ATTACHMENT ~~B~~ C

WASTE ANALYSIS PLAN

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ATTACHMENT ~~B~~ C

WASTE ANALYSIS PLAN

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ATTACHMENT ~~B~~ C

WASTE ANALYSIS PLAN

~~B~~C-0 Introduction and Attachment Highlights

This waste analysis plan (**WAP**) has been prepared for management, storage, or disposal activities to be conducted at the Waste Isolation Pilot Plant (**WIPP**) facility to meet requirements set forth in 20.4.1.500 NMAC (incorporating 40 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 this WAP (EPA, 1994). This WAP includes test methods, details of planned waste sampling and 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 (**QA**)/quality control (**QC**) program. Before the Permittees manage, store, or dispose transuranic (**TRU**) mixed waste from a generator/storage site (**site**), the ~~Permittees~~ ~~Department of Energy Carlsbad Field Office(**DOE**)~~ Permittees shall require that site to implement the applicable requirements of this WAP.

TRU mixed waste that may be stored or disposed at WIPP are or were generated at U.S. Department of Energy (**DOE**) generator/storage sites by various specific processes and activities. Examples of the major types of operations that generate this waste include:

- Production of Nuclear Products—Production of nuclear products includes reactor operation, radionuclide separation/finishing, and weapons fabrication and manufacturing. The majority of the TRU mixed waste was generated by 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, plastics, rags, salts used in electrorefining, precipitates, firebrick, soot, and filters.

- Research and Development (**R&D**)—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. These materials are expected to be the largest category by volume of TRU mixed waste to be generated in the future.

TRU mixed waste contains both TRU radioactive and hazardous components, as defined in 20.4.1.800 NMAC (incorporating 40 CFR, §268.35(d)), and in the Federal Facility Compliance Act, Public Law 102- 386, Title 1, §3021(d). It is designated and separately packaged as either contact-handled (**CH**) or remote-handled (**RH**), based on the radiological dose rate at the surface of the waste container.

The hazardous components of the TRU mixed waste to be managed at the WIPP facility are designated in Table ~~B~~ C-9. 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 Treatment, Storage, and Disposal Facility Waste Acceptance Criteria (**TSDF-WAC**) in Module II are met. This WAP 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 ~~B~~ C-9 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 mixed waste is retrievably stored at the DOE generator/storage sites. Additional TRU mixed waste will be generated and packaged into containers at these generator/storage sites in the future. TRU mixed waste will be retrieved from storage areas at a DOE generator/storage site. Retrievably stored waste is defined as TRU mixed waste generated after 1970 and before the New Mexico Environment Department (**NMED**) notifies ~~the Permittees DOE~~ the Permittees, by approval of the final audit report, that the characterization requirements of the WAP at a generator/storage site have been implemented. Newly generated waste is defined as TRU mixed waste generated after NMED approves the final audit report for a generator/storage site. Acceptable knowledge (**AK**) 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 requirements for newly generated and retrievably stored TRU mixed wastes differ, as discussed in Sections ~~B~~ C-3d(1) and ~~B~~ C-3d(2).

Waste characterization is defined in Module I 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 ~~B~~ C-2. Generator site waste characterization programs are first audited by ~~the Permittees~~ DOE, with NMED approving the final audit report. After this, generator sites determine whether AK alone is sufficient for characterization, or whether a sampling and analysis program in conjunction with AK is necessary to adequately characterize wastes. If an AK Sufficiency Determination is sought, information is provided to ~~the Permittees DOE~~ the Permittees for their review and DOE's provisional approval; NMED determination of adequacy of the AK information is required before final approval by ~~the Permittees~~ DOE. If the sampling and analysis route is chosen, sites proceed to sample and analyze waste in conjunction with AK and in accordance with this WAP. Once an AK Sufficiency Determination is obtained, or when required sampling and analysis data are obtained, sites would then prepare and submit the Waste Stream Profile Form for ~~the Permittees'~~ DOE's approval. Once the WSPF is approved, a site may ship waste to WIPP. ~~The Permittees DOE~~ The Permittees will perform waste confirmation prior to shipment of the waste from the generator/storage site to WIPP ~~as specified in~~ pursuant to Permit Attachment ~~B~~ C7, by performing radiography or visual examination of a representative subpopulation of certified

waste containers, to ensure that the wastes meet the applicable requirements of the TSDF-WAC.

~~B~~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 ~~generated from a single process or from an activity that 1) is similar in material,~~ that have common physical form, ~~, and~~ that contain similar hazardous constituents, and ~~2) is or was~~ 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. Generator/storage sites shall use the characterization techniques described in this 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 wastes are initially categorized into the three broad Summary Category Groups that are related to the final physical form of the wastes. Waste characterization requirements for these groups are specified separately in Section ~~B~~ C-2 of this WAP. 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 heterogeneous 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) 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.

If a waste does not include at least 50 percent of any given Summary Category Group by volume, characterization shall be performed using the waste characterization process required for the category constituting the greatest volume of waste for that waste stream (see Section ~~B~~ C-3d).

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

Metals

Some of the TRU mixed 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 (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 mixed 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 mixed 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 wastewaters, 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 mixed 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 generator/storage sites shall characterize their waste in accordance with this WAP and associated Permit Attachments, and ensure that waste proposed for storage and disposal at WIPP meets the applicable requirements of the TSDF-WAC in Module II. The generator/storage

site shall assemble the Acceptable Knowledge (**AK**) information into an auditable record[1] for the waste stream as described in Permit Attachment ~~B~~ C4. For those waste streams with an approved AK Sufficiency Determination (see below), sampling and analysis per the methods described in Permit Attachments ~~B~~ C1 and ~~B~~ C2 are not required.

All waste characterization activities specified in this WAP and associated Permit Attachments shall be carried out at generator/storage sites and ~~Permittee~~ DOE approved laboratories in accordance with this WAP. ~~The Permittees~~ DOE will audit generator/storage site waste characterization programs and activities as described in Section ~~B~~ 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 ~~B~~ C-3:

- 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
- Headspace-gas sampling to determine VOC content of gases in the void volume of the containers
- Sampling and analysis of waste forms that are homogeneous and can be representatively sampled to determine concentrations of hazardous waste constituents and toxicity characteristic contaminants of waste in containers
- Compilation of AK documentation into an auditable record

~~B~~C-0b AK Sufficiency Determination

Generator/storage sites may submit a request to ~~the Permittees~~ ~~DOE~~ the Permittees for an AK Sufficiency Determination (**Determination Request**) to meet all or part of the waste characterization requirements. The contents of the Determination Request are specified in Permit Attachment ~~B~~ C4, Section ~~B~~ C4-3d. The Determination Request may take one of the following forms:

Scenario 1 Radiography or visual examination (**VE**) of the waste stream is not required, and chemical sampling and analysis is not required;

Scenario 2 Radiography or VE of the waste stream is not required, but chemical sampling and analysis of a representative sample of the waste stream is required; or

Scenario 3 Chemical sampling and analysis is not required, but radiography or VE of 100% of the containers in the waste stream is required.

[1] "Auditable records" mean those records which allow the Permittees to conduct a systematic assessment, analysis, and evaluation of the Permittees' compliance with the WAP and this Permit.

~~The Permittees~~ ~~DOE~~ 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 Permit Attachment ~~B~~ C4, Section ~~B~~ 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.
- 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 TSDF-WAC should be addressed, and conclusions drawn must be technically adequate and substantiated by supporting information.
- If the AK record includes process control information specified in Permit Attachment ~~B~~ C4, Section ~~B~~ 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~~ ~~DOE~~ 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~~ ~~DOE~~ The Permittees shall resolve comments with the generator/storage site, and ~~the Permittees~~ ~~DOE~~ the Permittees may change the scope of the Determination Request to one of the three scenarios.

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 determines that the AK is sufficient, they will~~ If DOE provisionally approves the Determination Request, it may ~~and~~ forward it along with all relevant information submitted with the Determination Request to NMED for an evaluation that the provisional approval made by ~~the Permittees~~ 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. ~~Within five (5) days of~~ 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~~ ~~DOE~~ the Permittees will notify the generator/storage sites whether the AK information is sufficient and the Determination Request is approved. ~~The Permittees~~ DOE will not approve a Determination Request that NMED has determined to be inadequate unless the generator/storage site resolves the inadequacies and provides the resolution to NMED for evaluation of adequacy. Should the inadequacies not be resolved to NMED's satisfaction, ~~the Permittees~~ 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 Permittees~~ DOE disagrees, in whole or in part, with an evaluation performed by NMED resulting in a determination by NMED that ~~the Permittees'~~ DOE's provisional approval for a particular waste stream is inadequate, ~~the Permittees~~ DOE may seek dispute resolution. The dispute resolution process is specified in ~~Module I~~ 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 a generator/storage site does not submit a Determination Request, or if ~~the Permittees~~ DOE does not approve a Determination Request, or if NMED finds that ~~the Permittees'~~ DOE's provisional approval of a Determination Request is inadequate, the generator/storage site shall perform radiography or VE on 100% of the containers in a waste stream and chemical sampling and analysis on a representative sample of the waste stream using headspace gas sampling and analysis (for debris waste) or solids sampling and analysis (for homogeneous solid or soil/gravel waste) as specified in Permit Attachments ~~B~~ C1 and ~~B~~ C2.

If a generator/storage site submits a Determination Request, ~~the Permittees~~ DOE provisionally approves the Determination Request as Scenario 1, and NMED finds that ~~the Permittees'~~ DOE's provisional approval is adequate, neither radiography or VE nor chemical sampling and analysis of the waste stream is required.

If a generator/storage site submits a Determination Request, ~~the Permittees~~ DOE provisionally approves the Determination Request as Scenario 2, and NMED finds that ~~the Permittees'~~

DOE's provisional approval is adequate, chemical sampling and analysis of a representative sample of the waste stream is required, but radiography or VE is not required.

If a generator/storage site submits a Determination Request, ~~the Permittees~~ DOE provisionally approves the Determination Request as Scenario 3, and NMED finds that ~~the Permittees'~~ DOE's provisional approval is adequate, radiography or VE of 100% of the containers in the waste stream is required, but chemical sampling and analysis is not required.

~~B~~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 Permittees~~ DOE or the generator/storage site has completed the applicable representative sampling and analysis requirements specified in Permit Attachments ~~B~~ C1 and ~~B~~ C2, the generator/storage site will complete a Waste Stream Profile Form (**WSPF**) and Characterization Information Summary (**CIS**). The requirements for the completion of a WSPF and a CIS are specified in Permit Attachment ~~B~~ C3, Sections ~~B~~ C3-12b(1) and ~~B~~ C3-12b(2) respectively.

The WSPF and the CIS for the waste stream resulting from waste characterization activities shall be transmitted to ~~the Permittees~~~~DOE~~ the Permittees, who shall review~~ed~~ them for completeness, and screen~~ed~~ them for acceptance prior to loading any TRU mixed waste into the Contact-Handled or Remote-Handled Packaging at the generator facility, as described in Section ~~B~~ C-4. The review and approval process will ensure that the submitted waste analysis information is sufficient to meet the Data Quality Objectives (**DQOs**) for AK in Section ~~B~~ C-4a(1) and allow ~~the Permittees~~ ~~DOE~~ the Permittees to demonstrate compliance with the requirements of this WAP. Only TRU mixed waste and TRU waste that has been characterized in accordance with this WAP and that meets the **TSDF-WAC** specified in this Permit will be accepted at the WIPP facility for disposal in a permitted Underground Hazardous Waste Disposal Unit (**HWDU**). ~~The Permittees~~ 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 by ~~the Permittees~~ ~~DOE~~, the generator/storage site may be authorized to ship waste to WIPP.

