

ATTACHMENT C
WASTE ANALYSIS PLAN

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ATTACHMENT C
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TABLE OF CONTENTS

C-0	Introduction and Attachment Highlights	1
C-0a	Waste Characterization	2
C-0b	AK Sufficiency Determination	5
C-0c	Waste Stream Profile Form Completion	7
C-0d	Waste Confirmation	7
C-1	Identification of TRU Mixed Waste to be Managed at the WIPP Facility	7
C-1a	Waste Stream Identification	7
C-1b	Waste Summary Category Groups and Hazardous Waste Accepted at the WIPP Facility	8
C-1c	Waste Prohibited at the WIPP Facility	8
C-1d	Control of Waste Acceptance	9
C-1e	Waste Generating Processes at the WIPP Facility	10
C-2	Waste Characterization Program Requirements and Waste Characterization Parameters	10
C-3	Generator Waste Characterization Methods	11
C-3a	Acceptable Knowledge	12
C-3b	Radiography and Visual Examination	12
C-4	Data Verification and Quality Assurance	13
C-4a	Data Generation and Project Level Verification Requirements	13
C-4a(1)	Data Quality Objectives	13
C-4a(2)	Quality Assurance Objectives	14
C-4a(3)	Data Generation	15
C-4a(4)	Data Verification	15
C-4a(5)	Data Transmittal	15
C-4a(6)	Records Management	15
C-5	Permittee Level Waste Screening and Verification of TRU Mixed Waste	16
C-5a	Phase I Waste Stream Screening and Verification	16
C-5a(1)	WWIS Description	18
C-5a(2)	Examination of the Waste Stream Profile Form and Container Data Checks	19
C-5a(3)	Audit and Surveillance Program	20
C-5b	Phase II Waste Shipment Screening and Verification	21
C-5b(1)	Examination of the EPA Uniform Hazardous Waste Manifest and Associated Waste Tracking Information	22
C-5b(2)	Examination of the Land Disposal Restriction (LDR) Notice	23
C-5b(3)	Verification	24
C-6	Permittees' Waste Shipment Screening QA/QC	24
C-7	Records Management and Reporting	24
C-7a	General Requirements	25
C-7b	Records Storage	26

C-8 Reporting.....26
C-9 List of References27

LIST OF TABLES

Table	Title
Table C-1	Summary of Parameters, Characterization Methods, and Rationale for Transuranic Mixed Waste
Table C-2	Required Program Records Maintained in Generator/Storage Site Project Files
Table C-3	WIPP Waste Information System Data Fields ^a
Table C-4	Waste Tanks Subject to Exclusion
Table C-5	Listing of Permitted Hazardous Waste Numbers

LIST OF FIGURES

Figure	Title
Figure C-1	WIPP Waste Stream Profile Form (Example Only)
Figure C-2	Waste Characterization Process
Figure C-3	TRU Mixed Waste Screening and Verification

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1 or remote-handled (**RH**), based on the radiological dose rate at the surface of the waste
2 container.

3 The hazardous components of the TRU mixed waste to be managed at the WIPP facility are
4 designated in Table C-5. Some of the waste may also be identified by unique state hazardous
5 waste codes or numbers. These wastes are acceptable at WIPP as long as the Treatment,
6 Storage, and Disposal Facility Waste Acceptance Criteria (**TSDF-WAC**) in Part 2 are met. This
7 WAP describes the measures that will be taken to ensure that the TRU mixed wastes received
8 at the WIPP facility are within the scope of Table C-5 as established by 20.4.1.500 NMAC
9 (incorporating 40 CFR §264), and that they comply with unit-specific requirements of 20.4.1.500
10 NMAC (incorporating 40 CFR §264.600), Miscellaneous Units

