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RENEWAL APPLICATION
CHAPTER B
WASTE ANALYSIS PLAN

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2 **CHAPTER B**

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4 **WASTE ANALYSIS PLAN**

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1 **RENEWAL APPLICATION**
2 **CHAPTER B**

3
4 **WASTE ANALYSIS PLAN**

5
6 **B-0 Introduction and Chapter Highlights**

7 This waste analysis plan (WAP) has been prepared for management, storage, or disposal
8 activities to be conducted at the Waste Isolation Pilot Plant (WIPP) facility to meet requirements
9 set forth in 20.4.1.500 New Mexico Administrative Code (NMAC) (incorporating 40 CFR
10 §264.13). Guidance in the most recent U.S. Environmental Protection Agency (EPA) manual
11 on waste analysis has been incorporated into the preparation of this WAP (EPA, 1994). This
12 WAP includes test methods, details of planned waste sampling and analysis for complying with
13 the general waste analysis requirements of 20.4.1.500 NMAC (incorporating 40 CFR §264.13), a
14 description of the waste shipment screening and verification process, and a description of the
15 quality assurance (QA)/quality control (QC) program. Before the Permittees manage, store, or
16 dispose transuranic (TRU) mixed waste from a U.S. Department of Energy (DOE) TRU waste
17 site or DOE contract TRU waste site (TRU waste site) generator/storage site (site), the
18 Permittees shall require ~~that site~~ the Carlsbad Field Office (CBFO) certified waste
19 characterization program (certified characterization program) established at the TRU waste
20 site to implement the applicable requirements of this WAP. Certified characterization programs
21 are limited to the Central Characterization Project characterizing TRU mixed waste (after
22 receiving certification at that site) and the Advanced Mixed Waste Treatment Project
23 characterizing TRU mixed waste at the Idaho National Laboratory.

24
25 The TRU mixed waste that may be stored or disposed at WIPP is ~~are~~ or was ~~were~~ generated at
26 TRU waste DOE generator/storage sites by various specific processes and activities. Examples
27 of the major types of operations that generate this waste include:
28

- 29
- 30 • Production of Nuclear Products—Production of nuclear products includes reactor
31 operation, radionuclide separation/finishing, and weapons fabrication and manufacturing.
32 The majority of the TRU mixed waste was generated by weapons fabrication and
33 radionuclide separation/finishing processes. More specifically, wastes consist of residues
34 from chemical processes, air and liquid filtration, casting, machining, cleaning, product
35 quality sampling, analytical activities, and maintenance and refurbishment of equipment
and facilities.
 - 36 • Plutonium Recovery—Plutonium recovery wastes are residues from the recovery of
37 ~~plutonium-contaminated~~ plutonium contaminated molds, metals, glass, plastics, rags,
38 salts used in electrorefining, precipitates, firebrick, soot, and filters.
 - 39 • Research and Development (R&D)—R&D projects include a variety of hot cell or
40 glovebox activities that often simulate full-scale operations described above, producing
41 similar TRU mixed wastes. Other types of R&D projects include metallurgical research,

1 actinide separations, process demonstrations, and chemical and physical properties
2 determinations.

- 3 • Decontamination and Decommissioning—Facilities and equipment that are no longer
4 needed or usable are decontaminated and decommissioned, resulting in TRU mixed
5 wastes consisting of scrap materials, cleaning agents, tools, piping, filters, Plexiglas™,
6 gloveboxes, concrete rubble, asphalt, cinder blocks, and other building materials. These
7 materials are expected to be the largest category by volume of TRU mixed waste to be
8 generated in the future.

9 **The** TRU mixed waste contains both TRU radioactive and hazardous components, as defined in
10 20.4.1.800 NMAC (incorporating 40 CFR, §268.35(d)), and in the Federal Facility Compliance
11 Act, Public Law 102-386, Title 1, §3021(d). It is designated and separately packaged as either
12 contact-handled (**CH**) or remote-handled (**RH**), based on the radiological dose rate at the surface
13 of the waste container.

14
15 The hazardous components of the TRU mixed waste to be managed at the WIPP facility are
16 designated in Table B-9. Some of the waste may also be identified by unique state hazardous
17 waste codes or numbers. These wastes are acceptable at WIPP as long as the Treatment,
18 Storage, and Disposal Facility Waste Acceptance Criteria (**TSDF-WAC**) ~~in Module II~~ are met.
19 This WAP describes the measures that will be taken to ensure that the TRU mixed wastes
20 received at the WIPP facility are within the scope of Table B-9 as established by 20.4.1.500
21 NMAC (incorporating 40 CFR §264), and that they comply with unit-specific requirements of
22 20.4.1.500 NMAC (incorporating 40 CFR §264.600), Miscellaneous Units.

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

38
39 Waste characterization is defined in Module I **performed through implementing the requirements**
40 **of this WAP by a certified characterization program** as the activities performed by the waste
41 generator to satisfy the general waste analysis requirements of 20.4.1.500 NMAC (incorporating
42 40 CFR §264.13(a)). **The applicable waste characterization activities are completed** before waste
43 containers ~~have been~~ **are** certified for disposal at WIPP. The characterization process for WIPP

1 waste is presented in Figure B-2. Prior to receiving CBFO certification, a Generator site waste
2 characterization programs are is first audited by the Permittees, with the New Mexico
3 Environment Department (NMED) approving the final audit report. After this, generator sites
4 The certified characterization program determines whether Acceptable Knowledge (AK) AK
5 alone is sufficient for characterization, or whether a sampling and analysis program in
6 conjunction with AK is necessary to adequately characterize wastes. If an AK Sufficiency
7 Determination is sought, information is provided to the Permittees for their review and
8 provisional approval; NMED determination of adequacy of the AK information is required
9 before final approval by the Permittees. If the sampling and analysis route is chosen, sites the
10 certified characterization program proceeds to sample and analyze waste in conjunction with AK
11 and in accordance with this WAP. Once an AK Sufficiency Determination is obtained, or when
12 required sampling and analysis data are obtained, sites the certified characterization program
13 would then prepare and submit the Waste Stream Profile Form (WSPF) (Figure B-1) for the
14 Permittees' approval. Once the WSPF is approved, a site certified characterization program and
15 the TRU waste site may ship waste to WIPP. The Permittees will perform waste confirmation
16 prior to shipment receipt of the waste from the generator/storage TRU waste site to WIPP as
17 specified in Renewal Application Appendix B7, (Permittee Level TRU Waste Confirmation
18 Processes) by performing radiography or visual examination (VE) of a representative
19 subpopulation of certified waste containers, to ensure that the wastes meet the applicable
20 requirements of the TSDF-WAC. Waste confirmation will not be performed by the Permittees
21 when a Scenario 1 or 2 AK Sufficiency Determination has been approved for the waste stream.
22 An approved Scenario 1 and 2 AK Sufficiency Determination addresses that the waste is not
23 ignitable, corrosive, or reactive and only those Hazardous Waste Numbers authorized for storage
24 and disposal at WIPP apply to the waste (see Section B-0b and Renewal Application Chapter B,
25 Appendix B4, TRU Mixed Waste Characterization Using Acceptable Knowledge, Section B4-
26 3d). Approved Waste Stream Profile Forms document assigned EPA Hazardous Waste Numbers
27 (see Section B-0c).

28 29 B-0a Waste Characterization

30 Characterization requirements for individual containers of TRU mixed waste are specified on a
31 waste stream basis. A waste stream is defined as waste material generated from a single process
32 or from an activity that is similar in material, physical form, and hazardous constituents. Waste
33 streams are grouped by Waste Matrix Code Groups related to the physical and chemical
34 properties of the waste. Generator/storage The certified characterization programs sites shall use
35 the characterization techniques described in this WAP to assign appropriate Waste Matrix Code
36 Groups to waste streams for WIPP disposal. The Waste Matrix Code Groups are solidified
37 inorganics, solidified organics, salt waste, soils, lead/cadmium metal, inorganic nonmetal waste,
38 combustible waste, graphite, filters, heterogeneous debris waste, and uncategorized metal.
39 Waste Matrix Code Groups can be grouped into three Summary Category groups: Homogeneous
40 Solids (Summary Category S3000), Soil/Gravel (Summary Category S4000), and Debris Waste
41 (Summary Category S5000).

42
43 The TRU mixed wastes are initially categorized into the three broad Summary Category Groups
44 that are related to the final physical form of the wastes. Waste characterization requirements for

1 these groups are specified separately in Section B-2 of this WAP. Each of the three groups is
2 described below.

3
4 S3000 - Homogeneous Solids

5 Homogeneous solids are defined as solid materials, excluding soil, that do not meet the
6 NMED criteria for classification as debris (20.4.1.800 NMAC (incorporating 40 CFR
7 §268.2(g) and (h))). Included in the series of homogeneous solids are inorganic
8 process residues, inorganic sludges, salt waste, and pyrochemical salt waste. Other waste
9 streams are included in this Summary Category Group based on the specific waste stream
10 types and final waste form. This Summary Category Group is expected to contain toxic
11 metals and spent solvents. This category includes wastes that are at least 50 percent by
12 volume homogeneous solids.

13
14 S4000 - Soils/Gravel

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

18
19 S5000 - Debris Wastes

20 This Summary Category Group includes heterogeneous waste that is at least 50 percent
21 by volume materials that meet the criteria specified in 20.4.1.800 NMAC (incorporating
22 40 CFR §268.2(g)). Debris means solid material exceeding a 2.36 inch (in.) (60
23 millimeter) particle size that is intended for disposal and that is:

- 24
25 1. a manufactured object, or
26 2. plant or animal matter, or
27 3. natural geologic material.

28
29 Particles smaller than 2.36 inches (60 millimeters) in size may be considered debris if the
30 debris is a manufactured object and if it is not a particle of S3000 or S4000 material.

31
32 If a waste does not include at least 50 percent of any given Summary Category Group by
33 volume, characterization shall be performed using the waste characterization process required for
34 the category constituting the greatest volume of waste for that waste stream (see Section B-3d).

35
36 The most common hazardous constituents in the TRU mixed waste to be managed in the WIPP
37 facility consist of the following:

38
39 Metals

40
41 Some of the TRU mixed waste to be emplaced in the WIPP facility contains metals for
42 which 20.4.1.200 NMAC (incorporating 40 CFR §261.24), toxicity characteristics (TCs)
43 were established (EPA hazardous waste numbers D004 through D011). Cadmium,
44 chromium, lead, mercury, selenium, and silver are present in discarded tools and
45 equipment, solidified sludges, cemented laboratory liquids, and waste from

1 decontamination and decommissioning activities. A large percentage of the waste
2 consists of lead-lined gloveboxes, leaded rubber gloves and aprons, lead bricks and
3 piping, lead tape, and other lead items. Lead, because of its radiation-shielding
4 applications, is the most prevalent toxicity characteristic TC metal present.

5 6 Halogenated Volatile Organic Compounds

7
8 Some of the TRU mixed waste to be emplaced in the WIPP facility contains spent
9 halogenated volatile organic compound (VOC) solvents identified in 20.4.1.200 NMAC
10 (incorporating 40 CFR, §261.31) (EPA hazardous waste numbers F001 through and F002
11 F005). Tetrachloroethylene; trichloroethylene; methylene chloride; carbon tetrachloride;
12 1,1,1-trichloroethane; and 1,1,2-trichloro-1,2,2-trifluoroethane (EPA hazardous waste
13 numbers F001 and F002) are the most prevalent halogenated organic compounds
14 identified in TRU mixed waste that may be managed at the WIPP facility during the
15 Disposal Phase. These compounds are commonly used to clean metal surfaces prior to
16 plating, polishing, or fabrication; to dissolve other compounds; or as coolants. Because
17 they are highly volatile, only small amounts typically remain on equipment after cleaning
18 or, in the case of treated wastewaters, in the sludges after clarification and flocculation.
19 Radiolysis may also generate halogenated volatile organic compounds.

20 21 Nonhalogenated Volatile Organic Compounds

22
23 Xylene, methanol, and n-butanol are the most prevalent nonhalogenated VOCs (EPA
24 hazardous waste numbers F003 through F005) in TRU mixed waste that may be managed
25 at the WIPP facility during the Disposal Phase. Like the halogenated VOCs, they are
26 used as degreasers and solvents and are similarly volatile. The same analytical methods
27 that are used for halogenated VOCs are used to detect the presence of nonhalogenated
28 VOCs. Radiolysis may also generate non-halogenated volatile organic compounds.

29
30 The generator/storage sites certified characterization program shall characterize their waste in
31 accordance with this WAP and associated Renewal Application Appendices, and ensure that
32 waste proposed for storage and disposal at WIPP meets the applicable requirements of the
33 TSDF-WAC in Module II. The generator/storage site certified characterization program shall
34 assemble the AK Acceptable Knowledge (AK) information into an auditable record¹ for the
35 waste stream as described in Renewal Application Appendix B4 (TRU Mixed Waste
36 Characterization Using Acceptable Knowledge). For those waste streams with an approved AK
37 Sufficiency Determination (see below), sampling and analysis per the methods described in
38 Renewal Application Appendices B1 (Waste Characterization Sampling Methods) and B2
39 (Statistical Methods Used in Sampling and Analysis) are not required.
40

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 All waste characterization activities specified in this WAP and associated Renewal Application
2 Appendices shall be carried out ~~at generator/storage sites~~ by certified characterization programs
3 and Permittee approved laboratories in accordance with this WAP. The Permittees will audit
4 ~~generator/storage site waste~~ characterization programs and activities as described in Section B-3.
5 Waste characterization activities ~~at the generator/storage sites~~ performed by the certified
6 characterization programs at the TRU waste sites include the following, although not all these
7 techniques will be used on each container, as discussed in Section B-3:
8

- 9 • Radiography, which is an x-ray technique to determine physical contents of containers
- 10 • Visual examination of opened containers ~~as an alternative way~~ to determine their physical
11 contents
- 12 • ~~Headspace gas~~ Headspace gas sampling to determine VOC content of gases in the void
13 volume of the containers
- 14 • Sampling and analysis of waste forms that are homogeneous and can be representatively
15 sampled to determine ~~concentrations of hazardous waste constituents and TC toxicity~~
16 ~~characteristic~~ contaminants of waste in containers
- 17 • Compilation of AK documentation into an auditable record

18 B-0b Acceptable Knowledge ~~AK~~ Sufficiency Determination

19 ~~Certified Characterization Program~~ Certified characterization programs may submit a request to
20 the Permittees for an ~~AK~~ Acceptable Knowledge Sufficiency Determination (AKSD)
21 ~~(Determination Request)~~ to meet all or part of the waste characterization requirements. The
22 contents of the ~~Determination Request~~ AKSD request are specified in Renewal Application
23 Appendix B4, Section B4-3d. The ~~Determination Request~~ AKSD request may take one of the
24 following forms:
25