In the event ~~the Permittees~~ ~~DOE~~ the Permittees request~~s~~ detailed information on a waste stream, the site will provide a Waste Stream Characterization Package (Section ~~B~~ C3-12b(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 Batch Data Reports (**BDRs**) and raw analytical data associated with waste container characterization as requested by ~~the Permittees~~ ~~DOE~~ the Permittees.

~~B~~C-0d Waste Confirmation

~~The Permittees~~ ~~DOE~~ The Permittees will perform waste confirmation on a representative subpopulation of each waste stream shipment after certification and prior to shipment ~~as described in~~ pursuant to Permit Attachment ~~B~~ C7. ~~The Permittees~~ ~~DOE~~ 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~~ ~~DOE~~ the Permittees prior to shipment of the waste from the generator/storage site to WIPP.

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

~~B~~C-1a Waste Stream Identification

TRU mixed waste destined for disposal at WIPP will be characterized on a waste stream basis. Generator/storage sites will delineate waste streams using acceptable knowledge. Required acceptable knowledge is specified in Section ~~B~~ C-3b and Permit Attachment ~~B~~ C4.

All of the waste within a waste stream may not be accessible for sampling and analysis at one time. Permit Attachment ~~B~~ C2 addresses the requirements for selecting waste containers used for characterization of waste streams as they are generated or retrieved.

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

Once a waste stream has been delineated, generator/storage sites will assign a Waste Matrix Code 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 Permittees~~ ~~DOE~~ The Permittees will only allow generators to ship those TRU mixed waste streams with EPA hazardous waste numbers listed in Table ~~B~~ C-9. 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 TSDF-WAC are met. ~~The Permittees~~ ~~DOE~~ The Permittees will require sites to perform characterization of all waste streams as required by this WAP. If during the characterization process, new EPA hazardous waste numbers are identified, those wastes will be prohibited for disposal at the WIPP facility until a permit modification has been submitted to and approved by NMED for these new EPA hazardous waste numbers. Similar waste streams at other generator/storage sites will be examined by ~~the Permittees~~ ~~DOE~~ the Permittees to ensure that the newly identified EPA hazardous waste numbers do not apply to those similar waste streams. If the other waste streams also require new EPA hazardous waste numbers, shipment of these similar waste streams will also be prohibited for disposal until a permit modification has been submitted to and approved by NMED.

~~B~~C-1c Waste Prohibited at the WIPP Facility

The following TRU mixed waste are prohibited 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 visual examination 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 wastes (non-mixed hazardous wastes)
- 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 polychlorinated biphenyls (**PCBs**) not authorized under an EPA PCB waste disposal authorization
- wastes exhibiting the characteristic of ignitability, corrosivity, or reactivity (EPA Hazardous Waste Numbers of D001, D002, or D003)
- waste that has ever been managed as high-level waste and waste from tanks specified in Table ~~B~~ C-8, unless specifically approved through a Class 3 permit modification
- any waste container from a waste stream (or waste stream lot) which has not undergone either radiographic or visual examination of a statistically representative subpopulation of the waste stream in each shipment, ~~as described in~~ pursuant to Permit Attachment ~~B~~ C7
- any waste container from a waste stream which has not been preceded by an appropriate, certified WSPF (see Section ~~B~~ C-1d)

Before accepting a container holding TRU mixed waste, ~~the Permittees~~ ~~DOE~~ the Permittees will perform waste confirmation activities pursuant to Permit Attachment C7 on each waste stream shipment 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 Permit. Waste confirmation activities will be performed on at least 7 percent of each waste stream shipped, equating to examination of at least one of fourteen containers in each waste stream shipment. If a waste stream shipment contains fewer than fourteen containers, one container will be examined to satisfy waste confirmation requirements. Section ~~B~~ C-4 and Permit Attachment ~~B~~ C7 include descriptions of the waste confirmation processes that ~~the Permittees~~ ~~DOE~~ 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 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 cannot be shipped to WIPP unless

they are treated to remove the incompatibility. Only those waste streams that are compatible or have been treated to remove incompatibilities will be shipped to WIPP.

~~B~~C-1d Control of Waste Acceptance

Every waste stream shipped to WIPP shall be preceded by a WSPF (Figure ~~B~~ C-1) and a CIS. The required WSPF information and the CIS elements are found in Section ~~B~~ C3-12b(1) and Section ~~B~~ C3-12b(2).

Generator/storage sites will provide the WSPF to ~~the Permittees DOE~~ 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 DOE~~ the Permittees for each waste stream from a generator/storage site. If continued waste characterization reveals discrepancies that identify different hazardous waste numbers or indicates that the waste belongs to a different waste stream, the waste will be redefined to a separate waste stream and a new WSPF submitted. Generator/storage sites 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 by DOE during site audits (Attachment C6).

~~The Permittees are DOE is~~ The Permittees are responsible for the review of WSPFs and CISs to verify compliance with the restrictions on TRU mixed wastes for WIPP disposal. ~~The Permittees~~ DOE will approve and submit completed WSPFs to NMED prior to waste stream shipment. The Permittees will ~~also~~ be responsible for the review of shipping records (Section ~~B~~ C-5) to ~~confirm~~ ensure that each waste container has been prepared and characterized in accordance with applicable provisions of this WAP. Waste characterization data shall ensure the absence of prohibited items specified in Section ~~B~~ C-1c.

A~~s stated in the Introduction of this WAP, a~~ny time ~~the Permittees DOE~~ the Permittees request~~s~~ additional information concerning a waste stream, the generator/storage site will provide a Waste Stream Characterization Package (Section ~~B~~ C3-12b(2)). The option for ~~the Permittees DOE~~ the Permittees to request additional information ensures that the waste being offered for disposal is adequately characterized and accurately described on the WSPF.

~~B~~C-1e Waste Generating Processes at the WIPP Facility

Waste generated as a result of the waste containers handling and processing activities at the WIPP facility is termed “derived” waste. Because derived wastes can contain only those RCRA-regulated materials present in the waste from which they were derived, no additional characterization of the derived waste is required for disposal purposes. In other words, the generator/storage site’s characterization data and knowledge of the processes at the WIPP facility will be used to identify and characterize hazardous waste and hazardous constituents in derived waste. The management of derived waste is addressed in Permit Attachment ~~M~~ A1.

~~B~~C-2 Waste Characterization Program Requirements and Waste Characterization Parameters

~~The Permittees DOE~~ The Permittees shall require the sites to develop the procedure(s) which specify their programmatic waste characterization requirements. ~~The Permittees~~ DOE will evaluate the procedures during audits conducted under the ~~Permittees' DOE~~ Audit and Surveillance Program (Section ~~B~~ C-5a(3)) and may also evaluate the procedures as part of the review and approval of the WSPF. Sites must notify ~~the Permittees DOE~~ the Permittees and

obtain DOE approval prior to making data-affecting modifications to procedures (Permit Attachment ~~B~~ C3, Section ~~B~~ C3-15). 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.
- Procedures used to verify packaging configurations to determine the correct drum age criteria (**DAC**) if headspace gas sampling and analysis is used to collect waste characterization information per Section ~~B~~ C1-1a(1) of the WAP.
- 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 Permit Attachment ~~B~~ C3 of the WAP 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 ~~B~~ C-9.

For those waste streams or containers that are not amenable to radiography (e.g., RH TRU mixed waste, direct loaded ten-drum overpacks (**TDOPs**)) for waste confirmation by ~~the Permittees~~ ~~DOE~~ the Permittees ~~as described in~~ pursuant to Permit Attachment ~~B~~ C7, generator/storage site VE data may be used for waste acceptance. In those cases, ~~the Permittees~~ ~~DOE~~ the Permittees will review the generator/storage site VE procedures to ensure that data sufficient for ~~the Permittees'~~ ~~DOE's~~ the Permittees' waste acceptance activities ~~as described in~~ pursuant to Permit Attachment ~~B~~ C7 will be obtained and the procedures meet the minimum requirements for visual examination specified in Permit Attachment ~~B~~C1, Section ~~B~~ C1-3.

The following waste characterization parameters shall be obtained from the generator/storage sites:

- Determination whether TRU mixed 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

Tables ~~B~~ C-1, ~~B~~ C-2, ~~B~~ C-3 and ~~B~~ C-4 provide the parameters of interest for the various constituent groupings and analytical methodologies. The following sections provide a description of the acceptable methods to evaluate these parameters for each waste Summary Category Group.

~~B~~C-3 Generator Waste Characterization Methods

The characterization techniques used by generator/storage sites includes acceptable knowledge and may also include, as necessary, headspace-gas sampling and analysis, radiography, visual examination, and homogeneous waste sampling and analysis. All characterization activities are performed in accordance with the WAP. Table ~~B~~ C-5 provides a summary of the characterization requirements for TRU mixed waste.

~~B~~C-3a Sampling and Analytical Methods

~~B~~C-3a(1) Headspace Gas Sampling and Analysis

Representative headspace gas sampling and analysis shall be used by generator/storage sites to determine the types and concentrations of VOCs in the void volume of randomly selected waste containers in order to resolve the assignment of EPA hazardous waste numbers for those debris waste streams for which an AK Sufficiency Determination Request has not been approved by ~~the Permittees~~ DOE. In addition, VOC constituents will be compared to those assigned by acceptable knowledge, which may include an analysis of radiolytically derived VOCs. The generator/storage sites may also consider radiolysis and packaging materials when assessing the presence of hazardous constituents in the headspace gas results, and whether radiolysis would generate wastes which exhibit the toxicity characteristic. Refer to Permit Attachment ~~B~~ C4 for additional clarification regarding hazardous waste number assignment and headspace gas results. The methods for random selection of containers for headspace gas sampling and analysis are specified in Permit Attachment ~~B~~ C2. Headspace gas sampling and analysis shall be subject to the ~~Permittees'~~ DOE Audit and Surveillance Program (Permit Attachment ~~B~~ C6).

In accordance with EPA convention, identification of hazardous constituents detected by gas chromatography/mass spectrometry methods that are not on the list of target analytes shall be reported. These compounds are reported as tentatively identified compounds (**TICs**) in the analytical BDR and shall be added to the target analyte list if detected in a given waste stream, if they appear in the 20.4.1.200 NMAC (incorporating 40 CFR §261) Appendix VIII, and if they are reported in 25% of the waste containers sampled from a given waste stream. The

headspace gas analysis method Quality Assurance Objectives (**QAOs**) are specified in Permit Attachment ~~B~~ C3.

~~B~~C-3a(2) Homogeneous and Soil/Gravel Waste Sampling and Analysis

Representative homogeneous and soil/gravel waste sampling and analysis shall be used by generator/storage sites to resolve the assignment of EPA hazardous waste numbers for homogeneous and soil/gravel waste streams for which an AK Sufficiency Determination Request has not been approved by ~~the Permittees~~ DOE. Sampling of homogeneous and soil/gravel wastes shall result in the collection of a sample that is used to resolve the assignment of hazardous waste numbers. Sampling is accomplished through coring or other EPA approved sampling, which is described in Permit Attachment ~~B~~ C1.For those waste streams defined as Summary Category Groups S3000 or S4000 on page ~~B~~ C-3, debris that may also be present within these wastes need not be sampled. The waste containers for sampling and analysis are to be selected randomly from the population of containers for the waste stream. The random selection methodology is specified in Permit Attachment ~~B~~ C2. Homogeneous and soil/gravel sampling and analysis shall be subject to the ~~Permittees'~~ ~~DOE~~ Audit and Surveillance Program (Permit Attachment ~~B~~ C6).

