

ATTACHMENT B
WASTE ANALYSIS PLAN

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ATTACHMENT B

WASTE ANALYSIS PLAN

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ATTACHMENT B

WASTE ANALYSIS PLAN

1 B-0 Introduction and Attachment Highlights

2 This waste analysis plan (**WAP**) has been prepared for management, storage, or disposal
3 activities to be conducted at the Waste Isolation Pilot Plant (**WIPP**) facility to meet requirements
4 set forth in 20.4.1.500 NMAC (incorporating 40 CFR §264.13). Guidance in the most recent U.S.
5 Environmental Protection Agency (**EPA**) manual on waste analysis has been incorporated into
6 the preparation of this WAP (EPA, 1994). This WAP includes test methods, details of planned
7 waste sampling and analysis for complying with the general waste analysis requirements of
8 20.4.1.500 NMAC (incorporating 40 CFR §264.13), a description of the waste shipment
9 screening and verification process, and a description of the quality assurance (**QA**)/quality
10 control (**QC**) program. Before the Permittees manage, store, or dispose transuranic (**TRU**)
11 mixed waste from a generator/storage site (**site**), the Permittees shall require that site to
12 implement the applicable requirements of this WAP.

13 TRU mixed waste that may be stored or disposed at WIPP are or were generated at DOE
14 generator/storage sites by various specific processes and activities. Examples of the major
15 types of operations that generate this waste include:

- 16 • Production of Nuclear Products—Production of nuclear products includes reactor
17 operation, radionuclide separation/finishing, and weapons fabrication and
18 manufacturing. The majority of the TRU mixed waste was generated by weapons
19 fabrication and radionuclide separation/finishing processes. More specifically,
20 wastes consist of residues from chemical processes, air and liquid filtration,
21 casting, machining, cleaning, product quality sampling, analytical activities, and
22 maintenance and refurbishment of equipment and facilities.
- 23 • Plutonium Recovery—Plutonium recovery wastes are residues from the recovery
24 of plutonium-contaminated molds, metals, glass, plastics, rags, salts used in
25 electrorefining, precipitates, firebrick, soot, and filters.
- 26 • Research and Development (**R&D**)—R&D projects include a variety of hot cell or
27 glovebox activities that often simulate full-scale operations described above,
28 producing similar TRU mixed wastes. Other types of R&D projects include
29 metallurgical research, actinide separations, process demonstrations, and
30 chemical and physical properties determinations.
- 31 • Decontamination and Decommissioning—Facilities and equipment that are no
32 longer needed or usable are decontaminated and decommissioned, resulting in
33 TRU mixed wastes consisting of scrap materials, cleaning agents, tools, piping,
34 filters, Plexiglas™, gloveboxes, concrete rubble, asphalt, cinder blocks, and other
35 building materials. These materials are expected to be the largest category by
36 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.

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

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

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

1 subpopulation of certified waste containers, to ensure that the wastes meet the applicable
2 requirements of 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 to waste streams for
10 WIPP disposal. The Waste Matrix Code Groups are solidified inorganics, solidified organics, salt
11 waste, soils, lead/cadmium metal, inorganic nonmetal waste, combustible waste, graphite,
12 filters, heterogeneous debris waste, and uncategorized metal. Waste Matrix Code Groups can
13 be 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 are defined as solid materials, excluding soil, that do not meet the
22 NMED criteria for classification as debris (20.4.1.800 NMAC (incorporating 40 CFR
23 §268.2[g] and [h])). Included in the series of homogeneous solids are inorganic process
24 residues, inorganic sludges, salt waste, and pyrochemical salt waste. Other waste
25 streams are included in this Summary Category Group based on the specific waste
26 stream types and final waste form. This Summary Category Group is expected to
27 contain toxic metals and spent solvents. This category includes wastes that are at least
28 50 percent by volume homogeneous solids.

29 S4000 - Soils/Gravel

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

33 S5000 - Debris Wastes

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

- 38 1. a manufactured object, or
- 39 2. plant or animal matter, or
- 40 3. natural geologic material.

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

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

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

9 Metals

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

19 Halogenated Volatile Organic Compounds

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

32 Nonhalogenated Volatile Organic Compounds

33 Xylene, methanol, and n-butanol are the most prevalent nonhalogenated VOCs in TRU
34 mixed waste that may be managed at the WIPP facility during the Disposal Phase. Like
35 the halogenated VOCs, they are used as degreasers and solvents and are similarly
36 volatile. The same analytical methods that are used for halogenated VOCs are used to
37 detect the presence of nonhalogenated VOCs. Radiolysis may also generate non-
38 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 applicable requirements of the TSDF-WAC in Module II. The generator/storage
4 site shall assemble the Acceptable Knowledge (**AK**) information into an auditable record¹ for the
5 waste stream as described in Permit Attachment B4. For those waste streams with an approved
6 AK Sufficiency Determination (see below), sampling and analysis per the methods described in
7 Permit 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 • Radiography, which is an x-ray technique to determine physical contents of
15 containers
- 16
- 17 • Visual examination of opened containers as an alternative way to determine their
18 physical contents
- 19 • Headspace-gas sampling to determine VOC content of gases in the void volume
20 of the containers
- 21 • Sampling and analysis of waste forms that are homogeneous and can be
22 representatively sampled to determine concentrations of hazardous waste
23 constituents and toxicity characteristic contaminants of waste in containers
- 24 • Compilation of AK documentation into an auditable record

25 B-0b AK Sufficiency Determination

26 Generator/storage sites may submit a request to the Permittees for an AK Sufficiency
27 Determination (**Determination Request**) to meet all or part of the waste characterization
28 requirements. The contents of the Determination Request are specified in Permit Attachment
29 B4, Section B4-3d. The Determination Request may take one of the following forms:
30

- | | | |
|----|------------|--|
| 31 | Scenario 1 | Radiography or visual examination (VE) of the waste stream is not
32 required, and chemical sampling and analysis is not required; |
| 33 | Scenario 2 | Radiography or VE of the waste stream is not required, but chemical
34 sampling and analysis of a representative sample of the waste stream is
35 required; or |
| 36 | Scenario 3 | Chemical sampling and analysis is not required, but radiography or VE of
37 100% of the containers in the waste stream is required. |

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

1 The Permittees shall evaluate the Determination Request for completeness and technical
2 adequacy. This evaluation shall include, but not be limited to whether the Determination
3 Request is technically sufficient for the following:
4

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

27 The Permittees will review the Determination Request for technical adequacy and compliance
28 with the requirements of the Permit, using trained and qualified individuals in accordance with
29 standard operating procedures that shall, at a minimum, address all of the technical and
30 procedural requirements listed above. The Permittees shall resolve comments with the
31 generator/storage site, and the Permittees may change the scope of the Determination Request
32 to one of the three scenarios. If the Permittees determine that the AK is sufficient, they will
33 provisionally approve the Determination Request and forward it along with all relevant
34 information submitted with the Determination Request to NMED for an evaluation that the
35 provisional approval made by the Permittees is adequate. Within five (5) days of submitting a
36 Determination Request to NMED, the Permittees will post a link to the transmittal letter to NMED
37 on the WIPP Home Page and inform those on the e-mail notification list. Based on the results of
38 NMED's evaluation, the Permittees will notify the generator/storage sites whether the AK
39 information is sufficient and the Determination Request is approved. The Permittees will not
40 approve a Determination Request that NMED has determined to be inadequate unless the
41 generator/storage site resolves the inadequacies and provides the resolution to NMED for
42 evaluation of adequacy. Should the inadequacies not be resolved to NMED's satisfaction, the
43 Permittees shall not submit a Determination Request for the same waste stream at a later date.

44 In the event the Permittees disagree, in whole or in part, with an evaluation performed by NMED
45 resulting in a determination by NMED that the Permittees' provisional approval for a particular

1 waste stream is inadequate, the Permittees may seek dispute resolution. The dispute resolution
2 process is specified in Module I.

3 If a generator/storage site does not submit a Determination Request, or if the Permittees do not
4 approve a Determination Request, or if NMED finds that the Permittees' provisional approval of
5 a Determination Request is inadequate, the generator/storage site shall perform radiography or
6 VE on 100% of the containers in a waste stream and chemical sampling and analysis on a
7 representative sample of the waste stream using headspace gas sampling and analysis (for
8 debris waste) or solids sampling and analysis (for homogeneous solid or soil/gravel waste) as
9 specified in Permit Attachments B1 and B2.

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

14 If a generator/storage site submits a Determination Request, the Permittees provisionally
15 approve the Determination Request as Scenario 2, and NMED finds that the Permittees'
16 provisional approval is adequate, chemical sampling and analysis of a representative sample of
17 the waste stream is required, but radiography or VE is not required.

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

22 B-0c Waste Stream Profile Form Completion

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

30 The WSPF and the CIS for the waste stream resulting from waste characterization activities
31 shall be transmitted to the Permittees, reviewed for completeness, and screened for acceptance
32 prior to loading any TRU mixed waste into the Contact-Handled or Remote-Handled Packaging
33 at the generator facility, as described in Section B-4. The review and approval process will
34 ensure that the submitted waste analysis information is sufficient to meet the Data Quality
35 Objectives (**DQOs**) for AK in Section B-4a(1) and allow the Permittees to demonstrate
36 compliance with the requirements of this WAP. Only TRU mixed waste and TRU waste that has
37 been characterized in accordance with this WAP and that meets the **TSDF-WAC** specified in
38 this Permit will be accepted at the WIPP facility for disposal in a permitted Underground
39 Hazardous Waste Disposal Unit (**HWDU**). The Permittees will provide NMED with copies of the
40 approved WSPF and accompanying CIS prior to waste stream shipment. Upon notification of
41 approval of the WSPF by the Permittees, the generator/storage site may be authorized to ship
42 waste to WIPP.