- | | | |
|----|------------|--|
| 26 | Scenario 1 | Radiography or visual examination (VE) of the waste stream is not 27 required, and chemical sampling and analysis is not required; |
| 28 | | |
| 29 | Scenario 2 | Radiography or VE of the waste stream is not required, but chemical 30 sampling and analysis of a representative sample of the waste stream is 31 required; or |
| 32 | | |
| 33 | Scenario 3 | Chemical sampling and analysis is not required, but radiography or VE of 34 100% <u>percent</u> of the containers in the waste stream is required. |
| 35 | | |

36 The Permittees shall evaluate the ~~Determination Request~~ AKSD request for completeness and
37 technical adequacy. This evaluation shall include, but not be limited to whether the
38 ~~Determination Request~~ AKSD request is technically sufficient for the following:
39

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

21 The Permittees will review the ~~Determination Request~~ AKSD Request for technical adequacy
22 and compliance with the requirements of the WIPP Hazardous Waste Facility Permit (Permit),
23 using trained and qualified individuals in accordance with standard operating procedures (SOPs)
24 that shall, at a minimum, address all of the technical and procedural requirements listed above.
25 The Permittees shall resolve comments with the ~~generator/storage site~~ certified characterization
26 program, and the Permittees may change the scope of the ~~Determination Request~~ AKSD Request
27 to one of the three scenarios. If the Permittees determine that the AK is sufficient, they will
28 provisionally approve the ~~Determination Request~~ AKSD request and forward it along with all
29 relevant information submitted with the ~~Determination Request~~ AKSD request to NMED for an
30 evaluation that the provisional approval made by the Permittees is adequate. Within five (5)
31 days of submitting an ~~in~~ Determination Request AKSD request to NMED, the Permittees will post
32 a link to the transmittal letter to NMED on the WIPP Home Page and inform those on the e-mail
33 notification list. Based on the results of NMED's evaluation, the Permittees will notify the
34 ~~generator/storage sites~~ certified characterization program whether the AK information is
35 sufficient and the ~~Determination Request~~ AKSD request is approved. The Permittees will not
36 approve an ~~in~~ Determination Request AKSD request that NMED has determined to be inadequate
37 unless the ~~generator/storage site~~ certified characterization program resolves the inadequacies and

1 provides the resolution to NMED for evaluation of adequacy. Should the inadequacies not be
2 resolved to NMED's satisfaction, the Permittees shall not submit an ~~an Determination Request~~
3 AKSD request for the same waste stream at a later date.

4
5 In the event the Permittees disagree, in whole or in part, with an evaluation performed by NMED
6 resulting in a determination by NMED that the Permittees' provisional approval for a particular
7 waste stream is inadequate, the Permittees may seek dispute resolution. ~~The dispute resolution~~
8 ~~process is specified in Module I.~~

9
10 If a generator/storage site certified characterization program does not submit an ~~an Determination~~
11 ~~Request~~ AKSD request, or if the Permittees do not approve an ~~an Determination Request~~ AKSD
12 request, or if NMED finds that the Permittees' provisional approval of an ~~an Determination Request~~
13 AKSD request is inadequate and the Permittees either do not seek dispute resolution or are
14 unsuccessful in the dispute resolution process, the generator/storage site certified characterization
15 program shall perform radiography or VE on 100% percent of the containers in a waste stream
16 and chemical sampling and analysis on a representative sample of the waste stream using
17 headspace gas (HSG) sampling and analysis (for debris waste) or solids sampling and analysis
18 (for homogeneous solid or soil/gravel waste) as specified in Renewal Application Appendices B1
19 and B2.

20
21 If a generator/storage site certified characterization program submits an ~~an Determination Request~~
22 AKSD request, the Permittees provisionally approve the ~~Determination Request~~ AKSD request
23 as Scenario 1, and NMED finds that the Permittees' provisional approval is adequate, neither
24 radiography or VE nor chemical sampling and analysis of the waste stream is required.

25
26 If a generator/storage site certified characterization program submits an ~~an Determination Request~~
27 AKSD request, the Permittees provisionally approve the ~~Determination Request~~ AKSD request
28 as Scenario 2, and NMED finds that the Permittees' provisional approval is adequate, chemical
29 sampling and analysis of a representative sample of the waste stream is required, but radiography
30 or VE is not required.

31
32 If a generator/storage site certified characterization program submits an ~~an Determination Request~~
33 AKSD request, the Permittees provisionally approve the ~~Determination Request~~ AKSD request
34 as Scenario 3, and NMED finds that the Permittees' provisional approval is adequate,
35 radiography or VE of 100% percent of the containers in the waste stream is required, but
36 chemical sampling and analysis is not required.

37 38 B-0c Waste Stream Profile Form Completion

39 After a complete AK record has been compiled and either an ~~an Determination Request~~ AKSD
40 request has been approved by the Permittees or the generator/storage site certified
41 characterization program has completed the applicable representative sampling and analysis
42 requirements specified in Renewal Application Appendices B1 and B2, the generator/storage
43 site certified characterization program will complete a ~~Waste Stream Profile Form (WSPF)~~ WSPF
44 and a Characterization Information Summary (CIS). The requirements for the completion of a

1 WSPF and a CIS are specified in Renewal Application Appendix B3, Sections B3-12b(1) and
2 B3-12b(2) respectively.

3
4 The WSPF and the CIS for the waste stream resulting from waste characterization activities shall
5 be transmitted to the Permittees, reviewed for completeness, and screened for acceptance ~~prior to~~
6 ~~loading any TRU mixed waste into the Contact Handled or Remote Handled Packaging at the~~
7 ~~generator facility~~, as described in Section B-4. The review and approval process will ensure that
8 the submitted waste analysis information is sufficient to meet the Data Quality Objectives
9 (DQOs) for AK in Section B-4a(1) and allow the Permittees to demonstrate compliance with the
10 requirements of this WAP. Only TRU mixed waste and TRU waste that has been characterized
11 in accordance with this WAP and that meets the TSDF-WAC specified in this ~~the~~ Permit will be
12 accepted at the WIPP facility for disposal in a permitted Underground Hazardous Waste
13 Disposal Unit (HWDU). The Permittees will provide NMED with copies of the approved WSPF
14 and accompanying CIS prior to waste receipt at the WIPP ~~stream shipment~~. Upon notification of
15 approval of the WSPF by the Permittees, the ~~generator/storage site~~ certified characterization
16 program and the TRU waste site may be authorized to ship waste from the waste stream to
17 WIPP.

18
19 In the event the Permittees request detailed information on a waste stream, the site certified
20 characterization program will provide a Waste Stream Characterization Package (Renewal
21 Application Appendix B3, Section B3-12b(2)). For each waste stream, this package will include
22 the WSPF, the CIS, and the complete AK summary. The Waste Stream Characterization
23 Package will also include specific Batch Data Reports (BDRs) and raw analytical data associated
24 with waste container characterization as requested by the Permittees.

25 26 B-0d Waste Confirmation

27 The Permittees will perform waste confirmation on a representative subpopulation of each waste
28 stream shipment after certification and prior to ~~shipment~~ receipt as described in Renewal
29 Application Appendix B7. The Permittees will use radiography, review of radiography
30 audio/video recordings, ~~VE/VE~~, or review of VE records (e.g., VE data sheets or packaging
31 records logs) to examine at least 7 percent of each waste stream shipment to confirm that the
32 waste does not contain ignitable, corrosive, or reactive waste. Waste confirmation will be
33 performed by the Permittees prior to receipt ~~shipment~~ of the waste at the WIPP ~~from the~~
34 ~~generator/storage site to WIPP~~.

35 36 B-1 Identification of Transuranic TRU Mixed Waste to be Managed at the Waste Isolation Pilot 37 Plant WIPP Facility

38 B-1a Waste Stream Identification

39 The TRU mixed waste destined for disposal at WIPP will be characterized on a waste stream
40 basis. ~~Generator/storage sites~~ Certified characterization programs will delineate waste streams
41 using ~~acceptable knowledge~~ AK. Required ~~acceptable knowledge~~ AK is specified in Section
42 B-3b and Renewal Application Appendix B4.

1 All of the waste within a waste stream may not be accessible for sampling and analysis at one
2 time. Renewal Application Appendix B2 (Statistical Methods Used in Sampling and Analysis)
3 addresses the requirements for selecting waste containers used for characterization of waste
4 streams ~~as they are generated or retrieved.~~

5
6 B-1b Waste Summary Category Groups and Hazardous Waste Accepted at the Waste Isolation
7 Pilot Plant WIPP Facility

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

13
14 The Permittees will only allow generators certified characterization programs and TRU waste
15 sites to ship those TRU mixed waste streams with EPA hazardous waste numbers listed in Table
16 B-9. Some of the waste may also be identified by unique state hazardous waste codes or
17 numbers. These wastes are acceptable at WIPP as long as the TSDF-WAC are met. The
18 certified characterization program Permittees will perform characterization of all waste streams
19 as required by this WAP. If during the characterization process, new EPA hazardous waste
20 numbers not listed in Table B-9 are identified assigned to a waste stream, ~~those~~ the wastes streams
21 will be prohibited for disposal at the WIPP facility until a permit modification has been
22 submitted to and approved by NMED to include the additional ~~for these new~~ EPA hazardous
23 waste numbers in the Permit. Similar approved waste streams at other generator/storage TRU
24 waste sites will be examined by the certified characterization programs at the direction of the
25 Permittees to ensure that the newly identified EPA hazardous waste numbers do not apply to
26 those similar waste streams. ~~If the other waste streams also require new EPA hazardous waste~~
27 ~~numbers, shipment of these similar waste streams will also be prohibited for disposal until a~~
28 ~~permit modification has been submitted to and approved by NMED.~~

29
30 B-1c Waste Prohibited at the Waste Isolation Pilot Plant WIPP Facility

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

- 32
- 33 • ~~liquid waste (waste shall contain as little residual liquid as is reasonably achievable by~~
34 ~~pouring, pumping and/or aspirating, and internal containers shall contain less than 1 inch~~
35 ~~or 2.5 centimeters of liquid in the bottom of the container. Total residual liquid in any~~
36 ~~payload container (e.g., 55 gallon drum or standard waste box) may not exceed 1 percent~~
37 ~~volume of that container. Payload containers with U134 waste shall have no detectable~~
38 ~~liquid)~~

39 For purposes of demonstrating compliance with the liquid waste prohibition, the
40 following conditions shall apply when using the radiography and/or VE waste
41 characterization methods:

1 “Free-standing liquid” is the observable liquid fraction of S3000 or S4000 waste.
2 The observable free-standing liquid fraction of TRU mixed waste in an internal
3 container shall be no more than one percent of the internal container volume.
4

5 “Residual liquid” is the observable quantity of liquid allowed to remain in an
6 otherwise empty internal container and the residual liquid shall be no more than that
7 reasonably expected after all wastes have been removed that can be removed using
8 the practices commonly employed to remove material from that type of container
9 (e.g., pouring, pumping, and aspirating), and after emptying, no more than one inch
10 or 2.5 centimeters of residual liquid remains in the bottom of the container. Total
11 residual liquid in any payload container (e.g., 55 gallon drum or SWB) shall be no
12 more than one percent volume of that container.
13

14 The observable free-standing liquid and total residual liquid inside a payload
15 container shall be no more than one percent of the payload container volume. The
16 no more than one percent volume limit shall be based upon quantities of
17 free-standing liquid observed inside and outside of the container liner (when
18 present), free-standing liquid in internal containers, and residual liquids remaining
19 in internal containers (including bag confinement layers). Liquid observed within
20 debris items such as tubing, hoses, folds in plastic sheeting, and on the exterior
21 surface of bags, etc. are not prohibited provided the liquid volume is included in the
22 total volume calculation and the summed result is no more than one percent of the
23 payload container volume.
24

25 Payload containers with hazardous waste number U134 assigned shall have no
26 observable liquid.
27

28 When using a container identified in Renewal Application Appendix M1,
29 Section M1-1b as an overpack payload container the following shall apply:
30

- 31 1. Containers are considered overpacked and not direct loaded regardless of
32 the presence or absence of the container lid; and
- 33
- 34 2. The observable free-standing liquid fraction of TRU mixed waste in any
35 internal container, inside the overpacked container, shall be no more than
36 one percent of the internal container volume; and
- 37
- 38 3. Only residual quantities of liquid shall remain in an otherwise empty
39 internal container inside the overpacked container; and
- 40
- 41 4. All observable liquid shall be included in the overpacked container total
42 volume calculation and the result shall not exceed one percent of the
43 overpacked container volume.
44

1 The overpack payload container total limit is the sum of the one percent total
2 volume limit for each overpacked container.

- 3
- 4 • non-radionuclide pyrophoric materials, such as elemental potassium
- 5 • hazardous wastes not occurring as co-contaminants with TRU mixed wastes (non-mixed
- 6 hazardous wastes)
- 7 • wastes incompatible with backfill, seal and panel closures materials, container and
- 8 packaging materials, shipping container materials, or other wastes
- 9 • wastes containing explosives or compressed gases
- 10 • wastes with polychlorinated biphenyls (PCBs) not authorized under an EPA PCB waste
- 11 disposal authorization
- 12 • wastes exhibiting the characteristic of ignitability, corrosivity, or reactivity (EPA
- 13 Hazardous Waste Numbers of D001, D002, or D003)
- 14 • waste that has ever been managed as high-level waste and waste from tanks specified in
- 15 Table B-8, unless specifically approved through a Class 3 permit modification
- 16 • any waste container from a waste stream (or waste stream lot) which has not undergone
- 17 either radiographic or visual examination VE of a statistically representative
- 18 subpopulation of the waste stream in each shipment, as described in Renewal Application
- 19 Appendix B7, unless a Scenario 1 or Scenario 2 AKSD has been approved for the waste
- 20 stream.
- 21 • any waste container from a waste stream which has not been preceded by an appropriate,
- 22 certified WSPF (see Section B-1d)

23 Before accepting a container holding TRU mixed waste, the Permittees will perform waste
24 confirmation activities on each waste stream shipment to confirm that the waste does not contain
25 ignitable, corrosive, or reactive waste and the assigned EPA hazardous waste numbers are
26 allowed for storage and disposal by ~~this~~ the Permit. Waste confirmation activities will be
27 performed on at least 7 percent of each waste stream shipped, equating to examination of at least
28 one of fourteen containers in each waste stream shipment. If a waste stream shipment contains
29 fewer than fourteen containers, at least one container will be examined to satisfy waste
30 confirmation requirements. Section B-4 and Renewal Application Appendix B7 include
31 descriptions of the waste confirmation processes that the Permittees will conduct prior to
32 receiving a shipment at the WIPP facility.

