

ATTACHMENT B
WASTE ANALYSIS PLAN

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ATTACHMENT B
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ATTACHMENT B

WASTE ANALYSIS PLAN

B-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 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 DOE generator/storage sites by various specific processes and activities. Examples of the major types of operations that generate this waste include:

- C 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.
- C 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.
- C 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.
- C 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.

1 TRU mixed waste contains both TRU radioactive and hazardous components, as defined in
2 20.4.1.800 NMAC (incorporating 40 CFR, §268.35(d)), and in the Federal Facility Compliance
3 Act, Public Law 102- 386, Title 1, §3021(d). It is designated and separately packaged as either
4 contact-handled (**CH**) or remote-handled (**RH**), based on the radiological dose rate at the
5 surface of the waste container. ~~RH TRU mixed wastes will not be received and disposed at the~~
6 ~~WIPP facility.~~

7 The hazardous components of the TRU mixed waste to be managed at the WIPP facility are
8 designated in Table B-109. Some of the waste may also be identified by unique state hazardous
9 waste codes or numbers. These wastes are acceptable at WIPP as long as the Treatment,
10 Storage, and Disposal Facility Waste Acceptance Criteria (**TSDF-WAC**) in Module II are met.
11 This WAP describes the measures that will be taken to ~~assure~~ ensure that the TRU mixed
12 wastes received at the WIPP facility are within the scope of Table B-109 as established by
13 20.4.1.500 NMAC (incorporating 40 CFR §264), and that they comply with unit-specific
14 requirements of 20.4.1.500 NMAC (incorporating 40 CFR §264.600), Miscellaneous Units.

15 Some TRU mixed waste is retrievably stored at the DOE generator/storage sites. Additional
16 TRU mixed waste will be generated and packaged into containers at these generator/storage
17 sites in the future. TRU mixed waste will be retrieved from storage areas at a DOE
18 generator/storage site. Retrievably stored waste is defined as TRU mixed waste generated after
19 1970 and before the New Mexico Environment Department (**NMED**) notifies the Permittees, by
20 approval of the final audit report, that the characterization requirements of the WAP at a
21 generator/storage site have been implemented. Newly generated waste is defined as TRU
22 mixed waste generated after NMED approves the final audit report for a generator/storage site.
23 Acceptable knowledge (**AK**) information is assembled for both retrievably stored and newly
24 generated waste. ~~Retrievably Waste characterization of retrievably~~ stored TRU mixed waste will
25 ~~be characterized performed~~ on an ongoing basis, as the waste is retrieved. ~~Newly Waste~~
26 ~~characterization of newly~~ generated TRU mixed waste is typically ~~characterized performed~~ as it
27 is generated, although some characterization occurs post-generation. Waste characterization
28 requirements for retrievably stored and newly generated TRU mixed wastes differ, as discussed
29 in Sections B-3d(1) and B-3d(2).

30 Waste characterization is defined in Module I as the activities performed by the waste generator
31 to satisfy the general waste analysis requirements of 20.4.1.500 NMAC (incorporating 40 CFR
32 §264.13(a)) before waste containers have been certified for disposal at WIPP. The
33 characterization process for WIPP waste is presented in Figure B-2. Generator site waste
34 characterization programs are first audited by the Permittees, with NMED approving the final
35 audit report. After this, generator sites determine whether AK alone is sufficient for
36 characterization, or whether a sampling and analysis program in conjunction with AK is
37 necessary to adequately characterize wastes. If an AK Sufficiency Determination is sought,
38 information is provided to the Permittees for their review and provisional approval; NMED
39 determination of adequacy of the AK information is required before final approval by the
40 Permittees. If the sampling and analysis route is chosen, sites proceed to sample and analyze
41 waste in conjunction with AK and in accordance with this WAP. Once an AK Sufficiency
42 Determination is obtained, or when required sampling and analysis data are obtained, sites
43 would then prepare and submit the Waste Stream Profile Report for the Permittees' approval.
44 Once the WSPF is approved, a site may ship waste to WIPP. The Permittees will perform waste
45 confirmation as specified in Permit Attachment B7, through non destructive examination (**NDE**)

1 of a representative subpopulation of certified waste containers, to ensure that the wastes meet
2 the TSDf-WAC.

3 B-0a Waste Characterization

4 Characterization requirements for individual containers of TRU mixed waste are specified on a
5 waste stream basis. A waste stream is defined as waste material generated from a single
6 process or from an activity that is similar in material, physical form, and hazardous constituents.
7 Waste streams are grouped by Waste Matrix Code Groups related to the physical and chemical
8 properties of the waste. Generator/storage sites shall use the characterization techniques
9 described in this WAP to assign appropriate Waste Matrix Code Groups for WIPP disposal. The
10 Waste Matrix Code Groups are solidified inorganics, solidified organics, salt waste, soils,
11 lead/cadmium metal, inorganic nonmetal waste, combustible waste, graphite, filters,
12 heterogeneous debris waste, and uncategorized metal. Waste Matrix Code Groups can be
13 grouped into three Summary Category groups: Homogeneous Solids (Summary Category
14 S3000), Soil/Gravel (Summary Category S4000), and Debris Waste (Summary Category
15 S5000).

16 TRU mixed wastes are initially categorized into the three broad Summary Category Groups that
17 are related to the final physical form of the wastes. Waste characterization requirements for
18 these groups are specified separately in Section B-2 of this WAP. Each of the three groups is
19 described below.

20 S3000 - Homogeneous Solids

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

30 S4000 - Soils/Gravel

31 This Summary Category Group includes S4000 waste streams that are at least 50
32 percent by volume soil/gravel. This Summary Category Group is expected to contain
33 toxic metals. ~~Soils/gravel are further categorized by the amount of debris included in the~~
34 ~~matrix:~~

35 S5000 - Debris Wastes

36 This Summary Category Group includes heterogeneous waste that is at least 50 percent
37 by volume materials that meet the criteria specified in 20.4.1.800 NMAC (incorporating
38 40 CFR §268.2 (g)). Debris means solid material exceeding a 2.36 inch (in.) (60
39 millimeter) particle size that is intended for disposal and that is:

- 40 1. a manufactured object, or
41 2. plant or animal matter, or

1 3. natural geologic material.

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

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

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

10 Metals

11 Some of the TRU mixed waste to be emplaced in the WIPP facility contains metals for
12 which 20.4.1.200 NMAC (incorporating 40 CFR §261.24), toxicity characteristics were
13 established (EPA hazardous waste ~~codes~~ **numbers** D004 through D011). Cadmium,
14 chromium, lead, mercury, selenium, and silver are present in discarded tools and
15 equipment, solidified sludges, cemented laboratory liquids, and waste from
16 decontamination and decommissioning activities. A large percentage of the waste
17 consists of lead-lined gloveboxes, leaded rubber gloves and aprons, lead bricks and
18 piping, lead tape, and other lead items. Lead, because of its radiation-shielding
19 applications, is the most prevalent toxicity-characteristic metal present.

20 Halogenated Volatile Organic Compounds

21 Some of the TRU mixed waste to be emplaced in the WIPP facility contains spent
22 halogenated volatile organic compound (**VOC**) solvents identified in 20.4.1.200 NMAC
23 (incorporating 40 CFR, §261.31) (EPA hazardous waste numbers F001 through F005).
24 Tetrachloroethylene; trichloroethylene; methylene chloride; carbon tetrachloride;
25 1,1,1-trichloroethane; and 1,1,2-trichloro-1,2,2-trifluoroethane (EPA hazardous waste
26 ~~codes~~ **numbers** F001 and F002) are the most prevalent halogenated organic compounds
27 identified in TRU mixed waste that may be managed at the WIPP facility during the
28 Disposal Phase. These compounds are commonly used to clean metal surfaces prior to
29 plating, polishing, or fabrication; to dissolve other compounds; or as coolants. Because
30 they are highly volatile, only small amounts typically remain on equipment after cleaning
31 or, in the case of treated wastewaters, in the sludges after clarification and flocculation.
32 Radiolysis may also generate halogenated volatile organic compounds.

33 Nonhalogenated Volatile Organic Compounds

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

1 The generator/storage sites shall characterize their waste in accordance with this WAP and
2 associated Permit Attachments, and ensure that waste proposed for storage and disposal at
3 WIPP meets the TSDf-WAC in Module II. The generator/storage site shall assemble the
4 Acceptable Knowledge (AK) information into an auditable record¹ for the waste stream as
5 described in Permit Attachment B4. For those waste streams with an approved AK Sufficiency
6 Determination (see below), sampling and analysis per the methods described in Permit
7 Attachments B1 and B2 are not required.

8 All waste characterization activities specified in this WAP and associated Permit Attachments
9 shall be carried out at generator/storage sites and Permittee approved laboratories in
10 accordance with this WAP. The Permittees will audit generator/storage site waste
11 characterization programs and activities as described in Section B-3. Waste characterization
12 activities at the generator/storage sites include the following, although not all these techniques
13 will be used on each container, as discussed in Section B-3:

- 14 C Radiography, which is an x-ray technique to determine physical contents of
15 containers
- 16 C Visual examination of opened containers as an alternative way to determine their
17 physical contents
- 18 C Headspace-gas sampling to determine VOC content of gases in the void volume
19 of the containers
- 20 C Sampling and analysis of waste forms that are homogeneous and can be
21 representatively sampled to determine concentrations of hazardous waste
22 constituents and toxicity characteristic contaminants of waste in containers
- 23 C Compilation of AK documentation into an auditable record
- 24

25 B-0b AK Sufficiency Determination

26 Generator/storage sites may identify waste streams that can be adequately characterized using
27 AK alone, without the need to perform post packaging chemical or physical sampling and
28 analysis on any containers in the waste stream. For those waste streams, the generator/storage
29 sites may submit a request to the Permittees for an AK Sufficiency Determination
30 (**Determination Request**). The contents of the Determination Request are specified in Permit
31 Attachment B4, Section B4-3d.

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

- 35 C The Determination Request must include all information specified in Permit
36 Attachment B4, Section B4-3d
- 37

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.

- 1 C The AK Summary must identify relevant hazardous constituents, and must
- 2 correctly identify all toxicity characteristic and listed hazardous waste numbers.
- 3 C All hazardous waste number assignments must be substantiated by supporting
- 4 data and, if not, whether this lack of substantiation compromises the
- 5 interpretation.
- 6 C Resolution of data discrepancies between different AK sources must be
- 7 technically correct and documented.
- 8 C The AK Summary must include all the identification of waste material parameter
- 9 weights by percentage of the material in the waste stream, and determinations
- 10 must be technically correct.
- 11 C All prohibited items specified in the TSDF-WAC should be addressed, and
- 12 conclusions drawn must be technically adequate and substantiated by supporting
- 13 information.
- 14 C If the AK record includes process control information specified in Permit
- 15 Attachment B4, Section B4-3b, the information should include procedures, waste
- 16 manifests, or other documentation demonstrating that the controls were
- 17 adequate and sufficient.
- 18 C The site must provide the supporting information necessary to substantiate
- 19 technical conclusions within the Determination Request, and this information
- 20 must be correctly interpreted.

21 The Permittees will review the Determination Request for technical adequacy and compliance
22 with the requirements of the Permit, using trained and qualified individuals in accordance with
23 standard operating procedures that shall, at a minimum address all of the technical and
24 procedural requirements listed above. The Permittees shall resolve comments with the
25 generator/storage site and if the Permittees determine that the AK is sufficient, they will
26 provisionally approve the Determination Request and forward it along with all information
27 submitted with the Determination Request to NMED for an evaluation that the provisional
28 approval made by the Permittees is adequate. Based on the results of NMED's evaluation, the
29 Permittees will notify the generator/storage sites whether the AK information is sufficient and the
30 Determination Request is approved. The Permittees will not approve an Determination Request
31 that NMED has determined to be inadequate unless the generator/storage site resolves the
32 inadequacies and provides the resolution to NMED for evaluation of adequacy. At any time,
33 NMED may decide that certain waste stream groupings no longer require NMED evaluation of
34 adequacy of the Permittees' provisional approval of Determination Requests. If this arises, the
35 Secretary will notify the Permittees in writing of this decision, and the Sufficiency Determinations
36 for the specified waste stream groups would no longer require NMED evaluation of adequacy.

37 In the event the Permittees disagree, in whole or in part, with an evaluation performed by NMED
38 resulting in a determination by NMED that the Permittees' provisional approval for a particular
39 waste stream is inadequate, the Permittees may seek dispute resolution. The dispute resolution
40 process is specified in Module I.

41 If NMED determines that the Permittees' provisional approval is inadequate, or if the Permittees
42 do not approve a Determination Request, or the generator/storage site does not submit a
43 Determination Request, then sampling and analysis per the methods specified in Permit
44 Attachments B1 and B2 is required to resolve the assignment of EPA hazardous waste
45 numbers. The generator/storage site shall perform sampling and analysis on a representative

1 sample of the waste stream using headspace gas sampling and analysis (for debris waste) or
2 solids sampling and analysis (for homogeneous solid or soil/gravel waste streams).

3 B-0c Waste Stream Profile Form Completion

4 After a complete AK record has been compiled and either a Determination Request has been
5 approved by the Permittees or the generator/storage site has completed the applicable
6 representative sampling and analysis requirements specified in Permit Attachments B1 and B2,
7 the generator/storage site will complete a Waste Stream Profile Form (WSPF) and
8 Characterization Information Summary (CIS). The requirements for the completion of a WSPF
9 and a CIS are specified in Permit Attachment B3, Sections B3-12b(1) and B3-12b(2)
10 respectively.

11 ~~All waste characterization activities specified in this WAP and associated Permit Attachments~~
12 ~~shall be carried out at generator/storage sites and, as applicable, at the WIPP facility in~~
13 ~~accordance with this WAP. The Permittees will audit generator/storage site waste~~
14 ~~characterization programs and activities as described in Section B-3. Waste characterization~~
15 ~~activities at the generator/storage sites include the following, although not all these techniques~~
16 ~~will be used on each container, as discussed in Section B-3:~~

- 17 ~~_____ C _____ Radiography, which is an x-ray technique to determine physical contents of~~
18 ~~containers~~
- 19 _____
- 20 ~~_____ C _____ Visual examination of opened containers as an alternative way to determine their~~
21 ~~physical contents or to verify Radiography results~~
- 22 ~~_____ C _____ Headspace gas sampling to determine VOC content of gases in the void volume~~
23 ~~of the containers~~
- 24 ~~_____ C _____ Sampling and analysis of waste forms that are homogeneous and can be~~
25 ~~representatively sampled to determine concentrations of hazardous waste~~
26 ~~constituents and toxicity characteristic contaminants of waste in containers~~
- 27 ~~_____ C _____ Compilation of acceptable knowledge documentation into an auditable record²~~

28 ~~Once the required waste characterization is complete, the generator/storage site will complete a~~
29 ~~Waste Stream Profile Form (WSPF) to document the results of their characterization activities~~
30 ~~(Section B-1d). The WSPF and the Characterization Information Summary CIS for the waste~~
31 ~~stream resulting from waste characterization activities shall be transmitted to the Permittees,~~
32 ~~reviewed for completeness, and screened for acceptance prior to loading any TRU mixed waste~~
33 ~~into the Contact-Handled or Remote-Handled Packaging at the generator facility, as described~~
34 ~~in Section B-4. The review and approval process will ensure that the submitted waste analysis~~
35 ~~information is sufficient to meet the Data Quality Objectives (DQOs) for AK in Section B-4a(1)~~
36 ~~and allow the Permittees to demonstrate compliance with the requirements of this WAP. Only~~
37 ~~TRU mixed waste and TRU waste that has been characterized in accordance with this WAP~~

² "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.