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

7 B-0d Waste Confirmation

8 The Permittees will perform waste confirmation on a representative subpopulation of each
9 waste stream shipment after certification and prior to shipment as described in Permit
10 Attachment B7. The Permittees will use radiography, review of radiography audio/video
11 recordings, **VE**, or review of VE records (e.g., VE data sheets or packaging logs) to examine at
12 least 7 percent of each waste stream shipment to confirm that the waste does not contain
13 ignitable, corrosive, or reactive waste. Waste confirmation will be performed by the Permittees
14 prior to shipment of the waste from the generator/storage site to WIPP.

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

16 B-1a Waste Stream Identification

17 TRU mixed waste destined for disposal at WIPP will be characterized on a waste stream basis.
18 Generator/storage sites will delineate waste streams using acceptable knowledge. Required
19 acceptable knowledge is specified in Section B-3b and Permit Attachment B4.

20 All of the waste within a waste stream may not be accessible for sampling and analysis at one
21 time. Permit Attachment B2 addresses the requirements for selecting waste containers used for
22 characterization of waste streams as they are generated or retrieved.

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

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

29 The Permittees will only allow generators to ship those TRU mixed waste streams with EPA
30 hazardous waste numbers listed in Table B-9. Some of the waste may also be identified by
31 unique state hazardous waste codes or numbers. These wastes are acceptable at WIPP as
32 long as the TSDf-WAC are met. The Permittees will perform characterization of all waste
33 streams as required by this WAP. If during the characterization process, new EPA hazardous
34 waste numbers are identified, those wastes will be prohibited for disposal at the WIPP facility
35 until a permit modification has been submitted to and approved by NMED for these new EPA
36 hazardous waste numbers. Similar waste streams at other generator/storage sites will be
37 examined by the Permittees to ensure that the newly identified EPA hazardous waste numbers
38 do not apply to those similar waste streams. If the other waste streams also require new EPA

1 hazardous waste numbers, shipment of these similar waste streams will also be prohibited for
2 disposal until a permit modification has been submitted to and approved by NMED.

3 B-1c Waste Prohibited at the WIPP Facility

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

- 5 • liquid waste (waste shall contain as little residual liquid as is reasonably
6 achievable by pouring, pumping and/or aspirating, and internal containers shall
7 contain less than 1 inch or 2.5 centimeters of liquid in the bottom of the container.
8 Total residual liquid in any payload container (e.g., 55 gallon drum or standard
9 waste box) may not exceed 1 percent volume of that container. Payload
10 containers with U134 waste shall have no detectable liquid)
- 11 • non-radionuclide pyrophoric materials, such as elemental potassium
- 12 • hazardous wastes not occurring as co-contaminants with TRU mixed wastes
13 (non-mixed hazardous wastes)
- 14 • wastes incompatible with backfill, seal and panel closures materials, container
15 and packaging materials, shipping container materials, or other wastes
- 16 • wastes containing explosives or compressed gases
- 17 • wastes with polychlorinated biphenyls (**PCBs**) not authorized under an EPA PCB
18 waste disposal authorization
- 19 • wastes exhibiting the characteristic of ignitability, corrosivity, or reactivity (EPA
20 Hazardous Waste Numbers of D001, D002, or D003)
- 21 • waste that has ever been managed as high-level waste and waste from tanks
22 specified in Table B-8, unless specifically approved through a Class 3 permit
23 modification
- 24 • any waste container from a waste stream (or waste stream lot) which has not
25 undergone either radiographic or visual examination of a statistically
26 representative subpopulation of the waste stream in each shipment, as described
27 in Permit Attachment B7
- 28 • any waste container from a waste stream which has not been preceded by an
29 appropriate, certified WSPF (see Section B-1d)

30 Before accepting a container holding TRU mixed waste, the Permittees will perform waste
31 confirmation activities on each waste stream shipment to confirm that the waste does not
32 contain ignitable, corrosive, or reactive waste and the assigned EPA hazardous waste numbers
33 are allowed for storage and disposal by this Permit. Waste confirmation activities will be
34 performed on at least 7 percent of each waste stream shipped, equating to examination of at
35 least one of fourteen containers in each waste stream shipment. If a waste stream shipment

1 contains fewer than fourteen containers, one container will be examined to satisfy waste
2 confirmation requirements. Section B-4 and Permit Attachment B7 include descriptions of the
3 waste confirmation processes that the Permittees will conduct prior to receiving a shipment at
4 the WIPP facility.

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

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

13 B-1d Control of Waste Acceptance

14 Every waste stream shipped to WIPP shall be preceded by a WSPF (Figure B-1) and a CIS.
15 The required WSPF information and the CIS elements are found in Section B3-12b(1) and
16 Section B3-12b(2).

17 Generator/storage sites will provide the WSPF to the Permittees for each waste stream prior to
18 its acceptance for disposal at WIPP. The WSPF and the CIS will be transmitted to the
19 Permittees for each waste stream from a generator/storage site. If continued waste
20 characterization reveals discrepancies that identify different hazardous waste numbers or
21 indicates that the waste belongs to a different waste stream, the waste will be redefined to a
22 separate waste stream and a new WSPF submitted.

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

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

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

35 Waste generated as a result of the waste containers handling and processing activities at the
36 WIPP facility is termed "derived" waste. Because derived wastes can contain only those RCRA-
37 regulated materials present in the waste from which they were derived, no additional
38 characterization of the derived waste is required for disposal purposes. In other words, the
39 generator/storage site's characterization data and knowledge of the processes at the WIPP

1 facility will be used to identify and characterize hazardous waste and hazardous constituents in
2 derived waste. The management of derived waste is addressed in Permit Attachment M1.

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

4 The Permittees shall require the sites to develop the procedure(s) which specify their
5 programmatic waste characterization requirements. The Permittees will evaluate the procedures
6 during audits conducted under the Permittees' Audit and Surveillance Program (Section B-
7 5a(3)) and may also evaluate the procedures as part of the review and approval of the WSPF.
8 Sites must notify the Permittees and obtain approval prior to making data-affecting modifications
9 to procedures (Permit Attachment B3, Section B3-15). Program procedures shall address the
10 following minimum elements:

- 11 • Waste characterization and certification procedures for retrievably stored and
12 newly generated wastes to be sent to the WIPP facility
- 13 • Methods used to ensure prohibited items are documented and managed. These
14 will include procedures for performing radiography, VE, or treatment, if these
15 methods are used to ensure prohibited items are not present in the waste prior to
16 shipment of the waste to WIPP.
- 17 • Procedures used to verify packaging configurations to determine the correct
18 drum age criteria (**DAC**) if headspace gas sampling and analysis is used to
19 collect waste characterization information per Section B1-1a(1) of the WAP.
- 20 • Identify the organization(s) responsible for compliance with waste
21 characterization and certification procedures.
- 22 • Identify the oversight procedures and frequency of actions to verify compliance
23 with waste characterization and certification procedures.
- 24 • Develop training specific to waste characterization and certification procedures.
- 25 • Ensure that personnel may stop work if noncompliance with waste
26 characterization or certification procedures is identified.
- 27 • Develop a nonconformance process that complies with the requirements in
28 Permit Attachment B3 of the WAP to document and establish corrective actions.
- 29 • 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 • A listing of all approved hazardous waste numbers which are acceptable at WIPP
33 are included in Table B-9.

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

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

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

- 8 • Determination whether TRU mixed waste streams comply with the applicable
9 provisions of the TSDF-WAC
- 10 • Determination whether TRU mixed wastes exhibit a hazardous characteristic
11 (20.4.1.200 NMAC, incorporating 40 CFR §261 Subpart C)
- 12 • Determination whether TRU mixed wastes are listed (20.4.1.200 NMAC,
13 incorporating 40 CFR §261 Subpart D)
- 14 • Estimation of waste material parameter weights

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

18 B-3 Generator Waste Characterization Methods

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

24 B-3a Sampling and Analytical Methods

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

26 Representative headspace gas sampling and analysis shall be used by generator/storage sites
27 to determine the types and concentrations of VOCs in the void volume of randomly selected
28 waste containers in order to resolve the assignment of EPA hazardous waste numbers for those
29 debris waste streams for which an AK Sufficiency Determination Request has not been
30 approved by the Permitees. In addition, VOC constituents will be compared to those assigned
31 by acceptable knowledge, which may include an analysis of radiolytically derived VOCs. The
32 generator/storage sites may also consider radiolysis and packaging materials when assessing
33 the presence of hazardous constituents in the headspace gas results, and whether radiolysis
34 would generate wastes which exhibit the toxicity characteristic. Refer to Permit Attachment B4
35 for additional clarification regarding hazardous waste number assignment and headspace gas
36 results. The methods for random selection of containers for headspace gas sampling and

1 analysis are specified in Permit Attachment B2. Headspace gas sampling and analysis shall be
2 subject to the Permittees' Audit and Surveillance Program (Permit Attachment B6).

3 In accordance with EPA convention, identification of hazardous constituents detected by gas
4 chromatography/mass spectrometry methods that are not on the list of target analytes shall be
5 reported. These compounds are reported as tentatively identified compounds (**TICs**) in the
6 analytical BDR and shall be added to the target analyte list if detected in a given waste stream,
7 if they appear in the 20.4.1.200 NMAC (incorporating 40 CFR §261) Appendix VIII, and if they
8 are reported in 25% of the waste containers sampled from a given waste stream. The
9 headspace gas analysis method Quality Assurance Objectives (**QAOs**) are specified in Permit
10 Attachment B3.