Totals or TCLP analyses for VOCs, SVOCs, and RCRA-regulated metals are used to determine waste parameters in soils/gravels and solids that may be important to the performance within the disposal system (Tables ~~B~~ C-3 and ~~B~~ C-4). To determine if a waste exhibits a toxicity characteristic for compounds specified in 20.4.1.200 NMAC (incorporating 40 CFR §261, Subpart C), TCLP may be used instead of total analyses. The generator will use the results from these analyses to determine if a waste exhibits a toxicity characteristic. The mean concentration of toxicity characteristic contaminants are calculated for each waste stream such that it can be reported with an upper 90 percent confidence limit (**UCL_{90}**). The UCL_{90} values for the mean measured contaminant concentrations in a waste stream will be compared to the specified regulatory levels in 20.4.1.200 NMAC (incorporating 40 CFR §261 Subpart C), expressed as total/TCLP values, to determine if the waste stream exhibits a toxicity characteristic. A comparison of total analyses and TCLP analyses is presented in Appendix C3 of the WIPP RCRA Part B Permit Application (DOE, 1997), and a discussion of the UCL_{90} is included in Permit Attachment ~~B~~ C2. If toxicity characteristic (**TC**) wastes are identified, these will be compared to those determined by acceptable knowledge and TC waste numbers will be revised, as warranted. Refer to Permit Attachment ~~B~~ C4 for additional clarification regarding hazardous waste number assignment and homogeneous solid and soil/gravel analytical results.

~~B~~C-3a(3) Laboratory Qualification

~~The Permittees~~ DOE will ensure that generator/storage sites conduct analyses using laboratories that are qualified through participation in the Performance Demonstration Program (**PDP**) (DOE, 2003, 2005). Required QAOs are specified in Permit Attachment ~~B~~ C3. In addition, methods and supporting performance data demonstrating QAO compliance shall be ensured by ~~the Permittees~~ DOE during the annual certification audit of the laboratories.

Analytical methods used by the laboratories shall: 1) satisfy all of the appropriate QAOs, and 2) be implemented through laboratory-documented standard operating procedures. These analytical QAOs are discussed in detail in Permit Attachment ~~B~~ C3.

~~B~~C-3b Acceptable Knowledge

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 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

Acceptable knowledge is discussed in detail in Permit Attachment ~~B~~ C4, which outlines the minimum set of requirements and DQOs which shall be met by the generator/storage sites in order to use acceptable knowledge. In addition, Section ~~B~~ C-5a(3) of this permit attachment describes the assessment of acceptable knowledge through the ~~Permittees'~~ ~~DOE~~ Audit and Surveillance Program.

~~B~~C-3c Radiography and Visual Examination

Radiography and visual examination (**VE**) are nondestructive qualitative and quantitative techniques used to identify and verify waste container contents as specified in Permit Attachment ~~B~~ C1. Generator/storage sites shall perform radiography or VE of 100 percent of CH TRU mixed waste containers in waste streams except for those waste streams for which ~~the Permittees~~ DOE approves a Scenario 1 or Scenario 2 Determination Request. No RH TRU mixed 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 Permit Attachment ~~B~~ C1. Radiography and/or VE will be used, when necessary, to examine a waste container to verify its physical form. 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 able to ~~confirm~~ verify that 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 will be 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 indicates that the waste does not match the waste stream description arrived at by acceptable knowledge characterization, a non-conformance report (**NCR**) will be completed and the inconsistency will be resolved as specified in Permit Attachment ~~B~~ C4, and the NCR will be dispositioned as specified in Permit Attachment ~~B~~ C3, Section ~~B~~ C3-13. The proper waste stream assignment will be determined (including preparation of a new WSPF), the correct hazardous waste numbers will be assigned, and the resolution will be documented. Refer to Permit Attachment ~~B~~ C4 for a discussion of acceptable knowledge and its verification process.

For generator/storage sites that use VE, 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 would be rejected and/or repackaged to exclude the internal container if it is over the TSDF-WAC limits. When radiography is used, or visual examination of transparent containers is performed, if any liquid in internal containers is detected, the volume of liquid shall be added to the total for the container being characterized using radiography 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. Radiographic examination protocols and QA/QC methods are provided in Permit Attachment ~~B~~ C1. Radiography and VE shall be subject to the ~~Permittees' DOE~~ Audit and Surveillance Program (Permit Attachment ~~B~~ C6).

~~B~~C-3d Characterization Techniques and Frequency for Newly Generated and Retrievably Stored Waste

Generator/storage sites will use acceptable knowledge to delineate all TRU mixed waste containers into waste streams for the purposes of grouping waste for further characterization. The analyses performed may differ based on the waste stream and the physical form of the waste (i.e., heterogeneous debris waste cannot be sampled for totals analyses). Both retrievably stored and newly generated wastes will be delineated in this fashion, though the types of acceptable knowledge used may differ. Section ~~B~~ C-3b discusses the use of acceptable knowledge, sampling, and analysis in more detail. Acceptable knowledge is discussed more completely in Permit Attachment ~~B~~ C4. Every TRU mixed waste stream will be assigned hazardous waste numbers based upon acceptable knowledge, and the generator/storage sites may resolve the assignment of hazardous waste numbers using headspace gas (Summary Category Group S5000 only) and solid sampling and analysis (Summary Category Groups S3000 and S4000 only).

In the CIS for each waste stream, the generator/storage site will be required to document their methods, and the findings from those methods, for determining the physical form of the waste and the presence or absence of prohibited items for both retrievably stored and newly generated waste. Radiography and/or VE may be used to verify the physical form of retrievably stored TRU mixed waste. For newly generated waste, physical form and prohibited items may either be documented during packaging using VE or verified after packaging using radiography or VE.

For debris waste streams that do not have an AK Sufficiency Determination approved by ~~the Permittees~~ DOE, containers selected in accordance with Permit Attachment ~~B~~ C2 from those waste streams must be sampled and analyzed for VOCs in the headspace gas. Likewise, a statistically selected portion of homogeneous solids and soil/gravel waste streams must be sampled and analyzed for RCRA-regulated total VOCs, SVOCs, and metals when those waste streams do not have an AK Sufficiency Determination approved by ~~the Permittees~~ DOE. Sampling and analysis methods used for waste characterization are discussed in Section ~~B~~ C-3a.

In the process of performing organic headspace and solid sample analyses, nontarget compounds may be identified. These compounds will be reported as TICs. TICs reported in 25% of the samples and listed in 20.4.1.200 NMAC (incorporating 40 CFR §261) Appendix VIII,

will be compared with acceptable knowledge data to determine if the TIC is in a listed hazardous waste in the waste stream. TICs identified through headspace gas analyses that meet the Appendix VIII list criteria and the 25 percent reporting criteria for a waste stream will be added to the headspace gas waste stream target list, regardless of the hazardous waste listing associated with the waste stream. TICs subject to inclusion on the target analyte list that are toxicity characteristic parameters shall be added to the target analyte list regardless of origin because the hazardous waste designation for these numbers is not based on source. However, for toxicity characteristic and non-toxic F003 constituents, the site may take concentration into account when assessing whether to add a hazardous waste number. TICs reported from the Totals VOC or SVOC analyses may be excluded from the target analyte list for a waste stream if the TIC is a constituent in an F-listed waste whose presence is attributable to waste packaging materials or radiolytic degradation from acceptable knowledge documentation. If the TIC associated with a total VOC or SVOC analysis cannot be identified as a component of waste packaging materials or as a product of radiolysis, the generator/storage site will add these TICs to the list of hazardous constituents for the waste stream (and assign additional EPA listed hazardous waste numbers, if appropriate). A permit modification will be submitted to NMED for their approval to add these constituents (and waste numbers), if necessary. For toxicity characteristic compounds and non-toxic F003 constituents, the generator/storage site may consider waste concentration when determining whether to change a hazardous waste number. Refer to Permit Attachment ~~B~~ C3 for additional information on TIC identification.

Waste characterization solid sampling and analysis activities may differ for retrievably stored waste and newly generated waste. The waste characterization processes used by the generator/storage sites for both retrievably stored and newly generated waste streams will be evaluated during ~~the Permittees'~~ DOE's audit of the site. The typical waste characterization data collection design used by the generator/storage sites for each type of waste is described in the following sections. Table ~~B~~ C-1 provides a summary of hazardous waste characterization requirements for all TRU mixed waste by waste characterization parameters.

Table ~~B~~ C-5 summarizes the parameters, methods, and rationales for stored and newly generated CH TRU mixed wastes according to their waste forms.

WIPP may accept TRU mixed waste that has been repackaged or treated. Treated waste shall retain the original waste stream's listed hazardous waste number designation.

~~B~~C-3d(1) Newly Generated Waste

The RCRA-regulated constituents in newly generated wastes will typically be documented at the time of generation based on acceptable knowledge for the waste stream. Newly generated TRU mixed waste characterization typically begins with verification that processes generating the waste have operated within established written procedures. Waste containers are delineated into waste streams using acceptable knowledge. ~~The Permittees DOE~~ The Permittees will require that the generator/storage sites document the methods used to delineate waste streams in the acceptable knowledge record and Acceptable Knowledge Summary Report. Determination that the physical form of the waste (Summary Category Group) corresponds to the physical form of the assigned waste stream may be accomplished either using VE during packaging or by performing radiography as specified in Permit Attachment ~~B~~ C1, Section ~~B~~ C1-3 for retrievably stored waste. Instead of using a video/audio tape and a single operator, the VE method for newly generated waste (or repackaged retrievably stored waste) may use a second operator, who is equally trained to the requirements stipulated in Permit Attachment ~~B~~ C1, to

provide additional verification by reviewing the contents of the waste container to ensure correct reporting. If the second operator cannot provide concurrence, corrective actions [2] will be taken as specified in Permit Attachment ~~B~~ C3. The subsequent waste characterization activities depend on the assigned Summary Category Group, since waste within the Homogeneous Solids and Soils/Gravel Summary Category Groups may be characterized using different techniques than the waste in the Debris Waste Summary Category Group. The packaging configuration, type and number of filters, and rigid liner vent hole presence and diameter necessary to determine the appropriate drum age criteria (**DAC**) in accordance with Permit Attachment ~~B~~ C1, Section ~~B~~ C1-1, may be documented as part of the characterization information collected during the packaging of newly generated waste or repackaging of retrievably stored waste for those containers of debris waste that will undergo headspace gas sampling and analysis.

~~B~~C-3d(1)(a) Sampling of Newly Generated Homogeneous Solids and Soil/Gravel

When a Determination Request has not been approved by ~~the Permittees~~ DOE, sampling and analysis of newly generated homogeneous solid and soil/gravel waste streams shall be conducted in accordance with the requirements specified in Permit Attachment ~~B~~ C1, Section ~~B~~ C1-2. The number of newly generated homogeneous solid and soil/gravel waste containers to be sampled will be determined using the procedure specified in Section ~~B~~ C2-1, wherein a statistically selected portion of the waste will be sampled.

~~B~~C-3d(2) Retrievably Stored Waste

All retrievably stored waste containers will first be delineated into waste streams using acceptable knowledge. ~~The Permittees~~ ~~DOE~~ The Permittees will require that the generator/storage sites document the methods used to delineate waste streams in the acceptable knowledge record and Acceptable Knowledge Summary Report. Retrievably stored waste containers may be examined using radiography or VE to determine the physical waste form (Summary Category Group), the absence of prohibited items, and additional waste characterization techniques that may be used based on the Summary Category Groups (i.e., S3000, S4000, S5000).

The headspace gas sampling method provided in Permit Attachment ~~B~~ C1 will be used, when necessary, to resolve the assignment of EPA hazardous waste numbers to debris waste streams, as specified in Permit Attachment ~~B~~ C4.

A statistically selected portion of retrievably stored homogeneous solids and soil/gravel wastes will be sampled and analyzed for total VOCs, SVOCs, and metals, when necessary. The sample location selection method is described in Permit Attachment ~~B~~ C2. The sampling methods for these wastes are provided in Permit Attachment ~~B~~ C1.