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

24 Waste characterization is defined in Part 1 as the activities performed by the waste generator to
25 satisfy the general waste analysis requirements of 20.4.1.500 NMAC (incorporating 40 CFR
26 §264.13(a)) before waste containers have been certified for disposal at WIPP. The
27 characterization process for WIPP waste is presented in Figure C-2. Generator site waste
28 characterization programs are first audited by DOE, with NMED approving the final audit report.
29 After this, generator sites determine whether AK alone is sufficient for characterization, or
30 whether radiography or VE in conjunction with AK is necessary to adequately characterize
31 wastes. If an AK Sufficiency Determination is sought, information is provided to the Permittees
32 for their review and DOE's provisional approval; NMED determination of adequacy of the AK
33 information is required before final approval by DOE. If the radiography or VE route is chosen,
34 sites proceed to perform radiography or VE in conjunction with AK and in accordance with this
35 WAP. Once an AK Sufficiency Determination is obtained, or when required radiography or VE
36 data are obtained, sites would then prepare and submit the Waste Stream Profile Form for
37 DOE's approval. Once the WSPF is approved, a site may ship waste to WIPP. The Permittees
38 will perform waste confirmation prior to shipment of the waste from the generator/storage site to
39 WIPP pursuant to Permit Attachment C7, by performing radiography or visual examination of a
40 representative subpopulation of certified waste containers, to ensure that the wastes meet the
41 applicable requirements of the TSDF-WAC.

42 C-0a Waste Characterization

43 Characterization requirements for individual containers of TRU mixed waste are specified on a
44 waste stream basis. A waste stream is defined as waste materials that have common physical
45 form, that contain similar hazardous constituents, and that are generated from a single process

1 or activity. Waste streams are grouped by Waste Matrix Code Groups related to the physical
2 and chemical properties of the waste. Generator/storage sites shall use the characterization
3 techniques described in this WAP to assign appropriate Waste Matrix Code Groups to waste
4 streams for WIPP disposal. The Waste Matrix Code Groups are solidified inorganics, solidified
5 organics, salt waste, soils, lead/cadmium metal, inorganic nonmetal waste, combustible waste,
6 graphite, filters, heterogeneous debris waste, and uncategorized metal. Waste Matrix Code
7 Groups can be grouped into three Summary Category groups: Homogeneous Solids (Summary
8 Category S3000), Soil/Gravel (Summary Category S4000), and Debris Waste (Summary
9 Category S5000).

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

15 S3000 - Homogeneous Solids

16 Homogeneous solids are defined as solid materials, excluding soil, that do not meet the
17 NMED criteria for classification as debris (20.4.1.800 NMAC (incorporating 40 CFR
18 §268.2[g] and [h])). Included in the series of homogeneous solids are inorganic process
19 residues, inorganic sludges, salt waste, and pyrochemical salt waste. Other waste streams
20 are included in this Summary Category Group based on the specific waste stream types
21 and final waste form. This Summary Category Group is expected to contain toxic metals
22 and spent solvents. This category includes wastes that are at least 50 percent by volume
23 homogeneous solids.

24 S4000 - Soils/Gravel

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

27 S5000 - Debris Wastes

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

- 32 1. a manufactured object, or
- 33 2. plant or animal matter, or
- 34 3. natural geologic material.

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

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

39 Metals

40 Some of the TRU mixed waste to be emplaced in the WIPP facility contains metals for
41 which 20.4.1.200 NMAC (incorporating 40 CFR §261.24), toxicity characteristics were

1 established (EPA hazardous waste numbers D004 through D011). Cadmium, chromium,
2 lead, mercury, selenium, and silver are present in discarded tools and equipment,
3 solidified sludges, cemented laboratory liquids, and waste from decontamination and
4 decommissioning activities. A large percentage of the waste consists of lead-lined
5 gloveboxes, leaded rubber gloves and aprons, lead bricks and piping, lead tape, and other
6 lead items. Lead, because of its radiation-shielding applications, is the most prevalent
7 toxicity-characteristic metal present.