1 and that meets the **TSDF-WAC** specified in this Permit will be accepted at the WIPP facility for
2 disposal in a permitted Underground Hazardous Waste Disposal Unit (**HWDU**). **The Permittees**
3 **will provide NMED with copies of the approved WSPF and accompanying CIS prior to waste**
4 **stream shipment. Upon notification of approval of the WSPF by the Permittees, the**
5 **generator/storage site may be authorized to ship waste to WIPP.**

6 In the event the Permittees request detailed information on a waste stream, the site will provide
7 a Waste Stream Characterization Package (Section B3-12b(2)). For each waste stream, this
8 package will include the WSPF, the ~~Characterization Information Summary~~ **CIS**, and the
9 complete AK summary. The Waste Stream Characterization Package will also include specific
10 Batch Data Reports (**BDRs**) and raw analytical data associated with waste container
11 characterization as requested by the Permittees.

12 **B-0d Waste Confirmation**

13 **The Permittees will perform waste confirmation on a representative subpopulation of each**
14 **waste stream shipment after certification and prior to shipment as described in Permit**
15 **Attachment B7. The Permittees will use radiography, visual examination (VE), or review of VE**
16 **records (e.g., VE data sheets or packaging logs) to examine 7 percent of each waste stream**
17 **shipment to confirm that the waste does not contain ignitable, corrosive, or reactive waste.**
18 **Waste confirmation will be performed by the Permittees at the generator/storage site.**

19 **B-1 Identification of TRU Mixed Waste to be Managed at the WIPP Facility**

20 **B-1a Waste Stream Identification**

21 TRU mixed waste destined for disposal at WIPP will be **characterized** on a waste stream basis.
22 Generator/storage sites will delineate waste streams using acceptable knowledge. Required
23 acceptable knowledge is specified in Section B-3b and Permit Attachment B4. ~~If acceptable~~
24 ~~knowledge for retrievably stored waste does not comply with these requirements (e.g.,~~
25 ~~heterogeneous Debris Waste in Summary Category S5000), the Permittees will reexamine (and~~
26 ~~characterize) the waste in the same manner as newly generated waste.~~

27 All of the waste within a waste stream may not be available for **sampling and analysis** at one
28 time. ~~In these instances, generator/storage sites may divide waste streams into waste stream~~
29 ~~lots based on staging, transportation, or handling issues. Characterization activities shall then~~
30 ~~be undertaken on a waste stream lot basis. A WSPF need not be submitted for subsequent~~
31 ~~waste stream lots unless warranted by the characterization information. **Permit Attachment B2**~~
32 ~~addresses the requirements for selecting waste containers used for characterization of waste~~
33 ~~streams as they are generated or retrieved.~~

34 **B-1b Waste Summary Category Groups and Hazardous Waste Accepted at the WIPP Facility**

35 Once a waste stream has been delineated, generator/storage sites will assign a Waste Matrix
36 Code to the waste stream based on the physical form of the waste. Waste streams are then
37 assigned to one of three broad Summary Category Groups; S3000-Homogeneous Solids,
38 S4000-Soils/Gravel, and S5000-Debris Wastes. These Summary Category Groups **are** used to
39 determine further **characterization** requirements.

1 The Permittees will only allow generators to ship those TRU mixed waste streams with EPA
2 hazardous waste ~~codes~~ **numbers** listed in Table B-409. Some of the waste may also be
3 identified by unique state hazardous waste ~~codes~~ **or numbers**. These wastes are acceptable at
4 WIPP as long as the TSDF-WAC are met. The Permittees will perform characterization of all
5 waste streams as required by this WAP. If during the characterization process, new EPA
6 hazardous waste ~~codes~~ **numbers** are identified, those wastes will be prohibited for disposal at
7 the WIPP facility until a permit modification has been submitted to and approved by ~~the~~ NMED
8 for these new EPA hazardous waste ~~codes~~ **numbers**. Similar waste streams at other
9 generator/storage sites will be examined by the Permittees to ensure that the newly identified
10 EPA hazardous waste ~~codes~~ **numbers** do not apply to those similar waste streams. If the other
11 waste streams also require new EPA hazardous waste ~~code~~ **numbers**, shipment of these similar
12 waste streams will also be prohibited for disposal until a permit modification has been submitted
13 to and approved by NMED.

14 B-1c Waste Prohibited at the WIPP Facility

15 The following TRU mixed waste are prohibited at the WIPP facility:

- 16 C liquid waste (waste shall contain as little residual liquid as is reasonably
17 achievable by pouring, pumping and/or aspirating, and internal containers shall
18 contain less than 1 inch or 2.5 centimeters of liquid in the bottom of the container.
19 Total residual liquid in any payload container (e.g., 55 gallon drum or standard
20 waste box) may not exceed 1 percent volume of that container. Payload
21 containers with U134 waste shall have no detectable liquid)
- 22 C non-radionuclide pyrophoric materials, such as elemental potassium
- 23 C hazardous wastes not occurring as co-contaminants with TRU mixed wastes
24 (non-mixed hazardous wastes)
- 25 C wastes incompatible with backfill, seal and panel closures materials, container
26 and packaging materials, shipping container materials, or other wastes
- 27 C wastes containing explosives or compressed gases
- 28 C wastes with polychlorinated biphenyls (**PCBs**) not authorized under an EPA PCB
29 waste disposal authorization
- 30 C wastes exhibiting the characteristic of ignitability, corrosivity, or reactivity (EPA
31 Hazardous Waste Numbers of D001, D002, or D003)
- 32 ~~C RH TRU mixed waste (waste with a surface dose rate of 200 millirem per hour or
33 greater)~~
- 34 C waste that has ever been managed as high-level waste and waste from tanks
35 specified in Table B-98, unless specifically approved through a Class 3 permit
36 modification

- 1 ~~C~~ any waste container that does not have VOC concentration values reported for
2 the headspace
- 3 C any waste container from a waste stream (or waste stream lot) which has not
4 undergone either radiographic or visual examination of a statistically
5 representative subpopulation of the waste stream in each shipment, as described
6 in Permit Attachment B7
- 7 C any waste container from a waste stream which has not been preceded by an
8 appropriate, certified WSPF (see Section B-1d)

9 Before accepting a container holding TRU mixed waste, the Permittees will ensure, through
10 audit and as part of their Permittee-level data reviews (Section B3-10c), that generator/storage
11 sites examine the radiography or visual examination data records (Section B-4b) to verify that
12 the container holds no unvented compressed gas containers and that residual liquid does not
13 exceed 1 percent volume in any payload container. If discrepancies or inconsistencies are
14 detected during the data review, the generator/storage site will review the radiography video
15 tape or visual examination tape to verify that the observed physical form of the waste is
16 consistent with the waste stream description provided by the generator and to ensure that no
17 prohibited items are present in the waste. Radiography tapes will be selected randomly from at
18 least one percent of containers received at WIPP and will be reviewed and compared to
19 radiographic data forms. (Note that for radiography tapes containing classified information,
20 review of radiography tapes will be conducted by the Permittees at a secure location other than
21 WIPP. The records generated from the Permittee's review of radiography tapes will be sent to
22 WIPP for inclusion in the Operating Record, while the original tape will be maintained at another
23 secure location.) All personnel who review radiography video tapes will be trained to the same
24 standard as radiography operators. perform waste confirmation activities on each waste stream
25 shipment to confirm that the waste does not contain ignitable, corrosive, or reactive waste and
26 the assigned EPA hazardous waste numbers are allowed for storage and disposal by this
27 Permit. Waste confirmation activities will be performed on 7 percent of each waste stream
28 shipped, equating to examination of at least one of fourteen containers in each waste stream
29 shipment. If fewer than fourteen containers in a waste stream shipment are received, one
30 container will be examined to satisfy waste confirmation requirements. Section B-4 and Permit
31 Attachment B7 includes a descriptions of the waste verification confirmation processes that the
32 Permittees will conduct prior to receiving a shipment at the WIPP facility.

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

37 To ensure the integrity of the WIPP facility, waste streams identified to contain incompatible
38 materials or materials incompatible with waste containers cannot be shipped to WIPP unless
39 they are treated to remove the incompatibility. Only those waste streams that are compatible or
40 have been treated to remove incompatibilities will be shipped to WIPP.

41 The VOC concentrations in the headspace of waste containers have been limited to those
42 which when averaged on a room basis, will ensure compliance with the performance standards:

1 These limits are presented in Table B-2 as maximum allowable VOC room-averaged headspace
2 concentration limits. There are no maximum allowable headspace gas concentration limits for
3 individual containers, as some containers can exceed these values as long as container
4 headspace averages in a disposal room do not.

5 B-1d Control of Waste Acceptance

6 Every waste stream shipped to WIPP shall be preceded by a WSPF (Figure B-1) and a CIS.
7 The required WSPF information and the ~~Characterization Information Summary~~ CIS elements
8 are found in Section B3-12b(1) and Section B3-12b(2).

9 Generator/storage sites will provide the WSPF to the Permittees for each waste stream prior to
10 its acceptance for disposal at WIPP. The WSPF and the ~~Characterization Information Summary~~
11 CIS will be transmitted to the Permittees for each waste stream from a generator/storage site. If
12 continued waste characterization reveals discrepancies that identify different hazardous waste
13 codes numbers or indicates that the waste belongs to a different waste stream, the waste will be
14 redefined to a separate waste stream and a new WSPF submitted.

15 The Permittees are responsible for the review of WSPFs (~~Section B3-12b(1)~~) and
16 ~~Characterization Information Summaries~~ CISs to verify compliance with the restrictions on TRU
17 mixed wastes for WIPP disposal. The Permittees will submit completed WSPFs to NMED prior
18 to waste stream shipment. The Permittees will also be responsible for the review of shipping
19 records (~~Section B-4b5~~) to verify confirm that each waste container has been prepared and
20 characterized in accordance with applicable provisions of this WAP. Waste characterization
21 data shall ~~confirm~~ ensure the absence of prohibited items specified in Section B-1c.

22 As stated in the Introduction of this WAP, any time the Permittees request additional information
23 concerning a waste stream, the generator/storage site will provide a Waste Stream
24 Characterization Package (Section B3-12b(2)). The option for the Permittees to request
25 additional information ensures that the waste being offered for disposal is adequately
26 characterized and accurately described on the WSPF.

27 B-1e Waste Generating Processes at the WIPP Facility

28 Waste generated as a result of the waste containers handling and processing activities at the
29 WIPP facility is termed "derived" waste. Because derived wastes can contain only those RCRA-
30 regulated materials present in the waste from which they were derived, no additional
31 characterization of the derived waste is required for disposal purposes. In other words, the
32 generator/storage site's characterization data and knowledge of the processes at the WIPP
33 facility will be used to identify and characterize hazardous waste and hazardous constituents in
34 derived waste. The management of derived waste is addressed in Permit Attachment M1.

35 B-2 Waste Characterization Program Requirements and Waste Characterization Parameters

36 The Permittees shall require the sites to develop the procedure(s) which specify their
37 programmatic waste characterization requirements. The Permittees will evaluate the procedures
38 during audits conducted under the Permittees' Audit and Surveillance Program (Section B-
39 5a(3)) and may also evaluate the procedures as part of the review and approval of the WSPF.

1 Sites must notify the Permittees and obtain approval prior to making data-affecting modifications
2 to procedures. Program procedures shall address the following minimum elements:

- 3 C Waste characterization and certification procedures for retrievably stored and
4 newly generated wastes to be sent to the WIPP facility
- 5 C ~~Procedures describing management controls~~ Methods used to ensure prohibited
6 items are documented and managed. These will include procedures for
7 performing radiography, VE, or treatment, if these methods are used to ensure
8 prohibited items are not present in the waste prior to shipment of the waste to
9 WIPP.
- 10 ~~C Procedures that assure unacceptable wastes (e.g., reactive, ignitable, corrosive)~~
11 ~~are identified and segregated from TRU mixed waste populations sent to WIPP.~~
12 ~~These will include procedures for performing radiography, VE, or treatment, if~~
13 ~~these methods are used to assure unacceptable wastes are not present prior to~~
14 ~~shipment of the waste to WIPP.~~
- 15 C Procedures used to verify packaging configurations to determine the correct
16 drum age criteria (DAC) if headspace gas sampling and analysis is used to
17 collect waste characterization information per Section B1-1a(1) of the WAP.
- 18 C Identify the organization(s) responsible for compliance with administrative
19 controls and waste characterization and certification procedures.
- 20 C Identify the oversight procedures and frequency of actions to verify compliance
21 with administrative controls and waste characterization and certification
22 procedures.
- 23 C Develop training specific to administrative control and waste characterization and
24 certification procedures.
- 25 C Ensure that personnel may stop work if noncompliance with administrative
26 controls or waste characterization or certification procedures is identified.
- 27 C Develop a nonconformance process that complies with the requirements in
28 Permit Attachment B3 of the WAP to document and establish corrective actions.
- 29 C As part of the corrective action process, assess the potential time frame of the
30 noncompliance, the potentially affected waste population(s), and the
31 reassessment and recertification of those wastes.
- 32 C A listing of all approved hazardous waste numbers which are acceptable at WIPP
33 are included in the Table B-8.

34 For those waste streams or containers that are not amenable to radiography (e.g., RH TRU
35 mixed waste, direct loaded ten-drum overpacks (TDOPs)) for waste confirmation by the
36 Permittees as described in Permit Attachment B7, generator/storage site VE data may be used

1 for waste acceptance. In those cases, the Permittees will review the generator/storage site VE
2 procedures to ensure that data sufficient for the Permittees' waste acceptance activities as
3 described in Permit Attachment B7 will be obtained and the procedures meet the minimum
4 requirements for visual examination specified in Permit Attachment B1, Section B1-3.

5 The following waste analysis characterization parameters shall be characterized at obtained
6 from the generator/storage sites:

- 7 ~~C Confirmation of physical form and exclusion of prohibited items specified in~~
8 ~~Section B-1e~~
- 9 ~~C Toxicity characteristic contaminants listed in 20.4.1.200 NMAC (incorporating 40~~
10 ~~CFR, §261.24), Table 1 (excluding pesticides), as specified in .~~
- 11 ~~C F-listed, P-listed, and U-listed solvents or wastes in Table B-109 found in~~
12 ~~20.4.1.200 NMAC (incorporating 40 CFR §261.31)~~
- 13 ~~C Hazardous constituents included in 20.4.1.200 NMAC (incorporating 40 CFR~~
14 ~~§261) Appendix VIII as specified in Tables B-1, B-3 and B-4, as well as any other~~
15 ~~hazardous constituent identified through acceptable knowledge.~~
- 16 C Determination whether TRU mixed waste streams comply with the applicable
17 provisions of the TSDF-WAC
- 18 C Determination whether TRU mixed wastes exhibit a hazardous characteristic
19 (20.4.1.200 NMAC, incorporating 40 CFR §261 Subpart C)
- 20 C Determination whether TRU mixed wastes are listed (20.4.1.200 NMAC,
21 incorporating 40 CFR §261 Subpart D)
- 22 C Estimation of waste material parameter weights

23 Tables B-1, B-32, B-43 and B-54 provide the parameters of interest for the various constituent
24 groupings and analytical methodologies. The following sections provide a description of the
25 acceptable methods to evaluate these parameters for each waste Summary Category Group.