The toxicity characteristic of retrievably stored homogeneous solids and soil/gravel wastes will be determined using total analysis of toxicity characteristic parameters or TCLP. To determine if a waste exhibits a toxicity characteristic for compounds specified in 20.4.1.200 NMAC (incorporating 40 CFR §261, Subpart C), TCLP may be used instead of total analyses.

[2] "Corrective action" as used in this WAP and its attachments does not mean corrective action as defined under HWA, RCRA, and their implementing regulations.

Appendix C3 of the WIPP RCRA Part B Permit Application (DOE, 1997) discusses comparability of totals analytical results to those of the TCLP method.

Representativeness of containers selected for headspace gas sampling and waste subjected to homogeneous solids and soil/gravel sampling and analysis will be validated by the generator/storage site and by ~~the Permittees~~ DOE during an audit (Permit Attachment ~~B~~ C6) via examination of documentation that shows that random samples were collected. (Because representativeness is a quality characteristic that expresses the degree to which a sample or group of samples represent the population being studied, the random sampling of waste streams ensures representativeness.)

~~B~~C-4 Data Verification and Quality Assurance

~~The Permittees DOE~~ The Permittees will ensure that applicable waste characterization processes performed by generator/storage sites sending TRU mixed waste to the WIPP for disposal meets WAP requirements through data validation, usability and reporting controls. Verification occurs at three levels: 1) the data generation level, 2) the project level, and 3) the ~~Permittee DOE~~ Permittee level. The validation and verification process and requirements at each level are described in Permit Attachment ~~B~~ C3, Section ~~B~~ C3-10. The validation and verification process at the ~~Permittee DOE~~ Permittee Level is also described in Section ~~B~~ C-5.

~~B~~C-4a Data Generation and Project Level Verification Requirements

~~B~~C-4a(1) Data Quality Objectives

The waste characterization data obtained through WAP implementation will be used to ensure that the Permittees meet regulatory requirements with regard to both regulatory compliance and to ensure that all TRU mixed wastes are properly managed during the Disposal Phase. To satisfy the RCRA regulatory compliance requirements, the following DQOs are established by this WAP:

- Acceptable Knowledge
  - To delineate TRU mixed 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.
- Headspace-Gas Sampling and Analysis
  - To identify VOCs and quantify the concentrations of VOC constituents in waste containers to resolve the assignment of EPA hazardous waste numbers

- Homogeneous Waste Sampling and Analysis
  - To compare UCL_{90} values for the mean measured contaminant concentrations in a waste stream with specified toxicity characteristic levels in 20.4.1.200 NMAC (incorporating 40 CFR §261), to determine if the waste is hazardous, and to resolve the assignment of EPA hazardous waste numbers.
- Radiography
  - To determine the physical waste form, the absence of prohibited items, and additional waste characterization techniques that may be used based on the Summary Category Groups (i.e., S3000, S4000, S5000).
- Visual Examination
  - To determine the physical waste form, the absence of prohibited items, and additional waste characterization techniques that may be used based on the Summary Category Groups (i.e., S3000, S4000, S5000).

Reconciliation of these DQOs by the Generator/Storage Site Project Manager or ~~the Permittee~~ DOE approved laboratories, as applicable, is addressed in Permit Attachment ~~B~~ C3. Reconciliation requires determining whether sufficient type, quality, and quantity of data have been collected to ensure the DQO's cited above can be achieved.

~~B~~C-4a(2) Quality Assurance Objectives

The generator/storage sites or ~~the Permittee~~ DOE approved laboratories, as applicable, shall demonstrate compliance with each QAO associated with the various characterization methods as presented in Permit Attachment ~~B~~ C3. Generator/Storage Site Project Managers or ~~the Permittee~~ DOE approved laboratories, as applicable, are further required to perform a reconciliation of the data with the DQOs established in this WAP. The Generator/Storage Site Project Manager or ~~the Permittee~~ DOE approved laboratories, as applicable, shall conclude that all of the DQOs have been met for the characterization of the waste stream prior to submitting a WSPF to ~~the Permittees~~ DOE for approval (Permit Attachment ~~B~~ C3). The following QAO elements shall be 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, including a mathematical representation, where appropriate, can be found in Permit Attachment ~~B~~ C3, which describes the QAOs associated with each method of sampling and analysis.

~~B~~C-4a(3) Sample Control

The generator/storage sites and ~~Permittee~~ DOE approved laboratories, as applicable, will implement a sample handling and control program that will include the maintenance of field documentation records, proper labeling, and a chain of custody (**COC**) record. The generator/storage site and ~~Permittee~~ DOE approved laboratories, as applicable, Quality Assurance Project Plan (**QAPjP**) or procedures referenced in the QAPjP will document this program and include COC forms to control the sample from the point of origin to the final analysis result reporting. ~~The Permittees~~ DOE will review and approve the QAPjP, including their determination that the sample control program is adequate. The approved QAPjP will be provided to NMED prior to shipment of TRU mixed waste and before the generator/storage site audit, as specified in Permit Attachment ~~B~~ C5. Details of this sample control program are provided in Permit Attachment ~~B~~ C1 and are summarized below to include:

- Field Documentation of samples including: point of origin, date of sample, container ID, sample type, analysis requested, and COC number.
- Labeling and/or tagging including: sample numbering, sample ID, sample date, sampling conditions, and analysis requested.
- COC control including: name of sample relinquisher, sample receiver, and the date and time of the sample transfer.
- Proper sample handling and preservation.

~~B~~C-4a(4) Data Generation

BDRs, in a format approved by ~~the Permittees~~ DOE, will be used by each generator/storage site and ~~Permittee~~ DOE approved laboratories, as applicable, for reporting waste characterization data. This format will be included in the generator/storage site and ~~Permittee~~ DOE approved laboratories, as applicable, QAPjP, controlled electronic databases, or procedures referenced in the QAPjP (Permit Attachment ~~B~~ C5) and will include all of the elements required by this WAP for BDR (Permit Attachment ~~B~~ C3).

~~The Permittees~~ DOE shall perform audits of the generator/storage site waste characterization programs, as implemented by the generator/storage site QAPjP, to verify compliance with the WAP and the DQOs in this WAP (See Permit Attachment ~~B~~ C6 for a discussion of the content of

the audit program). The primary functions of these audits are to review generator/storage sites' adherence to the requirements of this WAP and ensure adherence to the WAP characterization program. ~~The Permittees~~ DOE shall provide the results of each audit to NMED. If audit results indicate that a generator/storage site is not in compliance with the requirements of this WAP, ~~the Permittees~~ DOE will take appropriate action as specified in Permit Attachment ~~B~~ C6.

~~The Permittees~~ DOE shall perform audits of the ~~Permittee~~ DOE approved laboratory's programs, as implemented by the laboratory's QAPjP (See Permit Attachment ~~B~~ C6 for a discussion of the content of the audit program). The primary functions of these audits are to review the ~~Permittee~~ DOE approved laboratory's adherence to the requirements of this WAP. ~~The Permittees~~ DOE shall provide the results of each audit to NMED. If audit results indicate that a ~~Permittee~~ DOE approved laboratory is not in compliance with the requirements of this WAP, ~~the Permittees~~ DOE will take appropriate action as specified in Permit Attachment ~~B~~ C6.

~~The Permittees~~ DOE shall further require all ~~Permittee~~ DOE approved laboratories analyzing WIPP waste samples for the generator/storage sites to have established, documented QA/QC programs. ~~The Permittees~~ DOE annually evaluates these laboratories and their QA/QC programs as part of their participation in ~~the Permittees'~~ DOE's PDP laboratory performance program. ~~The Permittees'~~ DOE's audits cover the requirements of the lab's QA/QC program, as well as compliance with this WAP. Continued compliance with these parameters will be verified by ongoing audits by ~~the Permittees~~ DOE at the generator/storage sites and these laboratories as specified in Permit Attachment ~~B~~ C6. ~~The Permittees'~~ DOE's audits of the generator/storage sites will verify that the laboratories analyzing the sites' waste have been properly audited by the generator/storage sites. The laboratory's QA/QC program shall include the following:

- Facility organization
- A list of equipment/instrumentation
- Operating procedures
- Laboratory QA/QC procedures
- Quality assurance review
- Laboratory records management

~~B~~C-4a(5) Data Verification

BDRs will document the testing, sampling, and analytical results from the required characterization activities, and document required QA/QC activities. Data validation and verification at both the data-generation level and the project level will be performed as required by this Permit before the required data are transmitted to ~~the Permittees~~ ~~DOE~~ the Permittees (Permit Attachment ~~B~~ C3). NMED may request, through ~~the Permittees~~ ~~DOE~~ the Permittees, copies of any BDR, and/or the raw data validated by the generator/storage sites, to check ~~the Permittees'~~ DOE's audit of the validation process.

~~B~~C-4a(6) Data Transmittal

BDRs will include the information required by Section ~~B~~ C3-10 and will be transmitted by hard copy or electronically (provided a hard copy is available on demand) from the data generation level to the project level.

The generator/storage site will transmit waste container information electronically via the WIPP Waste Information System (**WWIS**). Data will be entered into the WWIS in the exact format required by the database. Refer to Section ~~B~~ C-5a(1) for WWIS reporting requirements and the *Waste Data System User's Manual* (DOE, 2009) for the WWIS data fields and format requirements.

Once a waste stream is characterized, the Site Project Manager will also submit to ~~the Permittees~~ ~~DOE~~ the Permittees a WSPF (Figure ~~B~~ C-1) accompanied by the CIS for that waste stream which includes reconciliation with DQOs (Sections ~~B~~3 C-12b(1) and ~~B~~ C3-12b(2)). The WSPF, the CIS, and information from the WWIS will be used as the basis for acceptance of waste characterization information on TRU mixed wastes to be disposed of at the WIPP.

~~B~~C-4a(7) Records Management

Records related to waste characterization activities performed by the generator/storage sites will be maintained in the testing, sampling, or analytical facility files or generator/storage site project files, or at the WIPP Records Archive facility. ~~Permittee~~ DOE approved laboratories will forward testing, sampling, and analytical records along with BDRs, to the generator/storage site project office for inclusion in the generator/storage site's project files and to the Permittees for inclusion in the WIPP facility operating record. Raw data obtained by testing, sampling, and analyzing TRU mixed waste in support of this 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.

Records inventory and disposition schedule (**RIDS**) or an equivalent system shall be prepared and approved by generator/storage site personnel. All records relevant to an enforcement action under this Permit, regardless of disposition, shall be maintained at the generator/storage site 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 at a participating generator/storage site plus six years or transferred for permanent archival storage to the WIPP Records Archive facility.

Waste characterization records designated as Non-Permanent Records shall be maintained for ten years from the date of (record) generation 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 ~~B~~ C-6 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 generator/storage site RIDS will identify appropriate disposition of classified information. Nothing in this Permit is intended to, nor should it be interpreted to, require the disclosure of any U.S. Department of Energy classified information to persons without appropriate clearance to view such information.

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

~~Permittee DOE~~ Permittee waste screening is a two-phased process. Phase I will occur prior to configuring shipments of TRU mixed waste. Phase II will occur after configuration of shipments of TRU mixed waste but before it is disposed at the WIPP facility. Figure ~~B~~ C-3 presents Phase I and a portion of Phase II of the TRU mixed waste screening process. Permit Attachment ~~B~~ C7 presents ~~the Permittees' DOE's~~ the TRU mixed waste confirmation portion of Phase II activities.