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

12 Representative homogeneous and soil/gravel waste sampling and analysis shall be used by
13 generator/storage sites to resolve the assignment of EPA hazardous waste numbers for
14 homogeneous and soil/gravel waste streams for which an AK Sufficiency Determination
15 Request has not been approved by the Permittees. Sampling of homogeneous and soil/gravel
16 wastes shall result in the collection of a sample that is used to resolve the assignment of
17 hazardous waste numbers. Sampling is accomplished through coring or other EPA approved
18 sampling, which is described in Permit Attachment B1. For those waste streams defined as
19 Summary Category Groups S3000 or S4000 on page B-3, debris that may also be present
20 within these wastes need not be sampled. The waste containers for sampling and analysis are
21 to be selected randomly from the population of containers for the waste stream. The random
22 selection methodology is specified in Permit Attachment B2. Homogeneous and soil/gravel
23 sampling and analysis shall be subject to the Permittees' Audit and Surveillance Program
24 (Permit Attachment B6).

25 Totals or TCLP analyses for VOCs, SVOCs, and RCRA-regulated metals are used to determine
26 waste parameters in soils/gravels and solids that may be important to the performance within
27 the disposal system (Tables B-3 and B-4). To determine if a waste exhibits a toxicity
28 characteristic for compounds specified in 20.4.1.200 NMAC (incorporating 40 CFR §261,
29 Subpart C), TCLP may be used instead of total analyses. The generator will use the results from
30 these analyses to determine if a waste exhibits a toxicity characteristic. The mean concentration
31 of toxicity characteristic contaminants are calculated for each waste stream such that it can be
32 reported with an upper 90 percent confidence limit (**UCL₉₀**). The UCL₉₀ values for the mean
33 measured contaminant concentrations in a waste stream will be compared to the specified
34 regulatory levels in 20.4.1.200 NMAC (incorporating 40 CFR §261 Subpart C), expressed as
35 total/TCLP values, to determine if the waste stream exhibits a toxicity characteristic. A
36 comparison of total analyses and TCLP analyses is presented in Appendix C3 of the WIPP
37 RCRA Part B Permit Application (DOE, 1997), and a discussion of the UCL₉₀ is included in
38 Permit Attachment B2. If toxicity characteristic (**TC**) wastes are identified, these will be
39 compared to those determined by acceptable knowledge and TC waste numbers will be revised,
40 as warranted. Refer to Permit Attachment B4 for additional clarification regarding hazardous
41 waste 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 2003, 2005). Required QAOs are specified in Permit Attachment B3. In addition, methods and
5 supporting performance data demonstrating QAO compliance shall be ensured by the
6 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 five ways:

- 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 Acceptable knowledge is discussed in detail in Permit Attachment B4, which outlines the
20 minimum set of requirements and DQOs which shall be met by the generator/storage sites in
21 order to use acceptable knowledge. In addition, Section B-5a(3) of this permit attachment
22 describes the assessment of acceptable knowledge through the Permittees' Audit and
23 Surveillance Program.

24 **B-3c Radiography and Visual Examination**

25 Radiography is a nondestructive qualitative and quantitative technique that involves X-ray
26 scanning of waste containers to identify and verify waste container contents. Visual examination
27 (**VE**) constitutes opening a container and physically examining its contents. Generator/storage
28 sites shall perform radiography or VE of 100 percent of CH TRU mixed waste containers in
29 waste streams except for those waste streams for which the Permittees approve a Scenario 1 or
30 Scenario 2 Determination Request. No RH TRU mixed waste will be shipped to WIPP for
31 storage or disposal without documentation of radiography or VE of 100 percent of the
32 containers as specified in Permit Attachment B1. Radiography and/or visual examination will be
33 used, when necessary, to examine a waste container to verify its physical form. These
34 techniques can detect liquid wastes and containerized gases, which are prohibited for WIPP
35 disposal. The prohibition of liquids and containerized gases prevents the shipment of corrosive,
36 ignitable, or reactive wastes. Radiography and/or VE are also able to confirm that the physical

1 form of the waste matches its waste stream description (i.e. Homogeneous Solids, Soil/Gravel,
2 or Debris Waste [including uncategorized metals]). If the physical form does not match the
3 waste stream description, the waste will be designated as another waste stream and assigned
4 the preliminary hazardous waste numbers associated with that new waste stream assignment.
5 That is, if radiography and/or VE indicates that the waste does not match the waste stream
6 description arrived at by acceptable knowledge characterization, a non-conformance report will
7 be completed and the inconsistency will be resolved as specified in Permit Attachment B4. The
8 proper waste stream assignment will be determined (including preparation of a new WSPF), the
9 correct hazardous waste codes will be assigned, and the resolution will be documented. Refer
10 to Permit Attachment B4 for a discussion of acceptable knowledge and its 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. Radiographic examination protocols and QA/QC methods
23 are provided in Permit Attachment B1. Radiography and VE shall be subject to the Permittees'
24 Audit and Surveillance Program (Permit Attachment B6).

25 B-3d Characterization Techniques and Frequency for Newly Generated and Retrievably Stored 26 Waste

27 Generator/storage sites will use acceptable knowledge to delineate all TRU mixed waste
28 containers into waste streams for the purposes of grouping waste for further characterization.
29 The analyses performed may differ based on the waste stream and the physical form of the
30 waste (i.e., heterogeneous debris waste cannot be sampled for totals analyses). Both
31 retrievably stored and newly generated wastes will be delineated in this fashion, though the
32 types of acceptable knowledge used may differ. Section B-3b discusses the use of acceptable
33 knowledge, sampling, and analysis in more detail. Acceptable knowledge is discussed more
34 completely in Permit Attachment B4. Every TRU mixed waste stream will be assigned
35 hazardous waste numbers based upon acceptable knowledge, and the generator/storage sites
36 may resolve the assignment of hazardous waste numbers using headspace gas (Summary
37 Category Group S5000 only) and solid sampling and analysis (Summary Category Groups
38 S3000 and S4000 only).

39 In the CIS for each waste stream, the generator/storage site will be required to document their
40 methods, and the findings from those methods, for determining the physical form of the waste
41 and the presence or absence of prohibited items for both retrievably stored and newly
42 generated waste. Radiography and/or VE may be used to verify the physical form of retrievably
43 stored TRU mixed waste. For newly generated waste, physical form and prohibited items may

1 either be documented during packaging (using the VE technique) or verified after packaging
2 using radiography (or VE in lieu of radiography).

3 For debris waste streams that do not have an AK Sufficiency Determination approved by the
4 Permittees, containers selected in accordance with Permit Attachment B2 from those waste
5 streams must be sampled and analyzed for VOCs in the headspace gas. Likewise, a statistically
6 selected portion of homogeneous solids and soil/gravel waste streams must be sampled and
7 analyzed for RCRA-regulated total VOCs, SVOCs, and metals when those waste streams do
8 not have an AK Sufficiency Determination approved by the Permittees. Sampling and analysis
9 methods used for waste characterization are discussed in Section B-3a.

10 In the process of performing organic headspace and solid sample analyses, nontarget
11 compounds may be identified. These compounds will be reported as TICs. TICs reported in
12 25% of the samples and listed in 20.4.1.200 NMAC (incorporating 40 CFR §261) Appendix VIII,
13 will be compared with acceptable knowledge data to determine if the TIC is in a listed
14 hazardous waste in the waste stream. TICs identified through headspace gas analyses that
15 meet the Appendix VIII list criteria and the 25 percent reporting criteria for a waste stream will
16 be added to the headspace gas waste stream target list, regardless of the hazardous waste
17 listing associated with the waste stream. TICs subject to inclusion on the target analyte list that
18 are toxicity characteristic parameters shall be added to the target analyte list regardless of origin
19 because the hazardous waste designation for these numbers is not based on source. However,
20 for toxicity characteristic and non-toxic F003 constituents, the site may take concentration into
21 account when assessing whether to add a hazardous waste number. TICs reported from the
22 Totals VOC or SVOC analyses may be excluded from the target analyte list for a waste stream
23 if the TIC is a constituent in an F-listed waste whose presence is attributable to waste
24 packaging materials or radiolytic degradation from acceptable knowledge documentation. If the
25 TIC associated with a total VOC or SVOC analysis cannot be identified as a component of
26 waste packaging materials or as a product of radiolysis, the generator/storage site will add
27 these TICs to the list of hazardous constituents for the waste stream (and assign additional EPA
28 listed hazardous waste numbers, if appropriate). A permit modification will be submitted to
29 NMED for their approval to add these constituents (and waste numbers), if necessary. For
30 toxicity characteristic compounds and non-toxic F003 constituents, the generator/storage site
31 may consider waste concentration when determining whether to change a hazardous waste
32 number. Refer to Permit Attachment B3 for additional information on TIC identification.