26 B-3 Generator Waste Characterization Methods

27 The characterization techniques used by generator/storage sites includes acceptable
28 knowledge and may also include, as necessary, which incorporates confirmation by
29 headspace-gas sampling and analysis, radiography, visual examination, and homogeneous
30 waste sampling and analysis. All confirmation characterization activities are performed in
31 accordance with the WAP. Table B-65 provides a summary of the characterization requirements
32 for TRU mixed waste.

33 TRU mixed waste may be characterized in lots (Section B-1a) and/or batches. A sampling batch
34 can be up to 20 samples (excluding field QC samples), all of which shall be collected within 14
35 days of the first sample in the batch. An analytical batch can be up to 20 samples (excluding

laboratory QC samples), all of which shall be received by the laboratory within 14 days of the validated time of sample receipt of the first sample in the batch. For on-line integrated headspace-gas sampling/analytical systems, samples will be collected within a 12-hour period using the same on-line integrated sampling/analysis system. The analytical requirements are specified by the analytical method being used in the on-line system (e.g., FTIR, GC/MS). Refer to Permit Attachment B3 for additional clarification regarding the expected contents of Batch Data Reports.

B-3a Sampling and Analytical Methods

B-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. Headspace gas samples are used to determine the types and concentrations of VOCs in the void volume of waste containers. Measured headspace VOC concentrations in waste containers received at the WIPP facility will be compared routinely and in accordance with requirements of Permit Attachment N to ensure that, on an annual basis, there are no associated adverse worker or public health impacts. In addition, VOC constituents will be compared to those assigned by acceptable knowledge, and the Permittees will assign hazardous waste codes, as warranted. This comparison which may include an analysis of radiolytically derived VOCs. The Permittees generator/storage sites may also consider radiolysis and packaging materials when assessing the presence of listed waste hazardous constituents in the headspace gas results, and whether radiolysis would generate wastes which exhibit the toxicity characteristic. Refer to Permit Attachment B4 for additional clarification regarding hazardous waste code number assignment and headspace gas results. The methods for random selection of containers for headspace gas sampling and analysis are specified in Permit Attachment B2. Headspace gas sampling and analysis shall be subject to the Permittees' Audit and Surveillance Program (Permit Attachment B6).

With the exception of qualifying Los Alamos National Laboratory (LANL) sealed sources waste containers, every TRU mixed waste container or statistically selected containers from waste streams that meet the conditions for reduced headspace gas sampling listed in this section will be sampled and analyzed to determine the concentrations of VOCs (presented in Table B-3) in headspace gases. LANL sealed sources waste containers that meet the conditions specified in B-3a(1)(iii) must be assigned VOC concentration values in accordance with Section B-3a(1)(iii). If composite samples are used, containers used in the composite sample must be from the same waste stream with no more than 20 containers being included in a single composite sample. Sampling protocols, equipment, and QA/QC methods for headspace-gas sampling are provided in Permit Attachment B1. 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 batch data report 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

1 containers sampled from a given waste stream. The headspace gas analysis method Quality
2 Assurance Objectives (QAOs) are specified in Permit Attachment B3.

3 B-3a(1)(i) Reduced Sampling Requirements for Homogeneous Solid or Soil/Gravel Waste
4 Streams with no VOC-Related Hazardous Waste Codes

5 Headspace gas sampling of homogeneous solid and soil/gravel wastes that have no
6 VOC-related hazardous waste codes assigned may qualify for reduced headspace sampling if
7 they meet the following criteria:

- 8 ~~●~~ The waste stream or waste stream lot must consist of more than 10 containers.
- 9 ~~●~~ The waste stream must be a homogeneous solid or soil/gravel waste stream that
10 has no VOC-related hazardous waste codes assigned to it.
- 11 ~~●~~ The results of the solid sampling and analysis must confirm that no VOC-related
12 hazardous waste codes should be assigned to the waste stream.

13 If a waste stream meets these conditions for reduced headspace gas sampling,
14 generator/storage sites may choose to randomly select containers for headspace gas sampling
15 and analysis using the statistical approach in Permit Attachment B2, Section B2-2b.

16 B-3a(1)(ii) Reduced Sampling Requirements for Thermally Treated Waste Streams

17 Headspace gas sampling of wastes that have undergone high-temperature thermal processes
18 may qualify for reduced headspace sampling if they meet the following criteria:

- 19 ~~○~~ The waste stream or waste stream lot must consist of more than 10 containers.
- 20 ~~○~~ The waste stream must have either been generated using a high-temperature
21 thermal process or been subjected to a high-temperature thermal process after
22 generation that resulted in the reduction of matrix-related VOCs in the headspace
23 to concentrations below the PRQLs in Permit Attachment B3, Table B3-2.
- 24 ~~○~~ The site must have documentation demonstrating that high-temperature thermal
25 processes were used.

26 If a waste stream meets these conditions for reduced headspace gas sampling,
27 generator/storage sites may choose to randomly select containers for headspace gas sampling
28 and analysis using the statistical approach in Permit Attachment B2, Section B2-2b.

29 B-3a(1)(iii) Sampling Requirements for Waste Containers of LANL Sealed Sources Waste
30 Streams

31 Headspace gas sampling and analysis of a waste container containing a pipe overpack
32 component belonging to a LANL sealed sources waste stream is not required if compliance with
33 the following criteria has been determined and documented by LANL for its individual contents:

- 1 ~~C All LANL sealed sources will be characterized as newly generated waste.~~
- 2 ~~C The waste container contents meet the definition of sealed sources per~~
3 ~~10 CFR §30.4 and 10 CFR §835.2 (effective January 1, 2004), evidence of which~~
4 ~~must be assembled as part of the AK documentation.~~
- 5 ~~C Sealed sources must be the only non-packaging items in the waste container,~~
6 ~~which must be verified using the VE technique at the time of packaging.~~
- 7 ~~C The sealed sources must be U.S. Department of Transportation Special Form~~
8 ~~Class 7 (Radioactive) Material per 49 CFR §173.403 (effective October 1, 2003),~~
9 ~~the certification of which must be assembled as part of the AK documentation.~~
- 10 ~~C The integrity of each sealed source must be validated by documented~~
11 ~~contamination survey results to meet the requirements of 10 CFR §34.27~~
12 ~~(effective January 1, 2004), which must be assembled as part of the AK~~
13 ~~documentation.~~
- 14 ~~C Each sealed source must be, or be contained in, a rigid sealed container less~~
15 ~~than or equal to 4 liters in size, which must be verified using the VE technique at~~
16 ~~the time of packaging.~~
- 17 ~~C AK documentation does not indicate the use of VOCs or VOC-bearing materials~~
18 ~~as constituents of the sealed sources.~~
- 19 ~~C The outer casing of each sealed source must be of a non-VOC bearing material,~~
20 ~~which must be verified using the VE technique at the time of packaging.~~
- 21 ~~A packaging VOC source term for waste containers meeting these criteria must be established~~
22 ~~on a waste-stream basis for each headspace target analyte listed in Table B-3 as follows:~~
- 23 ~~C Samples must be collected from the headspace of a minimum of five containers,~~
24 ~~each containing only packaging materials typical and representative of the~~
25 ~~packaging materials used in containers belonging to the LANL sealed sources~~
26 ~~waste stream under consideration. In no case is this sampling required to occur~~
27 ~~on containers that hold sealed sources. Each headspace gas sample must be~~
28 ~~analyzed for the target analytes listed in Table B-3. Using the statistical approach~~
29 ~~in Permit Attachment B2, Section B2-3b, VOC concentration values shall be~~
30 ~~calculated. For each result that is nondetectable, the value calculated as one-half~~
31 ~~the method detection limit shall be used. For all detectable results, the mean~~
32 ~~values shall be used. The calculated VOC concentration values shall be~~
33 ~~assigned to each waste container meeting the criteria of this section.~~
- 34 ~~C Sampling and analysis must be managed in accordance with this Permit using an~~
35 ~~approved LANL headspace gas sampling and analysis program.~~

~~C The VOC source term also must be re-evaluated if any significant change (e.g., change in material or change in manufacturer) is made to the packaging materials used in the sealed sources waste stream.~~

~~If a waste container meets these criteria, concentrations for the headspace gas target analytes (Table B-3) must be assigned based on the VOC source term developed as described above. The assignment of VOC concentration values for qualifying waste containers belonging to LANL sealed sources waste streams must be managed as documented and approved in the LANL QAPJP.~~

B-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. Sampling of homogeneous and soil/gravel wastes shall result in the collection of a sample that is used to confirm verify hazardous waste code number assignment by acceptable knowledge. Sampling is accomplished through core coring or other EPA approved sampling, which is described in Permit Attachment B1. For those waste streams defined as Summary Category Groups S3000 or S4000 on page B-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 B2. Homogeneous and soil/gravel sampling and analysis shall be subject to the Permittees' Audit and Surveillance Program (Permit Attachment B6).

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-43 and B-54). 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 B2. If toxicity characteristic (TC) wastes are identified, these will be compared to those determined by acceptable knowledge and TC waste codes numbers will be revised, as warranted. Refer to Permit Attachment B4 for additional clarification regarding hazardous waste code number assignment and homogeneous solid and soil/gravel analytical results.

1 B-3a(3) Laboratory Qualification

2 The Permittees will ensure that generator/storage sites conduct analyses using laboratories that
3 are qualified through participation in the Performance Demonstration Program (**PDP**) (DOE,
4 ~~1995c, d 2003, 2005~~). Required QAOs are specified in Permit Attachment B3. In addition,
5 methods and supporting performance data demonstrating QAO compliance shall be ensured by
6 the Permittees during the annual certification audit **of the laboratories**.

7 Analytical methods used by the laboratories shall: 1) satisfy all of the appropriate QAOs, and
8 2) be implemented through laboratory-documented standard operating procedures. These
9 analytical QAOs are discussed in detail in Permit Attachment B3.

10 B-3b Acceptable Knowledge

11 Acceptable knowledge (**AK**) is used in TRU mixed waste **characterization** activities in ~~three~~ **five**
12 ways:

- 13 C To delineate TRU mixed waste streams
- 14 C **To assess whether TRU mixed wastes comply with the TSDF-WAC**
- 15 C To assess whether TRU mixed ~~heterogeneous debris~~ wastes exhibit a ~~toxicity~~
16 **hazardous** characteristic (20.4.1.200 NMAC, incorporating 40 CFR §261.24
17 **Subpart C**)
- 18 C To assess whether TRU mixed wastes are listed (20.4.1.200 NMAC,
19 incorporating 40 CFR §261.34 **Subpart D**)
- 20 C **To estimate waste material parameter weights**

21 Acceptable knowledge is discussed in detail in Permit Attachment B4, which outlines the
22 minimum set of requirements **and DQOs** which shall be met by the generator/storage sites in
23 order to use acceptable knowledge. In addition, Section B-~~4b(1)5a~~ of this permit attachment
24 describes the ~~verification~~ **assessment** of acceptable knowledge through ~~sampling and analysis~~
25 **and** the Permittees' Audit and Surveillance Program.

26 B-3c Radiography and Visual Examination

27 Radiography is a nondestructive qualitative and quantitative technique that involves X-ray
28 scanning of waste containers to identify and verify waste container contents. Visual examination
29 (**VE**) constitutes opening a container and physically examining its contents. **Generator/storage**
30 **sites shall perform radiography or VE on 100 percent of containers in waste streams where**
31 **acceptable knowledge does not substantiate the absence of prohibited items.** Radiography
32 and/or visual examination will be used, **when necessary**, to examine ~~every~~ **a** waste container to
33 verify its physical form. **These techniques can detect liquid wastes and containerized gases,**
34 **which are prohibited for WIPP disposal. The prohibition of liquids and containerized gases**
35 **prevents the shipment of corrosive, ignitable, or reactive wastes. Radiography and/or VE will are**
36 **also be able to confirm that the physical form of the waste matches its waste stream description**

1 (i.e. Homogeneous Solids, Soil/Gravel, or Debris Waste [including uncategorized metals]). If the
2 physical form does not match the waste stream description, the waste will be designated as
3 another waste stream and assigned the preliminary hazardous waste codes associated with
4 that new waste stream assignment. That is, if radiography and/or VE indicates that the waste
5 does not match the waste stream description arrived at by acceptable knowledge
6 characterization, a non-conformance report will be completed and the inconsistency will be
7 resolved as specified in Permit Attachment B4. The proper waste stream assignment will be
8 determined (including preparation of a new WSPF), the correct hazardous waste codes will be
9 assigned, and the resolution will be documented. Refer to Permit Attachment B4 for a
10 discussion of acceptable knowledge and its ~~confirmation~~ **verification** process.

11 Generator/storage sites may conduct visual examination of waste containers in lieu of
12 radiography. For generator/storage sites that choose to use visual examination in lieu of
13 radiography, the detection of any liquid waste in non-transparent inner containers, detected
14 from shaking the container, will be handled by assuming that the container is filled with liquid
15 and adding this volume to the total liquid in the payload container (e.g., 55 gallon drum or SWB).
16 The payload container would be rejected and/or repackaged to exclude the container if it is over
17 the TSDF-WAC limits. When radiography is used, or visual examination of transparent
18 containers is performed, if any liquid in inner containers is detected, the volume of liquid shall be
19 added to the total for the payload container. Radiography, or the equivalent, will be used **as**
20 **necessary** on the existing/stored waste containers to verify the physical characteristics of the
21 TRU mixed waste correspond with its waste stream identification/waste stream Waste Matrix
22 Code and to identify prohibited items. ~~The results of radiography are verified through visual~~
23 ~~examination of a statistically selected subpopulation of TRU mixed waste containers in each~~
24 ~~TRU mixed waste summary category group as specified in Permit Attachment B2.~~ Radiographic
25 examination protocols and QA/QC methods are provided in Permit Attachment B1. **Radiography**
26 **and VE shall be subject to the Permittees' Audit and Surveillance Program (Permit Attachment**
27 **B6).**

28 B-3d Characterization Techniques and Frequency for Newly Generated and Retrievably Stored 29 Waste

30 Generator/storage sites will use acceptable knowledge to delineate all TRU mixed waste
31 containers into waste streams for the purposes of grouping waste for further characterization.
32 The analyses performed ~~will not~~ **may** differ based on the waste stream ~~and, only on~~ the physical
33 form of the waste (i.e., heterogeneous debris waste cannot be sampled for totals analyses).
34 Both retrievably stored and newly generated wastes will be delineated in this fashion, though
35 the types of acceptable knowledge used may differ. Section B-3b discusses the use of
36 acceptable knowledge, sampling, and analysis in more detail. Acceptable knowledge is
37 discussed more completely in Permit Attachment B4. Every **TRU mixed** waste stream will be
38 assigned hazardous waste ~~codes~~ **numbers** based upon acceptable knowledge, and the
39 ~~Permittees will confirm~~ **generator/storage sites may verify** these designations using headspace
40 gas (all Summary Category Groups) and solid sampling and analysis (Summary Category
41 Groups S3000 and S4000 only).