8 Halogenated Volatile Organic Compounds

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

21 Nonhalogenated Volatile Organic Compounds

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

28 The generator/storage sites shall characterize their waste in accordance with this WAP and
29 associated Permit Attachments, and ensure that waste proposed for storage and disposal at
30 WIPP meets the applicable requirements of the TSDF-WAC in Part 2. The generator/storage
31 site shall assemble the Acceptable Knowledge (**AK**) information into an auditable record¹ for the
32 waste stream as described in Permit Attachment C4. For those waste streams with an approved
33 AK Sufficiency Determination (see below), radiography or VE per the methods described in
34 Permit Attachments C1 is not required.

35 All waste characterization activities specified in this WAP and associated Permit Attachments
36 shall be carried out at generator/storage sites in accordance with this WAP. DOE will audit
37 generator/storage site waste characterization programs and activities as described in Section C-
38 3. Waste characterization activities at the generator/storage sites include the following, as
39 discussed in Section C-3:

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 • Radiography, which is an x-ray technique to determine physical contents of containers
- 2 • Visual examination of opened containers as an alternative way to determine their
- 3 physical contents
- 4 • Compilation of AK documentation into an auditable record

5 C-0b AK Sufficiency Determination

6 Generator/storage sites may submit a request to the Permittees for an AK Sufficiency
7 Determination (Determination Request) to be exempt from the requirement to perform
8 radiography or visual examination (VE) based on AK. The contents of the Determination
9 Request are specified in Permit Attachment C4, Section C4-3d.

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

13 The Determination Request must include all information specified in Permit Attachment
14 C4, Section C4-3d

15 The AK Summary must identify relevant hazardous constituents, and must correctly
16 identify all toxicity characteristic and listed hazardous waste numbers.

17 All hazardous waste number assignments must be substantiated by supporting data and, if
18 not, whether this lack of substantiation compromises the interpretation.

19 Resolution of data discrepancies between different AK sources must be technically correct
20 and documented.

21 The AK Summary must include all the identification of waste material parameter weights
22 by percentage of the material in the waste stream, and determinations must be
23 technically correct.

24 All prohibited items specified in the TSDf-WAC should be addressed, and conclusions
25 drawn must be technically adequate and substantiated by supporting information.

26 If the AK record includes process control information specified in Permit Attachment C4,
27 Section C4-3b, the information should include procedures, waste manifests, or other
28 documentation demonstrating that the controls were adequate and sufficient.

- 29 • The site must provide the supporting information necessary to substantiate technical
30 conclusions within the Determination Request, and this information must be correctly
31 interpreted.

32 The Permittees will review the Determination Request for technical adequacy and compliance
33 with the requirements of the Permit, using trained and qualified individuals in accordance with
34 standard operating procedures that shall, at a minimum, address all of the technical and
35 procedural requirements listed above. The Permittees shall resolve comments with the
36 generator/storage site.

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

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

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

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

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

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

38 If a generator/storage site does not submit a Determination Request, or if DOE does not
39 approve a Determination Request, or if NMED finds that DOE's provisional approval of a
40 Determination Request is inadequate, the generator/storage site shall perform radiography or
41 VE on 100% of the containers in a waste stream.

1 If a generator/storage site submits a Determination Request, DOE provisionally approves the
2 Determination Request and NMED finds that DOE's provisional approval is adequate, neither
3 radiography nor VE of the waste stream is required.

4 C-0c Waste Stream Profile Form Completion

5 After a complete AK record has been compiled and either a Determination Request has been
6 approved by DOE or the generator/storage site has completed the applicable testing
7 requirements specified in Permit Attachments C1 the generator/storage site will complete a
8 Waste Stream Profile Form (**WSPF**) and Characterization Information Summary (**CIS**). The
9 requirements for the completion of a WSPF and a CIS are specified in Permit Attachment C3,
10 Sections C3-6b(1) and C3-6b(2) respectively.