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

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

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

1 B-3d(1) Newly Generated Waste

2 The RCRA-regulated constituents in newly generated wastes will typically be documented at the
3 time of generation based on acceptable knowledge for the waste stream. Newly generated TRU
4 mixed waste characterization typically begins with verification that processes generating the
5 waste have operated within established written procedures. Waste containers are delineated
6 into waste streams using acceptable knowledge. The Permittees will require that the
7 generator/storage sites document the methods used to delineate waste streams in the
8 acceptable knowledge record and Acceptable Knowledge Summary Report. Determination that
9 the physical form of the waste (Summary Category Group) corresponds to the physical form of
10 the assigned waste stream may be accomplished either during packaging or by performing
11 radiography as specified in Permit Attachment B1, Section B1-3 for retrievably stored waste.
12 Instead of using a video/audio tape as required with VE in lieu of radiography, the VE method
13 for newly generated waste (or repackaged retrievably stored waste) uses a second operator,
14 who is equally trained to the requirements stipulated in Permit Attachment B1, to provide
15 additional verification by reviewing the contents of the waste container to ensure correct
16 reporting. If the second operator cannot provide concurrence, corrective actions² will be taken
17 as specified in Permit Attachment B3. The subsequent waste characterization activities depend
18 on the assigned Summary Category Group, since waste within the Homogeneous Solids and
19 Soils/Gravel Summary Category Groups may be characterized using different techniques than
20 the waste in the Debris Waste Summary Category Group. The packaging configuration, type
21 and number of filters, and rigid liner vent hole presence and diameter necessary to determine
22 the appropriate drum age criteria (**DAC**) in accordance with Permit Attachment B1, Section B1-
23 1, may be documented as part of the characterization information collected during the
24 packaging of newly generated waste or repackaging of retrievably stored waste for those
25 containers of debris waste that will undergo headspace gas sampling and analysis.

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

27 When a Determination Request has not been approved by the Permittees, sampling and
28 analysis of newly generated homogeneous solid and soil/gravel waste streams shall be
29 conducted in accordance with the requirements specified in Permit Attachment B1, Section B1-
30 2. The number of newly generated homogeneous solid and soil/gravel waste containers to be
31 sampled will be determined using the procedure specified in Section B2-1, wherein a
32 statistically selected portion of the waste will be sampled.

33 B-3d(2) Retrievably Stored Waste

34 All retrievably stored waste containers will first be delineated into waste streams using
35 acceptable knowledge. The Permittees will require that the generator/storage sites document
36 the methods used to delineate waste streams in the acceptable knowledge record and
37 Acceptable Knowledge Summary Report. Retrievably stored waste containers may be
38 examined using radiography or VE to determine the physical waste form (Summary Category

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

1 Group), the absence of prohibited items, and additional waste characterization techniques that
2 may be used based on the Summary Category Groups (i.e., S3000, S4000, S5000).

3 The headspace gas sampling method provided in Permit Attachment B1 will be used, when
4 necessary, to resolve the assignment of EPA hazardous waste numbers to debris waste
5 streams, as specified in Permit Attachment B4.

6 A statistically selected portion of retrievably stored homogeneous solids and soil/gravel wastes
7 will be sampled and analyzed for total VOCs, SVOCs, and metals, when necessary. The sample
8 location selection method is described in Permit Attachment B2. The sampling methods for
9 these wastes are provided in Permit Attachment B1.

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

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

23 B-4 Data Verification and Quality Assurance

24 The Permittees will ensure that applicable waste characterization processes performed by
25 generator/storage sites sending TRU mixed waste to the WIPP for disposal meets WAP
26 requirements through data validation, usability and reporting controls. Verification occurs at
27 three levels: 1) the data generation level, 2) the project level, and 3) the Permittee level. The
28 validation and verification process and requirements at each level are described in Permit
29 Attachment B3, Section B3-10. The validation and verification process at the Permittee Level is
30 also described in Section B-5.

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

32 B-4a(1) Data Quality Objectives

33 The waste characterization data obtained through WAP implementation will be used to ensure
34 that the Permittees meet regulatory requirements with regard to both regulatory compliance and
35 to ensure that all TRU mixed wastes are properly managed during the Disposal Phase. To
36 satisfy the RCRA regulatory compliance requirements, the following DQOs are established by
37 this WAP:
38

- 1 • Acceptable Knowledge
 - 2 – To delineate TRU mixed waste streams.
 - 3 – To assess whether TRU mixed wastes comply with the applicable
 - 4 requirements of the TSDF-WAC.
 - 5 – To assess whether TRU mixed wastes exhibit a hazardous characteristic
 - 6 (20.4.1.200 NMAC, incorporating 40 CFR §261 Subpart C).
 - 7 – To assess whether TRU mixed wastes are listed (20.4.1.200 NMAC,
 - 8 incorporating 40 CFR §261, Subpart D).
 - 9 – To estimate waste material parameter weights.
- 10 • Headspace-Gas Sampling and Analysis
 - 11 – To identify VOCs and quantify the concentrations of VOC constituents in
 - 12 waste containers to resolve the assignment of EPA hazardous waste
 - 13 numbers
- 14 • Homogeneous Waste Sampling and Analysis
 - 15 – To compare UCL_{90} values for the mean measured contaminant
 - 16 concentrations in a waste stream with specified toxicity characteristic
 - 17 levels in 20.4.1.200 NMAC (incorporating 40 CFR §261), to determine if
 - 18 the waste is hazardous, and to resolve the assignment of EPA hazardous
 - 19 waste numbers.
- 20 • Radiography
 - 21 – To determine the physical waste form, the absence of prohibited items,
 - 22 and additional waste characterization techniques that may be used based
 - 23 on the Summary Category Groups (i.e., S3000, S4000, S5000).
- 24 • Visual Examination
 - 25 – To determine the physical waste form, the absence of prohibited items,
 - 26 and additional waste characterization techniques that may be used based
 - 27 on the Summary Category Groups (i.e., S3000, S4000, S5000).

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

1 B-4a(2) Quality Assurance Objectives

2 The generator/storage sites or the Permittee approved laboratories, as applicable, shall
3 demonstrate compliance with each QAO associated with the various characterization methods
4 as presented in Permit Attachment B3. Generator/Storage Site Project Managers or the
5 Permittee approved laboratories, as applicable, are further required to perform a reconciliation
6 of the data with the DQOs established in this WAP. The Generator/Storage Site Project
7 Manager or the Permittee approved laboratories, as applicable, shall conclude that all of the
8 DQOs have been met for the characterization of the waste stream prior to submitting a WSPF to
9 the Permittees for approval (Permit Attachment B3). The following QAO elements shall be
10 considered for each technique, as a minimum:

11 • Precision

- 12 – Precision is a measure of the mutual agreement among multiple
13 measurements.

14 • Accuracy

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

17 • Completeness

- 18 – Completeness is a measure of the amount of valid data obtained from a
19 method compared to the total amount of data obtained that is expressed
20 as a percentage.

21 • Comparability

- 22 – Comparability is the degree to which one data set can be compared to
23 another.

24 • Representativeness

- 25 – Representativeness expresses the degree to which data represent
26 characteristics of a population.

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

30 B-4a(3) Sample Control

31 The generator/storage sites and Permittee approved laboratories, as applicable, will implement
32 a sample handling and control program that will include the maintenance of field documentation
33 records, proper labeling, and a chain of custody (**COC**) record. The generator/storage site and
34 Permittee approved laboratories, as applicable, Quality Assurance Project Plan (**QAPjP**) or

1 procedures referenced in the QAPjP will document this program and include COC forms to
2 control the sample from the point of origin to the final analysis result reporting. The Permittees
3 will review and approve the QAPjP, including their determination that the sample control
4 program is adequate. The approved QAPjP will be provided to NMED prior to shipment of TRU
5 mixed waste and before the generator/storage site audit, as specified in Permit Attachment B5.
6 Details of this sample control program are provided in Permit Attachment B1 and are
7 summarized below to include:

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

15 B-4a(4) Data Generation

16 BDRs, in a format approved by the Permittees, will be used by each generator/storage site and
17 Permittee approved laboratories, as applicable, for reporting waste characterization data. This
18 format will be included in the generator/storage site and Permittee approved laboratories, as
19 applicable, QAPjP, controlled electronic databases, or procedures referenced in the QAPjP
20 (Permit Attachment B5) and will include all of the elements required by this WAP for BDR
21 (Permit Attachment B3).

22 The Permittees shall perform audits of the generator/storage site waste characterization
23 programs, as implemented by the generator/storage site QAPjP, to verify compliance with the
24 WAP and the DQOs in this WAP (See Permit Attachment B6 for a discussion of the content of
25 the audit program). The primary functions of these audits are to review generator/storage sites'
26 adherence to the requirements of this WAP and ensure adherence to the WAP characterization
27 program. The Permittees shall provide the results of each audit to NMED. If audit results
28 indicate that a generator/storage site is not in compliance with the requirements of this WAP,
29 the Permittees will take appropriate action as specified in Permit Attachment B6.

30 The Permittees shall perform audits of the Permittee approved laboratory's programs, as
31 implemented by the laboratory's QAPjP (See Permit Attachment B6 for a discussion of the
32 content of the audit program). The primary functions of these audits are to review the Permittee
33 approved laboratory's adherence to the requirements of this WAP. The Permittees shall provide
34 the results of each audit to NMED. If audit results indicate that a Permittee approved laboratory
35 is not in compliance with the requirements of this WAP, the Permittees will take appropriate
36 action as specified in Permit Attachment B6.