42 **In the CIS for each waste stream, the generator/storage site will be required to document their**
43 **methods, and the findings from those methods, for determining the physical form of the waste**
44 **and the presence or absence of prohibited items for both retrievably stored and newly**

1 **generated waste.** Radiography and/or VE ~~will~~ **may** be used to verify the physical form of
2 retrievably stored TRU mixed waste. For newly generated waste, physical form and prohibited
3 items ~~will~~ **may** either be ~~verified~~ **documented** during packaging (using the VE technique) or ~~will~~
4 **be** verified after packaging using radiography (or VE in lieu of radiography). ~~Generator/storage~~
5 ~~sites may use either the VE technique or radiography, separately or together, as long as 100%~~
6 ~~of the containers undergo confirmation of AK. Radiography and/or VE will also be used in~~
7 ~~conjunction with acceptable knowledge to characterize heterogeneous debris wastes.~~
8 Radiography and/or VE, and the associated information compiled from acceptable knowledge
9 (e.g., age of the waste, generating process) will be used to determine the RCRA-regulated
10 constituents present in the waste. VE, the VE technique, and/or radiography shall be performed
11 prior to any treatment designed to supercompact waste prior to shipment.

12 **For debris waste streams that do not have an AK Sufficiency Determination approved by the**
13 **Permittees,** ~~With the exception of qualifying LANL sealed sources waste containers, all waste~~
14 ~~containers (retrievably stored and newly generated) or randomly selected containers~~ **selected in**
15 **accordance with Permit Attachment B2** from ~~those~~ waste streams that meet the conditions for
16 reduced headspace gas sampling listed in Section B-3a(1) are **must be** sampled and analyzed
17 for VOCs in the headspace gas. ~~The LANL sealed sources waste containers that meet specified~~
18 ~~conditions must be assigned VOC concentration values in accordance with Section B-3a(1)(iii).~~
19 **A Likewise, a** statistically selected portion of each homogeneous solids and soil/gravel waste
20 streams **must be** is sampled and analyzed for RCRA-regulated total VOCs, SVOCs, and metals
21 **(see Permit Attachment B2) when those waste streams do not have an AK Sufficiency**
22 **Determination approved by the Permittees.** Sampling and analysis methods used for waste
23 characterization are discussed in Section B-3a.

24 In the process of performing organic headspace and solid sample analyses, nontarget
25 compounds may be identified. These compounds will be reported as TICs. TICs reported in
26 25% of the samples and listed in 20.4.1.200 NMAC (incorporating 40 CFR §261) Appendix VIII,
27 will be compared with acceptable knowledge data to determine if the TIC is in a listed
28 hazardous waste in the waste stream. TICs identified through headspace gas analyses that
29 meet the Appendix VIII list criteria and the 25 percent reporting criteria for a waste stream will
30 be added to the headspace gas waste stream target list, regardless of the hazardous waste
31 listing associated with the waste stream. TICs subject to inclusion on the target analyte list that
32 are toxicity characteristic parameters shall be added to the target analyte list regardless of origin
33 because the hazardous waste designation for these ~~codes~~ **numbers** is not based on source.
34 However, for toxicity characteristic and non-toxic F003 constituents, the site may take
35 concentration into account when assessing whether to add a hazardous waste ~~code~~ **number**.
36 TICs reported from the Totals VOC or SVOC analyses may be excluded from the target analyte
37 list for a waste stream if the TIC is a constituent in an F-listed waste whose presence is
38 attributable to waste packaging materials or radiolytic degradation from acceptable knowledge
39 documentation. If the TIC associated with a total VOC or SVOC analysis cannot be identified as
40 a component of waste packaging materials or as a product of radiolysis, the ~~Permittees~~
41 **generator/storage site** will add these TICs to the list of hazardous constituents for the waste
42 stream (and assign additional EPA listed hazardous waste ~~codes~~ **numbers**, if appropriate). A
43 permit modification will be submitted to NMED for their approval to add these constituents (and
44 waste ~~codes~~ **numbers**), if necessary. For toxicity characteristic compounds and non-toxic F003
45 constituents, the ~~Permittees~~ **generator/storage site** may consider waste concentration when

1 determining whether to change a hazardous waste code number. Refer to Permit Attachment
2 B3 for additional information on TIC identification.

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

10 Table B-65 summarizes the parameters, methods, and rationales for stored and newly
11 generated CH TRU mixed wastes according to their waste forms.

12 WIPP may accept TRU mixed waste that has been repackaged or treated. Repackaged or
13 treated waste shall undergo characterization required of newly generated waste except that
14 solids sampling for repackaged or treated S3000 waste may be characterized as retrievably
15 stored waste if the generator/storage sites demonstrates that control charting cannot be applied
16 effectively to the repackaging or treatment process. Repackaged waste shall also undergo
17 headspace gas analysis, and payload container headspace shall be sampled after repackaging,
18 as long as the criteria specified in Permit Attachment B1-1 are met. Treated waste shall retain
19 the original waste stream's listed hazardous waste code number designation.

20 B-3d(1) Newly Generated Waste

21 The RCRA-regulated constituents in newly generated wastes will typically be documented at the
22 time of generation based on acceptable knowledge for the waste stream. Newly generated TRU
23 mixed waste characterization will typically begins with verification that processes generating the
24 waste have operated within established written procedures. Waste containers are delineated
25 into waste streams using acceptable knowledge. The Permittees will require that the
26 generator/storage sites document the methods used to delineate waste streams in the
27 acceptable knowledge record and Acceptable Knowledge Summary Report. Verification that the
28 physical form of the waste (Summary Category Group) corresponds to the physical form of the
29 assigned waste stream is may be accomplished either during packaging (using the VE
30 technique) or by performing radiography as specified in Attachment B1-3 for retrievably stored
31 waste. Generator/storage sites may use either the VE technique or radiography, separately or
32 together, as long as 100% of the containers undergo confirmation of AK. If the VE technique is
33 used, it is different than the VE process described in Attachment B1-3b(3) and consists of the
34 operator confirming that the waste is assigned to a waste stream that has the correct Summary
35 Category Group for the waste being packaged. If a confirmation cannot be made, corrective
36 actions will be taken as specified in Permit Attachment B3. Instead of using a video/audio tape
37 as required with VE in support lieu of radiography in Attachment B1-3b(3), the VE technique
38 method for newly generated waste (or repackaged retrievably stored waste) uses a second
39 operator, who is equally trained to the requirements stipulated in Permit Attachment B1, to
40 provide additional verification by reviewing the contents of the waste container to ensure correct

1 reporting. If the second operator cannot provide concurrence, corrective actions³ will be taken
2 as specified in Permit Attachment B3. The subsequent waste characterization activities depend
3 on the assigned Summary Category Group, since waste within the Homogeneous Solids and
4 Soils/Gravel Summary Category Groups will **may** be characterized using different techniques
5 than the waste in the Debris Waste Summary Category Group. The packaging configuration,
6 type and number of filters, and rigid liner vent hole presence and diameter necessary to
7 determine the appropriate drum age criteria (DAC) in accordance with Permit Attachment B1,
8 Section B1-1, shall **may** be documented as part of the characterization information collected
9 during the packaging of newly generated waste or repackaging of retrievably stored waste. If
10 retrievably stored waste is characterized in the same manner as newly generated waste due to
11 unacceptable AK (see Section B-1a), the option to perform radiography in lieu of or in
12 combination with the VE technique does not apply.

13 ~~With the exception of qualifying LANL sealed sources waste containers, all containers of newly~~
14 ~~generated waste or newly generated waste containers randomly selected from waste streams~~
15 ~~that meet the conditions for reduced headspace gas sampling listed in Section B-3a(1) will~~
16 ~~undergo headspace gas analysis for VOC concentrations prior to shipment. The LANL sealed~~
17 ~~sources waste containers that meet specified conditions must be assigned VOC concentration~~
18 ~~values in accordance with Section B-3a(1)(iii). If the Permittees believe the frequency can be~~
19 ~~reduced in the future based on trends in analytical results, they may provide technical~~
20 ~~arguments for such a reduction and request a permit modification from NMED. The headspace-~~
21 ~~gas sampling method is provided in Permit Attachment B1. Headspace gas data will be used to~~
22 ~~confirm acceptable knowledge waste characterization, as specified in Permit Attachment B4.~~

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

24 **When a Determination Request has not been approved by the Permittees, sampling and**
25 **analysis of newly generated homogeneous solid and soil/gravel waste streams shall be**
26 **conducted in accordance with the requirements specified in Permit Attachment B1, Section B1-**
27 **2. The number of newly generated homogeneous solid and soil/gravel waste containers to be**
28 **sampled will be determined using the procedure specified in Section B2-1, wherein a**
29 **statistically selected portion of the waste will be sampled.** ~~Newly generated mixed waste~~
30 ~~streams of homogeneous solids will be randomly sampled a minimum of once per year for total~~
31 ~~VOCs, SVOCs and metals. An initial ten-sample set, however, will be collected to develop the~~
32 ~~baseline control chart. Sampling frequency of once per year is only allowed if a process has~~
33 ~~operated within procedurally established bounds without any process changes or fluctuations~~
34 ~~which would result in either a new waste stream or the identification of a new hazardous waste~~
35 ~~constituent in that waste stream. Otherwise, the waste shall be considered as process batches~~
36 ~~and each batch will undergo sampling and analysis. Process changes and process fluctuations~~
37 ~~will be determined using statistical process control charting techniques; these techniques~~
38 ~~require the ten-sample baseline and historical data for determining limits for indicator species~~
39 ~~and subsequent periodic sampling to assess process behavior relative to historical limits. If the~~
40 ~~limits are exceeded, the waste stream shall be recharacterized, and the characterization shall~~
41 ~~be performed according to procedures required for retrievably stored waste (i.e., waste~~

³ "Corrective action" as used in this WAP and its attachments does not mean corrective action as defined under HWA, RCRA, and their implementing regulations.

1 ~~sampling frequency will be increased). The process behind this control charting technique is~~
2 ~~described in Permit Attachment B2.~~

3 ~~Also, as another control of waste generated from a particular process, the bounds for a waste~~
4 ~~generating process will be established by specific written procedures for that process. Examples~~
5 ~~of parameter bounds that could affect a waste generated by a process are volumes of input~~
6 ~~material, change in the input material, and any other changes that would change the output of~~
7 ~~that process.~~

8 ~~To ensure that the generator/storage site procedures for waste generating processes include~~
9 ~~controls of the waste stream, these procedures will consist of sections containing the following~~
10 ~~information:~~

11 ~~_____ C _____ Responsible organizations for implementing the requirements of the procedure~~

12 ~~_____ C _____ Material inputs~~

13 ~~_____ C _____ Waste streams generated~~

14 ~~_____ C _____ Process controls and range of operation (bounds) that affect final hazardous~~
15 ~~waste determinations~~

16 ~~_____ C _____ Rate and quantity of hazardous waste generated~~

17 ~~_____ C _____ List of applicable operating procedures relevant to the hazardous waste~~
18 ~~determination~~

19 ~~Events where procedurally established bounds are exceeded or any condition of normal~~
20 ~~operation is not being met could trigger an increased sampling frequency of a waste stream. As~~
21 ~~long as a process does not change outside of established bounds within a year, the waste~~
22 ~~generated by that process will have the same characteristics, and therefore, a minimum of one~~
23 ~~sample will be collected annually to verify the lack of variability of that waste stream.~~
24 ~~Compliance with process procedures and the maintenance of the parameters specified by those~~
25 ~~procedures will be verified by the Permittees during the Permittees' Audit and Surveillance~~
26 ~~Program (Permit Attachment B6).~~

27 ~~The records generated by the process procedures will be examined weekly for indications of~~
28 ~~process changes or limits being exceeded that would change the hazardous constituents~~
29 ~~identified in the waste stream or add relevant prohibited materials. If these changes are~~
30 ~~discovered, the Permittees will notify NMED and will not manage, store or dispose the waste~~
31 ~~stream until a follow-up sample of process waste is collected and analyzed to assess whether~~
32 ~~the container contents are within those identified on the WSPF. If the second analysis is not~~
33 ~~consistent with the WSPF information, all waste containers in question will be segregated and a~~
34 ~~WSPF and waste generation procedures/bounds will be established. Records of that analysis~~
35 ~~will be available for examination by the auditors and will be provided to NMED upon request. If~~
36 ~~records of the analysis are not available, the Permittees will not accept the waste stream at the~~
37 ~~WIPP facility for disposal. If a generator/storage site changes a process but determines that~~
38 ~~increased sampling is not required because the change will not affect waste generated by that~~

1 process, the Permittees and NMED shall be notified in the form of a memorandum to the DOE's
2 Carlsbad Field Office (**CBFO**) Waste Characterization Manager. The Permittees shall concur
3 with the decision to not increase the sampling frequency before any additional waste from that
4 process is shipped, and NMED will be notified of the Permittees' decision.

5 The toxicity characteristics of newly generated homogeneous solids and soils/gravel waste
6 streams will be determined using total analysis of toxicity characteristic contaminants or TCLP.
7 To determine if a waste exhibits a toxicity characteristic for compounds specified in 20.4.1.200
8 NMAC (incorporating 40 CFR §261, Subpart C), TCLP may be used instead of total analyses.
9 The sampling methods for homogeneous solids and soil/gravel wastes are provided in Permit
10 Attachment B1.

11 B-3d(1)(b) Sampling of Newly Generated Soils/Gravels

12 Newly generated soils/gravel waste will be generated primarily by remediation or
13 decontamination and decommissioning (**D&D**) activities. Process controls for these types of
14 waste cannot readily be defined and, therefore, sampling cannot follow that used for newly
15 generated homogeneous waste. The number of newly generated soils/gravel waste containers
16 to be sampled will be determined using the procedure specified in Section B-3a(2), wherein a
17 statistically selected portion of the waste will be sampled. The generators shall estimate the
18 number of containers to be sampled within the waste stream based on the expected volume of
19 the waste stream and whether SWB or 55-gallon drum containers will be used. Refer to Permit
20 Attachment B2 for additional information.

21 B-3d(2) Retrievably Stored Waste

22 All retrievably stored waste containers will first be delineated into waste streams using
23 acceptable knowledge. **The Permittees will require that the generator/storage sites document**
24 **the methods used to delineate waste streams in the acceptable knowledge record and**
25 **Acceptable Knowledge Summary Report. Retrievably** All retrievably stored waste containers will
26 **may** be examined using radiography or VE to confirm **verify** the physical waste form (Summary
27 Category Group), to verify the absence of prohibited items, and to determine the **additional**
28 waste characterization techniques to **that may** be used based on the Summary Category
29 Groups (i.e., S3000, S4000, S5000). Repackaged retrievably stored waste, or any retrievably
30 stored waste with inadequate acceptable knowledge, will be characterized using either the
31 retrievably stored or newly generated waste characterization process, whichever results in
32 greater sampling requirements, unless it is demonstrated that control charting cannot be applied
33 effectively. Solids sampling for repackaged or treated S3000 waste may be characterized as
34 retrievably stored waste if the generator/storage sites demonstrates that control charting cannot
35 be applied effectively to the repackaging or treatment process. This determination by the
36 generator/storage site must be documented on the Characterization Information Summary and
37 will be examined by the Permittees during audits (Permit Attachment B6). In this case, the
38 minimum number of solids samples required for any S3000 waste stream or waste stream lot is
39 the number of samples determined in accordance with Section B2-2a. Radiographic results will
40 be compared to acceptable knowledge results to ensure correct Waste Matrix Code assignment
41 and identification of prohibited items. If radiographic analysis do not confirm the physical waste
42 form, waste will be reassigned as specified in Section B-3c. Generator/storage sites may elect
43 to substitute visual examination for radiographic analysis.