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

1
2 To ensure the integrity of the WIPP facility, waste streams identified to contain incompatible
3 materials or materials incompatible with waste containers cannot be shipped to WIPP unless they
4 are treated to remove the incompatibility. Only those waste streams that are compatible or have
5 been treated to remove incompatibilities will be shipped to WIPP.
6

7 B-1d Control of Waste Acceptance

8 Every waste stream shipped to WIPP shall be preceded by a WSPF (Figure B-1) and a CIS. The
9 required WSPF information and the CIS elements are found in Renewal Application Appendix
10 B3, Section B3-12b(1) and Section B3-12b(2).
11

12 ~~Generator/storage sites~~ Certified characterization programs will provide the WSPF and the CIS to
13 the Permittees for each waste stream from a TRU waste site prior to its acceptance for disposal at
14 WIPP. ~~The WSPF and the CIS will be transmitted to the Permittees for each waste stream from~~
15 ~~a generator/storage site.~~ If continued waste characterization reveals discrepancies that identify
16 different hazardous waste numbers or indicates that the waste belongs to a different waste
17 stream, a revised WSPF will be submitted, or alternatively, the waste may ~~will~~ be redefined to a
18 separate waste stream and a new WSPF submitted.
19

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

27 As stated in the Introduction of this WAP, any time the Permittees request additional information
28 concerning a waste stream, ~~the generator/storage site~~ certified characterization program will
29 provide a Waste Stream Characterization Package (Renewal Application Appendix B3,
30 Section B3-12b(23)). The option for the Permittees to request additional information ensures
31 that the waste being offered for disposal is adequately characterized and accurately described on
32 the WSPF.
33

34 B-1e Waste Generating Processes at the ~~Waste Isolation Pilot Plant~~ 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 ~~RCRA-regulated~~ materials present in the waste from which they were derived, no
38 additional characterization of the derived waste is required for disposal purposes. In other
39 words, the ~~generator/storage site's~~ certified characterization program's characterization data and
40 knowledge of the processes at the WIPP facility will be used to identify and characterize
41 hazardous waste and hazardous constituents in derived waste. The management of derived waste
42 is addressed in Renewal Application Appendix M1.
43

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

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

- 10
11 • Waste characterization and certification procedures for TRU mixed ~~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 will
14 include procedures for performing radiography, VE, or treatment, if these methods are
15 used to ensure prohibited items are not present in the waste prior to shipment of the waste
16 to WIPP.
- 17 • Procedures used to verify packaging configurations to determine the correct drum age
18 criteria (DAC) if ~~headspace gas~~ HSG sampling and analysis is used to collect waste
19 characterization information per Renewal Application Appendix B1, Section B1-1a(1) ~~of~~
20 ~~the WAP~~.
- 21 • Identify the organization(s) responsible for compliance with waste characterization and
22 certification procedures.
- 23 • Identify the oversight procedures and frequency of actions to verify compliance with
24 waste characterization and certification procedures.
- 25 • Develop training specific to waste characterization and certification procedures.
- 26 • Ensure that personnel may stop work if noncompliance with waste characterization or
27 certification procedures is identified.
- 28 • Develop a nonconformance process that complies with the requirements in Renewal
29 Application Appendix B3 ~~of the WAP~~ to document and establish corrective actions.
- 30 • As part of the corrective action process, assess the potential time frame of the
31 noncompliance, the potentially affected waste population(s), and the reassessment and
32 recertification of those wastes.
- 33 • A listing of all approved hazardous waste numbers which are acceptable at WIPP are
34 included in Table B-9.

1 For those waste streams or containers that are not amenable to radiography (e.g., RH TRU mixed
2 waste, direct loaded ten drum overpacks (TDOPs)) for waste confirmation by the Permittees as
3 described in Renewal Application Appendix B7, generator/storage site VE data may be used for
4 waste acceptance. In those cases, the Permittees will review the generator/storage site VE
5 procedures to ensure that data sufficient for the Permittees' waste acceptance activities as
6 described in Renewal Application Appendix B7 will be obtained and the procedures meet the
7 minimum requirements for visual examination specified in Renewal Application Appendix B1,
8 Section B1-3.

9
10 The following waste characterization parameters shall be obtained from the generator/storage
11 sites certified characterization programs:

- 12
- 13 • Determination whether TRU mixed waste streams comply with the applicable provisions
14 of the TSDF-WAC
- 15 • Determination whether TRU mixed wastes exhibit a hazardous characteristic (20.4.1.200
16 NMAC, incorporating 40 CFR §261 Subpart C)
- 17 • Determination whether TRU mixed wastes are listed (20.4.1.200 NMAC, incorporating
18 40 CFR §261 Subpart D)
- 19 • Estimation of waste material parameter weights

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

23 B-3 Generator Waste Characterization Methods

24
25 The characterization techniques used by generator/storage sites includes acceptable knowledge
26 and may also include, as necessary, headspace gas sampling and analysis, radiography, visual
27 examination, and homogeneous waste sampling and analysis. All characterization activities are
28 performed in accordance with the WAP. Table B-5 provides a summary of the characterization
29 requirements for TRU mixed waste.

30 B-3a Sampling and Analytical Methods

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

32
33 Representative headspace gas sampling and analysis shall be used by generator/storage sites to
34 determine the types and concentrations of VOCs in the void volume of randomly selected waste
35 containers in order to resolve the assignment of EPA hazardous waste numbers for those debris
36 waste streams for which an AK Sufficiency Determination Request has not been approved by the
37 Permittees. In addition, VOC constituents will be compared to those assigned by acceptable
38 knowledge, which may include an analysis of radiolytically derived VOCs. The
39 generator/storage sites may also consider radiolysis and packaging materials when assessing the

1 presence of hazardous constituents in the headspace gas results, and whether radiolysis would
2 generate wastes which exhibit the toxicity characteristic. Refer to Renewal Application
3 Appendix B4 for additional clarification regarding hazardous waste number assignment and
4 headspace gas results. The methods for random selection of containers for headspace gas
5 sampling and analysis are specified in Renewal Application Appendix B2. Headspace gas
6 sampling and analysis shall be subject to the Permittees' Audit and Surveillance Program (Permit
7 Attachment B6).

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

17 18 B-3a(2) Homogeneous and Soil/Gravel Waste Sampling and Analysis

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

32
33 Totals or TCLP analyses for VOCs, and RCRA regulated metals are used to determine waste
34 parameters in soils/gravels and solids that may be important to the performance within the
35 disposal system (Tables B-3 and B-4). To determine if a waste exhibits a toxicity characteristic
36 for compounds specified in 20.4.1.200 NMAC (incorporating 40 CFR §261, Subpart C), TCLP
37 may be used instead of total analyses. The generator will use the results from these analyses to
38 determine if a waste exhibits a toxicity characteristic. The mean concentration of toxicity
39 characteristic contaminants are calculated for each waste stream such that it can be reported with
40 an upper 90 percent confidence limit (UCL_{90}). The UCL_{90} values for the mean measured
41 contaminant concentrations in a waste stream will be compared to the specified regulatory levels
42 in 20.4.1.200 NMAC (incorporating 40 CFR §261 Subpart C), expressed as total/TCLP values,
43 to determine if the waste stream exhibits a toxicity characteristic. A comparison of total analyses
44 and TCLP analyses is presented in Appendix C3 of the WIPP RCRA Part B Permit Application

1 (~~DOE, 1997~~), and a discussion of the UCL_{90} is included in Renewal Application Appendix B2.
2 If toxicity characteristic (~~TC~~) wastes are identified, these will be compared to those determined
3 by acceptable knowledge and TC waste numbers will be revised, as warranted. Refer to
4 Renewal Application Appendix B4 for additional clarification regarding hazardous waste
5 number assignment and homogeneous solid and soil/gravel analytical results.
6

7 B-3a(3) Laboratory Qualification

8 The Permittees will ensure that generator/storage sites conduct analyses using laboratories that
9 are qualified through participation in the Performance Demonstration Program (~~PDP~~) (DOE,
10 2003, 2005). Required QAOs are specified in Renewal Application Appendix B3. In addition,
11 methods and supporting performance data demonstrating QAO compliance shall be ensured by
12 the Permittees during the annual certification audit of the laboratories.
13

14 Analytical methods used by the laboratories shall: 1) satisfy all of the appropriate QAOs, and 2)
15 be implemented through laboratory documented SOPs standard operating procedures. These
16 analytical QAOs are discussed in detail in Renewal Application Appendix B3.
17

18 B-3b Acceptable Knowledge

19 Acceptable knowledge (~~AK~~) is used in TRU mixed waste characterization activities in five
20 ways:
21

- 22 • ~~To delineate TRU mixed waste streams~~
- 23 • ~~To assess whether TRU mixed wastes comply with the TSDF-WAC~~
- 24 • ~~To assess whether TRU mixed wastes exhibit a hazardous characteristic (20.4.1.200~~
25 ~~NMAC, incorporating 40 CFR §261 Subpart C)~~
- 26 • ~~To assess whether TRU mixed wastes are listed (20.4.1.200 NMAC, incorporating 40~~
27 ~~CFR §261 Subpart D)~~
- 28 • ~~To estimate waste material parameter weights~~

29 Acceptable knowledge is discussed in detail in Renewal Application Appendix B4, which
30 outlines the minimum set of requirements and DQOs which shall be met by the generator/storage
31 sites in order to use acceptable knowledge. In addition, Section B-5a(3) of this Renewal
32 Application Appendix describes the assessment of acceptable knowledge through the Permittees'
33 Audit and Surveillance Program.
34

35 B-3c Radiography and Visual Examination

36 Radiography is a nondestructive qualitative and quantitative technique that involves X-ray
37 scanning of waste containers to identify and verify waste container contents. Visual examination
38 (~~VE~~) constitutes opening a container and physically examining its contents. Generator/storage

1 sites shall perform radiography or VE of 100 percent of CH TRU mixed waste containers in
2 waste streams except for those waste streams for which the Permittees approve a Scenario 1 or
3 Scenario 2 Determination Request. No RH TRU mixed waste will be shipped to WIPP for
4 storage or disposal without documentation of radiography or VE of 100 percent of the containers
5 as specified in Renewal Application Appendix B1.

6
7 Radiography and/or visual examination will be used, when necessary, to examine a waste
8 container to verify its physical form. These techniques can detect liquid wastes and
9 containerized gases, which are prohibited for WIPP disposal. The prohibition of liquids and
10 containerized gases prevents the shipment of corrosive, ignitable, or reactive wastes.
11 Radiography and/or VE are also able to confirm that the physical form of the waste matches its
12 waste stream description (i.e. Homogeneous Solids, Soil/Gravel, or Debris Waste [including
13 unclassified metals]). If the physical form does not match the waste stream description, the
14 waste will be designated as another waste stream and assigned the preliminary hazardous waste
15 numbers associated with that new waste stream assignment. That is, if radiography and/or VE
16 indicates that the waste does not match the waste stream description arrived at by acceptable
17 knowledge characterization, a non-conformance report will be completed and the inconsistency
18 will be resolved as specified in Renewal Application Appendix B4. The proper waste stream
19 assignment will be determined (including preparation of a new WSPF), the correct hazardous
20 waste codes will be assigned, and the resolution will be documented. Refer to Renewal
21 Application Appendix B4 for a discussion of acceptable knowledge and its verification process.

22
23 Generator/storage sites may conduct visual examination of waste containers in lieu of
24 radiography. For generator/storage sites that choose to use visual examination in lieu of
25 radiography, the detection of any liquid waste in non-transparent inner containers, detected from
26 shaking the container, will be handled by assuming that the container is filled with liquid and
27 adding this volume to the total liquid in the payload container (e.g., 55-gallon drum or SWB).
28 The payload container would be rejected and/or repackaged to exclude the container if it is over
29 the TSDF WAC limits. When radiography is used, or visual examination of transparent
30 containers is performed, if any liquid in inner containers is detected, the volume of liquid shall be
31 added to the total for the payload container. Radiography, or the equivalent, will be used as
32 necessary on the existing/stored waste containers to verify the physical characteristics of the
33 TRU mixed waste correspond with its waste stream identification/waste stream Waste Matrix
34 Code and to identify prohibited items. Radiographic examination protocols and QA/QC methods
35 are provided in Permit Appendix B1. Radiography and VE shall be subject to the Permittees'
36 Audit and Surveillance Program (Permit Attachment B6).

37 38 B-3d Characterization Techniques and Frequency for Newly Generated and Retrievably Stored 39 Waste

40 Generator/storage sites will use acceptable knowledge to delineate all TRU mixed waste
41 containers into waste streams for the purposes of grouping waste for further characterization.
42 The analyses performed may differ based on the waste stream and the physical form of the waste
43 (i.e., heterogeneous debris waste cannot be sampled for totals analyses). Both retrievably stored
44 and newly generated wastes will be delineated in this fashion, though the types of acceptable

1 knowledge used may differ. Section B-3b discusses the use of acceptable knowledge, sampling,
2 and analysis in more detail. Acceptable knowledge is discussed more completely in Renewal
3 Application Appendix B4. Every TRU mixed waste stream will be assigned hazardous waste
4 numbers based upon acceptable knowledge, and the generator/storage sites may resolve the
5 assignment of hazardous waste numbers using headspace gas (Summary Category Group S5000
6 only) and solid sampling and analysis (Summary Category Groups S3000 and S4000 only).
7 In the CIS for each waste stream, the generator/storage site will be required to document their
8 methods, and the findings from those methods, for determining the physical form of the waste
9 and the presence or absence of prohibited items for both retrievably stored and newly generated
10 waste. Radiography and/or VE may be used to verify the physical form of retrievably stored
11 TRU mixed waste. For newly generated waste, physical form and prohibited items may either be
12 documented during packaging (using the VE technique) or verified after packaging using
13 radiography (or VE in lieu of radiography).
14

15 For debris waste streams that do not have an AK Sufficiency Determination approved by the
16 Permittees, containers selected in accordance with Renewal Application Appendix B2 from those
17 waste streams must be sampled and analyzed for VOCs in the headspace gas. Likewise, a
18 statistically selected portion of homogeneous solids and soil/gravel waste streams must be
19 sampled and analyzed for RCRA regulated total VOCs, SVOCs, and metals when those waste
20 streams do not have an AK Sufficiency Determination approved by the Permittees. Sampling
21 and analysis methods used for waste characterization are discussed in Section B-3a.
22

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

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

10
11 ~~Table B-5 summarizes the parameters, methods, and rationales for stored and newly generated~~
12 ~~CH-TRU mixed wastes according to their waste forms.~~

13
14 ~~WIPP may accept TRU mixed waste that has been repackaged or treated. Treated waste shall~~
15 ~~retain the original waste stream's listed hazardous waste number designation.~~

16
17 ~~B-3d(1) Newly Generated Waste~~

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

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
2
3 ~~B-3d(1)(a) Sampling of Newly Generated Homogeneous Solids and Soil/Gravel~~