37 The Permittees shall further require all Permittee approved laboratories analyzing WIPP waste
38 samples for the generator/storage sites to have established, documented QA/QC programs.
39 The Permittees annually evaluate these laboratories and their QA/QC programs as part of their

1 participation in the Permittees' PDP laboratory performance program. The Permittees' audits
2 cover the requirements of the lab's QA/QC program, as well as compliance with this WAP.
3 Continued compliance with these parameters will be verified by ongoing audits by the
4 Permittees at the generator/storage sites and these laboratories as specified in Permit
5 Attachment B6. The Permittees' audits of the generator/storage sites will verify that the
6 laboratories analyzing the sites' waste have been properly audited by the generator/storage
7 sites. The laboratory's QA/QC program shall include the following:

- 8 • Facility organization
- 9 • A list of equipment/instrumentation
- 10 • Operating procedures
- 11 • Laboratory QA/QC procedures
- 12 • Quality assurance review
- 13 • Laboratory records management

14 B-4a(5) Data Verification

15 BDRs will document the testing, sampling, and analytical results from the required
16 characterization activities, and document required QA/QC activities. Data validation and
17 verification at both the data-generation level and the project level will be performed as required
18 by this Permit before the required data are transmitted to the Permittees (Permit Attachment
19 B3). NMED may request, through the Permittees, copies of any BDR, and/or the raw data
20 validated by the generator/storage sites, to check the Permittees' audit of the validation process.

21 B-4a(6) Data Transmittal

22 BDRs will include the information required by Section B3-10 and will be transmitted by hard
23 copy or electronically (provided a hard copy is available on demand) from the data generation
24 level to the project level.

25 The generator/storage site will transmit waste container information electronically via the WIPP
26 Waste Information System (**WWIS**). Data will be entered into the WWIS in the exact format
27 required by the database. Refer to Section B-5a(1) for WWIS reporting requirements and the
28 *WIPP Waste Information System User's Manual for Use by Shippers/Generators* (DOE, 2001)
29 for the WWIS data fields and format requirements.

30 Once a waste stream is characterized, the Site Project Manager will also submit to the
31 Permittees a WSPF (Figure B-1) accompanied by the CIS for that waste stream which includes
32 reconciliation with DQOs (Sections B3-12b(1) and B3-12b(2)). The WSPF, the CIS, and
33 information from the WWIS will be used as the basis for acceptance of waste characterization
34 information on TRU mixed wastes to be disposed of at the WIPP.

1 B-4a(7) Records Management

2 Records related to waste characterization activities performed by the generator/storage sites
3 will be maintained in the testing, sampling, or analytical facility files or generator/storage site
4 project files, or at the WIPP Records Archive facility. Permittee approved laboratories will
5 forward testing, sampling, and analytical records along with BDRs, to the generator/storage site
6 project office for inclusion in the generator/storage site's project files and to the Permittees for
7 inclusion in the WIPP facility operating record. Raw data obtained by testing, sampling, and
8 analyzing TRU mixed waste in support of this WAP will be identifiable, legible, and provide
9 documentary evidence of quality. TRU mixed waste characterization records submitted to the
10 Permittees shall be maintained in the WIPP facility operating record and be available for
11 inspection by NMED.

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

19 Records that are designated as Lifetime Records shall be maintained for the life of the waste
20 characterization program at a participating generator/storage site plus six years or transferred
21 for permanent archival storage to the WIPP Records Archive facility.

22 Waste characterization records designated as Non-Permanent Records shall be maintained for
23 ten years from the date of (record) generation at the participating generator/storage site or at
24 the WIPP Records Archive facility and then dispositioned according to their approved RIDS. If a
25 generator/storage site ceases to operate, all records shall be transferred before closeout to the
26 Permittees for management at the WIPP Records Archive facility. Table B-6 is a listing of
27 records designated as Lifetime Records and Non-Permanent Records. Classified information
28 will not be transferred to WIPP. Notations will be provided to the Permittees indicating the
29 absence of classified information. The approved generator/storage site RIDS will identify
30 appropriate disposition of classified information. Nothing in this Permit is intended to, nor should
31 it be interpreted to, require the disclosure of any U.S. Department of Energy classified
32 information to persons without appropriate clearance to view such information.

33 B-5 Permittee Level Waste Screening and Verification of TRU Mixed Waste

34 Permittee waste screening is a two-phased process. Phase I will occur prior to configuring
35 shipments of TRU mixed waste. Phase II will occur after configuration of shipments of TRU
36 mixed waste but before it is disposed at the WIPP facility. Figure B-3 presents Phase I and a
37 portion of Phase II of the TRU mixed waste screening process. Permit Attachment B7 presents
38 the Permittees' TRU mixed waste confirmation portion of Phase II activities.

1 B-5a Phase I Waste Stream Screening and Verification

2 The first phase of the waste screening and verification process will occur before TRU mixed
3 waste is shipped to the WIPP facility. Before the Permittees begin the process of accepting TRU
4 mixed waste from a generator/storage site, an initial audit of that generator/storage site will be
5 conducted as part of the Permittees' Audit and Surveillance Program (Permit Attachment B6).
6 The RCRA portion of the generator/storage site audit program will provide on-site verification of
7 characterization procedures; BDR preparation; and recordkeeping to ensure that all applicable
8 provisions of the WAP requirements are met. Another portion of the Phase I verification is the
9 WSPF approval process. At the WIPP facility, this process includes verification that all of the
10 required elements of the WSPF and the CIS are present (Permit Attachment B3) and that the
11 waste characterization information meet acceptance criteria required for compliance with the
12 WAP (Section B3-12b(1)).

13 A generator/storage site must first prepare a QAPjP, which includes applicable WAP
14 requirements, and submit it to the Permittees for review and approval (Permit Attachment B5).
15 Once approved, a copy of the QAPjP is provided to NMED for examination. The
16 generator/storage site will implement the specific parameters of the QAPjP after it is approved.
17 An initial audit will be performed after QAPjP implementation and prior to the generator/storage
18 site being certified for shipment of waste to WIPP. Additional audits, focusing on the results of
19 waste characterization, will be performed at least annually. The Permittees have the right to
20 conduct unannounced audits and to examine any records that are related to the scope of the
21 audit. See Section B-5a(3) and Permit Attachment B6 for further information regarding audits.

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

43 Audits of generator/storage sites will be conducted as part of the Permittees' Audit and
44 Surveillance Program (Permit Attachment B6). The RCRA portion of the generator/storage site

1 audit program will provide on-site verification of waste characterization procedures; BDR
2 preparation; and record keeping to ensure that all applicable provisions of the WAP
3 requirements are met. As part of the waste characterization data submittal, the
4 generator/storage site will also transmit the data on a container basis via the WWIS. This data
5 submittal can occur at any time as the data are being collected, but will be complete for each
6 container prior to shipment of that container. The WWIS will conduct internal edit/limit checks as
7 the data are entered, and the data will be available to the Permittees as supporting information
8 for WSPF review. NMED will have read-only access to the WWIS as necessary to determine
9 compliance with the WAP. The initial WSPF check performed by the Permittees will include
10 WWIS data submitted by the generator/storage site for each waste container and the CIS. The
11 Permittees will compare ongoing sampling/analysis characterization data obtained and
12 submitted via the WWIS to the approved WSPF. If this comparison shows that containers have
13 hazardous wastes not reported on the WSPF, or a different Waste Matrix Code applies, the data
14 are rejected and the waste containers are not accepted for shipment until a new or revised
15 WSPF is submitted to and approved by the Permittees.

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

24 B-5a(1) WWIS Description

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

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

41 The Permittees will use the WWIS to verify that all of the supplied data meet the edit and limit
42 checks prior to the shipment of any TRU mixed waste to WIPP. The WWIS automatically will
43 notify the generator/storage site if any of the supplied data fails to meet the requirements of the

1 edit and limit checks via an appropriate error message. The generator/storage site will be
2 required to correct the discrepancy with the waste or the waste data and re-transmit the
3 corrected data prior to acceptance of the data by the WWIS. The Permittees will review data
4 reported for each container of each shipment prior to providing notification to the shipping
5 generator/storage site that the shipment is acceptable. Read-only access to the WWIS will be
6 provided to NMED. Table B-7 contains a listing of the data fields contained in the WWIS that are
7 required as part of this Permit.

8 The WWIS will generate the following:

9 • Waste Emplacement Report

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

18 • Shipment Summary Report

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

24 • Waste Container Data Report

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

30 • Reports of Change Log

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

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-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 number(s) will be examined. If the WSPF is inaccurate, efforts will be
19 made to resolve discrepancies by contacting the generator/storage site in order for the waste
20 stream to be eligible for shipment to the WIPP facility. If discrepancies in the waste stream are
21 detected at the generator/storage site, the generator/storage site will implement a non-
22 conformance program to identify, document, and report discrepancies (Permit Attachment B3).

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

26 The EPA hazardous waste numbers for the wastes that appear on the Waste Stream Profile
27 Form will be compared to those in Table B-9 to ensure that only approved wastes are accepted
28 for management, storage, or disposal at WIPP. Some of the waste may also be identified by
29 unique state hazardous waste codes or numbers. These wastes are acceptable at WIPP as
30 long as the TSDF-WAC are met. The CIS will be reviewed by the Permittees to verify that the
31 waste has been classified correctly with respect to the assigned EPA hazardous waste
32 numbers. Any analytical method used will be compared to those listed in Tables B-2, B-3, and
33 B-4 to ensure that only approved analytical methods were used for analysis of the waste. The
34 Permittees will verify that the applicable requirements of the TSDF-WAC have been met by the
35 generator/storage site.

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

39 The Permittees will also verify that three different types of data specified below are available for
40 every container holding TRU mixed waste before that waste is managed, stored, or disposed at
41 WIPP: 1) an assignment of the waste stream's waste description (by Waste Matrix Codes) and

1 Waste Matrix Code Group; 2) a determination of ignitability, reactivity, and corrosivity; and 3) a
2 determination of compatibility. The verification of waste stream description will be performed by
3 reviewing the WWIS for consistency in the waste stream description and WSPF. The CIS will
4 indicate if the waste has been checked for the characteristics of ignitability, corrosivity, and
5 reactivity. The final verification of waste compatibility will be performed using Appendix C1 of the
6 WIPP RCRA Part B Permit Application (DOE, 1997), the compatibility study.