1 To confirm the results of radiography, a statistically selected number of the TRU mixed waste
2 container population will be visually examined by opening containers to inspect waste contents
3 to verify radiography results. Permit Attachment B2 contains the approach used to statistically
4 select the number of drums to be visually examined. For homogeneous waste and soils/gravels
5 selected for sampling, the containers opened for sampling may be used to help fulfill the visual
6 examination requirements.

7 With the exception of qualifying LANL sealed sources waste containers, all retrievably stored
8 containers or retrievably stored containers randomly selected from waste streams that meet the
9 conditions for reduced headspace gas sampling listed in Section B-3a(1) will undergo
10 headspace gas analysis for VOC concentrations. The LANL sealed sources waste containers
11 that meet specified conditions must be assigned VOC concentration values in accordance with
12 Section B-3a(1)(iii). Retrievably stored waste that is repackaged will be subject to the DAC
13 determination specified in Section B-3d(1). The headspace gas sampling method is provided in
14 Permit Attachment B1. All headspace gas data will be used, when necessary, to resolve the
15 assignment of EPA hazardous waste numbers to debris waste streams confirm acceptable
16 knowledge waste characterization, as specified in Permit Attachment B4.

17 A statistically selected portion of retrievably stored homogeneous solids and soil/gravel wastes
18 will be sampled and analyzed for total VOCs, SVOCs, and metals, when necessary. The
19 approach used to statistically select drums for homogeneous solids and soil/gravel wastes is
20 different than the method used to select waste containers for visual examination. This method is
21 also included. The sample location selection method is described in Permit Attachment B2. The
22 sampling methods for these wastes are provided in Permit Attachment B1.

23 The toxicity characteristic of retrievably stored homogeneous solids and soil/gravel wastes will
24 be determined using total analysis of toxicity characteristic parameters or TCLP. To determine if
25 a waste exhibits a toxicity characteristic for compounds specified in 20.4.1.200 NMAC
26 (incorporating 40 CFR §261, Subpart C), TCLP may be used instead of total analyses.
27 Appendix C3 of the WIPP RCRA Part B Permit Application (DOE, 1997) discusses
28 comparability of totals analytical results to those of the TCLP method.

29 Representativeness of containers selected for visual examination headspace gas sampling and
30 waste subjected to homogeneous solids and soil/gravel sampling and analysis will be validated
31 by the generator/storage site and by the Permittees during an audit (Permit Attachment B6) via
32 examination of documentation that shows that true random samples were collected. (Because
33 representativeness is a quality characteristic that expresses the degree to which a sample or
34 group of samples represent the population being studied, the random sampling of waste
35 streams ensures representativeness.)

36 B-4 Data Verification and Quality Assurance

37 The Permittees will assure ensure that applicable waste characterization processes performed
38 by generator/storage sites sending TRU mixed waste to the WIPP for disposal meets WAP
39 requirements through data validation, usability and reporting controls. Verification occurs at
40 three levels: 1) the data generation level, 2) the project level, and 3) the Permittee level. The
41 validation and verification process and requirements for the data generation and project level

1 ~~are at each level is~~ described in Section B3-10. The validation and verification process at the
2 ~~Permittee Level is described in Attachment B7.~~

3 B-4a Data Generation and Project Level Verification Requirements

4 B-4a(1) Data Quality Objectives

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

10 C Acceptable Knowledge

- 12 – To delineate TRU mixed waste streams.
- 13 – To assess whether TRU mixed wastes comply with the TSDF-WAC.
- 14 – To assess whether TRU mixed wastes exhibit a hazardous characteristic
15 (20.4.1.200 NMAC, incorporating 40 CFR §261 Subpart C).
- 16 – To assess whether TRU mixed wastes are listed (20.4.1.200 NMAC,
17 incorporating 40 CFR §261, Subpart D).
- 18 – To estimate waste material parameter weights.

19 C Headspace-Gas Sampling and Analysis

- 20 – To identify VOCs and quantify the concentrations of VOC constituents in
21 the total waste inventory to ensure compliance with the environmental
22 performance standards of 20.4.1.500 NMAC (incorporating 40 CFR,
23 §264.601(c)), and to confirm waste containers to resolve the assignment
24 of EPA hazardous waste numbers identification by acceptable
25 knowledge.

26 C Homogeneous Waste Sampling and Analysis

- 27 – To compare UCL_{90} values for the mean measured contaminant
28 concentrations in a waste stream with specified toxicity characteristic
29 levels in 20.4.1.200 NMAC (incorporating 40 CFR §261), to determine if
30 the waste is hazardous, and to confirm resolve the assignment of EPA
31 hazardous waste numbers identification by acceptable knowledge.

32 ~~————— To report the average concentration of hazardous constituents in a waste~~
33 ~~stream, as specified in 20.4.1.200 NMAC (incorporating 40 CFR §261)~~
34 ~~Appendix VIII, with a 90 percent confidence interval, with all averages~~
35 ~~greater than PRQL considered a detection and subsequent assignment of~~

1 the waste (if an adequate explanation for the constituent cannot be
2 determined) as a hazardous waste, and to confirm hazardous waste
3 identification by acceptable knowledge.

4 C Radiography

- 5 – To verify the TRU mixed waste streams by Waste Matrix Code for
6 purposes of physical waste form identification and determination of
7 sampling and analytical requirements, to identify prohibited items, and to
8 confirm the waste stream delineation by acceptable knowledge.

9 C Visual Examination

- 10 – To verify the TRU mixed waste streams by Waste Matrix Code for
11 purposes of physical waste form identification, determination of sampling
12 and analytical requirements, and to identify prohibited items.

- 13 – To provide a process check on a sample basis by verifying the
14 information determined by radiography, and to confirm the waste stream
15 delineation by acceptable knowledge.

16 Reconciliation of these DQOs by the Generator/Storage Site Project Manager or the Permittee
17 approved laboratories, as applicable, is addressed in Permit Attachment B3. Reconciliation
18 requires determining whether sufficient type, quality, and quantity of data have been collected to
19 ensure the DQO's cited above can be achieved.

20 B-4a(2) Quality Assurance Objectives

21 The generator/storage sites or the Permittee approved laboratories, as applicable, shall
22 demonstrate compliance with each QAO associated with the various characterization methods
23 as presented in Permit Attachment B3. Generator/Storage Site Project Managers or the
24 Permittee approved laboratories, as applicable, are further required to perform a reconciliation
25 at the project level of the data sets submitted by the various organizations at the
26 generator/storage site with the DQOs established in this WAP. The Generator/Storage Site
27 Project Manager or the Permittee approved laboratories, as applicable, shall conclude that all of
28 the DQOs have been met for the characterization of the waste stream prior to submitting a
29 WSPF to the Permittees for approval (Permit Attachment B3). The following QAO elements
30 shall be considered for each technique, as a minimum:

31 C Precision

- 32 – Precision is a measure of the mutual agreement among multiple
33 measurements.

34 C Accuracy

- 35 – Accuracy is the degree of agreement between a measurement result and
36 the true or known value.

1 C Completeness

2 – Completeness is a measure of the amount of valid data obtained from a
3 method compared to the total amount of data obtained that is expressed
4 as a percentage.

5 C Comparability

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

8 C Representativeness

9 – Representativeness expresses the degree to which data represent
10 characteristics of a population.

11 A more detailed discussion of the QAOs, including a mathematical representation, where
12 appropriate, can be found in Permit Attachment B3, which describes the QAOs associated with
13 each method of sampling and analysis.

14 B-4a(3) Sample Control

15 The generator/storage sites and Permittee approved laboratories, as applicable, will implement
16 a sample handling and control program that will include the maintenance of field documentation
17 records, proper labeling, and a chain of custody (COC) record. The generator/storage site and
18 Permittee approved laboratories, as applicable, Quality Assurance Project Plan (QAPjP) or
19 procedures referenced in the QAPjP will document this program and include COC forms to
20 control the sample from the point of origin to the final analysis result reporting. The Permittees
21 will review and approve the QAPjP, including their determination that the sample control
22 program is adequate. The approved QAPjP will be provided to NMED prior to shipment of TRU
23 mixed waste and before the generator/storage site audit, as specified in Permit Attachment B5.
24 Details of this sample control program are provided in Permit Attachment B1 and are
25 summarized below to include:

26 C Field Documentation of samples including: point of origin, date of sample,
27 container ID, sample type, analysis requested, and COC number.

28 C Labeling and/or tagging including: sample numbering, sample ID, sample date,
29 sampling conditions, and analysis requested.

30 C COC control including: name of sample relinquisher, sample receiver, and the
31 date and time of the sample transfer.

32 C Proper sample handling and preservation.

1 B-4a(4) Data Generation

2 ~~Batch Data Reports, BDRs~~, in a format approved by the Permittees, will be used by each
3 generator/storage site **and Permittee approved laboratories, as applicable**, for reporting waste
4 characterization data. This format will be included in the generator/storage site **and Permittee**
5 **approved laboratories, as applicable**, QAPjP, controlled electronic databases, or procedures
6 referenced in the QAPjP (Permit Attachment B5) and will include all of the elements required by
7 this WAP for ~~Batch Data Reports BDR~~ (Permit Attachment B3).

8 The Permittees shall perform audits of the generator/storage site waste **characterization**
9 programs, as implemented by the generator/storage site QAPjP, to verify compliance with the
10 WAP and the DQOs in this WAP (See Permit Attachment B6 for a discussion of the content of
11 the audit program). The primary functions of these audits are to review generator/storage sites'
12 adherence to the requirements of this WAP and ~~assure~~ **ensure** adherence to the WAP
13 **characterization** program. The Permittees shall provide the results of each audit to NMED. If
14 audit results indicate that a generator/storage site is not in compliance with the requirements of
15 this WAP, the Permittees will take appropriate action as specified in Permit Attachment B6.

16 **The Permittees shall perform audits of the Permittee approved laboratory's programs, as**
17 **implemented by the laboratory's QAPjP (See Permit Attachment B6 for a discussion of the**
18 **content of the audit program). The primary functions of these audits are to review the Permittee**
19 **approved laboratory's adherence to the requirements of this WAP. The Permittees shall provide**
20 **the results of each audit to NMED. If audit results indicate that a Permittee approved laboratory**
21 **is not in compliance with the requirements of this WAP, the Permittees will take appropriate**
22 **action as specified in Permit Attachment B6.**

23 The Permittees shall further require all ~~analytical~~ **Permittee approved** laboratories analyzing
24 WIPP waste ~~characterization~~ samples for the generator/storage sites to have established,
25 documented QA/QC programs. The Permittees annually evaluate these laboratories and their
26 QA/QC programs as part of their participation in the Permittees' ~~Performance Demonstration~~
27 ~~Program (PDP)~~ laboratory performance program. The Permittees' audits cover the requirements
28 of the lab's QA/QC program, as well as compliance with this WAP. Continued compliance with
29 these parameters will be verified by ongoing audits by the Permittees at **the generator/storage**
30 **sites and these laboratories** as specified in Permit Attachment B6. The Permittees' audits of the
31 generator/storage sites will verify that the laboratories analyzing **the sites'** waste have been
32 properly audited by the generator/storage sites. The laboratory's QA/QC program shall include
33 the following:

- 34 C Facility organization
- 35 C A list of equipment/instrumentation
- 36 C Operating procedures
- 37 C Laboratory QA/QC procedures
- 38 C Quality assurance review

C Laboratory records management

B-4a(5) Data Verification

~~Batch Data Reports~~ **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 (Permit Attachment B3). NMED may request, through the Permittees, copies of any ~~Batch Data Report~~ **BDR**, and/or the raw data validated by the generator/storage sites, to check the Permittees' audit of the validation process.

B-4a(6) Data Transmittal

~~Batch Data Reports~~ **BDRs** will include the information required by Section B3-10 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-4b5a(1)~~ for WWIS reporting requirements and the *WIPP Waste Information System User's Manual for Use by Shippers/Generators* (DOE, 2001) for the WWIS data fields and format requirements.

Once a waste stream is fully characterized, the Site Project Manager will also submit to the Permittees a WSPF (Figure B-1) accompanied by the ~~Characterization Information Summary~~ **CIS** for that waste stream which includes reconciliation with DQOs (Section B3-12b(1)). The WSPF, the ~~Characterization Information Summary~~ **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-4a(7) Records Management

Records related to waste characterization activities ~~at~~ **performed by** the generator/storage sites will be maintained in the testing, sampling, or analytical facility files or generator/storage site project files. ~~Contract~~ **Permittee approved** laboratories will forward testing, sampling, and analytical records along with ~~Batch Data Reports~~ **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 disposed of as specified in the approved RIDS. All waste characterization data and related

1 QA/QC records in the generator/storage site project files for TRU mixed waste to be shipped to
2 the WIPP facility are designated as either Lifetime Records or Non-Permanent Records.
3 Records that are designated as Lifetime Records shall be maintained for the life of the waste
4 characterization program at a participating generator/storage site plus six years, then offered to
5 the Permittees for permanent archival of information of these records in the appropriate form, or
6 transferred to the appropriate Federal Records Center (FRC). Waste characterization records
7 designated as Non-Permanent Records shall be maintained for ten years from the date of
8 (record) generation and then dispositioned according to their approved RIDS. If a
9 generator/storage site ceases to operate, all records shall be transferred before closeout. Table
10 B-76 is provides a listing of records designated as Lifetime Records and Non-Permanent
11 Records. Classified information will not be transferred to WIPP. Notations will be provided to the
12 Permittees indicating the absence of classified information. The approved generator/storage site
13 RIDS will identify appropriate disposition of classified information. Nothing in this Permit is
14 intended to, nor should it be interpreted to, require the disclosure of any U.S. Department of
15 Energy classified information to persons without appropriate clearance to view such information.