4 ~~When a Determination Request has not been approved by the Permittees, sampling and analysis~~
5 ~~of newly generated homogeneous solid and soil/gravel waste streams shall be conducted in~~
6 ~~accordance with the requirements specified in Renewal Application Appendix B1, Section B1-2.~~
7 ~~The number of newly generated homogeneous solid and soil/gravel waste containers to be~~
8 ~~sampled will be determined using the procedure specified in Renewal Application Appendix B2,~~
9 ~~Section B2-1, wherein a statistically selected portion of the waste will be sampled.~~

10
11 ~~B-3d(2) Retrievably Stored Waste~~

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

19
20 ~~The headspace gas sampling method provided in Permit Appendix B1 will be used, when~~
21 ~~necessary, to resolve the assignment of EPA hazardous waste numbers to debris waste streams,~~
22 ~~as specified in Permit Appendix B4.~~

23
24 ~~A statistically selected portion of retrievably stored homogeneous solids and soil/gravel wastes~~
25 ~~will be sampled and analyzed for total VOCs, SVOCs, and metals, when necessary. The sample~~
26 ~~location selection method is described in Permit Appendix B2. The sampling methods for these~~
27 ~~wastes are provided in Permit Appendix B1.~~

28
29 ~~The toxicity characteristic of retrievably stored homogeneous solids and soil/gravel wastes will~~
30 ~~be determined using total analysis of toxicity characteristic parameters or TCLP. To determine if~~
31 ~~a waste exhibits a toxicity characteristic for compounds specified in 20.4.1-200 NMAC~~
32 ~~(incorporating 40 CFR §261, Subpart C), TCLP may be used instead of total analyses. Appendix~~
33 ~~C3 of the WIPP RCRA Part B Permit Application (DOE, 1997) discusses comparability of totals~~
34 ~~analytical results to those of the TCLP method.~~

35
36 ~~Representativeness of containers selected for headspace gas sampling and waste subjected to~~
37 ~~homogeneous solids and soil/gravel sampling and analysis will be validated by the~~
38 ~~generator/storage site and by the Permittees during an audit (Permit Appendix B6) via~~
39 ~~examination of documentation that shows that random samples were collected. (Because~~
40 ~~representativeness is a quality characteristic that expresses the degree to which a sample or group~~
41 ~~of samples represent the population being studied, the random sampling of waste streams ensures~~
42 ~~representativeness.)~~

1 B-3 Waste Characterization Methods for Certified Characterization Programs

2 The characterization techniques used by certified characterization programs include acceptable
3 knowledge (AK) and may also include, as necessary, radiography and/or visual examination,
4 headspace-gas sampling and analysis, and homogeneous waste sampling and analysis. These
5 characterization techniques, when performed, shall be performed in accordance with this WAP.
6 Table B-5 provides a summary of the characterization requirements for TRU mixed waste.

7
8 B-3a Acceptable Knowledge

9 Acceptable knowledge is used in TRU mixed waste characterization activities in five ways:

- 10
11 • To delineate TRU mixed waste streams
12
13 • To assess whether TRU mixed wastes comply with the TSDF-WAC
14
15 • To assess whether TRU mixed wastes exhibit a hazardous characteristic (20.4.1.200
16 NMAC, incorporating 40 CFR §261 Subpart C)
17
18 • To assess whether TRU mixed wastes are listed (20.4.1.200 NMAC, incorporating 40
19 CFR §261 Subpart D)
20
21 • To estimate waste material parameter weights when seeking a Scenario 1 or a Scenario 2
22 AKSD
23

24 Acceptable knowledge is discussed in detail in Renewal Application Attachment B4, which
25 outlines the minimum set of requirements which shall be met by the certified characterization
26 programs in order to use AK. In addition, Section B-5a(3) of this Renewal Application describes
27 the assessment of AK through the Permittees' Audit and Surveillance Program.

28 B-3b Radiography and Visual Examination

29 Radiography is a nondestructive qualitative and quantitative technique that involves X-ray
30 scanning of waste containers to identify and verify waste container contents. Visual examination
31 (VE) constitutes opening a container and physically examining its contents. Certified
32 characterization programs shall perform radiography or VE of 100 percent of TRU mixed waste
33 containers in waste streams except for those waste streams for which the Permittees approve a
34 Scenario 1 or Scenario 2 AKSD Request.

35
36 Radiography and/or visual examination will be used, when necessary, to examine a waste
37 container to verify its physical form. These techniques can detect liquid wastes and

1 containerized gases, which are prohibited for WIPP disposal. The prohibition of liquids and
2 containerized gases prevents the shipment of corrosive, ignitable, or reactive wastes.
3 Radiography and/or VE are also able to confirm that the physical form of the waste matches its
4 waste stream description (i.e., Homogeneous Solids, Soil/Gravel, or Debris Waste). If the
5 physical form does not match the waste stream description, the waste will be designated as
6 another waste stream and assigned the preliminary hazardous waste numbers associated with that
7 new waste stream assignment. That is, if radiography and/or VE indicate that the waste does not
8 match the waste stream description arrived at by AK characterization, a non-conformance report
9 will be completed and the inconsistency will be resolved as specified in Renewal Application
10 Appendix B4. The proper waste stream assignment will be determined (including preparation of
11 a new WSPF), the correct hazardous waste numbers will be assigned, and the resolution will be
12 documented. Refer to Renewal Application Appendix B4 for a discussion of AK and its
13 verification process. Radiographic examination protocols and QA/QC methods are provided in
14 Permit Attachment B1. Radiography and VE shall be subject to the Permittees' Audit and
15 Surveillance Program (Renewal Application Appendix B6).

16 B-3c Headspace Gas Sampling and Analysis

17 Representative headspace gas sampling and analysis shall be used by certified characterization
18 programs to resolve the assignment of EPA hazardous waste numbers for debris waste streams
19 for which an AKSD Request has not been approved by the Permittees.

20
21 The waste containers for sampling and analysis are to be selected randomly from the population
22 of containers for the waste stream. The random selection methodology is specified in Renewal
23 Application Appendix B2. Representativeness of containers selected for waste subjected to
24 headspace gas sampling and analysis will be validated by the certified characterization program
25 and by the Permittees during an audit (Renewal Application Appendix B6) via examination of
26 documentation that shows that random samples were collected.

27
28 The HSG sampling method provided in Renewal Application Appendix B1 will be used by
29 certified characterization programs to determine the types and concentrations of VOCs in the
30 void volume of randomly selected waste containers. In addition, VOC constituents will be
31 compared to those assigned by AK, which may include an analysis of radiolytically derived
32 VOCs. The certified characterization programs may also consider radiolysis and packaging
33 materials when assessing the presence of hazardous constituents in the HSG results. Refer to
34 Renewal Application Appendix B4 for additional clarification regarding hazardous waste
35 number assignment and HSG results.

36 37 B-3d Homogeneous and Soils/Gravel Waste Sampling and Analysis

38 Representative homogeneous and soils/gravel waste sampling and analysis shall be used by
39 certified characterization programs to resolve the assignment of EPA hazardous waste numbers
40 for homogeneous and soil/gravel waste streams for which an AKSD Request has not been
41 approved by the Permittees. Sampling is accomplished through coring or other EPA approved

1 sampling, which is described in Renewal Application Appendix B1. Debris that may also be
2 present within these wastes need not be sampled.

3
4 The waste containers for sampling and analysis are to be selected randomly from the population
5 of containers for the waste stream. The random selection methodology is specified in Renewal
6 Application Appendix B2. Representativeness of containers selected for waste subjected to
7 homogeneous solids and soils/gravel sampling and analysis will be validated by the certified
8 characterization program and by the Permittees during an audit (Renewal Application
9 Appendix B6) via examination of documentation that shows that random samples were collected.

10
11 Totals or Toxicity Characteristic Leaching Procedure (TCLP) analyses for VOCs, semi-volatile
12 organic compounds (SVOCs), and RCRA related metals are used to resolve the assignment of
13 TC EPA hazardous waste numbers in homogeneous solids and soils/gravel (Tables B-3 and B-4).
14 To determine if a waste exhibits a TC for compounds specified in 20.4.1.200 NMAC
15 (incorporating 40 CFR §261, Subpart C), TCLP may be used instead of total analyses. The
16 certified characterization program will use the results from these analyses to determine if a waste
17 exhibits a TC. The mean concentration of TC contaminants is calculated for each waste stream
18 such that it can be reported with an upper 90 percent confidence limit (UCL₉₀). The UCL₉₀
19 values for the mean measured contaminant concentrations in a waste stream will be compared to
20 the specified regulatory levels in 20.4.1.200 NMAC (incorporating 40 CFR §261 Subpart C),
21 expressed as total/TCLP values, to determine if the waste stream exhibits a TC. A comparison of
22 total analyses and TCLP analyses is presented in Renewal Application Addendum B1, and a
23 discussion of the UCL₉₀ is included in Renewal Application Appendix B2. If TC wastes are
24 identified, these will be compared to those determined by AK and TC waste numbers will be
25 revised, as warranted. Refer to Renewal Application Appendix B4 for additional clarification
26 regarding hazardous waste number assignment and homogeneous solid and soils/gravel
27 analytical results.

28 29 B-3e Laboratory Qualification

30 The Permittees will ensure that certified characterization programs conduct analyses using
31 laboratories that are qualified through participation in a written performance demonstration
32 program (PDP). Required QAOs are specified in Renewal Application Appendix B3. In
33 addition, methods and supporting performance data demonstrating QAO compliance shall be
34 ensured by the Permittees during the annual certification audit of the laboratories.

35
36 Analytical methods used by the laboratories shall: 1) satisfy all of the appropriate QAOs, and
37 2) be implemented through laboratory-documented SOPs. These analytical QAOs are discussed
38 in detail in Renewal Application Appendix B3.

39 40 B-3f Characterization Techniques and Frequency for Transuranic Mixed Waste

41 Certified characterization programs will use AK to delineate all TRU mixed waste containers
42 into waste streams for the purposes of grouping waste for further characterization. The analyses
43 performed may differ based on the waste stream and the physical form of the waste (i.e.,

1 heterogeneous debris waste cannot be sampled for totals or TCLP analyses). All TRU mixed
2 wastes will be delineated in this fashion, though the AK used may differ. Section B-3a discusses
3 the use of AK, sampling, and analysis in more detail. Acceptable knowledge is discussed more
4 completely in Renewal Application Appendix B4. Waste streams will be assigned hazardous
5 waste numbers, as appropriate, based upon AK, and the certified characterization programs may
6 resolve the assignment of hazardous waste numbers using HSG (Summary Category Group
7 S5000 only) or solid sampling and analysis (Summary Category Groups S3000 and S4000 only).

8
9 For debris waste streams that do not have an AKSD approved by the Permittees, containers
10 selected in accordance with Renewal Application Appendix B2 from those waste streams must
11 be sampled and analyzed for VOCs in the HSG. A statistically selected portion of homogeneous
12 solids and soil/gravel waste streams must be sampled and analyzed for RCRA-regulated total
13 VOCs, SVOCs, and metals when those waste streams do not have an AKSD approved by the
14 Permittees. Sampling and analysis methods used for waste characterization are discussed in
15 Section B-3c and Section B-3d.

16
17 The typical waste characterization data collection design used by the certified characterization
18 programs for TRU mixed waste is described in the following sections. Table B-1 provides a
19 summary of HSG and solids sample analyses requirements for TRU mixed waste by waste
20 Summary Category Group. Table B-5 summarizes the parameters, methods, and rationales for
21 CH TRU mixed wastes according to their waste forms.

22
23 For toxicity characteristic constituents, the certified characterization program may take
24 concentration into account when assessing whether to add a hazardous waste number. Some
25 listed hazardous wastes are listed solely because they exhibit the characteristic of ignitability,
26 corrosivity, and/or reactivity. These F, K, P, and U wastes do not retain the associated listed
27 hazardous waste number if the wastes no longer exhibit the characteristics of ignitability,
28 corrosivity, and/or reactivity. The WIPP may accept TRU mixed waste that has been treated as
29 long as the assigned hazardous waste numbers are approved for disposal at WIPP (Table B-9).

30 31 B-3g TRU Mixed Waste

32 Waste containers are delineated into waste streams using AK. The Permittees will require that
33 the certified characterization programs document the methods used to delineate waste streams in
34 the AK record and Acceptable Knowledge Summary Report.

35
36 Radiography and/or VE will be performed as specified in Renewal Application Appendix B1,
37 Sections B1-3 and/or B1-4 to determine that the physical form of the waste (Summary Category
38 Group) corresponds to the physical form of the assigned waste stream, Waste Matrix Code,
39 waste material parameters, and the absence of prohibited items. The data is then used to identify
40 additional waste characterization techniques that may be used based on the confirmed Summary
41 Category Groups since waste within the Homogeneous Solids and Soils/Gravel Summary
42 Category Groups are characterized using different techniques than the waste in the Debris Waste
43 Summary Category Group. The packaging configuration, type and number of filters, and rigid
44 liner vent hole presence and diameter necessary to determine the appropriate drum age criteria

1 (DAC) in accordance with Renewal Application Appendix B1, Section B1-1, may be
2 documented as part of the characterization information collected during packaging, RTR, and/or
3 VE for those containers of debris waste that will undergo HSG sampling and analysis.

4
5 All VE activities shall be documented on video/audio media or by using a second operator, who
6 is equally trained to the requirements stipulated in Renewal Application Appendix B1, to provide
7 additional verification by reviewing the contents of the waste container to ensure correct
8 reporting. If the second operator cannot provide concurrence, corrective actions³ will be taken as
9 specified in Renewal Application Appendix B3.

10 11 B-3g(1) Sampling of Homogeneous Solids and Soils/Gravel

12 When a AKSD Request has not been approved by the Permittees, sampling and analysis of
13 homogeneous solid and soils/gravel waste streams shall be conducted in accordance with the
14 requirements specified in Renewal Application Appendix B1, Section B1-2. The number of
15 homogeneous solid and soils/gravel waste containers to be sampled will be determined using the
16 procedure specified in Section B2-1, wherein a statistically selected portion of the waste will be
17 sampled.