11 The WSPF and the CIS for the waste stream resulting from waste characterization activities
12 shall be transmitted to the Permittees, who shall review them for completeness, and screen
13 them for acceptance prior to loading any TRU mixed waste into the Contact-Handled or
14 Remote-Handled Packaging at the generator facility, as described in Section C-4. The review
15 and approval process will ensure that the submitted waste analysis information is sufficient to
16 meet the Data Quality Objectives (**DQOs**) for AK in Section C-4a(1) and allow the Permittees to
17 demonstrate compliance with the requirements of this WAP. Only TRU mixed waste and TRU
18 waste that has been characterized in accordance with this WAP and that meets the **TSDF-WAC**
19 specified in this Permit will be accepted at the WIPP facility for disposal in a permitted
20 Underground Hazardous Waste Disposal Unit (**HWDU**). DOE will approve and provide NMED
21 with copies of the approved WSPF and accompanying CIS prior to waste stream shipment.
22 Upon notification of DOE's approval of the WSPF, the generator/storage site may be authorized
23 to ship waste to WIPP.

24 In the event the Permittees request detailed information on a waste stream, the site will provide
25 a Waste Stream Characterization Package (Section C3-6b(2)). For each waste stream, this
26 package will include the WSPF, the CIS, and the complete AK summary. The Waste Stream
27 Characterization Package will also include specific Batch Data Reports (**BDRs**) and raw data
28 associated with waste container characterization as requested by the Permittees.

29 C-0d Waste Confirmation

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

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

38 C-1a Waste Stream Identification

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

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

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

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

20 C-1c Waste Prohibited at the WIPP Facility

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

- 22 • liquid waste is not acceptable at WIPP. Liquid in the quantities delineated below is
23 acceptable:
 - 24 – Observable liquid shall be no more than 1 percent by volume of the outermost
25 container at the time of radiography or visual examination
 - 26 – Internal containers with more than 60 milliliters or 3 percent by volume observable
27 liquid, whichever is greater, are prohibited
 - 28 – Containers with Hazardous Waste Number U134 assigned shall have no
29 observable liquid
 - 30 – Overpacking the outermost container that was examined during radiography or
31 visual examination or redistributing untreated liquid within the container shall not be
32 used to meet the liquid volume limits
- 33 • non-radionuclide pyrophoric materials, such as elemental potassium
- 34 • hazardous wastes not occurring as co-contaminants with TRU mixed wastes (non-
35 mixed hazardous wastes)
- 36 • wastes incompatible with backfill, seal and panel closures materials, container and
37 packaging materials, shipping container materials, or other wastes

- 1 • wastes containing explosives or compressed gases
- 2 • wastes with polychlorinated biphenyls (PCBs) not authorized under an EPA PCB
3 waste disposal authorization
- 4 • wastes exhibiting the characteristic of ignitability, corrosivity, or reactivity (EPA
5 Hazardous Waste Numbers of D001, D002, or D003)
- 6 • waste that has ever been managed as high-level waste and waste from tanks specified
7 in Table C-4, unless specifically approved through a Class 3 permit modification
- 8 • any waste container from a waste stream (or waste stream lot) which has not
9 undergone either radiographic or visual examination of a statistically representative
10 subpopulation of the waste stream in each shipment, pursuant to Permit Attachment
11 C7
- 12 • any waste container from a waste stream which has not been preceded by an
13 appropriate, certified WSPF (see Section C-1d)

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

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

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

32 C-1d Control of Waste Acceptance

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

36 Generator/storage sites will provide the WSPF to the Permittees for each waste stream prior to
37 its acceptance for disposal at WIPP. The WSPF and the CIS will be transmitted to the
38 Permittees for each waste stream from a generator/storage site. If continued waste
39 characterization reveals discrepancies that identify different hazardous waste numbers or

1 indicates that the waste belongs to a different waste stream, the waste will be redefined to a
2 separate waste stream and a new WSPF submitted. Generator/storage sites will develop criteria
3 to determine the specific circumstances under which a WSPF is revised versus when a new
4 WSPF is required. These criteria will be evaluated by DOE during site audits (Attachment C6).

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

11 Any time the Permittees request additional information concerning a waste stream, the
12 generator/storage site will provide a Waste Stream Characterization Package (Section C3-
13 6b(2)). The option for the Permittees to request additional information ensures that the waste
14 being offered for disposal is adequately characterized and accurately described on the WSPF.

