, types of waste generated, material input related to physical form and identification of percentage of each waste material parameter in the waste stream, chemical content information including hazardous constituents and hazardous waste identification, prohibited item content (including documented evidence that the waste meets the WIPP Hazardous Waste Permit TSDF-WAC Sections 2.3.3.1 through 2.3.3.10), waste packaging, presence of filter vents, number of layers of confinement)
 - Types of additional information gathered

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- Container specific data (if available and relevant)
- A complete reference list including all mandatory and additional information
- An AK roadmap (defined as a cross reference between mandatory programmatic and mandatory waste stream information, with references supporting these requirements)
- A complete reference list including all mandatory and additional documentation
- Additional relevant information for the required programmatic and waste stream data addressed in the AK Summary, examples of which are presented in Section C4-2c
- Identification of any mandatory requirements supported only by upper tier documents (i.e., there is insufficient supporting data)
- Description or other means of demonstrating that the AK process described in the QAPjP was followed (for example, AK personnel were appropriately trained; discrepancies were documented, etc.)
- Information showing that the AMWTP has developed a written procedure for compiling the AK information and assigning EPA HWNs as required in Section C4-3b
- Information showing that the AMWTP has assessed the AK process (e.g. internal audits, Section C4-3b).

The CBFO will evaluate the Determination Request for completeness and technical adequacy as specified in Attachment C.

C4-3e Requirements for Re-Evaluating AK Information

AK includes information regarding the physical form of the waste, the base materials composing the waste, and the process that generates the waste. Waste testing (i.e., RTR or VE) may be used to augment AK information.

The WSPF and CIS (including the AK summary) will be reviewed for each waste stream prior to CBFO approval of the WSPF. The CBFO review will ensure that the submitted AK information was collected under procedures that ensure implementation of the QAPjP, provides data sufficient to meet the DQOs in Section C-4a(1), and allow the AMWTP to demonstrate compliance with the waste analysis requirements of the QAPjP. A detailed discussion of the CBFO's waste stream review and approval process is provided in Section C-1d.

The AMWTP has established procedures for reevaluating AK if the results of waste confirmation indicate that the waste to be shipped does not match the approved waste stream, or if data obtained from RTR or VE for waste streams without an AK Sufficiency Determination exhibit

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this discrepancy. These procedures describe how the waste is reassigned, AK reevaluated, and appropriate EPA HWNs assigned. If the reevaluation requires that the Waste Matrix Code be changed for the waste stream or the waste does not match the approved waste stream, the following minimum steps are taken to reevaluate AK. This process is implemented in MP-TRUW-8.13.

- Review existing information based on the container identification number and document all differences in EPA HWN assignments.
- If differences exist in the EPA HWNs that were assigned, reassess and document all required AK information (Section C4-3b) associated with the new designation.
- Reassess and document all testing data associated with the waste.
- Verify and document that the reassigned Waste Matrix Code was generated within the specified time period, area and buildings, waste generating process, and that the process material inputs are consistent with the waste material parameter identified during RTR or VE.
- All changes to AK records are recorded.
- If discrepancies exist in the AK information for the revised Waste Matrix Code, the segregation of the affected portion of the waste stream is documented, and the actions necessary to fully characterize the waste are defined.

C4-3f Acceptable Knowledge Data Quality Requirements

The DQOs for testing techniques are provided in Attachment C3. Testing results are used to augment the characterization of wastes based on AK. To ensure that the AK process is consistently applied, the AMWTP complies with the data quality requirements for AK documentation described in Attachment C3.

The AMWTP addresses QC by tracking its performance with regard to the use of AK by: (1) assessing the frequency of inconsistencies among information, and (2) documenting the results of waste discrepancies identified by AMWTP during waste characterization or the CBFO during waste confirmation using RTR, review of RTR audio/video recordings, VE, or review of VE records. In addition, the AK process and waste stream documentation is evaluated through internal assessments by AMWTP QA organizations.

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C4-3g Audits of Acceptable Knowledge

CBFO will conduct an initial audit prior to certifying AMWTP for shipment of TRU mixed waste to the WIPP facility. This initial audit will establish an approved baseline that will be reassessed annually. Those audits verify compliance with the WIPP-WAP, ensure the consistent compilation, application, and interpretation requirements of AK information throughout the DOE complex, and evaluate the completeness and defensibility of site-specific AK documentation related to hazardous waste determinations.