16 ~~At the Permittee Level, all waste characterization data for each TRU mixed waste container~~
17 ~~transmitted to WIPP shall be maintained by the Permittees for the active life of the WIPP facility~~
18 ~~plus two years. The active life of the WIPP facility is defined as the period from the initial receipt~~
19 ~~of TRU mixed waste at the facility until NMED receives certification of final closure of the facility.~~
20 ~~After their active life, the records shall be retired to the FRC and maintained for 30 years. These~~
21 ~~records will then be offered to the National Archives. However, this disposition requirement does~~
22 ~~not preclude the inclusion of these records in the permanent marker system or other~~
23 ~~requirements for institutional control.~~

24 ~~B-4b5~~ Permittee Level: Waste Screening and Verification of TRU Mixed Waste

25 Permittee waste screening is a two-phased process. Phase I will occur prior to ~~transporting the~~
26 ~~configuring shipments of~~ TRU mixed waste to the WIPP facility. Phase II will occur after the
27 ~~configuration of shipments of~~ TRU mixed waste ~~shipment arrives but before it is~~ ~~emplaced~~
28 ~~placed into storage or disposed at the WIPP facility.~~ Figure B-53 presents Phase I of the TRU
29 mixed waste ~~shipment~~ screening process. ~~Permit Attachment B7 presents Phase II, which are~~
30 ~~the Permittees TRU mixed waste confirmation processes.~~

31 ~~B-4b(1)5a~~ Phase I Waste Stream Screening and Verification

32 The first phase of the waste screening and verification process will occur before TRU mixed
33 waste is shipped to the WIPP facility. Before the Permittees begin the process of accepting TRU
34 mixed waste from a generator/storage site, an initial audit of that generator/storage site will be
35 conducted as part of the Permittees' Audit and Surveillance Program (Permit Attachment B6).
36 The RCRA portion of the generator/storage site audit program will provide on-site verification of
37 characterization procedures; ~~Batch Data Report~~ BDR preparation; and recordkeeping to ensure
38 that all applicable provisions of the WAP requirements are met. Another portion of the Phase I
39 verification is the WSPF approval process. At the WIPP facility, this process includes verification
40 that all of the required elements of the WSPF and the ~~Characterization Information Summary~~
41 CIS are present (Permit Attachment B3) and that the waste characterization information meet
42 acceptance criteria required for compliance with the WAP (Section B3-12b(1)).

1 Once a generator/storage site has **must first** prepared a QAPjP, which includes applicable
2 WAP requirements, **it is and** submitted it to the Permittees for review and approval (Permit
3 Attachment B5). Once approved, a copy of the QAPjP is provided to NMED for examination.
4 The generator/storage site will implement the specific parameters of the QAPjP after it is
5 approved. **The An** initial generator/storage site RCRA audit will be performed at some point after
6 **this QAPjP** implementation has taken place, **but and** prior to shipment of TRU mixed waste from
7 **that the** generator/storage site **being certified for shipment of waste** to WIPP. Additional audits,
8 focusing on the results of waste characterization, will be performed at least annually. The
9 Permittees have the right to conduct unannounced audits and to examine any records that are
10 related to the scope of the audit. **See Section B-5a(3) and Permit Attachment B6 for further**
11 **information regarding audits.**

12 When the required waste stream characterization data have been collected by a
13 generator/storage site and the initial generator/storage site audit has been successfully
14 completed, the generator/storage Site Project Manager will verify that waste stream
15 characterization meets the applicable WAP requirements as a part of the project level
16 verification (Section B3-10b). If the waste characterization does not meet the applicable
17 requirements of the WAP, the mixed waste stream cannot be managed, stored, or disposed at
18 WIPP until those requirements are met. The Site Project Manager will then complete a WSPF
19 and submit it to the Permittees, along with the accompanying **Characterization Information**
20 **Summary CIS** for that waste stream (Section B3-12b(1)). All data necessary to check the
21 accuracy of the WSPF will be transmitted to the Permittees for verification. This provides
22 notification that the generator/storage site considers that the waste stream (identified by the
23 waste stream identification number) has been adequately characterized for disposal prior to
24 shipment to WIPP. The Permittees will compare headspace gas, radiographic, visual
25 examination and solid sampling/analysis data obtained subsequent to submittal and approval of
26 the WSPF (and prior to submittal) with characterization information presented on this form. If the
27 Permittees determine (through the data comparison) that the characterization information is
28 adequate, the WSPF will be approved. Prior to the first shipment of containers from the
29 approved waste stream, the approved WSPF and accompanying **Characterization Information**
30 **Summary CIS** will be provided to NMED. If the data comparison indicates that analyzed
31 containers have hazardous wastes not present on the WSPF, or a different Waste Matrix Code
32 applies, the WSPF is in error and shall be resubmitted. Ongoing WSPF examination is
33 discussed in detail in Section B-~~4b(1)(ii)~~ **5a(2)**.

34 **Audits of generator/storage sites will be conducted as part of the Permittees' Audit and**
35 **Surveillance Program (Permit Attachment B6). The RCRA portion of the generator/storage site**
36 **audit program will provide on-site verification of waste characterization procedures; BDR**
37 **preparation; and record keeping to ensure that all applicable provisions of the WAP**
38 **requirements are met.** As part of the waste characterization data submittal, the
39 generator/storage site will also transmit the data on a container basis via the WWIS. This data
40 submittal can occur at any time as the data are being collected, but will be complete for each
41 container prior to shipment of that container. The WWIS will conduct internal edit/limit checks as
42 the data are entered, and the data will be available to the Permittees ~~for review~~ as supporting
43 information for WSPF review. NMED will have read-only access to the WWIS as necessary to
44 determine compliance with the WAP. The initial WSPF check performed by the Permittees will
45 include WWIS data **submitted by the generator/storage site for each waste container** and the
46 **Characterization Information Summary CIS**. The Permittees will compare ongoing

1 sampling/analysis characterization data obtained and submitted via the WWIS to the approved
2 WSPF. If this comparison shows that containers have hazardous wastes not reported on the
3 WSPF, or a different Waste Matrix Code applies, the data are rejected and the waste containers
4 are not accepted for shipment **until a new or revised WSPF is submitted to and approved by the**
5 **Permittees.**

6 If discrepancies **regarding hazardous waste number assignment or Waste Matrix Code**
7 **designation** arise as a result of the Phase I review, the generator/storage sites will be contacted
8 by the Permittees and required to provide the necessary additional information to resolve the
9 discrepancy before that waste stream is approved for disposal at the WIPP facility. If the
10 discrepancy is not resolved, the waste stream will not be approved. **The Permittees will notify**
11 **NMED in writing of any discrepancies identified during WSPF review and the resulting**
12 **discrepancy resolution prior to waste shipment. The Permittees will not manage, store, or**
13 **dispose the waste stream until this discrepancy is resolved in accordance with this WAP.**

14 If discrepancies regarding hazardous waste number assignment or Waste Matrix Code
15 designation arise as a result of the Phase I review, the generator/storage sites will be contacted
16 by the Permittees and required to provide the necessary additional information to resolve the
17 discrepancy before that waste stream is approved for disposal at the WIPP facility. If the
18 discrepancy is not resolved, the waste stream will not be approved.

19 **B-4b(1)(i)5a(1) WWIS Description**

20 All generator/storage sites planning to ship TRU mixed waste to WIPP will supply the required
21 data to the WWIS. **The WWIS Data Dictionary includes all of the data fields, the field format and**
22 **the limits associated with the data as established by this WAP. These data will be subjected to**
23 **edit and limit checks that are performed automatically by the database, as defined in the *WIPP***
24 ***Waste Information System User's Manual for Use by Shippers/Generators* (DOE, 2001).**

25 **The Permittees will coordinate the data transmission with each generator/storage site. Actual**
26 **data transmission will use appropriate technology to ensure the integrity of the data**
27 **transmissions. The Permittees will require sites with large waste inventories and large**
28 **databases to populate a data structure provided by the Permittees that contains the required**
29 **data dictionary fields that are appropriate for the waste stream (or waste streams) at that site.**
30 **For example, totals analysis data will not be requested from sites that do not have**
31 **homogeneous solids or soil/gravel waste. The Permittees will access these data via the Internet**
32 **to ensure an efficient transfer of this data. Small quantity sites will be given a similar data**
33 **structure by the Permittees that is tailored to their types of waste. Sites with very small**
34 **quantities of waste will be provided with the ability to assemble the data interactively to this data**
35 **structure on the WWIS.**

36 The Permittees will use the WWIS to verify that all of the supplied data meet the edit and limit
37 checks prior to the shipment of any TRU mixed waste to WIPP. The WWIS automatically will
38 notify the generator/storage site if any of the supplied data fails to meet the requirements of the
39 edit and limit checks via an appropriate error message. The generator/storage site will be
40 required to correct the discrepancy with the waste or the waste data and re-transmit the
41 corrected data prior to acceptance of the data by the WWIS. The Permittees will review data
42 reported for each container of each shipment prior to providing notification to the shipping

1 generator/storage site that the shipment is acceptable. Read-only access to the WWIS will be
2 provided to the NMED. Table B-87 contains a listing of the data fields contained in the WWIS
3 that are required as part of this Permit.

4 The WWIS will generate the following:

5 C Waste Emplacement Report

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

14 C Shipment Summary Report

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

20 C Waste Container Data Report

21 This report will be generated on a waste stream basis and will be used by the Permittees
22 during the WSPF review and approval process. This report will contain the data listed in
23 the Characterization Module on Table B-87. This report will be generated and attached
24 to the WSPF for inclusion in the facility operating record and will be kept for the life of
25 the facility.

26 C Reports of Change Log

27 This will consist of a short report that lists the user ID and the fields changed. The report
28 will also include a reason for the change. A longer report will list the information provided
29 on the short report and include a before and after image of the record for each change, a
30 before-record for each deletion, and the new information for added records. These
31 reports will provide an auditable trail for the data in the database.

32 ~~The WWIS shall have data available for export so that the Permittees and NMED can~~
33 ~~summarize headspace gas concentrations for the open room being loaded. This is required to~~
34 ~~allow calculations of average room headspace gas concentrations to ensure they do not exceed~~
35 ~~the limits specified in Table B-2.~~

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

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

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

11 ~~B-4b(1)(iii)~~**5a(2)** Examination of the Waste Stream Profile Form and Container Data Checks

12 The Permittees will be responsible for the verification of completeness and accuracy of the
13 Waste Stream Profile Form (Section B3-12b(1)). **Figure B-2 includes the waste characterization
14 and Permittees' waste stream approval process.** The assignment of the waste stream
15 description, Waste Matrix Code Group, and Summary Category Groups; the results of waste
16 analyses, **as applicable**; the acceptable knowledge summary documentation; the methods used
17 for characterization; the Carlsbad Field Office (**CBFO**) certification, and appropriate designation
18 of EPA hazardous waste ~~code~~ **number(s)** will be examined. If the WSPF is inaccurate, efforts
19 will be made to resolve discrepancies by contacting the generator/storage site **in order for the
20 waste stream to be eligible for shipment to the WIPP facility.** If discrepancies in the waste
21 stream are detected at the generator/storage site, the generator/storage site will implement a
22 non-conformance program to identify, document, and report discrepancies (Permit Attachment
23 B3).

24 The WSPF shall pass all verification checks by the Permittees in order for the waste stream to
25 be approved for shipment to the WIPP facility. The WSPF check against waste container data
26 will occur during the initial WSPF approval process (Section B-~~4b(1)~~**5a**).

27 The EPA hazardous waste ~~codes~~ **numbers** for the wastes that appear on the Waste Stream
28 Profile Form will be compared to those in Table B-~~409~~ to ensure that only **approved** wastes that
29 ~~contain constituents listed Section XIV are approved~~ **accepted** for management, storage, or
30 disposal at WIPP. Some of the waste may also be identified by unique state hazardous waste
31 codes **or numbers**. These wastes are acceptable at WIPP as long as the TSDf-WAC are met.
32 The ~~Characterization Information Summary~~ **CIS** will be reviewed by the Permittees to verify that
33 the waste has been classified correctly with respect to the assigned EPA hazardous waste
34 ~~codes~~ **numbers**. ~~The~~ **Any** analytical method used will be compared to those listed in Tables
35 B-32, B-43, and B-54 to assure **ensure** that only approved analytical methods were used for
36 analysis of the waste. The Permittees will verify that TSDf-WAC compliance has been met by
37 the generator/storage site.

38 The EPA hazardous waste numbers for the wastes that appear on the Waste Stream Profile
39 Form will be compared to those in the WIPP Hazardous Waste Permit Application Part A,
40 Permit Attachment O, to ensure that only approved wastes are accepted for storage or disposal
41 at WIPP. Some of the waste may also be identified by unique state hazardous waste numbers.
42 These wastes are acceptable at WIPP as long as the TSDf-WAC are met. The CIS will be

1 reviewed by the Permittees to verify that the waste has been classified correctly with respect to
2 the assigned EPA hazardous waste numbers. The Permittees will verify that TSDF-WAC
3 compliance has been met by the generator/storage site.

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

7 The Permittees will also verify that three different types of data specified below are available for
8 every container holding TRU mixed waste before that waste is managed, stored, or disposed at
9 WIPP. The following three verifications will be performed on data from the following
10 determinations: 1) an assignment of the waste stream's waste description (by Waste Matrix
11 Codes) and Waste Matrix Code Group; 2) a determination of ignitability, reactivity, and
12 corrosivity; and 3) a determination of compatibility. The verification of waste stream description
13 will be performed by reviewing the WWIS for consistency in the waste stream description and
14 WSPF. The Characterization Information Summary CIS will indicate if the waste has been
15 checked for the characteristics of ignitability, corrosivity, and reactivity. The final verification of
16 waste compatibility will be performed using Appendix C1 of the WIPP RCRA Part B Permit
17 Application (DOE, 1997), the compatibility study.

18 Any container with unresolved discrepancies associated with hazardous waste characterization
19 will not be managed, stored, or disposed at the WIPP facility until the discrepancies are
20 resolved. All shipments of the subject waste stream will cease until the corrective action(s), as
21 necessary, have been implemented and the discrepancy resolved. The Permittees will notify
22 NMED when the certification status of a waste stream at a generator/storage site is revoked.
23 Waste characterization and certification authority will not be reinstated until the
24 generator/storage site demonstrates all corrective actions have been implemented and the
25 program is reassessed by the Permittees.

26 ~~B-4b(1)(iii)~~ 5a(3) Permittees' Audit and Surveillance Program

27 An important part of the Permittees' verification process is the Permittees' Audit and
28 Surveillance Program. The focus of this audit program is compliance with this WAP and the
29 Permit. This audit program addresses all AK implementation and waste sampling and analysis
30 activities, from waste stream classification assignment through final loading of the Contact
31 Handled Package waste container certification, and ensures compliance with SOPs and the
32 WAP. Audits will assure ensure that containers and their associated documentation are
33 adequately tracked throughout the waste handling process. Operator qualifications will be
34 verified, and implementation of QA/QC procedures will be surveyed. A final report that includes
35 generator/storage site or Permittee approved laboratory audit results and applicable WAP-
36 related corrective action report (CAR) resolution will be provided to NMED for approval, and will
37 be kept in the WIPP facility operating record until closure of the WIPP facility.

38 An initial audit will be performed at each generator/storage site performing waste
39 characterization activities prior to the formal acceptance of the WSPFs and/or any waste
40 characterization data supplied by the generator/storage sites. Audits will be performed at least
41 annually thereafter, including the possibility of unannounced audits (i.e., not a regularly
42 scheduled audit). These audits will allow NMED to verify that the Permittees have implemented

1 the WAP and that generator/storage sites have implemented a QA program for the
2 characterization of waste and meet applicable WAP requirements. **The Permittees will also audit**
3 **annually the Permittee approved laboratories performing waste sampling and/or analysis.** The
4 accuracy of physical waste description and waste stream assignment provided by the
5 generator/storage site will be verified by review of the radiography results, and visual
6 examination of data records and radiography images (as necessary) during audits conducted by
7 the Permittees. More detail on this audit process is provided in Permit Attachment B6.