15 C-1e Waste Generating Processes at the WIPP Facility

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

23 C-2 Waste Characterization Program Requirements and Waste Characterization Parameters

24 The Permittees shall require the sites to develop the procedure(s) which specify their
25 programmatic waste characterization requirements. DOE will evaluate the procedures during
26 audits conducted under the Audit and Surveillance Program (Section C-5a(3)) and may also
27 evaluate the procedures as part of the review and approval of the WSPF. Sites must notify the
28 Permittees and obtain DOE approval prior to making data-affecting modifications to procedures
29 (Permit Attachment C3, Section C3-9). Program procedures shall address the following
30 minimum elements:

- 31 • Waste characterization and certification procedures for retrievably stored and newly
32 generated wastes to be sent to the WIPP facility
- 33 • Methods used to ensure prohibited items are documented and managed. These will
34 include procedures for performing radiography, VE, or treatment, if these methods are
35 used to ensure prohibited items are not present in the waste prior to shipment of the
36 waste to WIPP.
- 37 • Identify the organization(s) responsible for compliance with waste characterization and
38 certification procedures.
- 39 • Identify the oversight procedures and frequency of actions to verify compliance with
40 waste characterization and certification procedures.

- 1 • Develop training specific to waste characterization and certification procedures.
- 2 • Ensure that personnel may stop work if noncompliance with waste characterization or
3 certification procedures is identified.
- 4 • Develop a nonconformance process that complies with the requirements in Permit
5 Attachment C3 of the WAP to document and establish corrective actions.
- 6 • As part of the corrective action process, assess the potential time frame of the
7 noncompliance, the potentially affected waste population(s), and the reassessment
8 and recertification of those wastes.
- 9 • A listing of all approved hazardous waste numbers which are acceptable at WIPP are
10 included in Table C-5.

11 For those waste streams or containers that are not amenable to radiography (e.g., RH TRU
12 mixed waste, direct loaded ten-drum overpacks (**TDOPs**)) for waste confirmation by the
13 Permittees pursuant to Permit Attachment C7, generator/storage site VE data may be used for
14 waste acceptance. In those cases, the Permittees will review the generator/storage site VE
15 procedures to ensure that data sufficient for the Permittees' waste acceptance activities
16 pursuant to Permit Attachment C7 will be obtained and the procedures meet the minimum
17 requirements for visual examination specified in Permit Attachment C1, Section C1-1.

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

- 20 • Determination whether TRU mixed waste streams comply with the applicable
21 provisions of the TSDF-WAC
- 22 • Determination whether TRU mixed wastes exhibit a hazardous characteristic
23 (20.4.1.200 NMAC, incorporating 40 CFR §261 Subpart C)
- 24 • Determination whether TRU mixed wastes are listed (20.4.1.200 NMAC, incorporating
25 40 CFR §261 Subpart D)
- 26 • Estimation of waste material parameter weights

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

30 C-3 Generator Waste Characterization Methods

31 The characterization techniques used by generator/storage sites includes acceptable
32 knowledge and may also include, as necessary, radiography and visual examination. All
33 characterization activities are performed in accordance with the WAP. Table C-1 provides a
34 summary of the characterization requirements for TRU mixed waste.

1 C-3a Acceptable Knowledge

2 Acceptable knowledge (**AK**) is used in TRU mixed waste characterization activities in five ways:

- 3 • To delineate TRU mixed waste streams
- 4 • To assess whether TRU mixed wastes comply with the TSDF-WAC
- 5 • To assess whether TRU mixed wastes exhibit a hazardous characteristic (20.4.1.200
6 NMAC, incorporating 40 CFR §261 Subpart C)
- 7 • To assess whether TRU mixed wastes are listed (20.4.1.200 NMAC, incorporating 40
8 CFR §261 Subpart D)
- 9 • To estimate waste material parameter weights