~~B~~C-5a Phase I Waste Stream Screening and Verification

The first phase of the waste screening and verification process will occur before TRU mixed waste is shipped to the WIPP facility. Before the Permittees begin the process of accepting TRU mixed waste from a generator/storage site, an initial audit of that generator/storage site will be conducted as part of the ~~Permittees' DOE~~ Audit and Surveillance Program (Permit Attachment ~~B~~ C6). The RCRA portion of the generator/storage site audit program will provide on-site 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 I 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 (Permit Attachment ~~B~~ C3) and that the waste characterization information meet acceptance criteria required for compliance with the WAP (Section ~~B~~ C3-12b(1)).

A generator/storage site must first prepare a QAPjP, which includes applicable WAP requirements, and submit it to ~~the Permittees~~ DOE for review and approval (Permit Attachment ~~B~~ C5). Once approved, a copy of the QAPjP is provided to NMED for examination. The generator/storage site will implement the specific parameters of the QAPjP after it is approved. An initial audit will be performed after QAPjP implementation and prior to the generator/storage site being certified for shipment of waste to WIPP. Additional audits, focusing on the results of waste characterization, will be performed at least annually. ~~The Permittees have~~ DOE has the right to conduct unannounced audits and to examine any records that are related to the scope of the audit. See Section ~~B~~ C-5a(3) and Permit Attachment ~~B~~ C6 for further information regarding audits.

When the required waste stream characterization data have been collected by a generator/storage site and the initial generator/storage site audit has been successfully completed, the generator/storage Site Project Manager will verify that waste stream characterization meets the applicable WAP requirements as a part of the project level verification (Section ~~B~~ C3-10b). If the waste characterization does not meet the applicable requirements of the WAP, the mixed waste stream cannot be managed, stored, or disposed at WIPP until those requirements are met. The Site Project Manager will then complete a WSPF and submit it to ~~the Permittees DOE~~ the Permittees, along with the accompanying CIS for that waste stream (Section ~~B~~ C3-12b(1)). All data necessary to check the accuracy of the WSPF will be transmitted to ~~the Permittees DOE~~ the Permittees for verification. This provides notification that the generator/storage site 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 DOE~~ The Permittees will compare headspace gas, radiographic, visual examination and solid sampling/analysis data obtained subsequent to submittal and approval of the WSPF (and prior to submittal) with characterization information presented on this form. If ~~the Permittees DOE~~ the Permittees determine~~s~~ (through the data comparison) that the characterization information is adequate, DOE will approve the WSPF ~~will be approved~~. Prior to

the first shipment of containers from the approved waste stream, the approved WSPF and accompanying CIS will be 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 shall be resubmitted. Ongoing WSPF examination is discussed in detail in Section ~~B~~ C-5a(2).

Audits of generator/storage sites will be conducted as part of the ~~Permittees' DOE~~ Audit and Surveillance Program (Permit Attachment ~~B~~ C6). The RCRA portion of the generator/storage site 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 generator/storage site will also transmit the data on a container basis via the 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 WWIS will conduct internal edit/limit checks as the data are entered, and the data will be available to ~~the Permittees DOE~~ the Permittees as supporting information for WSPF review. NMED will have read-only access to the WWIS as necessary to determine compliance with the WAP. The initial WSPF check performed by ~~the Permittees DOE~~ the Permittees will include WWIS data submitted by the generator/storage site for each waste container submitted for the WSPF review and the CIS. ~~The Permittees DOE~~ The Permittees will compare ongoing sampling/analysis characterization data obtained and submitted via the 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 the Permittees and approved by ~~the Permittees~~ DOE.

If discrepancies regarding hazardous waste number assignment or Waste Matrix Code designation arise as a result of the Phase I review, the generator/storage sites will be contacted by ~~the Permittees DOE~~ the Permittees and required to provide 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 will not be approved. ~~The Permittees~~ DOE will notify NMED in writing of any discrepancies identified during WSPF review and the resulting discrepancy resolution prior to waste shipment. The Permittees will not manage, store, or dispose the waste stream until this discrepancy is resolved in accordance with this WAP.

~~B~~C-5a(1) WWIS Description

All generator/storage sites planning to ship TRU mixed waste to WIPP will supply the required data to the WWIS. The WWIS Data Dictionary includes all of the data fields, the field format and the limits associated with the data as established by this WAP. These 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 Permittees DOE~~ The Permittees will coordinate the data transmission with each generator/storage site. Actual data transmission will use appropriate technology to ensure the integrity of the data transmissions. ~~The Permittees DOE~~ The Permittees will require sites with large waste inventories and large databases to populate a data structure provided by ~~the Permittees DOE~~ the Permittees that contains the required data dictionary fields that are appropriate for the waste stream (or waste streams) at that site. For example, totals analysis data will not be requested from sites that do not have homogeneous solids or soil/gravel waste.

~~The Permittees DOE~~ 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 DOE~~ 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.

~~The Permittees DOE~~ The Permittees will use the WWIS to verify that all of the supplied data meet the edit and limit checks prior to the shipment of any TRU mixed waste to WIPP. The WWIS automatically will notify the generator/storage site if any of the supplied data fails to meet the requirements of the edit and limit checks via an appropriate error message. The generator/storage site will be required to correct the discrepancy with the waste or the waste data and re-transmit the corrected data prior to acceptance of the data by the WWIS. ~~The Permittees DOE~~ The Permittees will review data reported for each container of each shipment prior to providing notification to the shipping generator/storage site that the shipment is acceptable. Read-only access to the WWIS will be provided to NMED. Table ~~B~~ C-7 contains a listing of the data fields contained in the WWIS that are required as part of this Permit.

The WWIS will generate the following:

- Waste Emplacement Report

  This report will be added to the operating record to track the quantities of waste, date of emplacement, and location of authorized containers or container assemblies in the repository. ~~The Permittees DOE~~ The Permittees will document the specific panel room or drift that an individual waste container is placed in as well as the row/column/height coordinates location of the container or containers assembly. This report will be generated on a weekly basis. Locations of containers or container assemblies will also be placed on a map separate from the WWIS. Reports and maps that are included as part of the operating record will be retained at the WIPP site, for the life of the facility.

- Shipment Summary Report

  This report will contain the container identification numbers (**IDs**) of every container in the shipment, listed by Shipping Package number and by assembly number (for seven-packs, four-packs, and three-packs), for every assembly in the Shipping Package. This report is used by ~~the Permittees DOE~~ the Permittees to verify containers in a shipment and will be generated on a shipment basis.

- Waste Container Data Report

  This report will be generated on a waste stream basis and will be used by ~~the Permittees DOE~~ the Permittees during the WSPF review and DOE approval process. This report will contain the data listed in the Characterization Module on Table ~~B~~ C-7. This report will be generated and attached to the WSPF for inclusion in the facility operating record and will be kept for the life of the facility.

- Reports of Change Log

  This will consist of a short report that lists the user ID and the fields changed. The report will also include a reason for the change. A longer report will list the information

provided on the short report and include a before and after image of the record for each change, a before-record for each deletion, and the new information for added records. These reports will provide an auditable trail for the data in the database.

Access to the WWIS will be controlled by ~~the Permittees' DOE's~~ the Permittees' Data Administrator (**DA**) who will control the WWIS users based on approval from management personnel.

The TRU mixed waste generator/storage sites will only have access to data that they have supplied, and only until the data have been formally accepted by ~~the Permittees~~~~DOE~~ the Permittees. After the data have been accepted, the data will be protected from indiscriminate change and can only be changed by an authorized DA.

The WWIS has a Change Log that requires a reason for the change from the DA prior to accepting the change. The data change information, the user ID of the authorized DA making the change, and the date of the change will be recorded in the data change log automatically. The data change log cannot be revised by any user, including the DA. The data change log will be subject to internal and external audits and will provide an auditable trail for all changes made to previously approved data.

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

~~The Permittees DOE~~ The Permittees will ~~be responsible for the verification of~~ verify the completeness and accuracy of the Waste Stream Profile Form (Section ~~B~~ C3-12b(1)). Figure ~~B~~ C-2 includes the waste characterization and ~~Permittees' DOE's~~ waste stream approval process. The assignment of the waste stream description, Waste Matrix Code Group, and Summary Category Groups; the results of waste analyses, as applicable; the acceptable knowledge summary documentation; the methods used for characterization; the ~~Carlsbad Field Office (**CBFO**)~~ DOE certification, and appropriate designation of EPA hazardous waste number(s) will be examined by the Permittees. If the WSPF is inaccurate, efforts will be made to resolve discrepancies by contacting the generator/storage site 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 generator/storage site, the generator/storage site will implement a non-conformance program to identify, document, and report discrepancies (Permit Attachment ~~B~~ C3).

The WSPF shall pass all verification checks by ~~the Permittees DOE~~ 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 approval process (Section ~~B~~ C-5a).

The EPA hazardous waste numbers for the wastes that appear on the Waste Stream Profile Form will be compared to those in Table ~~B~~ C-9 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 TSDF-WAC are met. The CIS will be reviewed by ~~the Permittees DOE~~ the Permittees to verify that the waste has been classified correctly with respect to the assigned EPA hazardous waste numbers. Any analytical method used will be compared to those listed in Tables ~~B~~ C-2, ~~B~~ C-3, and ~~B~~ C-4 to ensure that only approved analytical methods were used for analysis of the waste. ~~The Permittees DOE~~ The Permittees will verify that the applicable requirements of the TSDF-WAC have been met by the generator/storage site.

Waste data transferred via the 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.

~~The Permittees DOE~~ The Permittees 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 3) a determination of compatibility. The verification of waste stream description will be performed by reviewing the 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 will be performed using Appendix C1 of the WIPP RCRA Part B Permit Application (DOE, 1997), 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 Permittees~~ DOE 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 generator/storage site demonstrates all corrective actions have been implemented and the generator/storage site waste characterization program is reassessed by ~~the Permittees~~ DOE.

~~B~~C-5a(3) ~~Permittees' DOE~~ Audit and Surveillance Program

An important part of ~~the Permittees' DOE's~~ the Permittees' verification process is the ~~Permittees' DOE~~ Audit and Surveillance Program. The focus of this audit program is compliance with this WAP and the Permit. This audit program addresses all AK implementation and waste sampling and analysis activities, from waste stream classification assignment through waste container certification, and ensures compliance with SOPs and the WAP. 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 generator/storage site or ~~Permittee~~ DOE approved laboratory audit results and applicable WAP-related corrective action report (**CAR**) resolution will be provided to NMED for approval, and will be kept in the WIPP facility operating record until closure of the WIPP facility.

DOE will perform an ~~An~~ initial audit ~~will be performed~~ at each generator/storage site performing waste characterization activities prior to the formal acceptance of the WSPFs and/or any waste characterization data supplied by the generator/storage sites. Audits will be performed at least annually thereafter, including the possibility of unannounced audits (i.e., not a regularly scheduled audit). These audits will allow NMED to verify that ~~the Permittees have DOE has~~ the Permittees have implemented the WAP and that generator/storage sites have implemented a QA program for the characterization of waste and meet applicable WAP requirements. ~~The Permittees~~ DOE will also audit annually the ~~Permittee~~ DOE approved laboratories performing waste sampling and/or analysis. The accuracy of physical waste description and waste stream assignment provided by the generator/storage site will be verified by review of the radiography results, and visual examination of data records and radiography images (as necessary) during audits conducted by ~~the Permittees~~ DOE. More detail on this audit process is provided in Permit Attachment ~~B~~ C6.