The QA organization performs a periodic independent audit, or several small scope audits, of AMWTP activities in accordance with MP-M&IA-17.2, *Independent Assessment*. QA AK audit checklists include the elements listed below for review during the periodic audit, and the AMWTP provides information as requested by QA to satisfy the AK audit/surveillance requirements:

- Documentation of the process used to compile, evaluate, and record AK is available and implemented
- Personnel training and qualifications are documented
- All of the required AK documentation specified in Section C4-2 has been compiled in an auditable record
- All the required procedures specified in Section C4-3 have been developed and implemented, including but not limited to
 - A procedure exists for assigning EPA HWNs as referenced in Section C4-3b(5)
 - A procedure exists for resolving discrepancies in AK documentation in accordance with Section C4-3b
- Results of other audits of the TRU mixed waste characterization programs at AMWTP are available in site records.

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Attachment C5. Quality Assurance Project Plan Requirements

C5-1 Quality Assurance Project Plans

The AMWTP has developed and implemented this QAPjP to address the applicable requirements specified in the WIPP-WAP. This QAPjP will be submitted and approved by the CBFO to ensure that it includes the qualitative or quantitative criteria to ensure that waste characterization activities are being performed satisfactorily.

The AMWTP uses standard operating procedures for all activities which affect the quality of the waste characterization program elements specified in this QAPjP. For the purposes of the QA program, the term *standard operating procedure* refers to any site-specific implementing document. Compliance with standard operating procedures ensures that tasks are performed in a consistent manner that results in achieving the quality required for the QA program. Throughout this QAPjP, site-specific documents are referenced that detail how each of the required elements of the characterization program are performed.

C5-2 Document Review, Approval, and Control

The preparation, issuance, and change to documents that specify quality requirements or prescribe activities affecting quality for the TRU mixed characterization program elements specified in this QAPjP are controlled to ensure the correct and current documents are used and referenced. QAPjPs include a document control number consisting of a unique document identification number, current revision number, date, and page number which will be placed on the individual pages of the document. Qualified and independent individuals will review all quality documents for the waste characterization program prior to approval and issuance. There will be appropriate QAPjP approval that is indicated by a signature and date page included in the front of each document. AMWTP compliance with the WIPP-WAP requirements for document review, approval, and control is defined in Section 4 of MP-TRUW-8.1 and MP-DOCS-18.4. The CBFO approves this QAPjP and other program documents defining performance criteria or data quality.

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Table C5-1. Minimum requirements for review, approval, implementation, and control of QAPjP.

	RESPONSIBLE PARTY				
	Manager, CBFO QA	CBFO Director National TRU Program	DOE-ID	AMWTP SPM	AMWTP QA Manager
Review/Approval	X	X	X	X	X
Implementation				X	X
Change Approval	X	X	X	X	X
Change Control				X	X

Table C5-1 presents the minimum requirements for review, approval, and implementation of the QAPjP. The QAPjP will be reviewed for technical adequacy, completeness, and correctness, and the inclusion of requirements established by the WIPP-WAP.

Revisions to documents that implement the requirements of the QAPjP will be denoted by including the current revision number on the document’s title page, the revised signature page, and each page that has been revised. Only revised pages need to be reissued although the entire document may be reissued. Changes to documents, other than those defined as editorial changes or minor changes, will be reviewed and approved by the same functional organizations that performed the original review and approval, unless other organizations are specifically designated in accordance with approved procedures. Editorial or minor changes may be made without the same level of review and approval as the original or otherwise changed document. The following items are considered editorial or minor changes:

- Correcting grammar or spelling (the meaning has not changed)
- Renumbering sections or attachments
- Updating organizational titles
- Changes to nonquality-affecting schedules
- Revised or reformatted forms, providing the original intent of the form has not been altered
- Attachments marked “Example,” “Sample,” or exhibits that are clearly intended to be representative only.

A change in an organizational title accompanied by a change in the responsibilities is not considered an editorial change. Changes to the text shall be clearly indicated in the document. AMWTP shall provide CBFO with the final issued QAPjP.

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CBFO ensures that QAPjPs include a detailed description of the reporting and approval requirements for changes to approved QA document and SOPs, including procedures for implementing changes to these documents. All members of the AMWTP site project staff are responsible for reporting any obsolete or superseded information to the SPM. All site-specific changes are evaluated and approved by the AMWTP SPM and QA Manager before implementation. The SPM notifies the appropriate personnel and the affected documents are revised as necessary. The SPM also is responsible for notifying the DOE field office of the changes. The SPM will contact CBFO for approval prior to implementing changes that affect performance criteria or data quality, such as testing procedures, QAOs, calibration requirements, or QC sample acceptance criteria to ensure compliance with the WAP (Attachment C).