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

15 C-3b Radiography and Visual Examination

16 Radiography and visual examination (**VE**) are nondestructive qualitative and quantitative
17 techniques used to identify and verify waste container contents as specified in Permit
18 Attachment C1. Generator/storage sites shall perform radiography or VE of 100 percent of CH
19 TRU mixed waste containers in waste streams except for those waste streams for which DOE
20 approves a Determination Request. No RH TRU mixed waste will be shipped to WIPP for
21 storage or disposal without documentation of radiography or VE of 100 percent of the containers
22 as specified in Permit Attachment C1. Radiography and/or VE will be used, when necessary, to
23 examine a waste container to verify the physical form of the waste matches its waste stream
24 description as determined by AK. These techniques can detect observable liquid in excess of
25 TSDF-WAC limits and containerized gases, which are prohibited for WIPP disposal. The
26 prohibition of liquid in excess of TSDF-WAC limits and containerized gases prevents the
27 shipment of corrosive, ignitable, or reactive wastes. Radiography and/or VE are also able to
28 verify that the physical form of the waste matches its waste stream description (i.e.
29 Homogeneous Solids, Soil/Gravel, or Debris Waste [including uncategorized metals]). If the
30 physical form does not match the waste stream description, the waste will be designated as
31 another waste stream and assigned the preliminary hazardous waste numbers associated with
32 that new waste stream assignment. That is, if radiography and/or VE indicates that the waste
33 does not match the waste stream description arrived at by acceptable knowledge
34 characterization, a non-conformance report (**NCR**) will be completed and the inconsistency will
35 be resolved as specified in Permit Attachment C4, and the NCR will be dispositioned as
36 specified in Permit Attachment C3, Section C3-7. The proper waste stream assignment will be
37 determined (including preparation of a new WSPF), the correct hazardous waste numbers will
38 be assigned, and the resolution will be documented. Refer to Permit Attachment C4 for a
39 discussion of acceptable knowledge and its verification process.

1 For generator/storage sites that use VE, the detection of any liquid in non-transparent internal
2 containers, detected from shaking the internal container, will be handled by assuming that the
3 internal container is filled with liquid and adding this volume to the total liquid in the container
4 being characterized using VE. The container being characterized using VE would be rejected
5 and/or repackaged to exclude the internal container if it is over the TSDF-WAC limits. When
6 radiography is used, or visual examination of transparent containers is performed, if any liquid in
7 internal containers is detected, the volume of liquid shall be added to the total for the container
8 being characterized using radiography or VE. Radiography, or the equivalent, will be used as
9 necessary on the existing/stored waste containers to verify the physical characteristics of the
10 TRU mixed waste correspond with its waste stream identification/waste stream Waste Matrix
11 Code and to identify prohibited items. Radiographic examination protocols and QA/QC methods
12 are provided in Permit Attachment C1. Radiography and VE shall be subject to the Audit and
13 Surveillance Program (Permit Attachment C6).

14 C-4 Data Verification and Quality Assurance

15 The Permittees will ensure that applicable waste characterization processes performed by
16 generator/storage sites sending TRU mixed waste to the WIPP for disposal meets WAP
17 requirements through data validation, usability and reporting controls. Verification occurs at
18 three levels: 1) the data generation level, 2) the project level, and 3) the Permittee level. The
19 validation and verification process and requirements at each level are described in Permit
20 Attachment C3, Section C3-4. The validation and verification process at the Permittee Level is
21 also described in Section C-5.

22 C-4a Data Generation and Project Level Verification Requirements

23 C-4a(1) Data Quality Objectives

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

- 29 • Acceptable Knowledge
 - 30 – To delineate TRU mixed waste streams.
 - 31 – To assess whether TRU mixed wastes comply with the applicable requirements of
32 the TSDF-WAC.
 - 33 – To assess whether TRU mixed wastes exhibit a hazardous characteristic
34 (20.4.1.200 NMAC, incorporating 40 CFR §261 Subpart C).
 - 35 – To assess whether TRU mixed wastes are listed (20.4.1.200 NMAC, incorporating
36 40 CFR §261, Subpart D).
 - 37 – To estimate waste material parameter weights.