7 Any container with unresolved discrepancies associated with hazardous waste characterization
8 will not be managed, stored, or disposed at the WIPP facility until the discrepancies are
9 resolved. If the discrepancies cannot be resolved, the Permittees will revoke the approval status
10 of the waste stream, suspend shipments of the waste stream, and notify NMED. Waste stream
11 approval will not be reinstated until the generator/storage site demonstrates all corrective
12 actions have been implemented and the generator/storage site waste characterization program
13 is reassessed by the Permittees.

14 B-5a(3) Permittees' Audit and Surveillance Program

15 An important part of the Permittees' verification process is the Permittees' Audit and
16 Surveillance Program. The focus of this audit program is compliance with this WAP and the
17 Permit. This audit program addresses all AK implementation and waste sampling and analysis
18 activities, from waste stream classification assignment through waste container certification, and
19 ensures compliance with SOPs and the WAP. Audits will ensure that containers and their
20 associated documentation are adequately tracked throughout the waste handling process.
21 Operator qualifications will be verified, and implementation of QA/QC procedures will be
22 surveyed. A final report that includes generator/storage site or Permittee approved laboratory
23 audit results and applicable WAP-related corrective action report (**CAR**) resolution will be
24 provided to NMED for approval, and will be kept in the WIPP facility operating record until
25 closure of the WIPP facility.

26 An initial audit will be performed at each generator/storage site performing waste
27 characterization activities prior to the formal acceptance of the WSPFs and/or any waste
28 characterization data supplied by the generator/storage sites. Audits will be performed at least
29 annually thereafter, including the possibility of unannounced audits (i.e., not a regularly
30 scheduled audit). These audits will allow NMED to verify that the Permittees have implemented
31 the WAP and that generator/storage sites have implemented a QA program for the
32 characterization of waste and meet applicable WAP requirements. The Permittees will also audit
33 annually the Permittee approved laboratories performing waste sampling and/or analysis. The
34 accuracy of physical waste description and waste stream assignment provided by the
35 generator/storage site will be verified by review of the radiography results, and visual
36 examination of data records and radiography images (as necessary) during audits conducted by
37 the Permittees. More detail on this audit process is provided in Permit Attachment B6.

38 B-5b Phase II Waste Shipment Screening and Verification

39 As presented in Figure B-3, Phase II of the waste shipment screening and verification process
40 begins with confirmation of the waste as required by Permit Attachment B7 after waste
41 shipments are configured. After the waste shipment has arrived, the Permittees will screen the
42 shipments to determine the completeness and accuracy of the EPA Hazardous Waste Manifest

1 and the land disposal restriction notice completeness. The Permittees will verify there are no
2 waste shipment irregularities and the waste containers are in good condition. Only those waste
3 containers that are from shipments that have been confirmed as required by Permit Attachment
4 B7 and that pass all Phase II waste screening and verification determinations will be emplaced
5 at WIPP. For each container shipped, the Permittees shall ensure that the generator/storage
6 sites provide the following information:

7 Hazardous Waste Manifest Information:

- 8 • Generator/storage site name and EPA ID
- 9 • Generator/storage site contact name and phone number
- 10 • Quantity of waste
- 11 • List of up to six state and/or federal hazardous waste numbers in each
12 line item
- 13 • Listing of all shipping container IDs (Shipping Package serial number)
- 14 • Signature of authorized generator representative

15 Specific Waste Container information:

- 16 • Waste Stream Identification Number
- 17 • List of Hazardous Waste Numbers per Container
- 18 • Certification Data
- 19 • Shipping Data (Assembly numbers, ship date, shipping category, etc.)

20 This information shall also be supplied electronically to the WWIS. The container-specific
21 information will be supplied electronically as described in Section B-5a(1), and shall be supplied
22 prior to the Permittees' management, storage, or disposal of the waste.

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

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

28 Upon receipt of a TRU mixed waste shipment, the Permittees will make a determination of EPA
29 Uniform Hazardous Waste Manifest completeness and sign the manifest to allow the driver to
30 depart. For CH TRU mixed waste, the Permittees will then make a determination of waste
31 shipment completeness by checking the unique, bar-coded identification number found on each

1 container holding TRU mixed waste against the WWIS database after opening the Shipping
2 Package.

3 The WWIS links the bar-coded identification numbers of all containers in a specific waste
4 shipment to the waste assembly (for 7-packs, 4-packs, 3-packs and 5-drum carriages) and to
5 the shipment identification number, which is also written on the EPA Hazardous Waste
6 Manifest.

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

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

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

- 20 • Package inner containment vessel or shipping cask closure date
- 21 • Package (container or canister) receipt date
- 22 • Overpack identification number (if appropriate)
- 23 • Package (container or canister) emplacement date
- 24 • Package (container or canister) emplacement location

25 Manifest discrepancies will be identified during manifest examination and container bar-code
26 WWIS data comparison. A manifest discrepancy is a difference between the quantity or type of
27 hazardous waste designated on the manifest and the quantity or type of hazardous waste the
28 WIPP facility actually receives. The generator/storage site technical contact (as listed on the
29 manifest) will be contacted to resolve the discrepancy. If the discrepancy is identified prior to the
30 containers being removed from the package or shipping cask, the waste will be retained in the
31 parking area. If the discrepancy is identified after the waste containers are removed from the
32 package or cask, the waste will be retained in the Waste Handling Building (**WHB**) until the
33 discrepancy is resolved. Errors on the manifest can be corrected by the WIPP facility with a
34 verbal (followed by a mandatory written) concurrence by the generator/storage site technical
35 contact. All discrepancies that are unresolved within fifteen (15) days of receiving the waste will
36 be immediately reported to NMED in writing. Notifications to NMED will consist of a letter
37 describing the discrepancies, discrepancy resolution, and a copy of the manifest. If the manifest
38 discrepancies have not been resolved within thirty (30) days of waste receipt, the shipment will
39 be returned to the generator/storage facility. If it becomes necessary to return waste containers
40 to the generator/storage site, a new EPA Uniform Hazardous Waste Manifest may be prepared
41 by the Permittees.

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

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

7 B-5b(2) Examination of the Land Disposal Restriction (LDR) Notice

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

16 Land Disposal Restriction Notice Information:

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

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

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

30 B-5b(3) Verification

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

- 34 ● Whether the number and type of containers holding TRU mixed waste match the
35 information in the WWIS

- Whether the containers are in good condition

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

B-6 Permittees' Waste Shipment Screening QA/QC

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

B-7 Records Management and Reporting

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

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

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

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

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

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

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

23 B-7a General Requirements

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

32 B-7b Records Storage

- 33 • Active records shall be stored when not in use

- 1 • Quality records shall be kept in a one-hour (certified) fire-rated container or a
2 copy of a record shall be stored separately (sufficiently remote from the original)
3 in order to prevent destruction of both copies as a result of a single event such as
4 fire or natural disaster
- 5 • Unauthorized access to the records is controlled by locking the storage container
6 or controlling personnel access to the storage area

7 B-8 Reporting

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

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

10 U.S. Department of Energy (DOE), 2005, "Performance Demonstration Program Plans for
11 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 Methylene chloride 1,1,1,2-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
<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)

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

Parameter	Techniques and Procedure
<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</u> ^g 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</u> ^g 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)

20 ^a Permit Attachment B
 21 ^b Required only for homogeneous solids and soil/gravel waste from Savannah River Site to resolve the assignment of
 22 EPA hazardous waste numbers.
 23 ^c Required only for homogeneous solids and soil/gravel waste from Oak Ridge National Laboratory and Savannah
 24 River Site to resolve the assignment of EPA hazardous waste numbers.
 25 ^d Can also be analyzed as a semi-volatile organic compound.
 26 ^e Can also be analyzed as a volatile organic compound.
 27 ^f Required only to resolve the assignment of EPA hazardous waste numbers to debris waste streams.
 28 ^g Required only to resolve the assignment of EPA hazardous waste numbers to homogeneous solid and soil/gravel
 29 waste streams.

TABLE B-2
HEADSPACE TARGET ANALYTE LIST AND METHODS ^b

Parameter	EPA Specified Analytical Method
Benzene Bromoform Carbon tetrachloride Chlorobenzene Chloroform 1,1-Dichloroethane 1,2-Dichloroethane 1,1-Dichloroethylene (cis)-1,2-Dichloroethylene (trans)-1,2-Dichloroethylene Ethyl benzene Ethyl ether Methylene chloride 1,1,2,2-Tetrachloroethane Tetrachloroethylene Toluene 1,1,1-Trichloroethane Trichloroethylene 1,1,2-Trichloro-1,2,2-trifluoroethane Xylenes	EPA: Modified TO-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 debris waste when required to resolve the assignment of EPA hazardous waste numbers.