18 19 B-4 Data Verification and Quality Assurance

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

27 28 B-4a Data Generation and Project Level Verification Requirements

29 B-4a(1) Data Quality Objectives

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

- 35
36 • Acceptable Knowledge

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

- 1 - To delineate TRU mixed waste streams.
- 2 - To assess whether TRU mixed wastes comply with the applicable requirements of
3 the TSDF-WAC.
- 4 - To assess whether TRU mixed wastes exhibit a hazardous characteristic
5 (20.4.1.200 NMAC, incorporating 40 CFR §261 Subpart C).
- 6 - To assess whether TRU mixed wastes are listed (20.4.1.200 NMAC,
7 incorporating 40 CFR §261, Subpart D).
- 8 - To estimate waste material parameter weights when seeking a Scenario 1 or a
9 Scenario 2 AKSD.
- 10 • ~~Headspace Gas~~ Headspace Gas Sampling and Analysis
- 11 - To identify VOCs and quantify the concentrations of VOC constituents in debris
12 waste containers to resolve the assignment of EPA hazardous waste numbers
- 13 • Homogeneous Waste Sampling and Analysis
- 14 - To compare ~~UCL₉₀~~ UCL₉₀ values for the mean measured contaminant
15 concentrations in a homogeneous solid or soil/gravel waste stream with specified
16 TC toxicity characteristic levels in 20.4.1.200 NMAC (incorporating 40 CFR
17 §261), to determine if the waste is hazardous, and to resolve the assignment of
18 EPA TC hazardous waste numbers.
- 19 • Radiography
- 20 - To determine the physical waste form, the absence of prohibited items, and
21 additional waste characterization techniques that may be used based on the
22 Summary Category Groups (i.e., S3000, S4000, S5000).
- 23 • Visual Examination
- 24 - To determine the physical waste form, the absence of prohibited items, and
25 additional waste characterization techniques that may be used based on the
26 Summary Category Groups (i.e., S3000, S4000, S5000).
- 27 Reconciliation of these DQOs by the Generator/Storage certified characterization program Site
28 Project Manager or the Permittee approved laboratories, as applicable, is addressed in Renewal
29 Application Appendix B3. Reconciliation requires determining whether sufficient type, quality,
30 and quantity of data have been collected to ensure the ~~DQOs~~ DQOs cited above can be achieved.
31

1 B-4a(2) Quality Assurance Objectives

2 The ~~generator/storage site~~ certified characterization programs or the Permittee approved
3 laboratories, as applicable, shall demonstrate compliance with each QAO associated with the
4 various characterization methods as presented in Renewal Application Appendix B3.

5 ~~Generator/Storage Site~~ The certified characterization program Site Project Managers or the
6 Permittee approved laboratories, as applicable, are further required to perform a reconciliation of
7 the data with the DQOs established in this WAP. The ~~Generator/Storage Site~~ certified
8 characterization program Site Project Manager or the Permittee approved laboratories, as
9 applicable, shall conclude that all of the DQOs have been met for the characterization of the
10 waste stream prior to submitting a WSPF to the Permittees for approval (Renewal Application
11 Appendix B3). The following QAO elements shall be considered for each technique, as a
12 minimum:

13
14 • Precision

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

16 • Accuracy

17 – Accuracy is the degree of agreement between a measurement result and the true
18 or known value.

19 • Completeness

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

22 • Comparability

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

24 • Representativeness

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

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

30
31 B-4a(3) Sample Control

32 The ~~generator/storage sites~~ certified characterization programs and Permittee approved
33 laboratories, as applicable, will implement a sample handling and control program that will
34 include the maintenance of field documentation records, proper labeling, and a chain of custody

1 (COC) record. The ~~generator/storage sites~~ certified characterization programs and Permittee
2 approved laboratories, as applicable, Quality Assurance Project Plan (QAPjP) or procedures
3 referenced in the QAPjP will document this program and include COC forms to control the
4 sample from the point of origin to the final analysis result reporting. The Permittees will review
5 and approve the QAPjP, including their determination that the sample control program is
6 adequate. The approved QAPjP will be provided to NMED prior to shipment of TRU mixed
7 waste and before the ~~generator/storage sites~~ certified characterization program audit, as specified
8 in Renewal Application Appendix B5 (Quality Assurance Project Plan Requirements). Details
9 of this sample control program are provided in Renewal Application Appendix B1 and are
10 summarized below to include:

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

19 B-4a(4) Data Generation

20 The BDRs, in a format approved by the Permittees, will be used by each ~~generator/storage~~
21 ~~site~~ certified characterization program and Permittee approved laboratory laboratories, as
22 applicable, for reporting waste characterization data. This format will be included in the
23 ~~generator/storage site~~ certified characterization program and Permittee approved laboratories, as
24 applicable, QAPjP, controlled electronic databases, or procedures referenced in the QAPjP
25 (Renewal Application Appendix B5) and will include all of the elements required by this WAP
26 for BDR (Renewal Application Appendix B3).

27

28 The Permittees shall perform audits of the ~~generator/storage site waste~~ certified characterization
29 programs, as implemented by the ~~generator/storage site~~ certified characterization program
30 QAPjP, to verify compliance with the WAP and the DQOs in this WAP (See Renewal
31 Application Appendix B6 for a discussion of the content of the audit program). The primary
32 functions of these audits are to review ~~generator/storage sites'~~ certified characterization
33 programs' adherence to the requirements of this WAP and ensure adherence to the WAP
34 characterization program. The Permittees shall provide the results of each audit to NMED. If
35 audit results indicate that a ~~generator/storage site~~ certified characterization program is not in
36 compliance with the requirements of this WAP, the Permittees will take appropriate action as
37 specified in Renewal Application Appendix B6.

38

39 The Permittees shall perform audits of the Permittee approved laboratory's programs, as
40 implemented by the laboratory's QAPjP (See Renewal Application Appendix B6 for a discussion
41 of the content of the audit program). The primary functions of these audits are to review the

1 Permittee approved laboratory's adherence to the requirements of this WAP. The Permittees
2 shall provide the results of each audit to NMED. If audit results indicate that a Permittee
3 approved laboratory is not in compliance with the requirements of this WAP, the Permittees will
4 take appropriate action as specified in Renewal Application Appendix B6.

5
6 The Permittees shall further require all Permittee approved laboratories analyzing WIPP waste
7 samples for the ~~generator/storage sites~~ certified characterization programs to have established,
8 documented QA/QC programs. The Permittees annually evaluate these laboratories and their
9 QA/QC programs as part of their participation in the Permittees' PDP laboratory performance
10 program. The Permittees' audits cover the requirements of the lab's QA/QC program, as well as
11 compliance with this WAP. Continued compliance with these parameters will be verified by
12 ongoing audits by the Permittees ~~at the generator/storage sites~~ of the certified characterization
13 programs and these laboratories as specified in Renewal Application Appendix B6. The
14 Permittees' audits of the ~~generator/storage sites~~ certified characterization programs will verify
15 that the laboratories analyzing the sites' waste^s have been properly audited by the
16 ~~generator/storage sites~~ certified characterization programs. The laboratory's QA/QC program
17 shall include the following:

- 18
- 19 • Facility organization
- 20 • A list of equipment/instrumentation
- 21 • Operating procedures
- 22 • Laboratory QA/QC procedures
- 23 • Quality assurance review
- 24 • Laboratory records management

25 B-4a(5) Data Verification

26 The BDRs will document the testing, sampling, and analytical results from the required
27 characterization activities, and document required QA/QC activities. Data validation and
28 verification at both the data-generation level and the project level will be performed as required
29 by ~~this~~ the Permit before the required data are transmitted to the Permittees (Renewal
30 Application Appendix B3). The NMED may request, through the Permittees, copies of any
31 BDR, and/or the raw data validated by the ~~generator/storage sites~~ certified characterization
32 programs, to check the Permittees' audit of the validation process.

33
34 B-4a(6) Data Transmittal

35 BDRs will include the information required by Renewal Application Appendix B3,
36 Section B3-10 and will be transmitted by hard copy or electronically (provided a hard copy is
37 available on demand) from the data generation level to the project level.

1 The generator/storage site certified characterization program will transmit waste container
2 information electronically via the WIPP Waste Information System (WWIS). Data will be
3 entered into the WWIS in the exact format required by the database. Refer to Section B-5a(1)
4 for WWIS reporting requirements and Table B-7 the *WIPP Waste Information System User's*
5 *Manual for Use by Shippers/Generators* (DOE, 2001) for the WWIS data fields and format
6 requirements.

7
8 Once a waste stream is characterized, the certified characterization program Site Project
9 Manager will also submit to the Permittees a WSPF (Figure B-1) accompanied by the CIS for
10 that waste stream which includes reconciliation with DQOs (Renewal Application Appendix B3,
11 Sections B3-12b(1) and B3-12b(2)). The WSPF, the CIS, and information from the WWIS will
12 be used as the basis for acceptance of waste characterization information on TRU mixed wastes
13 to be disposed of at the WIPP.

14 B-4a(7) Records Management

15
16 ~~Records related to waste characterization activities performed by the generator/storage sites will~~
17 ~~be maintained in the testing, sampling, or analytical facility files or generator/storage site project~~
18 ~~files, or at the the WIPP Records Archive facility. Permittee approved laboratories will forward~~
19 ~~testing, sampling, and analytical records along with BDRs, to the generator/storage site project~~
20 ~~office for inclusion in the generator/storage site's project files and to the Permittees for inclusion~~
21 ~~in the WIPP facility operating record. Raw data obtained by testing, sampling, and analyzing~~
22 ~~TRU mixed waste in support of this WAP will be identifiable, legible, and provide documentary~~
23 ~~evidence of quality. TRU mixed waste characterization records submitted to the Permittees shall~~
24 ~~be maintained in the WIPP facility operating record and be available for inspection by NMED.~~

25
26 ~~Records inventory and disposition schedule (RIDS) or an equivalent system shall be prepared~~
27 ~~and approved by generator/storage site personnel. All records relevant to an enforcement action~~
28 ~~under this Permit, regardless of disposition, shall be maintained at the generator/storage site until~~
29 ~~NMED determines they are no longer needed for enforcement action, and then dispositioned as~~
30 ~~specified in the approved RIDS. All waste characterization data and related QA/QC records for~~
31 ~~TRU mixed waste to be shipped to the WIPP facility are designated as either Lifetime Records or~~
32 ~~Non-Permanent Records.~~

33
34 ~~Records that are designated as Lifetime Records shall be maintained for the life of the waste~~
35 ~~characterization program at a participating generator/storage the TRU waste site plus six years or~~
36 ~~transferred for permanent archival storage to the WIPP Records Archive facility.~~

37
38 ~~Waste characterization records designated as Non-Permanent Records shall be maintained for ten~~
39 ~~years from the date of (record) generation at the participating generator/storage TRU waste site~~
40 ~~or at the WIPP Records Archive facility and then dispositioned according to their approved~~
41 ~~RIDS. If a generator/storage site ceases to operate, all records shall be transferred before~~
42 ~~closeout to the Permittees for management at the WIPP Records Archive facility. Table B-6 is a~~
43 ~~listing of records designated as Lifetime Records and Non-Permanent Records. Classified~~
44 ~~information will not be transferred to WIPP. Notations will be provided to the Permittees~~

1 ~~indicating the absence of classified information. The approved generator/storage site RIDS will~~
2 ~~identify appropriate disposition of classified information. Nothing in this Permit is intended to,~~
3 ~~nor should it be interpreted to, require the disclosure of any U.S. Department of Energy~~
4 ~~classified information to persons without appropriate clearance to view such information.~~
5

6 B-5 Permittee Level Waste Screening and Verification of **Transuranic** TRU Mixed Waste

7 Permittee waste screening is a two-phased process. Phase I will occur prior to configuring
8 shipments of TRU mixed waste. Phase II will occur after configuration of shipments of TRU
9 mixed waste but before it is disposed at the WIPP facility. Figure B-3 presents Phase I and a
10 portion of Phase II of the TRU mixed waste screening process. Renewal Application
11 Appendix B7 presents the Permittees' TRU mixed waste confirmation portion of Phase II
12 activities.
13

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

15 The first phase of the waste screening and verification process will occur before TRU mixed
16 waste is shipped to the WIPP facility. Before the Permittees begin the process of accepting TRU
17 mixed waste from a ~~generator/storage site~~ **TRU waste site**, an initial audit of that
18 ~~generator/storage site~~ **characterization program** will be conducted as part of the Permittees' Audit
19 and Surveillance Program (Renewal Application Appendix B6). The RCRA portion of the
20 ~~generator/storage site~~ **characterization program** audit program will provide on-site verification of
21 characterization procedures; BDR preparation; and recordkeeping to ensure that all applicable
22 provisions of the WAP requirements are met. Another portion of the Phase I verification is the
23 WSPF approval process. At the WIPP facility, this process includes verification that all of the
24 required elements of the WSPF and the CIS are present (Renewal Application Appendix B3) and
25 that the waste characterization information meet acceptance criteria required for compliance with
26 the WAP (Renewal Application Appendix B3, Section B3-12b(1)).
27

28 A ~~generator/storage site~~ **characterization program** must first prepare a QAPjP, which includes
29 applicable WAP requirements, and submit it to the Permittees for review and approval (Renewal
30 Application Appendix B5). Once approved, a copy of the QAPjP is provided to NMED for
31 examination. The ~~generator/storage site~~ **characterization program** will implement the specific
32 parameters of the QAPjP after it is approved. An initial audit will be performed after QAPjP
33 implementation and prior to the ~~generator/storage site~~ **characterization program** being certified
34 for shipment of waste to WIPP. Additional audits, focusing on the results of waste
35 characterization, will be performed at least annually. The Permittees have the right to conduct
36 unannounced audits and to examine any records that are related to the scope of the audit. See
37 Section B-5a(3) and Renewal Application Appendix B6 for further information regarding audits.
38

39 When the required waste stream characterization data have been collected by a ~~generator/storage~~
40 ~~site~~ **certified characterization program** and the initial ~~generator/storage site~~ **characterization**
41 **program certification** audit has been successfully completed, the ~~generator/storage~~ **certified**
42 **characterization program** Site Project Manager will verify that waste stream characterization
43 meets the applicable WAP requirements as a part of the project level verification (Renewal

1 Application B3, Section B3-10b). If the waste characterization does not meet the applicable
2 requirements of the WAP, the mixed waste stream cannot be managed, stored, or disposed at
3 WIPP until those requirements are met. The certified characterization program Site Project
4 Manager will then complete a WSPF and submit it to the Permittees, along with the
5 accompanying CIS for that waste stream (Renewal Application B3, Section B3-12b(1)). All data
6 necessary to check the accuracy of the WSPF will be transmitted to the Permittees for
7 verification. This provides notification that the ~~generator/storage site~~ certified characterization
8 program considers that the waste stream (identified by the waste stream identification number)
9 has been adequately characterized for disposal prior to shipment to WIPP. The Permittees will
10 compare ~~headspace gas HSG, radiographic, visual examination VE~~ and solid sampling/analysis
11 data obtained subsequent to submittal and prior to approval of the WSPF ~~(and prior to submittal)~~
12 with characterization information presented on this form. If the Permittees determine (through
13 the data comparison) that the characterization information is adequate, the WSPF will be
14 approved. Prior to the first shipment of containers from the approved waste stream, the approved
15 WSPF and accompanying CIS will be provided to NMED. If the data comparison indicates that
16 analyzed containers have hazardous wastes not present on the WSPF, or a different Waste Matrix
17 Code applies, the WSPF is in error and shall be resubmitted. Ongoing WSPF examination is
18 discussed in detail in Section B-5a(2).