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Attachment C6. Audit and Surveillance Program

C6-1 Introduction

The CBFO Audit and Surveillance Program shall ensure that: (1) each site that plans to transport TRU mixed waste to the WIPP facility conduct testing of wastes in accordance with the current WIPP-WAP, and (2) the information supplied by each site to satisfy the waste screening and acceptability requirements of Section C-4 of the WAP is being managed properly. The CBFO will conduct these audits and surveillances at each site performing these activities in accordance with a standard operating procedure. Only personnel with appropriate DOE clearances will have access to classified information during audits. Classified information will not be included in audit reports and records.

Deficiencies may be identified during audits. A deficiency is any failure to comply with an applicable provision of the WAP. During audit interviews or audit meetings, AMWTP personnel may be advised of deficiencies identified within their areas of responsibility to establish a clear understanding of the identified condition.

AMWTP personnel will be given the opportunity to correct any deficiency that can be corrected during the audit period. Deficiencies and observations will be documented and included as part of the final audit report. Those items that have been resolved during the audit (isolated deficiencies that do not require a root cause determination or actions to preclude recurrence), will be verified prior to the end of the audit, and the resolution will be described in the audit report. Those items that affect the quality of the program, and/or the data generated by that program, which are required by the WIPP-WAP will be documented on a CAR and included as part of the final audit report. The CAR will be entered into the CBFO CAR tracking system and tracked until closure. RCRA-related items will be uniquely identified by the AMWTP during self-audits will be evaluated during the CBFO's audit and surveillance program and tracked in the CBFO tracking systems.

If a discrepancy is identified during a CBFO audit, the audit team may prepare a CAR. The AMWTP will review the CAR, evaluate the extent and cause of the deficiency, and provide a response to CBFO indicating the remedial actions and action taken to preclude recurrence. CBFO will review the response and, if acceptable, communicate the acceptance to AMWTP. After all corrective actions have been completed, the CBFO may schedule and perform a verification visit to assure that corrective actions have been completed and are effective.

AMWTP will submit a corrective action plan to CBFO to eliminate the deficiency stated on the CAR, including a resolution of the acceptability of any data generated prior to the resolution of the corrective action.

User is responsible to use the correct revision.

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The corrective action response will include a discussion of the investigation performed to determine the extent and impact of the deficiency, a description of the remedial actions taken, determination of root cause, and actions to preclude recurrence. This process is described in MP-Q&SI-5.4 and MP-Q&SI-5.3, Corrective Action.

The AMWTP will respond to any deficiencies and observations within thirty days after receipt of any CARs and indicate the corrective action taken or to be taken. If the corrective action has not been completed, the response will indicate the expected date the action will be completed. CARs applicable to WAP requirements will be resolved prior to shipment.

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Attachment C7. TRU Waste Confirmation

Introduction

This section of the QAPjP describes the actions that CBFO will take to approve and accept waste for and disposal at the WIPP, including waste confirmation activities. Discussion of the CBFO actions that are relevant to AMWTP will be included here.

CBFO demonstrates compliance with the Permit by ensuring that the waste characterization processes performed by AMWTP produce data compliant with the WIPP-WAP and through the waste screening and verification processes. Verification occurs at three levels: (1) the data generation level, (2) the project level, and (3) the CBFO level. The CBFO also examines a representative subpopulation of waste prior to shipment to confirm that the waste contains no ignitable, corrosive, or reactive waste; and that assigned EPA HWNs are allowed by the WIPP RCRA Permit. The waste confirmation activities described herein occur prior to receipt of TRU mixed waste at WIPP.

C7-1 Permittee Confirmation of TRU Mixed Waste

Waste confirmation is defined in Part 1 as the activities performed by the CBFO to satisfy the requirements in Section 310 of Public Law 108-447. Waste confirmation occurs after waste containers have been certified for disposal at WIPP.

C7-1a Permittee Confirmation of a Representative Subpopulation of the Waste

CBFO will confirm that the waste contains no ignitable, corrosive, or reactive waste through RTR or the use of VE of a statistically representative subpopulation of the waste. Prior to shipment to WIPP, waste confirmation will be performed on randomly selected containers from each CH and RH-TRU mixed waste stream shipment.