8 **B-4b(2)5b Phase II Waste Shipment Screening and Verification**

9 Phase II of the waste shipment screening and verification process includes examination of a
10 waste shipment after the waste shipment has arrived. The Phase II, **the Permittees will**
11 **determinations are:** 1) ~~a determination of~~ the completeness and accuracy of the EPA Hazardous
12 Waste Manifest; 2) ~~a determination of~~ waste shipment completeness **and container defects**; 3) ~~a~~
13 ~~determination of~~ land disposal restriction notice completeness; and 4) ~~an identification and~~
14 ~~resolution of~~ waste shipment irregularities. **In addition, as part of Phase II activities, the**
15 **Permittees will perform waste confirmation activities specified in Attachment B7.** Only those
16 waste containers that pass all Phase II waste screening determinations will be emplaced at
17 WIPP. For each container shipped, the Permittees shall ensure that the generator/storage sites
18 provide the following information:

19 Hazardous Waste Manifest Information:

- 20 C Generator/storage site name and EPA ID
- 21 C Generator/storage site contact name and phone number
- 22 C Quantity of waste
- 23 C List of the hazardous waste ~~codes~~ **numbers** in the shipment
- 24 C Listing of all shipping container IDs (~~Contact Handled Shipping~~ Package
25 serial number)
- 26 C Signature of authorized generator representative

27 Specific Waste Container information:

- 28 C Waste Stream Identification Number
- 29 C List of Hazardous ~~Codes~~ **Hazardous Waste Numbers** per Container
- 30 C Certification Data
- 31 C Shipping Data (Assembly numbers, ship date, shipping category, etc.)

1 This information shall also be supplied electronically to the WWIS. The container-specific
2 information will be supplied electronically as ~~part of the Level 3 Phase I Screening~~ described in
3 **Section B-5a(1)**, and shall be supplied prior to the Permittees' management, storage, or
4 disposal of the waste.

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

8 ~~B-4b(2)(i)~~ **5b(1)** Examination of the EPA Uniform Hazardous Waste Manifest and Associated
9 Waste Tracking Information

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

15 The WWIS links the bar-coded identification numbers of all containers in a specific waste
16 shipment to the waste assembly (for 7-packs, 4-packs, and 3-packs) and to the shipment
17 identification number, which is also written on the EPA Hazardous Waste Manifest. **For**
18 **shipments in the RH-TRU 72B cask, only one payload container is bar-coded. For shipments in**
19 **the CNS 10-160B cask, the WWIS links the bar-coded identification numbers of all containers in**
20 **a specific waste shipment to the shipment identification number, which is also written on the**
21 **EPA hazardous waste manifest.** Generators electronically transmit the waste shipment
22 information to the WWIS before the TRU mixed waste shipment is transported. Once a TRU
23 mixed waste shipment arrives, the Permittees verify the identity of each **cask or** container **(or**
24 **one container in a bound 7-pack, 4-pack, or 3-pack)** using the data already in the WWIS.

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

- 28 C ~~Contact Handled~~ Package inner containment vessel **or shipping cask** closure
- 29 date
- 30 C Package (container **or canister**) receipt date
- 31 C Overpack identification number (if appropriate)
- 32 C Package (container **or canister**) emplacement date
- 33 C Package (container **or canister**) emplacement location

34 The WWIS links the bar-coded identification numbers of all containers in a specific TRU mixed
35 waste shipment to the waste assembly (for 7-packs, 4-packs, and 3-packs) and to the shipment
36 identification number, which is also written on the EPA Hazardous Waste Manifest. Generators
37 electronically transmit the waste shipment information to the WWIS before the TRU mixed
38 waste shipment is transported. Once a TRU mixed waste shipment arrives, the Permittees verify
39 the identity of each container (or one container in a bound 7-pack, 4-pack, or 3-pack) using the
40 data already in the WWIS.

1 ~~Discrepancies~~ **Manifest discrepancies** will be identified during manifest examination and
2 container bar-code WWIS data comparison. A manifest discrepancy is a difference between the
3 quantity or type of hazardous waste designated on the manifest and the quantity or type of
4 hazardous waste the WIPP facility actually receives. The generator/storage site technical
5 contact (as listed on the manifest) will be contacted to resolve the discrepancy. If the
6 discrepancy is identified prior to the containers being removed from the ~~Contact Handled~~
7 **Package package or shipping cask**, the waste will be retained in the parking area. If the
8 discrepancy is identified after the waste containers are removed from the ~~Contact Handled~~
9 **Package package or cask**, the waste will be retained in the Waste Handling Building (**WHB**)
10 until the discrepancy is resolved. Errors on the manifest can be corrected by the WIPP facility
11 with a verbal (followed by a mandatory written) concurrence by the generator/storage site
12 technical contact. All discrepancies that are unresolved within fifteen (15) days of receiving the
13 waste will be immediately reported to ~~the~~ NMED in writing. Notifications to ~~the~~ NMED will
14 consist of a letter describing the discrepancies, discrepancy resolution, and a copy of the
15 manifest. If the manifest discrepancies have not been resolved within **thirty (30)** days of waste
16 receipt, the shipment will be returned to the generator/storage facility. If it becomes necessary
17 to return waste containers to the generator/storage site, a new EPA Uniform Hazardous Waste
18 Manifest may be prepared by the Permittees.

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

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

25 ~~B-4b(2)(ii)~~ **5b(2) Examination of the Land Disposal Restriction (LDR) Notice**

26 TRU mixed waste **designated by the Secretary of Energy for disposal at WIPP** is exempt from
27 the LDRs by the **WIPP** Land Withdrawal Act Amendment (Public Law 104-201). This
28 amendment states that WIPP "Waste is exempted from treatment standards promulgated
29 pursuant to section 3004(m) of the Solid Waste Disposal Act (42 U.S. C. 6924(m)) and shall not
30 be subjected to the Land Disposal prohibitions in section 3004(d), (e), (f), and (g) of the Solid
31 Waste Disposal Act." Therefore, with the initial shipment of a TRU mixed waste stream, the
32 generator shall provide the Permittees with a one time written notice. The notice must include
33 the information listed below:

34 Land Disposal Restriction Notice Information:

- 35 ● EPA Hazardous Waste Number(s) and Manifest Numbers of first
36 shipment of a mixed waste stream
- 37 ● Statement: this waste is not prohibited from land disposal
- 38 ● Date the waste is subject to prohibition

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

7 The Permittees will review the LDR notice for accuracy and completeness. The generator will
8 prepare this notice in accordance with the applicable requirements of 20.4.1.800 NMAC
9 (incorporating 40 CFR §268.7(a)(4)).

10 ~~B-4b(2)(iii)~~ **5b(3)** Verification

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

- 14 C Whether the number and type of containers holding TRU mixed waste match the
15 information in the WWIS
- 16 C Whether there are any container defects

17 The Permittees will verify that the containers (as identified by their container ID numbers) are
18 the containers for which accepted data already exists in the WWIS. A check will be performed
19 by the Permittees comparing the data on the WWIS Shipment Summary Report for the
20 shipment to the actual shipping papers (including the EPA Hazardous Waste Manifest). This
21 check also verifies that the containers included in the shipment are those for which approved
22 shipping data already exist in the WWIS Transportation Data Module (Table B-87). For standard
23 waste boxes (**SWBs**) and ten drum overpacks (**TDOPs**), this check will include comparing the
24 barcode on the container with the container number on the shipping papers and the data on the
25 WWIS Shipment Summary Report. For 7-pack assemblies, one of the seven container barcodes
26 will be read by the barcode reader and compared to the assembly information for this container
27 on the WWIS Shipment Summary Report. This will automatically identify the remaining six
28 containers in the assembly. This process enables the Permittees to identify all of the containers
29 in the assembly with minimum **radiological** exposure. If all of the container IDs and the
30 information on the shipping papers agree with the WWIS Shipment Summary Report, **and the**
31 **shipment was subject to waste confirmation by the Permittees at an off-site facility as specified**
32 **in Permit Attachment B7**, the containers will be approved for **storage and** disposal at the WIPP
33 facility.

34 ~~B-4b(2)(iv)~~ **6** Permittees' Waste Shipment Screening QA/QC

35 Waste shipment screening QA/QC ensures that TRU mixed waste received is that which has
36 been approved for shipment during the Phase I **and Phase II** screening. This is accomplished
37 by maintaining QA/QC control of the waste shipment screening process. The screening process
38 will be controlled by administrative processes which will generate records documenting waste
39 receipt that will become part of the waste receipt record. The waste receipt record documents
40 that container identifications correspond to shipping information and approved TRU mixed

1 waste streams. The Permittees will extend QA/QC practices to the management of all records
2 associated with waste shipment screening determinations.

3 ~~B-4b(2)(v)~~ **7** Records Management and Reporting

4 As part of the WIPP facility's operating record, data and documents associated with waste
5 characterization **and waste confirmation** data are managed in accordance with standard records
6 management practices.

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

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

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

21 ~~B-4b(2)(vi)~~ **7a** General Requirements

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

30 ~~B-4b(2)(vii)~~ **7b** Records Storage

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

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

- 3 C Completed WIPP WSPFs and accompanying Characterization Information
4 Summary CIS, including individual container data as transferred on the WWIS (or
5 received as hard-copy) and any discrepancy-related documentation as specified
6 in Section ~~B-4b(1)~~5a
- 7 C Radiography and visual examination records (data sheets, packaging logs, and
8 video and audio recordings) of waste confirmation activities
- 9 C Completed Waste Receipt Checklists and discrepancy-related documentation as
10 specified in Section ~~B-4b(2)~~5b
- 11 C WIPP WWIS Waste Emplacement Report as specified in Section ~~B-4b(1)(i)~~5a(1)
- 12 C Audit reports and corrective action reports from the Permittees' Audit and
13 Surveillance Program audits as specified in Section ~~B-4b(1)(iii)~~5a(3) and Permit
14 Attachment B6
- 15 C CARs and closure information for corrective actions taken due to nonconforming
16 waste being identified during waste confirmation by the Permittees

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

19 ~~B-4b(2)(viii)~~8 Reporting

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

1 B-59 List of References

2 U.S. Department of Energy (DOE), 2001, "WIPP Waste Information System User's Manual for
3 Use by Shippers/Generators", DOE/CAO 97-2273, U.S. Department of Energy.

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

6 U.S. Department of Energy (DOE), ~~1995~~ 2003, "Performance Demonstration Program Plan for
7 the Analysis of Simulated Headspace Gases for the TRU Waste Characterization Program,"
8 CAO-95-1076, Current Revision, Carlsbad, New Mexico, Carlsbad Field Office, U.S.
9 Department of Energy.

10 U.S. Department of Energy (DOE), ~~1995~~ 2005, "Performance Demonstration Program Plans
11 for Analysis of Solid Waste Forms," CAO-95-1077, Current Revision, Carlsbad, New Mexico,
12 Carlsbad Field Office, U.S. Department of Energy.

13 U.S. Environmental Protection Agency (EPA), April 1994, "Waste Analysis at Facilities that
14 Generate, Treat, Store, and Dispose of Hazardous Waste, a Guidance Manual," OSWER
15 9938.4-03, Office of Solid Waste and Emergency Response, Washington, D.C.

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

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

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TABLES

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TABLE B-1
SUMMARY OF HAZARDOUS WASTE CHARACTERIZATION
REQUIREMENTS
FOR TRANSURANIC MIXED WASTE ^a

Parameter	Techniques and Procedure
<u>Physical Waste Form</u> <u>Summary</u> <u>Category Names</u> S3000 Homogeneous Solid S4000 Soil/Gravel S5000 Debris Wastes	<u>Waste Inspection Procedures</u> Radiography Visual Examination (Permit Attachment B1-3)
<u>Headspace Gases</u> <u>Volatile Organic Compounds</u> Benzene <u>Alcohols and Ketones</u> Bromoform Acetone Carbon tetrachloride Butanol Chlorobenzene Methanol Chloroform Methyl ethyl ketone 1,1-Dichloroethane Methyl isobutyl ketone 1,2-Dichloroethane 1,1-Dichloroethylene (cis)-1,2-Dichloroethylene (trans)-1,2-Dichloroethylene Ethyl benzene Ethyl ether Formaldehyde ^b Hydrazine ^c Methylene chloride 1,1,2,2-Tetrachloroethane Tetrachloroethylene Toluene 1,1,1-Trichloroethane Trichloroethylene 1,1,2-Trichloro-1,2,2-trifluoroethane Xylenes	<u>Gas Analysis ^f</u> Gas Chromatography /Mass Spectroscopy (GC/MS), EPA TO-14 or modified SW-846 8240/8260 (Permit Attachment B3) GC/Flame Ionization Detector (FID), for alcohols and ketones, SW-846 8015 (Permit Attachment B3) Fourier Transform Infrared Spectroscopy (FTIRS), SW-846

**TABLE B-1
 SUMMARY OF HAZARDOUS WASTE CHARACTERIZATION
 REQUIREMENTS
 FOR TRANSURANIC MIXED WASTE ^a**

Parameter	Techniques and Procedure
<u>Total Volatile Organic Compounds</u> Acetone Isobutanol Benzene Methanol Bromoform Methyl ethyl ketone Butanol Methylene chloride Carbon disulfide Pyridine ^d Carbon tetrachloride 1,1,2,2-Tetrachloroethane Chlorobenzene Tetrachloroethylene Chloroform Toluene 1,4-Dichlorobenzene ^d 1,1,2-Trichloro-1,2,2-trifluoroethane 1,2-Dichlorobenzene ^d Trichlorofluoromethane 1,2-Dichloroethane 1,1,1-Trichloroethane 1,1-Dichloroethylene 1,1,2-Trichloroethane Ethyl benzene Trichloroethylene Ethyl ether Vinyl chloride Formaldehyde ^b Xylenes Hydrazine ^c (trans)-1,2-Dichloroethylene	<u>Total Volatile Organic Compound Analysis ^g</u> TCLP, SW-846 1311 GC/MS, SW-846 8260 or 8240 GC/FID, SW-846 8015 (Permit Attachment B3) Acceptable Knowledge for Summary Category S5000 (Debris Wastes)
<u>Total Semivolatile Organic Compounds</u> Cresols 1,4-Dichlorobenzene ^e 1,2-Dichlorobenzene ^e 2,4-Dinitrophenol 2,4-Dinitrotoluene Hexachlorobenzene Hexachloroethane Nitrobenzene Pentachlorophenol Pyridine ^e	<u>Total Semivolatile Organic Compound Analysis ^g</u> TCLP, SW-846 1311 GC/MS, SW-846 8250 or 8270 (Permit Attachment B3) Acceptable Knowledge for Summary Category S5000 (Debris Wastes)
<u>Total Metals</u> Antimony Mercury Arsenic Nickel Barium Selenium Beryllium Silver Cadmium Thallium Chromium Vanadium Lead Zinc	<u>Total Metals Analysis ^g</u> TCLP, SW-846 1311 ICP- MS, SW-846 6020 , ICP Emission Spectroscopy, SW-846 6010 Atomic Absorption Spectroscopy , SW-846 7000 (Permit Attachment B3) Acceptable Knowledge for Summary Category S5000 (Debris Wastes)

^a Permit Attachment B

^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.