TABLE B-3
REQUIRED ORGANIC ANALYSES AND TEST METHODS
ORGANIZED BY ORGANIC ANALYTICAL GROUPS ^e

Organic Analytical Group	Required Organic Analyses	EPA Specified Analytical Method ^{a,d}
Nonhalogenated Volatile Organic Compounds (VOCs)	Acetone Benzene n-Butanol Carbon disulfide Ethyl benzene Ethyl ether Formaldehyde Hydrazine ^b Isobutanol Methanol Methyl ethyl ketone Toluene Xylenes	8015 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-3 (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-4
 SUMMARY OF SAMPLE PREPARATION AND
 ANALYTICAL METHODS FOR METALS**

Parameters	EPA-Specified Analytical Methods ^{a,b,c}
Sample Preparation	3051, or equivalent, as appropriate for analytical method
Total Antimony	6010, 6020, 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-5
 SUMMARY OF PARAMETERS, CHARACTERIZATION METHODS, AND RATIONALE
 FOR TRANSURANIC MIXED WASTE (STORED WASTE)**

Waste Matrix Code Summary Categories	Waste Matrix Code Groups	Characterization Parameter	Method	Rationale
S3000-Homogeneous Solids	<ul style="list-style-type: none"> • Solidified inorganics • Salt waste • Solidified organics 	Physical waste form	Acceptable knowledge, radiography, and/or visual examination	<ul style="list-style-type: none"> • Determine waste matrix • Demonstrate compliance with waste acceptance criteria (e.g., no free liquids, no incompatible wastes, no compressed gases)
		Hazardous constituents <ul style="list-style-type: none"> • Listed • Characteristic 	Acceptable knowledge or statistical sampling ^a (see Tables B-3 and B-4)	<ul style="list-style-type: none"> • Determine characteristic metals and organics • Resolve the assignment of EPA hazardous waste numbers
S4000-Soil/Gravel	<ul style="list-style-type: none"> • Contaminated soil/debris 	Physical waste form	Acceptable knowledge, radiography, and/or visual examination	<ul style="list-style-type: none"> • Determine waste matrix • Demonstrate compliance with waste acceptance (e.g., no free liquids, no incompatible wastes, no compressed gases)
		Hazardous constituents <ul style="list-style-type: none"> • Characteristic • Listed 	Statistical gas sampling and analysis ^a (see Table B-2)	<ul style="list-style-type: none"> • Resolve the assignment of EPA hazardous waste numbers
		Hazardous constituents <ul style="list-style-type: none"> • Characteristic 	Acceptable knowledge	<ul style="list-style-type: none"> • Determine characteristic metals and organics
S5000-Debris Waste	<ul style="list-style-type: none"> • Uncategorized metal (metal waste other than lead/cadmium) • Lead/cadmium waste • Inorganic nonmetal waste • Combustible waste • Graphite waste • Heterogeneous waste • Composite filter waste 	Physical waste form	Acceptable knowledge, radiography, and/or visual examination	<ul style="list-style-type: none"> • Determine waste matrix • Demonstrate compliance with waste acceptance (e.g., no free liquids, no incompatible wastes, no compressed gases)
		Hazardous constituents <ul style="list-style-type: none"> • Characteristic • Listed 	Statistical gas sampling and analysis ^a (see Table B-2)	<ul style="list-style-type: none"> • Resolve the assignment of EPA hazardous waste numbers
		Hazardous constituents <ul style="list-style-type: none"> • Characteristic 	Acceptable knowledge	<ul style="list-style-type: none"> • Determine characteristic metals and organics

TABLE B-5 (CONTINUED)
SUMMARY OF PARAMETERS, CHARACTERIZATION METHODS, AND RATIONALE
FOR TRANSURANIC MIXED WASTE (NEWLY GENERATED WASTE)

Waste Matrix Code Summary Categories	Waste Matrix Code Groups	Characterization Parameter	Method	Rationale
S3000-Homogeneous Solids	<ul style="list-style-type: none"> Solidified inorganics Salt waste Solidified organics 	Physical waste form	Acceptable knowledge, radiography, and/or visual examination	<ul style="list-style-type: none"> Determine waste matrix Demonstrate compliance with waste acceptance criteria (e.g., no free liquids, no incompatible wastes, no compressed gases)
		Hazardous constituents <ul style="list-style-type: none"> Listed Characteristic 	Statistical sampling ^a (see Tables B-3 and B-4)	<ul style="list-style-type: none"> Determine characteristic metals and organics Resolve the assignment of EPA hazardous waste numbers
S4000-Soil/Gravel	<ul style="list-style-type: none"> Contaminated soil/debris 	Physical waste form	Acceptable knowledge, radiography, and/or visual examination	<ul style="list-style-type: none"> Determine waste matrix Demonstrate compliance with waste acceptance (e.g., no free liquids, no incompatible wastes, no compressed gases)
		Hazardous constituents <ul style="list-style-type: none"> Characteristic Listed 	Statistical gas sampling and analysis ^a (see Table B-2)	<ul style="list-style-type: none"> Resolve the assignment of EPA hazardous waste numbers
		Hazardous constituents <ul style="list-style-type: none"> Characteristic 	Acceptable knowledge	<ul style="list-style-type: none"> Determine characteristic metals and organics
S5000-Debris Waste	<ul style="list-style-type: none"> Uncategorized metal (metal waste other than lead/cadmium) Lead/cadmium waste Inorganic nonmetal waste Combustible waste Graphite waste Heterogeneous waste Composite filter waste 	Physical waste form	Acceptable knowledge, radiography, and/or visual examination	<ul style="list-style-type: none"> Determine waste matrix Demonstrate compliance with waste acceptance (e.g., no free liquids, no incompatible wastes, no compressed gases)
		Hazardous constituents <ul style="list-style-type: none"> Characteristic Listed 	Statistical gas sampling and analysis ^a (see Table B-2)	<ul style="list-style-type: none"> Resolve the assignment of EPA hazardous waste numbers
		Hazardous constituents <ul style="list-style-type: none"> Characteristic 	Acceptable knowledge	<ul style="list-style-type: none"> Determine characteristic metals and organics

^a Applies to waste streams that require sampling.

1 **TABLE B-6**
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 • Waste Stream Profile Form and Characterization Information Summary

13 Non-Permanent Records

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

TABLE B-7
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-7
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-8
WASTE TANKS SUBJECT TO EXCLUSION

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

TABLE B-9
LISTING OF PERMITTED HAZARDOUS WASTE NUMBERS

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

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

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FIGURES

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WASTE STREAM PROFILE FORM

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

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

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

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

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

Required Program Information

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

Required Waste Stream Information

- Area(s) and building(s) from which waste stream was generated: _____
 - Waste stream volume and time period of generation: _____
 - Waste generating process description for each building: _____
 - Waste process flow diagrams: _____
-
- Material inputs or other information identifying chemical/radionuclide content and physical waste form: _____
-
- Waste material parameter estimates per unit of waste: _____
 - Which Defense Activity generated the waste: (check one)
 - Weapons activities including defense inertial confinement fusion
 - Naval reactors development
 - Verification and control technology
 - Defense research and development
 - Defense nuclear waste and material by products management
 - Defense nuclear material production
 - Defense nuclear waste and materials security and safeguards and security investigations

WASTE STREAM PROFILE FORM

Supplemental Documentation

Process design documents: _____
Standard operating procedures: _____
Safety Analysis Reports: _____
Waste packaging logs: _____
Test plans/research project reports: _____
Site data bases: _____
Information from site personnel: _____
Standard industry documents: _____
Previous analytical data: _____
Material safety data sheets: _____
Sampling and analysis data from comparable/surrogate waste: _____
Laboratory notebooks: _____

Confirmation Information⁽²⁾

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

Radiography: _____

Visual Examination: _____

Waste Stream Profile Form Certification

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

Signature of Site Project Manager

Printed Name and Title

Date

NOTE:

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

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

PERMIT ATTACHMENT B
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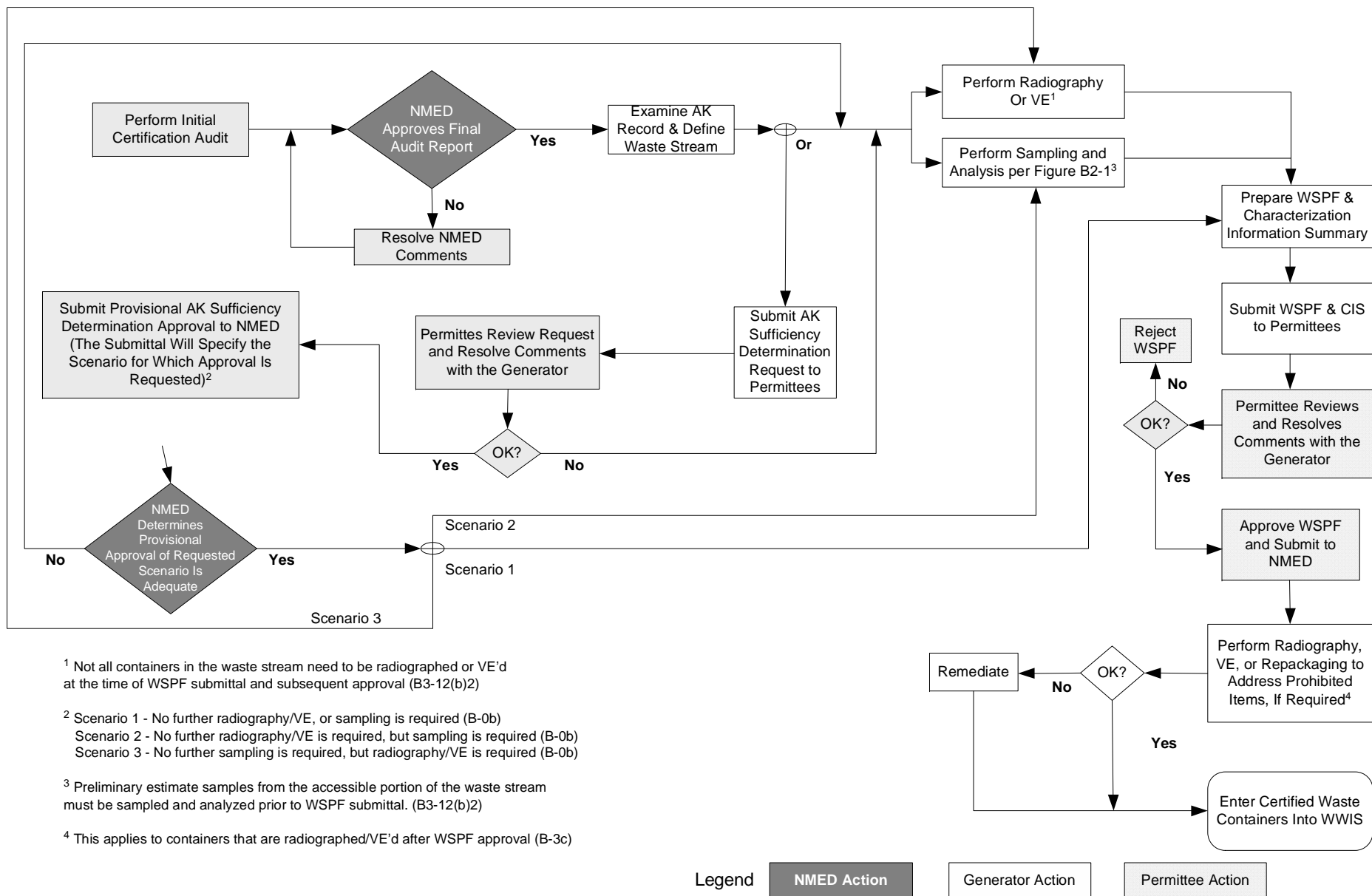