Waste confirmation encompasses ensuring that the physical characteristics of the TRU mixed waste correspond with its waste stream description and that the waste does not contain liquid in excess of TSDF-WAC limits or compressed gases.

Noncompliant waste identified during waste confirmation will be managed as described in Section C7-2.

CBFO randomly selects at least 7% of each waste stream shipment for waste confirmation. This equates to a minimum of one container from each fourteen containers in each waste stream in each designated shipment.

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For each container selected for confirmation, the confirmation team will examine the respective NCR documentation to verify NCRs have been dispositioned for the selected container as required in Section C3-13.

C7-1a(1) Confirmation Training Requirements

This section does not apply to the AMWTP.

C7-1b Radiography Methods Requirements

This section describes the portion of the CBFO confirmation program that applies to the AMWTP.

For containers that have been characterized using RTR by the AMWTP in accordance with the method in Attachment C1, Section C1-1, the CBFO may perform confirmation by review of the AMWTP's RTR audio/video recordings.

Independent replicate scans and replicate observations of the video output of the RTR process shall be performed under uniform conditions and procedures. Independent replicate scans will be performed on one waste container per day or once per shipment, whichever is less frequent, by a qualified RTR operator other than the individual who performed the first examination. When confirmation is performed by review of audio/video recorded scans produced by the AMWTP as specified in Section C1-3, independent observations will be performed on two waste containers per shipment or two containers per day, whichever is less frequent.

C7-1c Visual Examination Methods Requirements

This section describes the portion of the CBFO confirmation program that applies to the AMWTP.

VE may also be used as a waste confirmation method by the CBFO. VE shall be conducted by the CBFO in accordance with written standard operating procedures to describe the contents of a waste container. VE shall be conducted to identify and describe all waste items, packaging materials, and waste material parameters. VE may be used by the CBFO to examine a statistically representative subpopulation of the waste certified for shipment to WIPP to confirm that the waste contains no ignitable, corrosive, or reactive waste. This is achieved by confirming that the waste contains no liquid in excess of TSDF-WAC limits or compressed gases, and that the physical form of the waste matches the waste stream description documented on the WSPF. During packaging, the waste container contents are directly examined by trained personnel. This form of waste confirmation may be performed by the CBFO at AMWTP. VE may be documented on video and audio media, or by using a second operator to provide additional verification by reviewing the contents of the waste container to ensure correct reporting. When VE is performed using a second operator, each operator performing the VE shall observe for themselves the waste being placed in the waste container or the contents within the examined

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waste container when waste is not removed. The results of all VE shall be documented on VE data forms which are used to document (1) the Waste Matrix Code, (2) that the waste container contains no ignitable, corrosive, or reactive waste by documenting the absence of liquids in excess of TSDF-WAC limits or compressed gases, and (3) that the physical form of the waste is consistent with the waste stream description documented on the WSPF.

In order to keep radiation doses as low as reasonably achievable at the AMWTP, the CBFO may use their own trained VE operators to perform VE for waste confirmation by reviewing VE data forms, waste packaging records, and may use the audio/video media. The confirmation team shall document their review of the AMWTP VE data on confirmation data forms.

If the AMWTP documents VE using audio/video media in accordance with Section C1-2, the confirmation team must use the audio/video to perform confirmation. If the waste confirmation team performs waste confirmation by review of audio/video media, the audio/video record of the VE must be sufficiently complete to confirm the Waste Matrix Code and waste stream description, and verify the waste contains no liquid in excess of TSDF-WAC limits or compressed gases. AMWTP VE video/audio media subject to review by the CBFO shall meet the following minimum requirements:

- The video/audio media shall record the waste packaging event for the container such that all waste items placed into the container are recorded in sufficient detail and shall contain an inventory of waste items in sufficient detail that a trained CBFO VE operator can identify the associated waste material parameters.
- The video/audio media shall capture the waste container identification number.
- The personnel loading the waste container shall be identified on the video/audio media or on packaging records traceable to the loading of the waste container.
- The date of loading of the waste container will be recorded on the video/audio media or on packaging records traceable to the loading of the waste container.

VE audio/video media of containers that contain classified shapes shall be considered classified information.