~~B~~C-5b Phase II Waste Shipment Screening and Verification

As presented in Figure ~~B~~ C-3, Phase II of the waste shipment screening and verification process begins with confirmation of the waste ~~as required by~~ pursuant to Permit Attachment ~~B~~ C7 after waste shipments are configured. After the waste shipment has arrived, the Permittees will screen the shipments to determine the completeness and accuracy of the EPA Hazardous Waste Manifest and the land disposal restriction notice completeness. The Permittees 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 ~~as required by~~ pursuant to Permit Attachment ~~B~~ C7 and that pass all Phase II waste screening and verification determinations will be emplaced at WIPP. For each container shipped, the Permittees shall ensure that the generator/storage sites provide 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 federal hazardous waste numbers in each line item
- Listing of all shipping container 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 shall also be supplied electronically to the WWIS. The container-specific information will be supplied electronically as described in Section ~~B~~ C-5a(1), and shall be supplied prior to the Permittees' management, storage, or disposal of the waste.

The Permittees will verify each approved shipment upon receipt at WIPP against the data on the WWIS shipment summary report to ensure containers have the required information. A Waste Receipt Checklist will be used to document the verification.

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

Upon receipt of a TRU mixed waste shipment, the Permittees will make a determination of EPA Uniform Hazardous Waste Manifest completeness and sign the manifest to allow the driver to depart. For CH TRU mixed waste, the Permittees will then make a determination of waste shipment completeness by checking the unique, bar-coded identification number found on each container holding TRU mixed waste against the WWIS database after opening the Shipping Package.

The WWIS links the bar-coded identification numbers of all containers in a specific waste shipment to the waste assembly (for 7-packs, 4-packs, 3-packs and 5-drum carriages) and to

the shipment identification number, which is also written on the EPA Hazardous Waste Manifest.

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 WWIS database. For shipments in the CNS 10-160B cask, the Permittees 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 WWIS database after unloading the cask.

Generators electronically transmit the waste shipment information to the WWIS before the TRU mixed waste shipment is transported. Once a TRU mixed waste shipment arrives, the Permittees verify the identity of each cask or container (or one container in a bound 7-pack, 4-pack, or 3-pack) using the data already in the WWIS.

The WWIS will maintain waste container receipt and emplacement information provided by the Permittees. It will include, among other items, the following information associated with each container of TRU mixed waste:

- Package inner containment vessel or shipping cask closure date
- Package (container or canister) receipt date
- Overpack identification number (if appropriate)
- Package (container or canister) emplacement date
- Package (container or canister) emplacement location

Manifest discrepancies will be identified during manifest examination and container bar-code 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 generator/storage site technical contact (as listed on the manifest) will be contacted to resolve the discrepancy. If the discrepancy is identified prior to the containers being removed from the package or shipping cask, the waste will be retained in the parking area. If the discrepancy is identified after the waste containers are removed from the package or cask, the waste will be retained in the Waste Handling Building (**WHB**) until the discrepancy is resolved. Errors on the manifest can be corrected by the WIPP facility with a verbal (followed by a mandatory written) concurrence by the generator/storage site technical contact. All discrepancies that are unresolved within fifteen (15) days of receiving the waste will be immediately reported to NMED in writing. Notifications to NMED will consist of a letter describing the discrepancies, discrepancy resolution, and a copy of the manifest. If the manifest discrepancies have not been resolved within thirty (30) days of waste receipt, the shipment will be returned to the generator/storage facility. If it becomes necessary to return waste containers to the generator/storage site, a new EPA Uniform Hazardous Waste Manifest may be prepared by the Permittees.

Documentation of the returned containers will be recorded in the WWIS. Changes will be made to the WWIS data to indicate the current status of the container(s) The reason for the WWIS data change and the record of the WWIS data change will be maintained in the change log of the WWIS, which will provide an auditable record of the returned shipment.

The Permittees will be responsible for the resolution of discrepancies, notification of NMED, as well as returning the original copy of the manifest to the generator/storage site.

~~B~~C-5b(2) Examination of the Land Disposal Restriction (**LDR**) Notice

TRU mixed waste designated by the Secretary of Energy for disposal at WIPP is exempt from the 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 mixed waste stream, the generator shall provide the Permittees with a one time written notice. The notice must include the information listed below:

Land Disposal Restriction Notice Information:

- EPA Hazardous Waste Number(s) 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 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 will review the LDR notice for accuracy and completeness. The generator will prepare this notice in accordance with the applicable requirements of 20.4.1.800 NMAC (incorporating 40 CFR §268.7(a)(4)).

~~B~~C-5b(3) Verification

The Permittees will make a determination of TRU mixed waste shipment irregularities. The following items will be inspected for each TRU mixed waste shipment arriving at the WIPP facility:

- Whether the number and type of containers holding TRU mixed waste match the information in the WWIS
- Whether the containers are in good condition

The Permittees will verify that the containers (as identified by their container ID numbers) are the containers for which accepted data already exists in the WWIS. A check will be performed by the Permittees comparing the data on the WWIS Shipment Summary Report for the shipment to the actual shipping papers (including the EPA Hazardous Waste Manifest). This check also verifies that the containers included in the shipment are those for which approved

shipping data already exist in the WWIS Transportation Data Module (Table ~~B~~ C-7). For standard waste boxes (**SWBs**) and ten drum overpacks (**TDOPs**), this check will include comparing the barcode on the container with the container number on the shipping papers and the data on the WWIS Shipment Summary Report. For 7-pack assemblies, one of the seven container barcodes will be read by the barcode reader and compared to the assembly information for this container on the WWIS Shipment Summary Report. This will automatically identify the remaining six containers in the assembly. This process enables the Permittees to identify all of the containers in the assembly with minimum radiological exposure. If all of the container IDs and the information on the shipping papers agree with the WWIS Shipment Summary Report, and the shipment was subject to waste confirmation by ~~the Permittees DOE~~ the Permittees prior to shipment to WIPP ~~as specified in~~ pursuant to Permit Attachment ~~B~~ C7, the containers will be approved for storage and disposal at the WIPP facility.

~~B~~C-6 Permittees' Waste Shipment Screening QA/QC

Waste shipment screening QA/QC ensures that TRU mixed waste received is that which has been approved for shipment during the Phase I and Phase II screening. This is accomplished by maintaining QA/QC control of the waste shipment screening process. The screening process will be controlled by administrative processes which will generate records documenting waste receipt that will become part of the waste receipt record. The waste receipt record documents that container identifications correspond to shipping information and approved TRU mixed waste streams. The Permittees will extend QA/QC practices to the management of all records associated with waste shipment screening determinations.

~~B~~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 are managed in accordance with standard records management practices.

All waste characterization data for each TRU mixed waste container transmitted to WIPP shall be maintained by the Permittees for the active life of the WIPP facility plus two years. The active life of the WIPP facility is defined as the period from the initial receipt of TRU mixed 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.

The storage of the Permittees' copy of the manifest, LDR information, waste characterization data, WSPFs, waste confirmation activity records, and other related records will be identified on the appropriate records inventory and disposition schedule.

The following records will be maintained for waste characterization and waste confirmation purposes as part of the WIPP facility operating record:

- Completed WIPP WSPFs and accompanying CIS, including individual container data as transferred on the WWIS (or received as hard-copy) and any discrepancy-related documentation as specified in Section ~~B~~ C-5a

- Radiography and visual examination records (data sheets, packaging logs, and video and audio recordings) of waste confirmation activities

- Completed Waste Receipt Checklists and discrepancy-related documentation as specified in Section ~~B~~ C-5b

- WIPP WWIS Waste Emplacement Report as specified in Section ~~B~~ C-5a(1)

- Audit reports and corrective action reports from the ~~Permittees' DOE~~ Audit and Surveillance Program audits as specified in Section ~~B~~ C-5a(3) and Permit Attachment ~~B~~ C6

- CARs and closure information for corrective actions taken due to nonconforming waste being identified during waste confirmation by ~~the Permittees DOE~~ the Permittees

These records will be maintained for all TRU mixed waste managed at the WIPP facility.

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:

~~B~~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

~~B~~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

~~B~~C-8 Reporting

The Permittees will provide a biennial report in accordance with 20.4.1.500 NMAC (incorporating 40 CFR §264.75) to NMED that includes information on actual volume and waste descriptions received for disposal during the time period covered by the report.

~~B~~C-9 List of References

U.S. Department of Energy (DOE), 2009, "Waste Data System User's Manual", DOE/WIPP 09-3427, U.S. Department of Energy.

U.S. Department of Energy (DOE), 1997, Resource Conservation and Recovery Act Part B Permit Application for the Waste Isolation Pilot Plant", Revision 6.5, U.S. Department of Energy.

U.S. Department of Energy (DOE), 2003, "Performance Demonstration Program Plan for the Analysis of Simulated Headspace Gases for the TRU Waste Characterization Program," CAO-95-1076, Current Revision, Carlsbad, New Mexico, Carlsbad Field Office, U.S. Department of Energy.

U.S. Department of Energy (DOE), 2005, "Performance Demonstration Program Plans for Analysis of Solid Waste Forms," CAO-95-1077, Current Revision, Carlsbad, New Mexico, Carlsbad Field Office, U.S. Department of Energy.

U.S. Environmental Protection Agency (EPA), April 1994, "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, Washington, D.C.

U.S. Environmental Protection Agency (EPA), April 1980. "A Method for Determining the Compatibility of Hazardous Wastes," EPA-600/2-80-076, California Department of Health Services and the U.S. Environmental Protection Agency, Office of Research and Development.

U.S. Environmental Protection Agency (EPA), 1996. "Test Methods for Evaluating Solid Waste," Laboratory Manual Physical/Chemical Methods, SW-846, 3rd ed., U.S. Environmental Protection Agency, Office of Solid Waste and Emergency Response, Washington, D.C.

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TABLES

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Table ~~B~~ C-1
Summary of Hazardous Waste Characterization Requirements for Transuranic Mixed Waste [a]

Parameter	Techniques and Procedure
Physical Waste Form Summary Category — Names S3000 — Homogeneous Solid S4000 — Soil/Gravel S5000 — Debris Wastes	**Waste Inspection Procedures** Radiography Visual Examination (Permit Attachment ~~B~~ C1~~-3~~)
Headspace Gases **Volatile Organic Compounds** Benzene Bromoform Carbon tetrachloride Chlorobenzene Chloroform 1,1-Dichloroethane 1,2-Dichloroethane 1,1-Dichloroethylene ~~(cis)-1,2-Dichloroethylene~~ (trans)-1,2-Dichloroethylene Ethyl benzene Ethyl ether Methylene chloride 1,1,2,2-Tetrachloroethane Tetrachloroethylene Toluene 1,1,1-Trichloroethane Trichloroethylene 1,1,2-Trichloro-1,2,2-trifluoroethane Xylenes Alcohols and Ketones Acetone Butanol Methanol Methyl ethyl ketone Methyl isobutyl ketone	**Gas Analysis [f]** Gas Chromatography /Mass Spectroscopy (GC/MS), EPA TO-14A or TO-15, or modified SW-846 8260 (Permit Attachment ~~B~~ C3) GC/Flame Ionization Detector (FID), for alcohols and ketones, SW-846 8015 (Permit Attachment ~~B~~ C3) Fourier Transform Infrared Spectroscopy (FTIRS), SW-846
Total Volatile Organic Compounds Acetone Benzene Bromoform Butanol Carbon disulfide Carbon tetrachloride Chlorobenzene Chloroform 1,4-Dichlorobenzene[d] 1,2-Dichlorobenzene[d] 1,2-Dichloroethane 1,1-Dichloroethylene Ethyl benzene Ethyl ether Formaldehyde[b] Hydrazine[c] Isobutanol Methanol Methyl ethyl ketone Methylene chloride Pyridine[d] 1,1,2,2-Tetrachloroethane Tetrachloroethylene Toluene 1,1,2-Trichloro-1,2,2-trifluoroethane Trichlorofluoromethane 1,1,1-Trichloroethane 1,1,2-Trichloroethane Trichloroethylene Vinyl chloride Xylenes (trans)-1,2-Dichloroethylene	**Total Volatile Organic Compound Analysis [g]** TCLP, SW-846 1311 GC/MS, SW-846 8260 GC/FID, SW-846 8015 (Permit Attachment ~~B~~ C3) HPLC, SW-846 8315A Acceptable Knowledge for Summary Category S5000 (Debris Wastes)