19
20 Audits of ~~generator/storage sites~~ certified characterization programs will be conducted as part of
21 the Permittees' Audit and Surveillance Program (Renewal Application Appendix B6). The
22 RCRA portion of the ~~generator/storage site~~ certified characterization program audit program will
23 provide on-site verification of waste characterization procedures; BDR preparation; and record
24 keeping to ensure that all applicable provisions of the WAP requirements are met. As part of the
25 waste characterization data submittal, the ~~generator/storage site~~ certified characterization
26 program will also transmit the data on a container basis via the WWIS. This data submittal can
27 occur at any time as the data are being collected, but will be complete for each container prior to
28 shipment of that container. The WWIS will conduct internal edit/limit checks as the data are
29 entered, and the data will be available to the Permittees as supporting information for WSPF
30 review. The NMED will have read-only access to the WWIS as necessary to determine
31 compliance with the WAP. The initial WSPF check performed by the Permittees will include
32 WWIS data submitted by the ~~generator/storage site~~ certified characterization program for each
33 waste container and the CIS. The Permittees will compare ongoing sampling/analysis
34 characterization data obtained and submitted via the WWIS to the approved WSPF. If this
35 comparison shows that containers have hazardous wastes not reported on the WSPF, or a
36 different Waste Matrix Code applies, the data are rejected and the waste containers are not
37 accepted for shipment until a new or revised WSPF is submitted to and approved by the
38 Permittees.

39
40 If discrepancies regarding hazardous waste number assignment or Waste Matrix Code
41 designation arise as a result of the Phase I review, the ~~generator/storage sites~~ certified
42 characterization programs will be contacted by the Permittees and required to provide the
43 necessary additional information to resolve the discrepancy before that waste stream is approved
44 for disposal at the WIPP facility. If the discrepancy is not resolved, the waste stream will not be
45 approved. ~~The Permittees will notify NMED in writing of any discrepancies identified during~~

1 ~~WSPF review and the resulting discrepancy resolution prior to waste shipment. The Permittees~~
2 ~~will not manage, store, or dispose the waste stream until this discrepancy is resolved in~~
3 ~~accordance with this WAP.~~
4

5 B-5a(1) Waste Isolation Pilot Plant Waste Information System ~~WWIS~~ Description

6 All generator/storage sites certified characterization programs planning to ship TRU mixed waste
7 to WIPP will supply the required data to the WWIS. The WWIS Data Dictionary includes all of
8 the data fields, the field format and the limits associated with the data as established by this
9 WAP. These data will be subjected to edit and limit checks that are performed automatically by
10 the database, as defined in the *WIPP Waste Information System User's Manual for Use by*
11 *Shippers/Generators* (DOE, 2001).
12

13 The Permittees will coordinate the data transmission with each generator/storage site certified
14 characterization program. Actual data transmission will use appropriate technology to ensure the
15 integrity of the data transmissions. The Permittees will require sites certified characterization
16 programs with large waste inventories and large databases to populate a data structure provided
17 by the Permittees that contains the required data dictionary fields that are appropriate for the
18 waste stream (or waste streams) at that TRU waste site. For example, totals analysis data will
19 not be requested from sites certified characterization programs that do not have homogeneous
20 solids or soil/gravel waste. The Permittees will access these data via the Internet to ensure an
21 efficient transfer of this these data. ~~Small quantity sites will be given a similar data structure by~~
22 ~~the Permittees that is tailored to their types of waste. Sites with very small quantities of waste~~
23 ~~will be provided with the ability to assemble the data interactively to this data structure on the~~
24 ~~WWIS.~~
25

26 The Permittees will use the WWIS to verify that all of the supplied data meet the edit and limit
27 checks prior to the shipment of any TRU mixed waste to WIPP. The WWIS automatically will
28 notify the generator/storage site certified characterization program if any of the supplied data
29 fails to meet the requirements of the edit and limit checks via an appropriate error message. The
30 generator/storage site certified characterization program will be required to correct the
31 discrepancy with the waste or the waste data and re-transmit the corrected data prior to
32 acceptance of the data by the WWIS. The Permittees will review data reported for each
33 container of each shipment prior to providing notification to the ~~shipping generator/storage site~~
34 certified characterization program that the shipment is acceptable. Read-only access to the
35 WWIS will be provided to NMED. Table B-7 contains a listing of the data fields contained in
36 the WWIS that are required as part of this the Permit.
37

38 The WWIS will generate the following:
39

- 40 • Waste Emplacement Report

41 This report will be added to the operating record to track the quantities of waste, date of
42 emplacement, and location of authorized containers or container assemblies in the
43 repository. The Permittees will document the specific panel room or drift that an

1 individual waste container is placed in as well as the row/column/height coordinates
2 location of the container or containers assembly. This report will be generated on a
3 weekly basis. Locations of containers or container assemblies will also be placed on a
4 map separate from the WWIS. Reports and maps that are included as part of the
5 operating record will be retained at the WIPP site, for the life of the facility.
6

7 • Shipment Summary Report

8 This report will contain the container identification **ID** numbers (~~IDs~~) of every
9 container in the shipment, listed by Shipping Package number and by assembly number
10 (for seven-packs, four-packs, and three-packs), for every assembly in the Shipping
11 Package. This report is used by the Permittees to verify containers in a shipment and will
12 be generated on a shipment basis.
13

14 • Waste Container Data Report

15 This report will be generated on a waste stream basis and will be used by the Permittees
16 during the WSPF review and approval process. This report will contain the data listed in
17 the Characterization Module **Data Fields** on Table B-7. This report will be generated and
18 attached to the WSPF for inclusion in the facility operating record and will be kept for the
19 life of the facility.
20

21 • Reports of Change Log

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

28 Access to the WWIS will be controlled by the Permittees' Data Administrator (**DA**) who will
29 control the WWIS users based on approval from management personnel.
30

31 The TRU mixed waste generator/storage sites **certified characterization programs** will only have
32 access to data that they have supplied, and only until the data have been formally accepted by the
33 Permittees. After the data have been accepted, **the these** data will be protected from
34 indiscriminate change and can only be changed by a **an** authorized DA.
35

36 The WWIS has a Change Log that requires a reason for the change from the DA prior to
37 accepting the change. The data change information, the user ID of the authorized DA making
38 the change, and the date of the change will be recorded in the data change log automatically.
39 The data change log cannot be revised by any user, including the DA. The data change log will
40 be subject to internal and external audits and will provide an auditable trail for all changes made
41 to previously approved data.
42

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

2 The Permittees will be responsible for the verification of completeness and accuracy of the
3 ~~WSPF Waste Stream Profile Form~~ (Renewal Application B3, Section B3-12b(1)). Figure B-2
4 includes the waste characterization and Permittees' waste stream approval process. The
5 assignment of the waste stream description, Waste Matrix Code Group, and Summary Category
6 Groups; the results of waste analyses, as applicable; the ~~acceptable knowledge~~ AK summary
7 documentation; the methods used for characterization; the Carlsbad Field Office (**CBFO**)
8 certification, and appropriate designation of EPA hazardous waste number(s) will be examined.
9 If the WSPF is inaccurate, efforts will be made to resolve discrepancies by contacting the
10 ~~generator/storage site~~ certified characterization program in order for the waste stream to be
11 eligible for shipment to the WIPP facility. If discrepancies in the waste stream are detected at
12 the ~~generator/storage~~ TRU waste site, the ~~generator/storage site~~ certified characterization
13 program will implement a non-conformance program to identify, document, and report
14 discrepancies (Renewal Application Appendix B3).

15
16 The WSPF shall pass all verification checks by the Permittees in order for the waste stream to be
17 approved for shipment to the WIPP facility. The WSPF check against waste container data will
18 occur during the initial WSPF approval process (Section B-5a).

19
20 The EPA hazardous waste numbers for the wastes that appear on the ~~WSPF Waste Stream~~
21 ~~Profile Form~~ will be compared to those in Table B-9 to ensure that only approved wastes are
22 accepted for management, storage, or disposal at WIPP. Some of the waste may also be
23 identified by unique state hazardous waste codes or numbers. These wastes are acceptable at
24 WIPP as long as the TSDF-WAC are met. The CIS will be reviewed by the Permittees to verify
25 that the waste has been classified correctly with respect to the assigned EPA hazardous waste
26 numbers. Any analytical method used will be compared to those listed in Tables B-2, B-3, and
27 B-4 to ensure that only approved analytical methods were used for analysis of the waste. The
28 Permittees will verify that the applicable requirements of the TSDF-WAC have been met by the
29 ~~generator/storage site~~ certified characterization program.

30
31 Waste data transferred via the WWIS after WSPF approval will be compared with the approved
32 WSPF. Any container from an approved hazardous waste stream with a description different
33 from its WSPF will not be managed, stored, or disposed at WIPP.

34
35 The Permittees will also verify that three different types of data specified below are available for
36 every container holding TRU mixed waste before that waste is managed, stored, or disposed at
37 WIPP: 1) an assignment of the waste stream's waste description (by Waste Matrix Codes) and
38 Waste Matrix Code Group; 2) a determination of ignitability, reactivity, and corrosivity; and 3) a
39 determination of compatibility. The verification of waste stream description will be performed
40 by reviewing the WWIS for consistency in the waste stream description and WSPF. The CIS
41 will indicate if the waste has been checked for the characteristics of ignitability, corrosivity, and
42 reactivity. The final verification of waste compatibility will be performed using Addendum B-2
43 Appendix C1 of the WIPP RCRA Part B Permit Application (DOE, 1997), the compatibility
44 study.

1
2 Any container with unresolved discrepancies associated with hazardous waste characterization
3 will not be managed, stored, or disposed at the WIPP facility until the discrepancies are resolved.
4 If the discrepancies cannot be resolved, the Permittees will revoke the approval status of the
5 waste stream, suspend shipments of the waste stream, and notify NMED. Waste stream approval
6 will not be reinstated until the ~~generator/storage site~~ certified characterization program
7 demonstrates all corrective actions have been implemented and the ~~generator/storage site waste~~
8 certified characterization program is reassessed by the Permittees.
9

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

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

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

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

38 As presented in Figure B-3, Phase II of the waste shipment screening and verification process
39 begins with confirmation of the waste as required by Renewal Application Appendix B7 after
40 waste shipments are configured. After the waste shipment has arrived, the Permittees will screen
41 the shipments to determine the completeness and accuracy of the EPA Hazardous Waste
42 Manifest and the land disposal restriction notice completeness. The Permittees will verify there
43 are no waste shipment irregularities and the waste containers are in good condition. Only those

1 waste containers that are from shipments that have been confirmed as required by Renewal
2 Application Appendix B7 and that pass all Phase II waste screening and verification
3 determinations will be emplaced at WIPP. For each container shipped, the Permittees shall
4 ensure that the generator/storage sites certified characterization programs provide the following
5 information:

6
7 Hazardous Waste Manifest Information:

- 8
- 9 • ~~Generator/storage site name and EPA~~ Item 1, Generator ID Number
 - 10 • ~~Generator/storage~~ Item 5, Generator's name, mailing address, site address, site
11 ~~contact name and phone number~~
 - 12 • Item 11, Quantity of waste
 - 13 • Item 13, List of up to six state and/or federal hazardous waste numbers in each
14 line item
 - 15 • Item 9b, Listing of each all shipping Shipping Package container IDs number
16 (~~Shipping Package serial number~~)
 - 17 • Item 15, Signature of authorized ~~generator~~ representative

18
19 Specific Waste Container information:

- 20
- 21 • Waste Stream Identification Number
 - 22 • List of Hazardous Waste Numbers per Container
 - 23 • Certification Data
 - 24 • Shipping Data (Assembly numbers, ship date, shipping category, etc.)

25
26 This information shall also be supplied electronically to the WWIS. The container-specific
27 information will be supplied electronically as described in Section B-5a(1), and shall be supplied
28 prior to the Permittees' management, storage, or disposal of the waste.

29
30 The Permittees will verify each approved shipment upon receipt at WIPP against the data on the
31 WWIS shipment summary report to ensure containers have the required information. A Waste
32 Receipt Checklist will be used to document the verification.

1 B-5b(1) Examination of the Environmental Protection Agency EPA Uniform Hazardous Waste
2 Manifest and Associated Waste Tracking Information

3 Upon receipt of a TRU mixed waste shipment, the Permittees will make a determination of EPA
4 Uniform Hazardous Waste Manifest completeness and sign the manifest to allow the driver to
5 depart. The generator's copy of the Uniform Hazardous Waste Manifest is returned to the
6 generator. For CH TRU mixed waste, the Permittees will then make a determination of waste
7 shipment completeness by checking the unique, bar-coded identification number found on each
8 container holding TRU mixed waste against the WWIS database after opening the Shipping
9 Package.

10
11 The WWIS links the bar-coded identification numbers of all containers in a specific waste
12 shipment to the waste assembly (for 7-packs, 4-packs, 3-packs and 5-drum carriages) and to the
13 shipment identification number, which is also written on the EPA Uniform Hazardous Waste
14 Manifest.

15
16 For shipments in the RH-TRU 72B cask, the identification number of the single payload
17 container is read during cask-to-cask transfer in the Transfer Cell and then checked against the
18 WWIS database. For shipments in the CNS 10-160B cask, the Permittees will make a
19 determination of waste shipment completeness by checking the unique identification number
20 found on each container holding TRU mixed waste in the Hot Cell against the WWIS database
21 after unloading the cask.

22
23 Generators Certified characterization programs electronically transmit the waste shipment
24 information to the WWIS before the TRU mixed waste shipment is transported. Once a TRU
25 mixed waste shipment arrives, the Permittees verify the identity of each cask or container (or one
26 container in a bound 7-pack, 4-pack, or 3-pack) using the data already in the WWIS.