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If the AMWTP did not document VE using audio/video media, the CBFO may use their own trained VE operators to perform VE for waste confirmation by reviewing VE data forms or packaging records prepared by the generator during their packaging of the waste. To be acceptable, the AMWTP VE data forms or packaging records must be signed by two AMWTP personnel who witnessed the packaging of the waste and must provide sufficient information for the CBFO to determine that the waste container contents match the waste stream description on the WSPF and the waste contains no liquids in excess of WIPP Hazardous Waste Permit TSDf-WAC limits or compressed gases. AMWTP VE forms or packaging records subject to review by CBFO shall meet the following minimum requirements:

- At least two generator site personnel shall approve the data forms or packaging records attesting to the contents of the waste container.
- The data forms or packaging records shall contain an inventory of waste items in sufficient detail that a trained CBFO VE operator can identify the associated waste material parameters.
- The waste container identification number shall be recorded on the data forms or packaging records.
- VE video media of containers that contain classified shapes shall be considered classified information. VE data forms will not contain classified information.

C7-2 Noncompliant Waste Identified During Waste Confirmation

This section describes the portion of the CBFO confirmation program that applies to the AMWTP.

If the CBFO identifies noncompliant waste during waste confirmation at AMWTP (i.e., the waste does not match the waste stream description documented in the WSPF or there is liquid in excess of TSDf-WAC limits or compressed gases), the waste will not be shipped.

The CBFO will suspend further shipments of the affected waste stream and issue a CAR to the AMWTP. Shipments of affected waste streams will not resume until the CAR has been closed.

As part of the corrective action plan in response to the CAR, the AMWTP will evaluate whether the waste characterization information documented in the CIS and/or WSPF for the waste stream must be updated because the results of waste confirmation for the waste stream indicated that the TRU mixed waste being examined did not match the waste stream description. AMWTP will thoroughly evaluate the potential impacts on waste that has been shipped to WIPP. The CBFO will evaluate the potential that prohibited items were shipped to WIPP and what remedial actions should occur, if any. The results of these evaluations will be provided to NMED before shipments of affected waste stream resume. If the CIS and/or WSPF require revision, shipments of the affected waste stream shall not resume until the revised waste stream waste

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characterization information has been reviewed and approved by the CBFO. If AMWTP certifies noncompliant waste more than once during a running 90-day period, the CBFO will suspend acceptance of AMWTP's waste until the CBFO find that all corrective actions have been implemented and the site complies with all applicable requirements of the WIPP-WAP.

D. RECORDS PROCESSING

Record Description	Classification
MP-TRUW-8.2, Case file	Nonpermanent WIPP / ENV1-J-1 Destroy 75 years after submittal

E. REFERENCES

E-0 AMWTP Documents

INST-FOI-17, Facility Visual Examination Operations

INST-FOI-20, Supercompactor and Post-Compaction Operations

INST-OI-12, Real-Time Radiography Operations (Drum)

INST-OI-34, Non-Facility Visual Examination Operations

INST-TRUW-8.13.4, Accelerated Retrieval Project (ARP) Visual Examination Activities

LST-RTQP-03-IM, WIPP Training Requirements Implementation Matrix

MP-DOCS-18.2, Records Management

MP-DOCS-18.4, Document Control

MP-M&IA-17.1, Management Assessment

MP-M&IA-17.2, Independent Assessment

MP-Q&SI-5.3, Corrective Action

MP-Q&SI-5.4, Identification of Nonconforming Conditions

MP-RTQP-14.1, Preparation and Administration of Training Plans

MP-RTQP-14.4, Personnel Qualification and Certification

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MP-RTQP-14.19, Training Records Administration

MP-TRUW-8.1, Certification Plan for INL Transuranic Waste

MP-TRUW-8.5, TRU Waste Certification

MP-TRUW-8.8, Level I Data Validation

MP-TRUW-8.9, Level II Data Validation

MP-TRUW-8.11, Data Reconciliation

MP-TRUW-8.13, Collection, Review, and Management of Acceptable Knowledge Documentation

MP-TRUW-8.14, Preparation of Waste Stream Profile Forms

E-1 External References

15 USC 2601–2692, “The Toxic Substances Control Act of 1976.”

20 NMAC 4.1, “Hazardous Waste Management,” Title 20, New Mexico Administrative Code, Chapter 4, Part 1, Sections 200, 300, 500, and 800.

40 CFR 261, “Identification and Listing of Hazardous Waste,” Code of Federal Regulations, Office of the Federal Register.

40 CFR 262, “Standards Applicable to Generators of Hazardous Waste,” Code of Federal Regulations, Office of the Federal Register, National Archives and Records Administration, Washington D.C.