Figure B-2
 WASTE CHARACTERIZATION PROCESS
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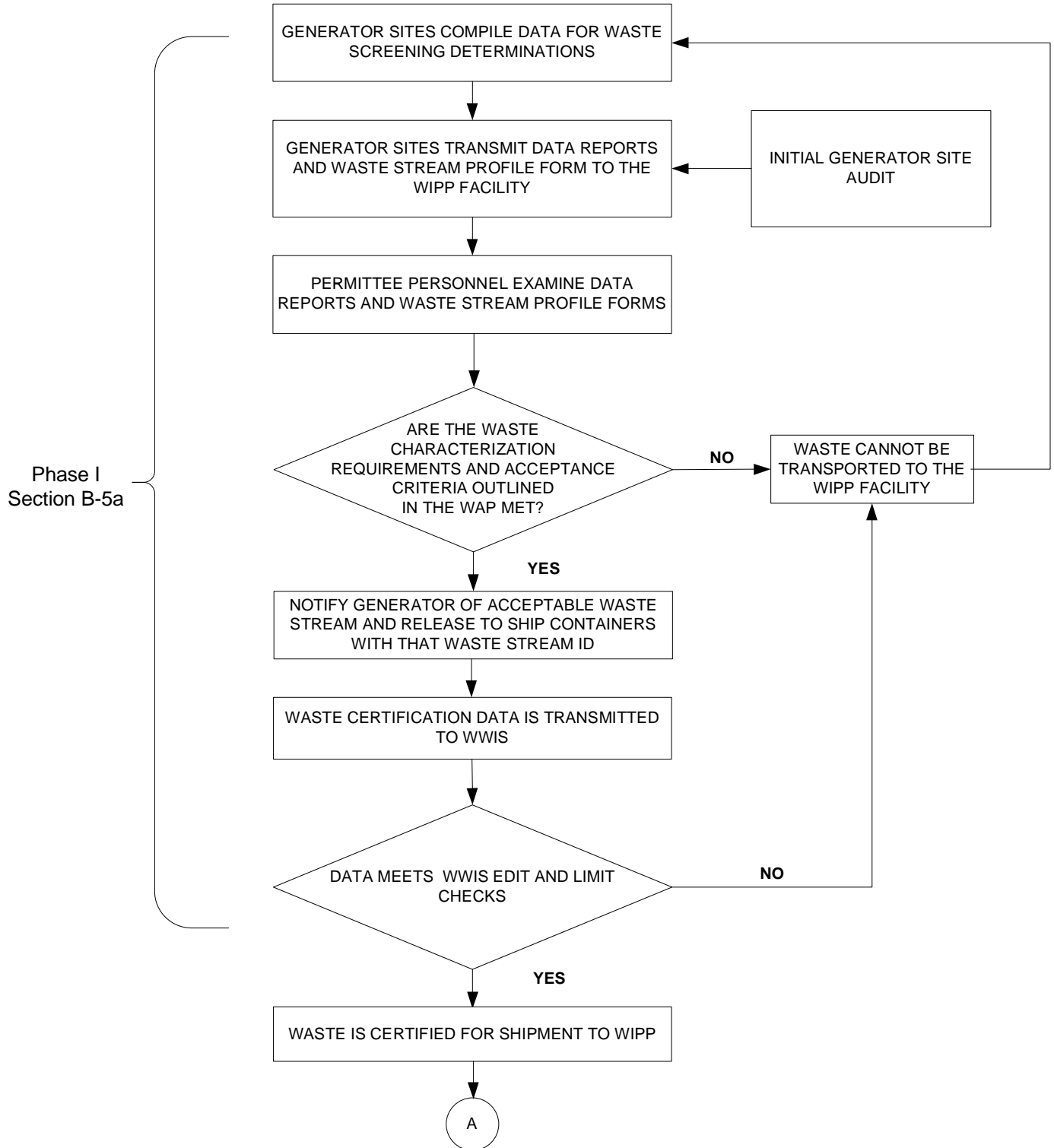


Figure B-3
TRU Mixed Waste Screening and Verification Flow Diagram
PERMIT ATTACHMENT B
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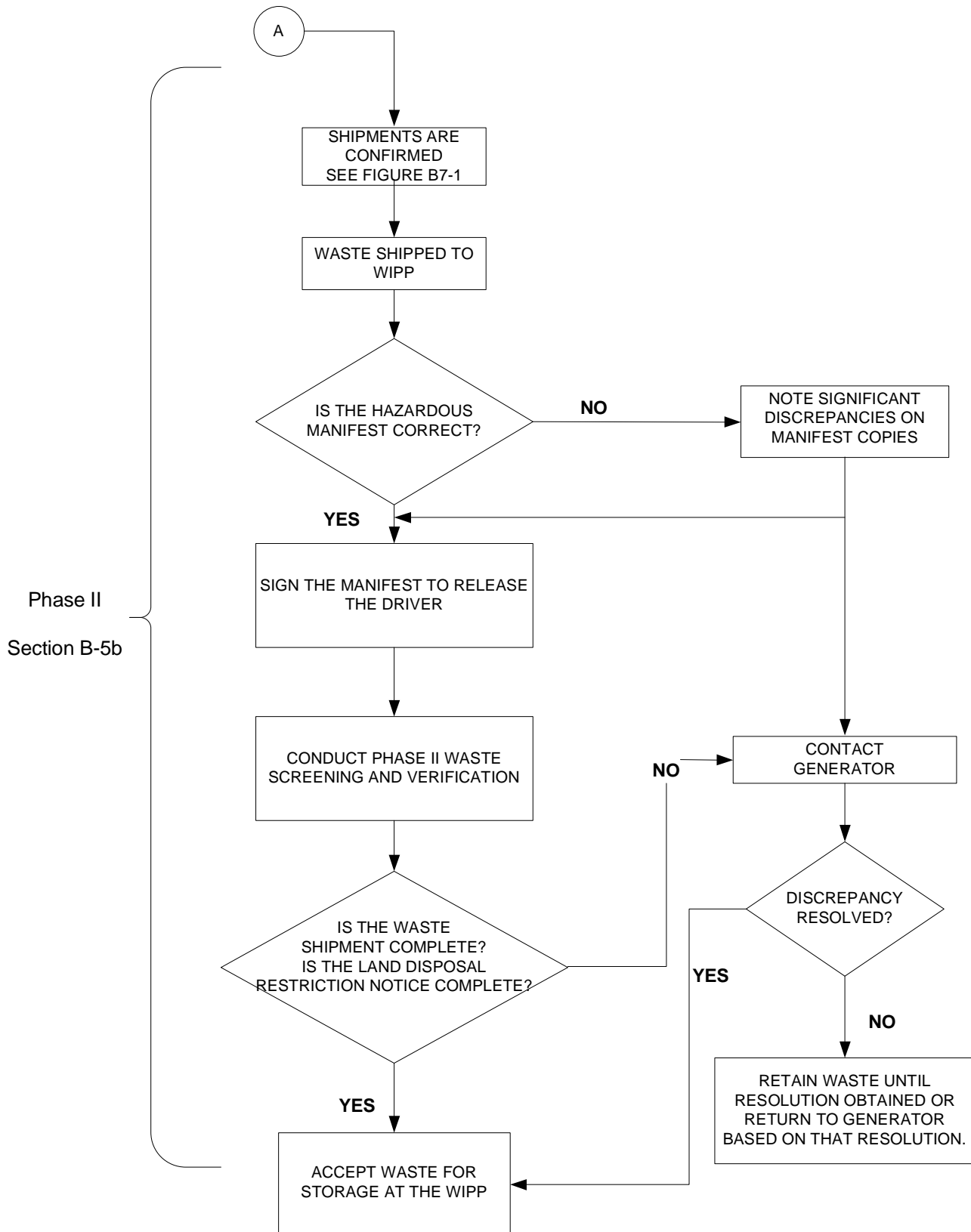


Figure B-3
TRU Mixed Waste Screening and Verification Flow Diagram (continued)
PERMIT ATTACHMENT B