Table ~~B~~ C-1
Summary of Hazardous Waste Characterization Requirements for Transuranic Mixed Waste [a]

Parameter	Techniques and Procedure
Total Semivolatile Organic Compounds Cresols 1,4-Dichlorobenzene[e] 1,2-Dichlorobenzene[e] 2,4-Dinitrophenol 2,4-Dinitrotoluene Hexachlorobenzene Hexachloroethane Nitrobenzene Pentachlorophenol Pyridine[e]	**Total Semivolatile Organic Compound Analysis [g]** TCLP, SW-846 1311 GC/MS, SW-846 8270 (Permit Attachment ~~B~~ C3) Acceptable Knowledge for Summary Category S5000 (Debris Wastes)
Total Metals Antimony, Arsenic, Barium, Beryllium, Cadmium, Chromium, Lead, Mercury, Nickel, Selenium, Silver, Thallium, Vanadium, Zinc	**Total Metals Analysis [g]** TCLP, SW-846 1311 ICP- MS, SW-846 6020 , ICP Emission Spectroscopy, SW-846 6010 Atomic Absorption Spectroscopy , SW-846 7000 (Permit Attachment ~~B~~ C3) Acceptable Knowledge for Summary Category S5000 (Debris Wastes)

[a] Permit Attachment ~~B~~ C

[b] Required only for homogeneous solids and soil/gravel waste from Savannah River Site to resolve the assignment of EPA hazardous waste numbers.

[c] Required only for homogeneous solids and soil/gravel waste from Oak Ridge National Laboratory and Savannah River Site to resolve the assignment of EPA hazardous waste numbers.

[d] Can also be analyzed as a semi-volatile organic compound.

[e] Can also be analyzed as a volatile organic compound.

[f] Required only to resolve the assignment of EPA hazardous waste numbers to debris waste streams.

[g] Required only to resolve the assignment of EPA hazardous waste numbers to homogeneous solid and soil/gravel waste streams.

Table ~~B~~ C-2
Headspace Target Analyte List and Methods [b]

Parameter	EPA Specified Analytical Method
Benzene Bromoform Carbon tetrachloride Chlorobenzene Chloroform 1,1-Dichloroethane 1,2-Dichloroethane 1,1-Dichloroethylene ~~(cis)-1,2-Dichloroethylene~~ (trans)-1,2-Dichloroethylene Ethyl benzene Ethyl ether Methylene chloride 1,1,2,2-Tetrachloroethane Tetrachloroethylene Toluene 1,1,1-Trichloroethane Trichloroethylene 1,1,2-Trichloro-1,2,2-trifluoroethane Xylenes	EPA: Modified TO-14A, TO-15[a]; Modified 8260 EPA – Approved FTIRS
Acetone Butanol Methanol Methyl ethyl ketone Methyl isobutyl ketone	EPA: Modified TO-14 A, TO-15[a]; Modified 8260 Method 8015 EPA - Approved FTIRS

[a] U.S. Environmental Protection Agency (EPA), 1999, Compendium of Methods for the Determination of Toxic Organic Compounds in Ambient Air – Second Edition (EPA/625/R-96/010b). The most current revision of the specified methods may be used.

[b] Required only for debris waste when required to resolve the assignment of EPA hazardous waste numbers.

Table ~~B~~ C-3
Required Organic Analyses and Test Methods Organized by Organic Analytical Groups [e]

Organic Analytical Group	Required Organic Analyses	EPA Specified Analytical Method [a,d]
Nonhalogenated Volatile Organic Compounds (VOCs)	Acetone Benzene n-Butanol Carbon disulfide Ethyl benzene Ethyl ether Formaldehyde Hydrazine[b] Isobutanol Methanol Methyl ethyl ketone Toluene Xylenes	8015 8260 8315A
Halogenated VOCs	Bromoform Carbon tetrachloride Chlorobenzene Chloroform 1,2-Dichloroethane 1,1-Dichloroethylene (trans)-1,2-Dichloroethylene Methylene chloride 1,1,2,2-Tetrachloroethane Tetrachloroethylene 1,1,2-Trichloroethane 1,1,1-Trichloroethane Trichloroethylene Trichlorofluoromethane 1,1,2-Trichloro-1,2,2-trifluoroethane Vinyl Chloride	8015 8260
Semivolatile Organic Compounds (SVOCs)	Cresols (o, m, p) 1,2-Dichlorobenzene[c] 1,4-Dichlorobenzene[c] 2,4-Dinitrophenol 2,4-Dinitrotoluene Hexachlorobenzene Hexachloroethane Nitrobenzene Pentachlorophenol Pyridine[c]	8270

[a] U.S. Environmental Protection Agency (EPA), 1996, "Test Methods for Evaluating Solid Waste, Physical/Chemical Methods," SW-846, Third Edition.

[b] Generator/Storage Sites will have to develop an analytical method for hydrazine. This method will be submitted to ~~the Permittees~~ DOE for approval.

[c] These compounds may also be analyzed as VOCs by SW-846 Method 8260.

[d] TCLP (SW-846 1311) may be used to determine if compounds in 20.4.1.200 NMAC (incorporating 40 CFR §261, Subpart C) exhibit a toxicity characteristic.

[e] Required only to resolve the assignment of EPA hazardous waste numbers.

Table ~~B~~ C-4
Summary of Sample Preparation and Analytical Methods for Metals

Parameters	EPA-Specified Analytical Methods[a,b,c]
Sample Preparation	3051, or equivalent, as appropriate for analytical method
Total Antimony	6010, 6020, 7000, 7010, 7062
Total Arsenic	6010, 6020, 7010, 7061, 7062
Total Barium	6010, 6020, 7000, 7010
Total Beryllium	6010, 6020, 7000, 7010
Total Cadmium	6010, 6020, 7000, 7010
Total Chromium	6010, 6020, 7000, 7010
Total Lead	6010, 6020, 7000, 7010
Total Mercury	7471
Total Nickel	6010, 6020, 7000, 7010
Total Selenium	6010, 7010, 7741, 7742
Total Silver	6010, 6020, 7000, 7010
Total Thallium	6010, 6020, 7000, 7010
Total Vanadium	6010, 7000, 7010
Total Zinc	6010, 6020, 7000, 7010

[a] U.S. Environmental Protection Agency (EPA), 1996. "Test Methods for Evaluating Solid Waste," Laboratory Manual Physical/Chemical Methods, SW-846, 3rd ed., U.S. Environmental Protection Agency, Office of Solid Waste and Emergency Response, Washington, D.C.

[b] TCLP (SW-846 1311) may be used to determine if compounds in 20.4.1.200 NMAC (incorporating 40 CFR §261, Subpart C) exhibit a toxicity characteristic.

[c] Required only for homogeneous solids and soil/gravel to resolve the assignment of EPA hazardous waste numbers.

Table ~~B~~ C-5
Summary of Parameters, Characterization Methods, and Rationale for Transuranic Mixed Waste

Waste Matrix Code Summary Categories	Waste Matrix Code Groups	Characterization Parameter	Method	Rationale
Stored Waste				
S3000-Homogeneous Solids	• Solidified inorganics • Salt waste • Solidified organics	Physical waste form	Acceptable knowledge, radiography, and/or visual examination	• 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)
S4000-Soil/Gravel	• Contaminated soil/debris	Hazardous constituents • Listed • Characteristic	Acceptable knowledge or statistical sampling[a] (see Tables ~~B~~ C-3 and ~~B~~ C-4)	• Determine characteristic metals and organics • Resolve the assignment of EPA hazardous waste numbers
S5000–Debris Waste	• Uncategorized metal (metal waste other than lead/cadmium) • Lead/cadmium waste • Inorganic nonmetal waste • Combustible waste • Graphite waste • Heterogeneous debris waste • Composite filter waste	Physical waste form	Acceptable knowledge, radiography, and/or visual examination	• 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)
		Hazardous constituents • Characteristic • Listed	Statistical gas sampling and analysis[a] (see Table ~~B~~ C-2)	• Resolve the assignment of EPA hazardous waste numbers
		Hazardous constituents • Characteristic	Acceptable knowledge	• Determine characteristic metals and organics

Table ~~B~~ C-5
Summary of Parameters, Characterization Methods, and Rationale for Transuranic Mixed Waste (Continued)

Waste Matrix Code Summary Categories	Waste Matrix Code Groups	Characterization Parameter	Method	Rationale
Newly Generated Waste				
S3000-Homogeneous Solids	• Solidified inorganics • Salt waste • Solidified organics	Physical waste form	Acceptable knowledge, radiography, and/or visual examination	• 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)
S4000-Soil/Gravel	• Contaminated soil/debris	Hazardous constituents • Listed • Characteristic	Statistical sampling[a] (see Tables ~~B~~ C-3 and ~~B~~ C-4)	• Determine characteristic metals and organics • Resolve the assignment of EPA hazardous waste numbers
S5000–Debris Waste	• Uncategorized metal (metal waste other than lead/cadmium) • Lead/cadmium waste • Inorganic nonmetal waste • Combustible waste • Graphite waste • Heterogeneous debris waste • Composite filter waste	Physical waste form	Acceptable knowledge, radiography, and/or visual examination	• 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)
		Hazardous constituents • Characteristic • Listed	Statistical gas sampling and analysis [a] (see Table ~~B~~ C-2)	• Resolve the assignment of EPA hazardous waste numbers
		Hazardous constituents • Characteristic	Acceptable knowledge	• Determine characteristic metals and organics

[a] Applies to waste streams that require sampling.

Table ~~B~~ C-6
Required Program Records Maintained in Generator/Storage Site Project Files

Lifetime Records • Field sampling data forms • Field and laboratory chain-of-custody forms • Test facility and laboratory batch data reports • Waste Stream Characterization Package • Sampling Plans • Data reduction, validation, and reporting documentation • Acceptable knowledge documentation • Waste Stream Profile Form and Characterization Information Summary
Non-Permanent Records • 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 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.)

Table ~~B~~ C-7
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 Headspace Gas Sample Date Headspace Gas Analysis Date Layers of Packaging Liner Exists Liner Hole Size Filter Model Number of Filters Installed Headspace Gas Analyte [d] Headspace Gas Concentration [d] Headspace Gas Char. Method [d] Total VOC Char. Method [d] Total Metals Char. Method [d] Total Semi-VOC Char. Method [d] Item Description Code Haz. Manifest Number NDE Complete [e]	Total VOC Sample Date Total VOC Analysis Date Total VOC Analyte Name [d] Total VOC Analyte Concentration [d] Total Metal Sample Date Total Metal Analysis Date Total Metal Analyte Name [d] Total Metal Analyte Concentration [d] Semi-VOC Sample Date Semi-VOC Analysis Date Semi-VOC Analyte Name [d] Semi-VOC Concentration [d] 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 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 Database.

[d] This is a multiple occurring field for each analyte, nuclide, etc.

[e] These are logical fields requiring only a yes/no.

[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 breakup the assembly.

Table ~~B~~ C-8
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 Engineering and Environmental Laboratory - 15 Tanks	
WM-103 through WM-106	WM-180 through 190

Table ~~B~~ C-9
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.