40 CFR 264, “Standards for Owners and Operators of Hazardous Waste Treatment, Storage, and Disposal Facilities,” Code of Federal Regulations, Office of the Federal Register, July 2011.

40 CFR 268, “Land Disposal Restrictions,” Code of Federal Regulations, Office of the Federal Register. DOE/TRU-14-3425, “Annual Transuranic Waste Inventory Report,” U.S. Department of Energy- Carlsbad Area Office, current revision.

DOE/CBFO-94-1012, “Quality Assurance Program Document,” U.S. Department of Energy- Carlsbad Field Office, Carlsbad, New Mexico, current revision.

DOE/LLW-217, “DOE Waste Treatability Group Guidance,” U.S. Department of Energy-Idaho National Laboratory, January 1995.

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DOE/WIPP-02-3122, "Transuranic Waste Acceptance Criteria for the Waste Isolation Pilot Plant," U.S. Department of Energy-Carlsbad Field Office, Carlsbad, New Mexico, current revision.

DOE/WIPP-09-3427, "Waste Data System User's Manual," U.S. Department of Energy-Carlsbad Field Office, Carlsbad, New Mexico, current revision.

California Department of Health Services and the U.S. Environmental Protections Agency, 1980, "A Method for Determining the Compatibility of Hazardous Wastes," EPA/600/2-80-076, Office of Research and Development.

U.S. Environmental Protections Agency, 1994a, "Waste Analysis at Facilities that Generate, Treat, Store, and Dispose of Hazardous Waste, a Guidance Manual," OSWER 9938.4-03, Office of Solid Waste and Emergency Response..

New Mexico Environment Department, "Waste Isolation Pilot Plant (WIPP) Hazardous Waste Facility Permit," Permit No. NM4890139088-TSDF, Santa Fe, New Mexico.

NRC Docket No. 71-9218, "TRUPACT-II Certificate of Compliance," Office of Regulatory Procedures, U.S. Nuclear Regulatory Commission, Washington, D.C. .

NRC Docket No. 71-9305, "TRUPACT-III Certificate of Compliance", Office of Regulatory Procedures, U.S. Nuclear Regulatory Commission, Washington D.C

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F. GLOSSARY

F-0 Acronyms and Abbreviations

AK	acceptable knowledge
AMWTP	Advanced Mixed Waste Treatment Project
BDR	Batch Data Report
CAR	corrective action report
CCP	Central Characterization Project
CFR	Code of Federal Regulations
CH	contact-handled
CH-TRU	contact-handled transuranic
CIS	Characterization Information Summary
DOE	U.S. Department of Energy
DQO	Data Quality Objective
EPA	Environmental Protection Agency
HWN	EPA hazardous waste number
INL	Idaho National Laboratory
ITR	independent technical review
L	liter
mL	milliliter
mm	millimeter
mm Hg	millimeters mercury
MP	management procedure
NCR	nonconformance report
NDE	nondestructive examination
NMAC	New Mexico Administrative Code
NMED	New Mexico Environment Department
OJT	on-the-job training
OVA	organic vapor analyzer
PCB	polychlorinated biphenyl
ppm	parts per million
ppmv	parts per million by volume
psig	pounds per square inch gauge
pt	point
QA	quality assurance

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QAO	Quality Assurance Objective
QA/QC	Quality Assurance/Quality Control
QAPD	Quality Assurance Program Document
QAPjP	Quality Assurance Project Plan
QC	quality control
RA	radioassay
R&D	research and development
RCRA	Resource Conservation and Recovery Act
RH	remote-handled
RIDS	Records Inventory and Disposition Schedule
RTR	real-time radiography
RWMC	Radioactive Waste Management Complex
SPM	Site Project Manager
TC	toxicity characteristic
TRU	transuranic
TRUCON	TRUPACT-II Content Codes (DOE 1992)
TRUPACT-II	Transuranic Package Transporter Model II
TSDf	Treatment, Storage, and Disposal Facility
VE	visual examination
VEE	Visual Examination Expert
WAC	waste acceptance criteria
WDS	Waste Data System
WIPP	Waste Isolation Pilot Plant
WIPP-WAP	Waste Analysis Plan for the Waste Isolation Pilot Plant, Attachment C of the WIPP Hazardous Waste Facility Permit
WSPF	Waste Stream Profile Form
WTS	Waste Tracking System
WWIS	WIPP Waste Information System