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

- 31
- 32 • Package inner containment vessel or shipping cask closure date
 - 33 • Overpack identification number (if appropriate)
 - 34 • Package (container or canister) emplacement date
 - 35 • Package (container or canister) emplacement location
- 36

37 Manifest discrepancies will be identified during manifest examination and container bar-code
38 WWIS data comparison. A manifest discrepancy is a difference between the quantity or type of
39 hazardous waste designated on the manifest and the quantity or type of hazardous waste the
40 WIPP facility actually receives. ~~The generator/storage site technical contact~~ generator site (as
41 listed on ~~the~~ manifest Item 5) will be contacted to resolve the discrepancy. If the discrepancy is
42 identified prior to the containers being removed from the package or shipping cask, the waste
43 will be retained in the parking area. If the discrepancy is identified after the waste containers are
44 removed from the package or cask, the waste will be retained in the Waste Handling Building

1 (WHB) until the discrepancy is resolved. Errors on the manifest can be corrected by the WIPP
2 facility with a verbal (followed by a mandatory written) concurrence by the generator/storage
3 site technical contact generator site (as listed on manifest Item 5). All discrepancies that are
4 unresolved within ~~fifteen~~ (15) days of receiving the waste will be immediately reported to
5 NMED in writing. Notifications to NMED will consist of a letter describing the discrepancies,
6 discrepancy resolution, and a copy of the manifest. If the manifest discrepancies have not been
7 resolved within ~~thirty~~ (30) days of waste receipt, the shipment will be returned to the
8 generator/storage facility TRU waste site. If it becomes necessary to return waste containers to
9 the generator/storage TRU waste site, a new EPA Uniform Hazardous Waste Manifest may be
10 prepared by the Permittees.

11
12 Documentation of the returned containers will be recorded in the WWIS. Changes will be made
13 to the WWIS data to indicate the current status of the container(s). The reason for the WWIS
14 data change and the record of the WWIS data change will be maintained in the change log of the
15 WWIS, which will provide an auditable record of the returned shipment.

16
17 The Permittees will be responsible for the resolution of discrepancies, notification of NMED, as
18 well as returning the original copy of the manifest to the generator/storage TRU waste site.

19
20 B-5b(2) Examination of the Land Disposal Restriction (~~LDR~~) Notice

21 The TRU mixed waste designated by the Secretary of Energy for disposal at WIPP is exempt
22 from the Land Disposal Restrictions (LDRs) by the WIPP Land Withdrawal Act Amendment
23 (Public Law 104-201). This amendment states that WIPP "Waste is exempted from treatment
24 standards promulgated pursuant to section 3004(m) of the Solid Waste Disposal Act (42 U.S. C.
25 6924(m)) and shall not be subjected to the Land Disposal prohibitions in section 3004(d), (e), (f),
26 and (g) of the Solid Waste Disposal Act." Therefore, with the initial shipment of a TRU mixed
27 waste stream, the generator certified characterization program shall provide the Permittees with a
28 one time written notice. The notice must include the information listed below:

29
30 Land Disposal Restriction Notice Information:

- 31
- 32 • EPA Hazardous Waste Number(s) and Manifest Numbers of first shipment of a
33 mixed waste stream

 - 34 • Statement: this waste is not prohibited from land disposal

 - 35 • Date the waste is subject to prohibition

36 This information is the applicable information taken from column "268.7(a)(4)" of the
37 "Generator Paperwork Requirements Table" in 20.4.1.800 NMAC (incorporating 40 CFR
38 §268.7(a)(4)). Note that item "5" from the "Generator Paperwork Requirements Table" is not
39 applicable since waste analysis data are provided electronically via the WWIS and item "7" is not
40 applicable since waste designated by the Secretary of Energy for disposal at WIPP is exempted
41 from the treatment standards.

1 The Permittees will review the LDR notice for accuracy and completeness. The ~~generator~~
2 certified characterization program will prepare this notice in accordance with the applicable
3 requirements of 20.4.1.800 NMAC (incorporating 40 CFR §268.7(a)(4)).
4

5 B-5b(3) Verification

6 The Permittees will make a determination of TRU mixed waste shipment irregularities. The
7 following items will be inspected for each TRU mixed waste shipment arriving at the WIPP
8 facility:
9

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

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

31 B-6 Permittees' Waste Shipment Screening Quality Assurance/Quality Control QA/QC

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

1 B-7 Records Management and Reporting

2 Waste characterization records will be maintained in the certified characterization program site
3 project files or the WIPP Records Archive facility until the closure of the facility. This includes
4 testing, sampling, and analytical records along with BDRs, obtained from Permittee approved
5 laboratories. This also includes those records identified as Lifetime Records in Table B-6. Raw
6 data obtained by testing, sampling, and analyzing TRU mixed waste in support of this WAP will
7 be identifiable, legible, and provide documentary evidence of quality.

8
9 The following records will be maintained for waste characterization and waste confirmation
10 purposes as part of the WIPP facility operating record in accordance with 20.4.1.501 NMAC
11 (incorporating 40 CFR § 264.73):

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

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

26
27 Classified information will not be transferred to WIPP. Notations will be provided to the
28 Permittees indicating the absence of classified information. The Permittees will identify the
29 appropriate disposition of classified information. Nothing in this Renewal Application is
30 intended to, nor should it be interpreted to, require the disclosure of any U.S. Department of
31 Energy DOE classified information to persons without appropriate clearance to view such
32 information.

33
34 Waste characterization and waste confirmation data and documents related to waste
35 characterization that are part of the WIPP facility operating record are managed in accordance
36 with the following guidelines:

1 B-7a General Requirements

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

10 B-7b Records Storage

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

18 B-8 Reporting

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

1 List of References

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29 Protection Agency, Office of Solid Waste and Emergency Response, Washington, D.C.

TABLES

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TABLE B-1
SUMMARY OF HEADSPACE GAS AND SOLIDS SAMPLE ~~HAZARDOUS WASTE~~
CHARACTERIZATION REQUIREMENTS
FOR TRANSURANIC MIXED WASTE ^a

| Parameter | Techniques and Procedure | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
|---|---|-----------------------------|----------------------|--------------------|----------------------|--------------------|---------------|---------------------|------------|---------------------|--------------------|------------------------|--------------------|--|----------------------|--|----------------------------|--|------------------------------|--|---------------|--|-------------|--|--------------------|--|---------------------------|--|---------------------|--|---------|--|-----------------------|--|-------------------|--|---------------------------------------|--|---------|--|---|
| <p><u>Physical Waste Form</u></p> <p><u>Summary</u> <u>Category Names</u> S3000 — Homogeneous Solid S4000 — Soil/Gravel S5000 — Debris Wastes</p> | <p><u>Waste Inspection Procedures</u></p> <p>Radiography Visual Examination (Permit Attachment B1-3)</p> | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| <p><u>Headspace Gases</u> — <u>Required for S5000 Debris Waste Only</u></p> <p>Volatile Organic Compounds <u>Analytes</u></p> <table border="0"> <tr> <td>Benzene</td> <td><u>Alcohols and Ketones</u></td> </tr> <tr> <td>Bromoform</td> <td>Acetone</td> </tr> <tr> <td>Carbon tetrachloride</td> <td>Butanol</td> </tr> <tr> <td>Chlorobenzene</td> <td>Methanol</td> </tr> <tr> <td>Chloroform</td> <td>Methyl ethyl ketone</td> </tr> <tr> <td>1,1-Dichloroethane</td> <td>Methyl isobutyl ketone</td> </tr> <tr> <td>1,2-Dichloroethane</td> <td></td> </tr> <tr> <td>1,1-Dichloroethylene</td> <td></td> </tr> <tr> <td>(cis) 1,2-Dichloroethylene</td> <td></td> </tr> <tr> <td>(trans) 1,2-Dichloroethylene</td> <td></td> </tr> <tr> <td>Ethyl benzene</td> <td></td> </tr> <tr> <td>Ethyl ether</td> <td></td> </tr> <tr> <td>Methylene chloride</td> <td></td> </tr> <tr> <td>1,1,2,2-Tetrachloroethane</td> <td></td> </tr> <tr> <td>Tetrachloroethylene</td> <td></td> </tr> <tr> <td>Toluene</td> <td></td> </tr> <tr> <td>1,1,1-Trichloroethane</td> <td></td> </tr> <tr> <td>Trichloroethylene</td> <td></td> </tr> <tr> <td>1,1,2-Trichloro-1,2,2-trifluoroethane</td> <td></td> </tr> <tr> <td>Xylenes</td> <td></td> </tr> </table> | 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 | | 1,1,2,2-Tetrachloroethane | | Tetrachloroethylene | | Toluene | | 1,1,1-Trichloroethane | | Trichloroethylene | | 1,1,2-Trichloro-1,2,2-trifluoroethane | | Xylenes | | <p><u>Gas Analysis</u> ^{fd}</p> <p>Gas Chromatography /Mass Spectroscopy (GC/MS), EPA TO-14A , TO-15 or modified SW-846 8240/8260 (Permit Attachment B3-)</p> <p>GC/Flame Ionization Detector (FID), for alcohols and ketones, SW-846 8015 (Permit Attachment B3-)</p> <p>Fourier Transform Infrared Spectroscopy (FTIRS), SW-846</p> |
| 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 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 1,1,2,2-Tetrachloroethane | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Tetrachloroethylene | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Toluene | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 1,1,1-Trichloroethane | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Trichloroethylene | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 1,1,2-Trichloro-1,2,2-trifluoroethane | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Xylenes | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |

TABLE B-1
SUMMARY OF HEADSPACE GAS AND SOLIDS SAMPLE HAZARDOUS WASTE
CHARACTERIZATION REQUIREMENTS
FOR TRANSURANIC MIXED WASTE ^a

| Parameter | Techniques and Procedure |
|--|---|
| <p align="center"><u>Solids Sample Analysis – Required for S3000 Homogeneous Solids and S4000 Soil/Gravel</u></p> <p align="center"><u>Total Volatile Organic Compounds</u></p> <p>Acetone Benzene Bromoform Butanol Carbon disulfide Carbon tetrachloride Chlorobenzene Chloroform 1,4-Dichlorobenzene^{db} 1,2-Dichlorobenzene^d 1,2-Dichloroethane 1,1-Dichloroethylene Ethyl benzene Ethyl ether Formaldehyde^b Hydrazine^c</p> <p>Isobutanol Methanol Methyl ethyl ketone Methylene chloride Pyridine^d 1,1,2,2-Tetrachloroethane Tetrachloroethylene Toluene 1,1,2-Trichloro-1,2,2-trifluoroethane Trichlorofluoromethane 1,1,1-Trichloroethane 1,1,2-Trichloroethane Trichloroethylene Vinyl chloride Xylenes (trans)-1,2-Dichloroethylene</p> | <p align="center"><u>Total Volatile Organic Compound Analysis</u> ^{§§}</p> <p>TCLP, SW-846 1311 GC/MS, SW-846 8260 or 8240 GC/FID, SW-846 8015 (Permit Attachment B3-) HPLC, SW-846 8315A Acceptable Knowledge for Summary Category S5000 (Debris Wastes)</p> |
| <p align="center"><u>Total Semivolatile Organic Compounds</u></p> <p>Cresols 1,4-Dichlorobenzene^{ec} 1,2-Dichlorobenzene^e 2,4-Dinitrophenol 2,4-Dinitrotoluene Hexachlorobenzene <u>Hexachlorobutadiene</u> Hexachloroethane Nitrobenzene Pentachlorophenol Pyridine^e</p> | <p align="center"><u>Total Semivolatile Organic Compound Analysis</u> ^{§§}</p> <p>TCLP, SW-846 1311 GC/MS, SW-846 8270 (Permit Attachment B3-) Acceptable Knowledge for Summary Category S5000 (Debris Wastes)</p> |
| <p align="center"><u>Total Metals</u></p> <p>Antimony Arsenic Barium Beryllium Cadmium Chromium Lead</p> <p>Mercury Nickel Selenium Silver Thallium Vanadium Zinc</p> | <p align="center"><u>Total Metals Analysis</u> ^{§§}</p> <p>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)</p> |

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 2 ^a Permit Chapter B
 3 ^b Required only for homogeneous solids and soil/gravel waste from Savannah River Site to resolve the assignment of
 4 EPA hazardous waste numbers.
 5 ^c Required only for homogeneous solids and soil/gravel waste from Oak Ridge National Laboratory and Savannah
 6 River Site to resolve the assignment of EPA hazardous waste numbers.

- 1  Can also be analyzed as a semi-volatile organic compound.
- 2  Can also be analyzed as a volatile organic compound.
- 3  Required only to resolve the assignment of EPA hazardous waste numbers to debris waste streams.
- 4  Required only to resolve the assignment of EPA hazardous waste numbers to homogeneous solid and soil/gravel waste streams.
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TABLE B-2
HEADSPACE TARGET ANALYTE LIST AND METHODS ^b

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

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^a U.S. Environmental Protection Agency (EPA), 1999, "Compendium Method TO-14A or TO-15, 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 in Ambient Air—Second Edition (EPA/625/R-96/010b), The most current revision of the specified methods may be used.

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

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**TABLE B-3
 REQUIRED ORGANIC ANALYSES AND TEST METHODS
 ORGANIZED BY ORGANIC ANALYTICAL GROUPS ^{ed}**

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

1 **TABLE B-3 (CONTINUED)**
2 **REQUIRED ORGANIC ANALYSES AND TEST METHODS**
3 **ORGANIZED BY ORGANIC ANALYTICAL GROUPS**
4

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

7 ~~^b Generator/Storage Sites will have to develop an analytical method for hydrazine. This method will be submitted to~~
8 ~~the Permittees for approval.~~

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

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

12 ^e Required only to resolve the assignment of EPA hazardous waste numbers.
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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, 7000, 7010, 7062 |
| Total Arsenic | 6010, 6020, 7010, 7061, 7062 |
| Total Barium | 6010, 6020, 7000, 7010 |
| Total Beryllium | 6010, 6020, 7000, 7010 |
| Total Cadmium | 6010, 6020, 7000, 7010 |
| Total Chromium | 6010, 6020, 7000, 7010 |
| Total Lead | 6010, 6020, 7000, 7010 |
| Total Mercury | 7471 |
| Total Nickel | 6010, 6020, 7000, 7010 |
| Total Selenium | 6010, 7010, 7741, 7742 |
| Total Silver | 6010, 6020, 7000, 7010 |
| Total Thallium | 6010, 6020, 7000, 7010 |
| Total Vanadium | 6010, 7000, 7010 |
| Total Zinc | 6010, 6020, 7000, 7010 |

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^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.

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TABLE B-5
SUMMARY OF PARAMETERS, CHARACTERIZATION METHODS, AND RATIONALE
FOR TRANSURANIC MIXED WASTE WITHOUT ACCEPTABLE KNOWLEDGE SUFFICIENCY DETERMINATION
(~~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 waste, no incompatible wastes, no compressed gases) |
| | | Hazardous constituents <ul style="list-style-type: none"> · Listed · Characteristic | Acceptable knowledge, or <u>radiography, visual examination, and/or</u> 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 |
| S5000-Debris Waste | <ul style="list-style-type: none"> · Uncategorized metal (metal waste other than lead/cadmium) · Lead/cadmium waste · Inorganic nonmetal waste · Combustible waste · Graphite waste · Heterogeneous debris waste · Composite filter waste | 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 waste, no incompatible wastes, no compressed gases) |
| | | Hazardous constituents <ul style="list-style-type: none"> · Characteristic · Listed · Characteristic | <u>Acceptable knowledge,</u> Statistical gas sampling and analysis ^a (see Table B-2) | <ul style="list-style-type: none"> · <u>Determine listed and characteristic metals and organics</u> · 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 |

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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 — Listed — Characteristic | Statistical sampling* (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 — Characteristic — Listed | Statistical gas sampling and analysis* (see Table B-2) | <ul style="list-style-type: none"> — Resolve the assignment of EPA hazardous waste numbers |
| | | Hazardous constituents — Characteristic | Acceptable knowledge | <ul style="list-style-type: none"> — Determine characteristic metals and organics |

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* Applies to waste streams that require sampling.