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TABLE B-2
MAXIMUM ALLOWABLE VOC ROOM-AVERAGED HEADSPACE
CONCENTRATION LIMITS (PPMV)

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COMPOUND	VOC HEADSPACE CONCENTRATION LIMITS ^a (PPMV)
Carbon Tetrachloride	9625
Chlorobenzene	13000
Chloroform	9930
1,1-Dichloroethene	5490
1,2-Dichloroethane	2400
Methylene Chloride	100000
1,1,2,2-Tetrachloroethane	2960
Toluene	11000
1,1,1-Trichloroethane	33700

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^a There are no headspace limits for other VOCs.

TABLE B-32
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 Formaldehyde ^b Hydrazine ^c 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-14 ^a ; Modified 8240/8260 EPA - Approved FTIRS
Acetone Butanol Methanol Methyl ethyl ketone Methyl isobutyl ketone	EPA: Modified TO-14 ^a ; Modified 8240/8260 Method 8015 EPA - Approved FTIRS

^a U.S. Environmental Protection Agency (EPA), 1988, "Compendium Method TO-14, the Determination of Volatile Organic Compounds (VOC) in Ambient Air Using SUMMA[®] Passivated Canister Sampling and Gas Chromatographic Analysis," in Compendium of Methods for the Determination of Toxic Organic Compounds on Ambient Air. Research Triangle Park, North Carolina, Quality Assurance Division, Monitoring System Laboratory, U.S. EPA. The most current revision of the specified methods may be used.

~~^b Required only for containers of homogeneous solids and soil/gravel waste from Savannah River Site.~~

~~^c Required only for containers of homogeneous solids and soil/gravel waste from Oak Ridge National Laboratory and Savannah River Site.~~

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

TABLE B-43
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 8240 8260
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 8240 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	8250 8270

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TABLE B-43 (CONTINUED)
REQUIRED ORGANIC ANALYSES AND TEST METHODS
ORGANIZED BY ORGANIC ANALYTICAL GROUPS

^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 for approval.

^c These compounds may also be analyzed as VOCs by SW-846 Methods 8240 and 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-54
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, 7040, 7041, 7062
Total Arsenic	6010, 6020, 7060, 7061, 7062
Total Barium	6010, 6020, 7080, 7081
Total Beryllium	6010, 6020, 7090, 7091
Total Cadmium	6010, 6020, 7130, 7131
Total Chromium	6010, 6020, 7190, 7191
Total Lead	6010, 6020, 7420, 7421
Total Mercury	7471
Total Nickel	6010, 6020, 7520, 7521
Total Selenium	6010, 7740, 7741, 7742
Total Silver	6010, 6020, 7760, 7761
Total Thallium	6010, 6020, 7840, 7841
Total Vanadium	6010, 7910, 7911
Total Zinc	6010, 6020, 7950, 7951

^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-65
SUMMARY OF PARAMETERS, CHARACTERIZATION METHODS, AND RATIONALE
FOR CH TRANSURANIC MIXED WASTE (STORED WASTE)

Waste Matrix Code Summary Categories	Waste Matrix Code Groups	Characterization Parameter	Method	Rationale
S3000-Homogeneous Solids S4000-Soil/Gravel	C Solidified inorganics C Salt waste C Solidified organics	Physical waste form	100% Acceptable knowledge , radiography, and/or visual examination	C Verify Determine waste matrix C Demonstrate compliance with waste acceptance criteria (e.g., no free liquids, no incompatible wastes, no compressed gases)
	C Contaminated soil/debris	Headspace gases Gas volatile organic compounds (VOC)	100% gas sampling and analysis or statistical sampling^{a,b} (see Table B-3)	C Quantify concentration of flammable VOCs C Determine potential flammability of transuranic (TRU) mixed waste headspace gases C Quantify concentrations of VOC constituents in headspace of containers C Ensure that environmental performance standards are not exceeded
		Hazardous constituents TCLP/total metals TCLP/total VOCs TCLP/total semi-VOCs C Listed C Characteristic	Acceptable knowledge or C Statistical sampling^a (see Tables B-43 and B-54)	C Determine characteristic metals and organics C Determine total quantity of metals, VOCs, and semi-VOCs C Resolve the assignment of EPA hazardous waste numbers

TABLE B-65 (CONTINUED)
SUMMARY OF PARAMETERS, CHARACTERIZATION METHODS, AND RATIONALE
FOR GH TRANSURANIC MIXED WASTE (STORED WASTE)

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Waste Matrix Code Summary Categories	Waste Matrix Code Groups	Characterization Parameter	Method	Rationale
S5000–Debris Waste	C Uncategorized metal (metal waste other than lead/cadmium) C Lead/cadmium waste C Inorganic nonmetal waste C Combustible waste C Graphite waste C Heterogeneous waste C Composite filter waste	Physical waste form	100% Radiography Visual examination (statistical sample) ^a or visual examination Acceptable knowledge, radiography, and/or visual examination	C Verify-Determine waste matrix C Demonstrate compliance with waste acceptance (e.g., no free liquids, no incompatible wastes, no compressed gases)
		Headspace gases C Gas VOCs	100% Statistical gas sampling and analysis; statistical sampling or assignment of VOC concentrations ^a (see Table B-32)	Quantify concentration of flammable VOCs Determine potential flammability of TRU mixed waste headspace gases Quantify concentrations of VOC constituents in headspace of containers Ensure that environmental performance standards are not exceeded Verify acceptable knowledge C Resolve the assignment of EPA hazardous waste numbers
		Hazardous constituents TCLP/total metals TCLP/total VOCs TCLP/total semi-VOCs C Characteristic	Acceptable knowledge	C Determine characteristic metals and organics Determine total quantity of metals, VOCs, and semi-VOCs

TABLE B-65 (CONTINUED)
SUMMARY OF PARAMETERS, CHARACTERIZATION METHODS, AND RATIONALE
FOR GH TRANSURANIC MIXED WASTE (NEWLY GENERATED WASTE)

Waste Matrix Code Summary Categories	Waste Matrix Code Groups	Characterization Parameter	Method	Rationale
S3000-Homogeneous Solids S4000-Soil/Gravel	C Solidified inorganics C Salt waste C Solidified organics	Physical waste form	Documentation and verification ^b or radiography. Applies to 100% of containers. Acceptable knowledge, radiography, and/or visual examination	C Verify Determine waste matrix C Demonstrate compliance with waste acceptance criteria (e.g., no free liquids, no incompatible wastes, no compressed gases)
	C Contaminated soil/debris	Headspace gases Gas VOCs (VOCs)	100% gas sampling and analysis or statistical sampling ^{a,t} (see Table B-3)	Quantify concentration of flammable VOCs Determine potential flammability of TRU mixed waste headspace gases Quantify concentrations of VOC constituents in headspace of containers Ensure that environmental performance standards are not exceeded
		Hazardous constituents TCLP/total metals TCLP/total VOCs TCLP/total semi-VOCs C Listed C Characteristic	Statistical sampling ^a (see Tables B-43 and B-54)	C Determine characteristic metals and organics Determine total quantity of metals, VOCs, and semi-VOCs C Resolve the assignment of EPA hazardous waste numbers

TABLE B-65 (CONTINUED)
SUMMARY OF PARAMETERS, CHARACTERIZATION METHODS, AND RATIONALE
FOR GH TRANSURANIC MIXED WASTE (NEWLY GENERATED WASTE)

Waste Matrix Code Summary Categories	Waste Matrix Code Groups	Characterization Parameter	Method	Rationale
S5000–Debris Waste	C Uncategorized metal (metal waste other than lead/cadmium) C Lead/cadmium waste C Inorganic nonmetal waste C Combustible waste C Graphite waste C Heterogeneous waste C Composite filter waste	Physical waste form	Documentation and verification ^b or radiography. Applies to 100% of containers. Acceptable knowledge, radiography, and/or visual examination	C Verify Determine waste matrix C Demonstrate compliance with waste acceptance (e.g., no free liquids, no incompatible wastes, no compressed gases)
		Headspace gases C Gas VOCs	100% Statistical gas sampling and analysis; statistical sampling or assignment of VOC concentrations ^a (see Table B-32)	Quantify concentration of flammable VOCs Determine potential flammability of TRU mixed waste headspace gases Quantify concentrations of VOC constituents in headspace of containers Ensure that environmental performance standards are not exceeded Verify acceptable knowledge C Resolve the assignment of EPA hazardous waste numbers
		Hazardous constituents TCLP/total metals TCLP/total VOCs TCLP/total semi-VOCs C Characteristic	Acceptable knowledge	C Determine characteristic metals and organics C Determine total quantity of metals, VOCs, and semi-VOCs

^a Applies to certain waste streams that **require sampling** meet the conditions in Section B-3a(1).

^b Number determined as specified in Permit Attachment B2.

^c See discussion in Permit Attachment B4.

1 **TABLE B-76**
2 **REQUIRED PROGRAM RECORDS MAINTAINED IN GENERATOR/STORAGE**
3 **SITE PROJECT FILES**

4 Lifetime Records

- 5 • Field sampling data forms
6 • Field and laboratory chain-of-custody forms
7 • Test facility and laboratory batch data reports
8 • Waste Stream Characterization Package
9 • Sampling Plans
10 • Data reduction, validation, and reporting documentation
11 • Acceptable knowledge documentation
12 • ~~Data reconciliation report~~
13 • Waste Stream Profile Form and Characterization Information Summary

14 Non-Permanent Records

- 15 • Nonconformance documentation
16 • Variance documentation
17 • Assessment documentation
18 • Gas canister tags
19 • Methods performance documentation
20 • Performance Demonstration Program documentation
21 • Sampling equipment certifications
22 • Calculations and related software documentation
23 • Training/qualification documentation
24 • QAPjPs (generator/storage sites) documentation (all revisions)
25 • Calibration documentation
26 • Analytical raw data
27 • Procurement documentation
28 • QA procedures (all revisions)
29 • Technical implementing procedures (all revisions)
30 • Audio/video recording (radiography, visual, etc.)

TABLE B-87
WIPP WASTE INFORMATION SYSTEM DATA FIELDS^a

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

TABLE B-87
WIPP WASTE INFORMATION SYSTEM DATA FIELDS^a

1	Disposal Module Data
2	Container ID ^c
3	Disposal Date
4	Disposal Location

5 ^a This is not a complete list of the WWIS data fields.

6 ^b Some of the fields required for characterization are also required for certification and/or transportation.

7 ^c Container ID is the main relational field in the WWIS Database.

8 ^d This is a multiple occurring field for each analyte, nuclide, etc.

9 ^e These are logical fields requiring only a yes/no.

10 ^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
11 that assembly together. This facilitates the identification of waste containers in a shipment without need to breakup
12 the assembly.

TABLE B-98
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-109
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	U229 239*

* Acceptance of U-coded ~~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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Figure B-1
WIPP Waste Stream Profile Form (Example Only)

Figure B-1
WIPP Waste Stream Profile Form (Example Only - Continued)

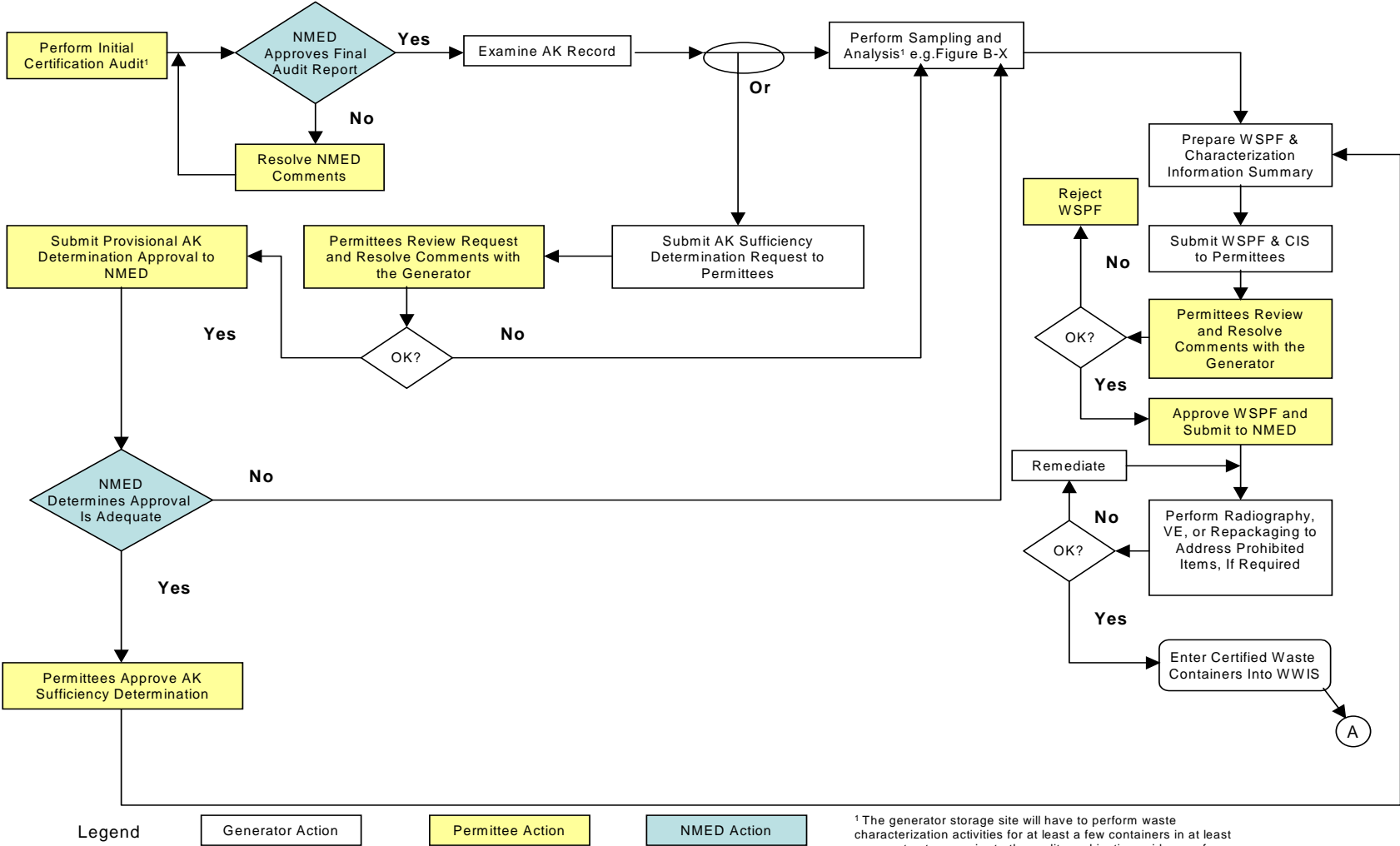


Figure B-2
 Waste Data Collection Design for Characterization of Newly Generated Waste Process

Figure B-3
~~Data Collection Design for Characterization of Retrievably Stored Waste~~

Figure B-53
TRU Mixed Waste Screening Flow Diagram