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FIGURES

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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, enter 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~~ C-1
WIPP Waste Stream Profile Form (Example Only)

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: _____

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~~ C-1
WIPP Waste Stream Profile Form (Example Only – Continued)

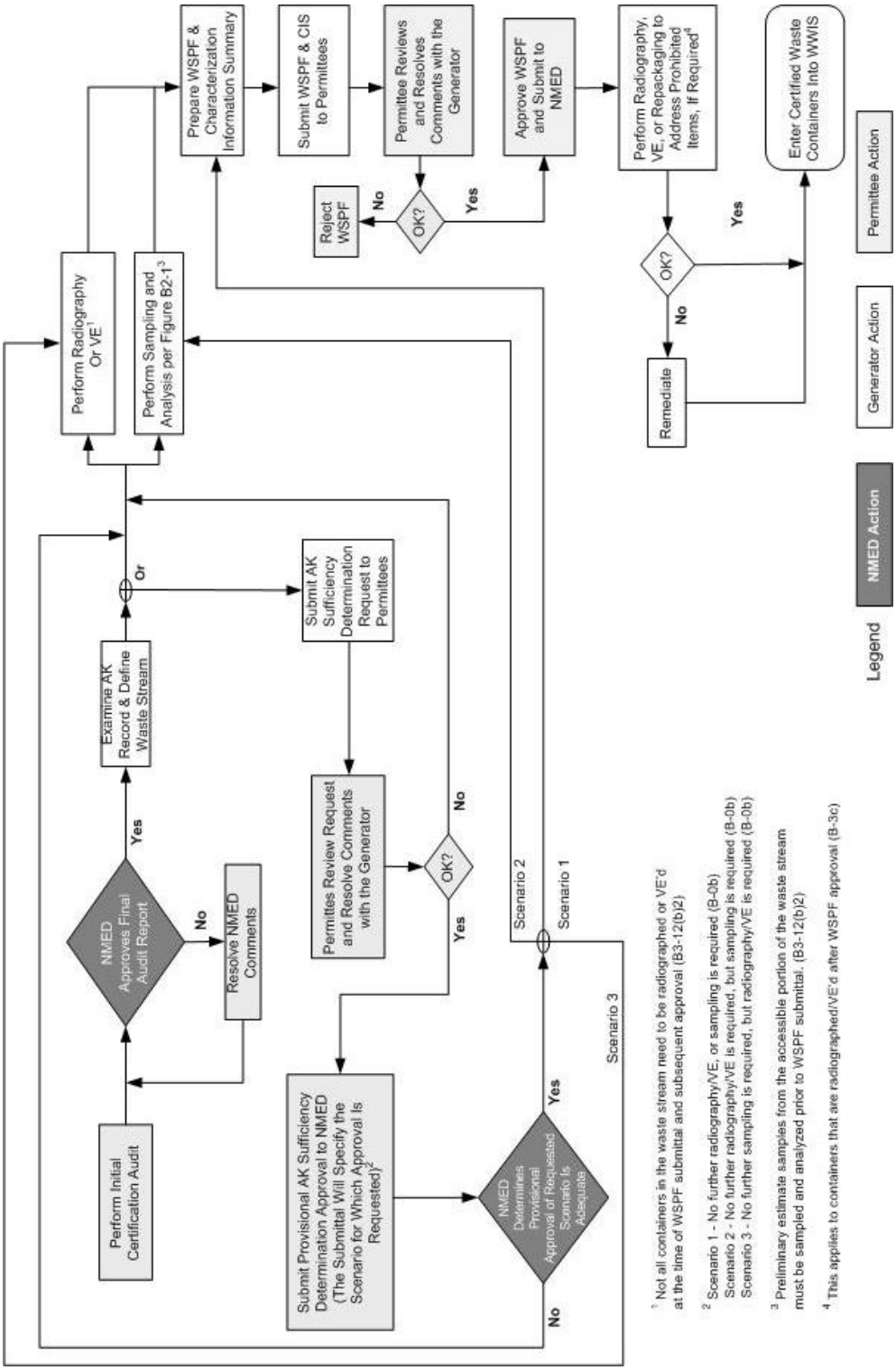

Figure ~~B~~ C-2
Waste Characterization Process

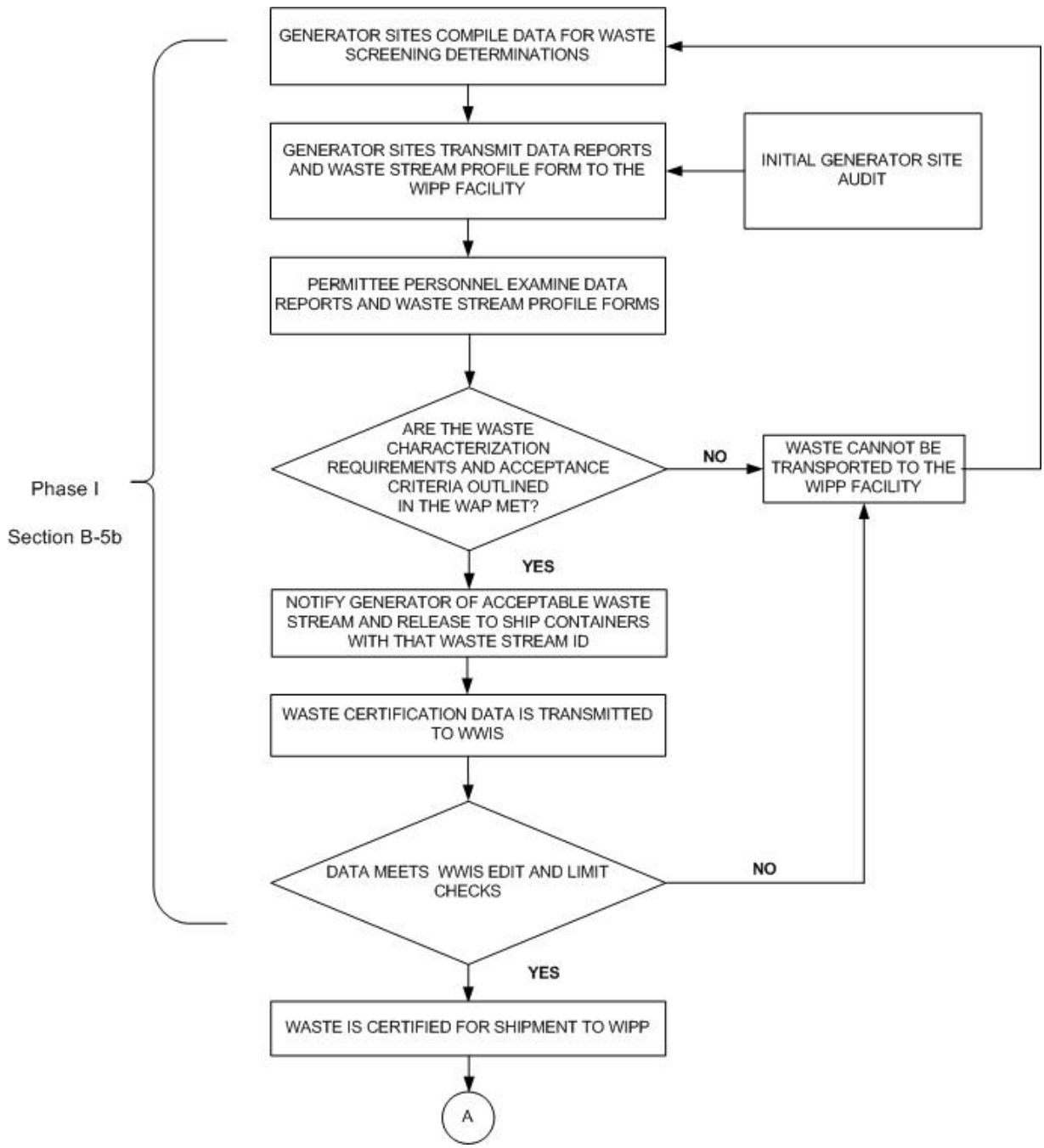

Figure ~~B~~ C-3
TRU Mixed Waste Screening and Verification

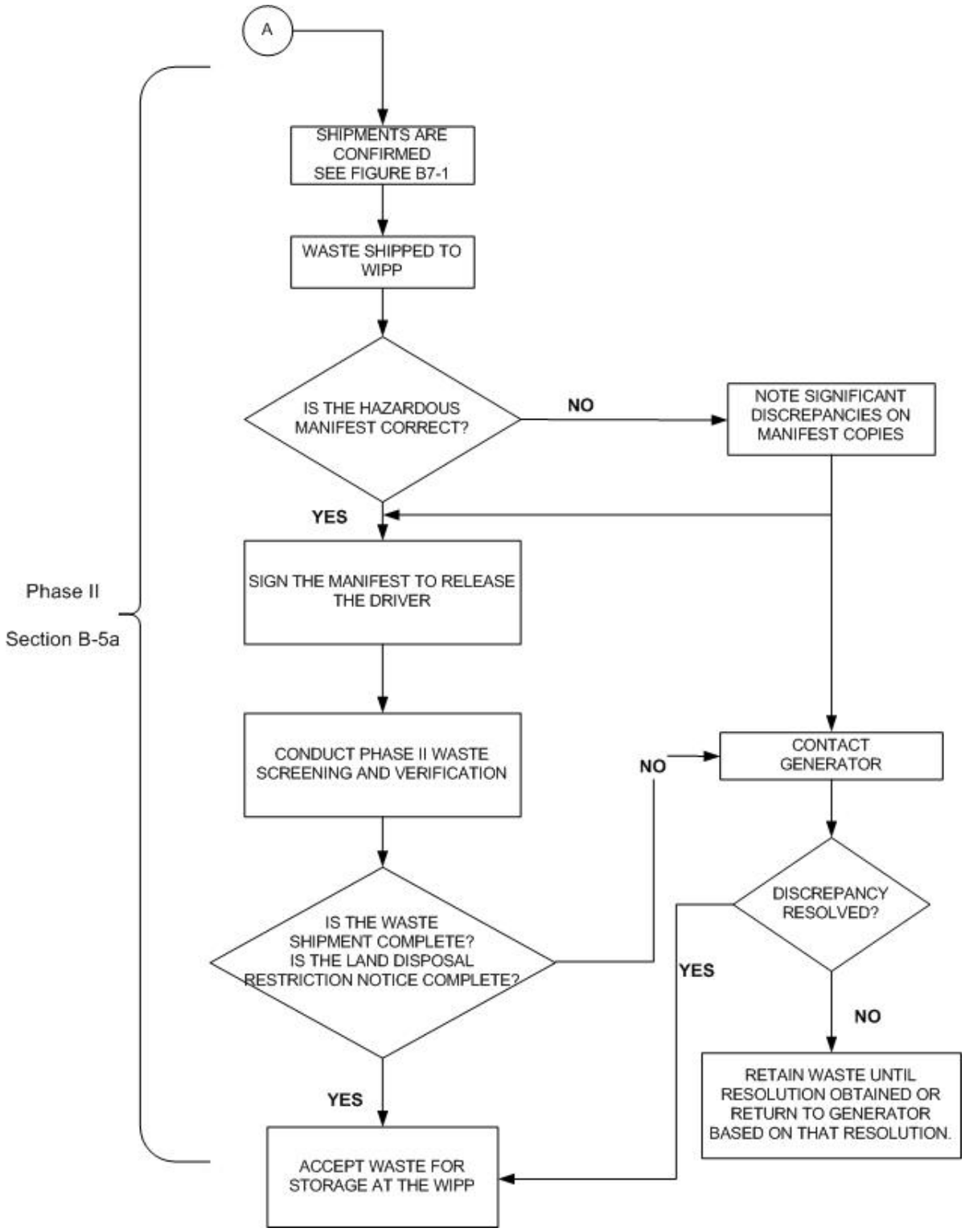

Figure ~~B~~ C-3
TRU Mixed Waste Screening and Verification (Continued)