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TABLE B-6
REQUIRED PROGRAM RECORDS MAINTAINED IN GENERATOR/STORAGE SITE
CERTIFIED CHARACTERIZATION PROGRAM SITE-SPECIFIC PROJECT FILES

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|---|
| <p><u>Lifetime Records</u></p> <ul style="list-style-type: none">• Field sampling data forms• Field and laboratory chain-of-custody forms• Test facility and laboratory batch data reports• Waste Stream Characterization Package• Sampling Plans• Data reduction, validation, and reporting documentation• Acceptable knowledge documentation• Waste Stream Profile Form and Characterization Information Summary |
| <p><u>Non-Permanent Records</u></p> <ul style="list-style-type: none">• Nonconformance documentation• Variance documentation• Assessment documentation• Gas canister tags• Methods performance documentation• Performance Demonstration Program documentation• Sampling equipment certifications• Calculations and related software documentation• Training/qualification documentation• QAPjPs (generator/storage sites <u>certified characterization program</u>) documentation (all revisions)• Calibration documentation• Analytical raw data• Procurement documentation• QA procedures (all revisions)• Technical implementing procedures (all revisions)• Audio/video recording (radiography, visual, etc.) |

**TABLE B-7
WIPP WASTE INFORMATION SYSTEM DATA FIELDS^a**

| 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 | |

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|---|
| Disposal Module Data |
| Container ID ^c Disposal Date Disposal Location |

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

5

^bSome of the fields required for characterization are also required for certification and/or transportation.

6

^cContainer ID is the main relational field in the WWIS Database.

7

^dThis is a multiple occurring field for each analyte, nuclide, etc.

8

^eThese are logical fields requiring only a yes/no.

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^fRequired for 7-packs of 55-gal drums, 4-packs of 85-gal drums, or 3-packs of 100-gal drums to tie all of the drums in that assembly together. This facilitates the identification of waste containers in a shipment without need to breakup the assembly.

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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 |

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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* |

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* 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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1

FIGURES

1

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WASTE STREAM PROFILE FORM

Waste Stream Profile Number: _____
Generator: TRU Waste Site Name: _____ Technical Contract: _____
Generator: TRU Waste 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 Matrix Code Group: _____
Waste Stream Name: _____
Description from the WTWBIR: _____

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

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

Required Program Information

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

Required Waste Stream Information

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

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

WASTE STREAM PROFILE FORM

Supplemental Documentation

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

Confirmation Information⁽²⁾

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

Radiography: _____

Visual Examination: _____

Waste characterization procedure(s) used and reference and date of the procedures(s):

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

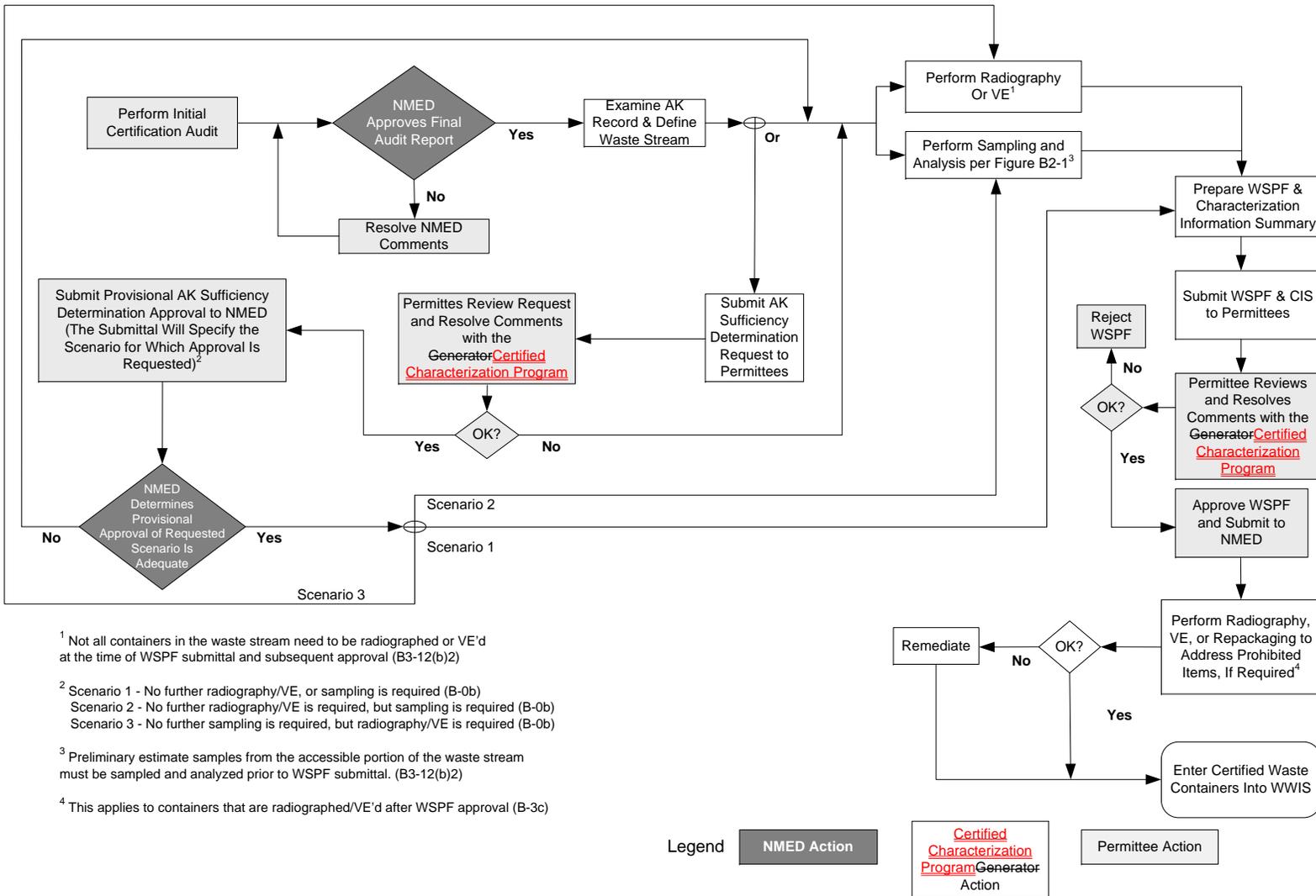
Printed Name and Title

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
WIPP Waste Stream Profile Form (Example Only - Continued)



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2
3

Figure B-2
 Waste Characterization Process
 RENEWAL APPLICATION CHAPTER B
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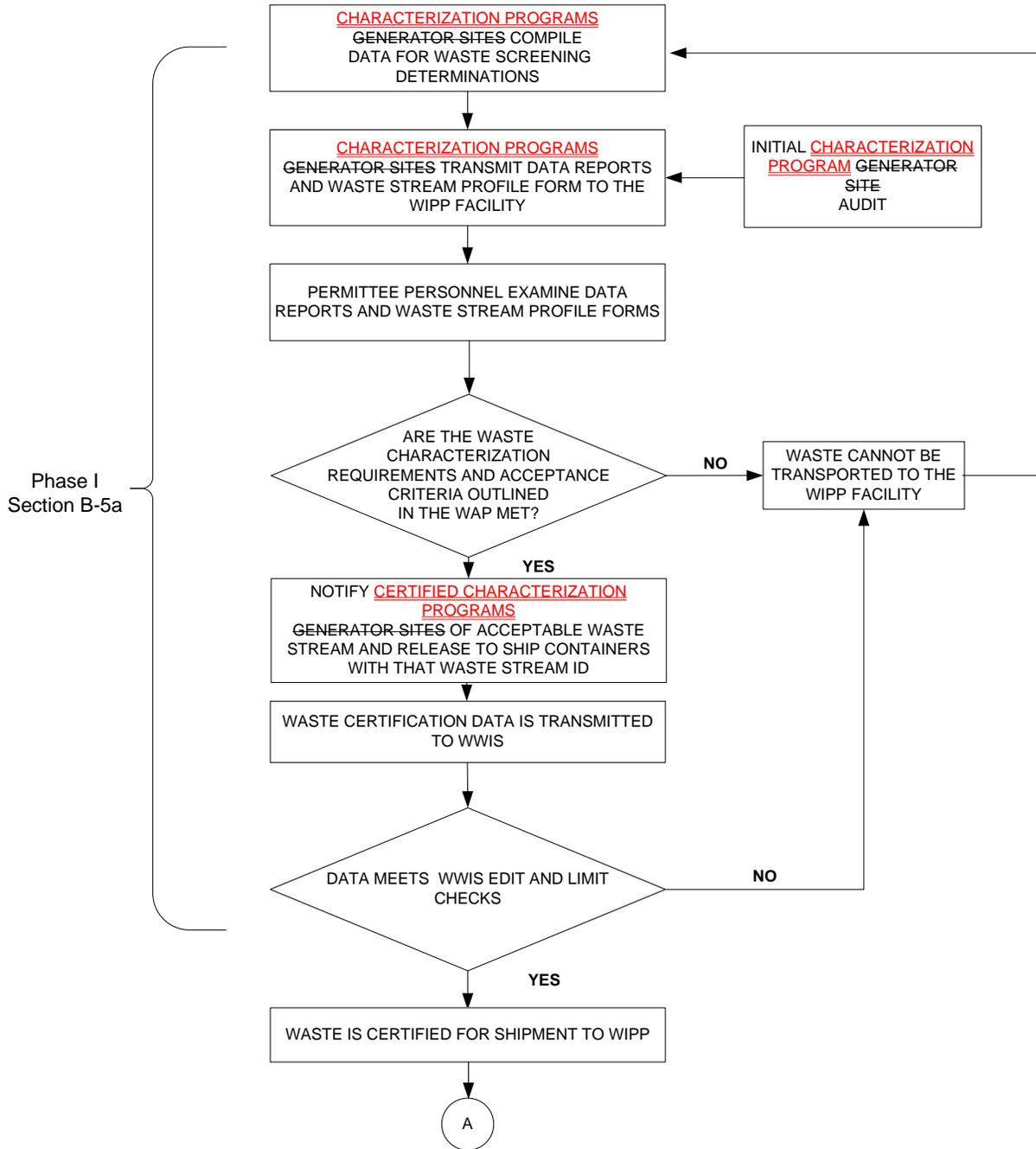
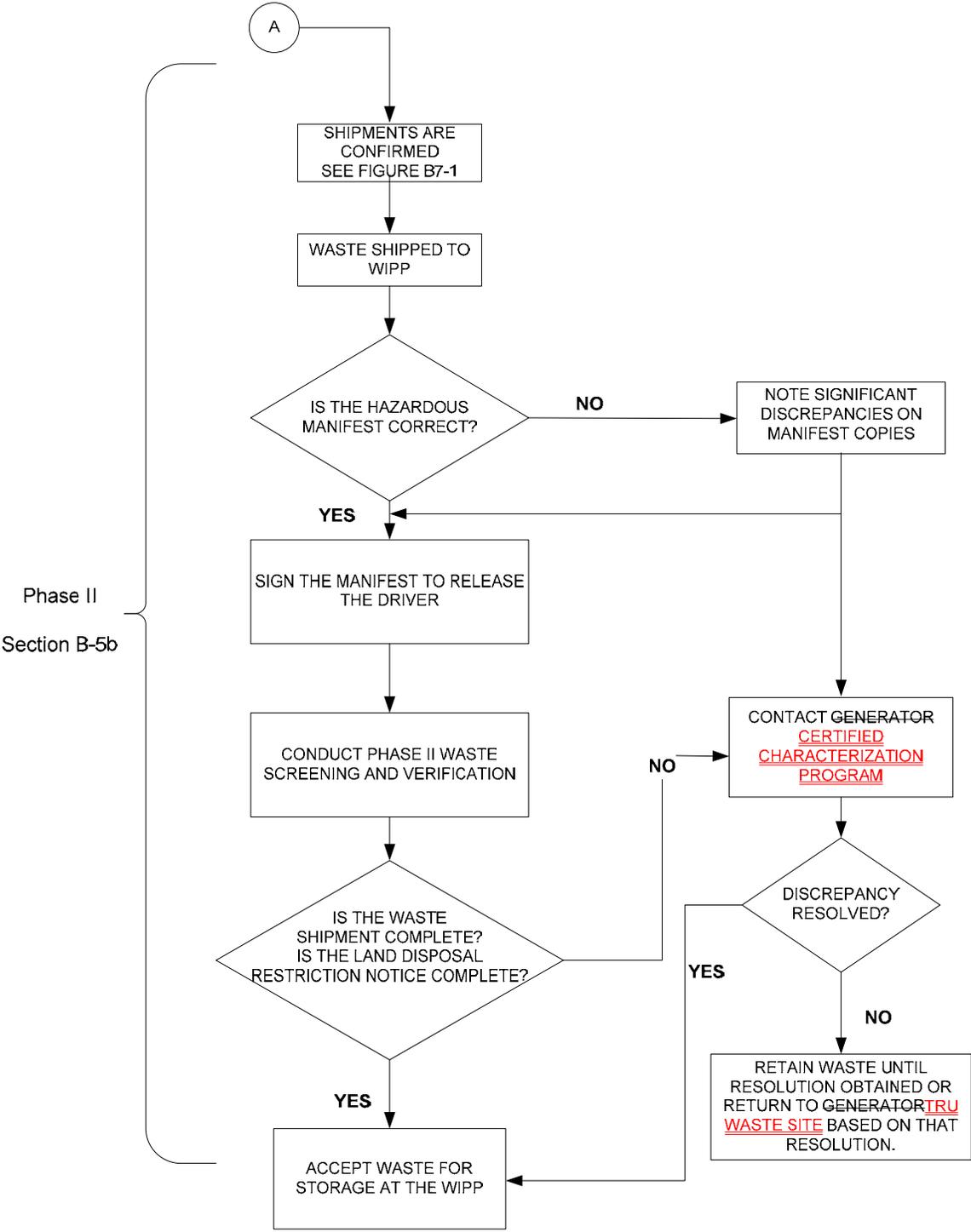


Figure B-3
 TRU Mixed Waste Screening and Verification Flow Diagram

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 4
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Phase II
 Section B-5b

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