1 • Radiography and VE

- 2 – To verify the TRU mixed waste streams contain no prohibited items and to verify
3 that physical form of the waste matches the waste stream description as
4 determined by AK.

5 Reconciliation of these DQOs by the Generator/Storage Site Project Manager, as applicable, is
6 addressed in Permit Attachment C3. Reconciliation requires determining whether sufficient type,
7 quality, and quantity of data have been collected to ensure the DQOs cited above can be
8 achieved.

9 C-4a(2) Quality Assurance Objectives

10 The generator/storage sites shall demonstrate compliance with each QAO associated with the
11 characterization methods as presented in Permit Attachment C3. Generator/Storage Site
12 Project Managers are further required to perform a reconciliation of the data with the DQOs
13 established in this WAP. The Generator/Storage Site Project Manager shall conclude that all of
14 the DQOs have been met for the characterization of the waste stream prior to submitting a
15 WSPF to DOE for approval (Permit Attachment C3). The following QAO elements shall be
16 considered for each technique, as a minimum:

17 • Precision

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

19 • Accuracy

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

22 • Completeness

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

25 • Comparability

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

27 • Representativeness

- 28 – Representativeness expresses the degree to which data represent characteristics
29 of a population.

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

1 C-4a(3) Data Generation

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

6 DOE shall perform audits of the generator/storage site waste characterization programs, as
7 implemented by the generator/storage site QAPjP, to verify compliance with the WAP and the
8 DQOs in this WAP (See Permit Attachment C6 for a discussion of the content of the audit
9 program). The primary functions of these audits are to review generator/storage sites'
10 adherence to the requirements of this WAP and ensure adherence to the WAP characterization
11 program. DOE shall provide the results of each audit to NMED. If audit results indicate that a
12 generator/storage site is not in compliance with the requirements of this WAP, DOE will take
13 appropriate action as specified in Permit Attachment C6.

14 C-4a(4) Data Verification

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

21 C-4a(5) Data Transmittal

22 BDRs will include the information required by Section C3-4 and will be transmitted by hard copy
23 or electronically (provided a hard copy is available on demand) from the data generation level to
24 the project level.

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

30 Once a waste stream is characterized, the Site Project Manager will also submit to the
31 Permittees a WSPF (Figure C-1) accompanied by the CIS for that waste stream which includes
32 reconciliation with DQOs (Sections C3-6b(1) and C3-6b(2)). The WSPF, the CIS, and
33 information from the WWIS will be used as the basis for acceptance of waste characterization
34 information on TRU mixed wastes to be disposed of at the WIPP.

35 C-4a(6) Records Management

36 Records related to waste characterization activities performed by the generator/storage sites will
37 be maintained in the testing facility files or generator/storage site project files, or at the WIPP
38 Records Archive facility. Raw data obtained by testing TRU mixed waste in support of this WAP
39 will be identifiable, legible, and provide documentary evidence of quality. TRU mixed waste

1 characterization records submitted to the Permittees shall be maintained in the WIPP facility
2 operating record and be available for inspection by NMED.

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

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

13 Waste characterization records include historical characterization records (i.e. headspace gas
14 sampling/analysis and homogeneous solids and soil/gravel sampling/analysis) generated
15 through implementation of previous requirements in this WAP. Those waste characterization
16 records designated as Non-Permanent Records shall be maintained for ten years from the date
17 of (record) generation at the participating generator/storage site or at the WIPP Records Archive
18 facility and then dispositioned according to their approved RIDS. If a generator/storage site
19 ceases to operate, all records shall be transferred before closeout to the Permittees for
20 management at the WIPP Records Archive facility. Table C-2 is a listing of records designated
21 as Lifetime Records and Non-Permanent Records. Classified information will not be transferred
22 to WIPP. Notations will be provided to the Permittees indicating the absence of classified
23 information. The approved generator/storage site RIDS will identify appropriate disposition of
24 classified information. Nothing in this Permit is intended to, nor should it be interpreted to,
25 require the disclosure of any U.S. Department of Energy classified information to persons
26 without appropriate clearance to view such information.

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

28 Permittee waste screening is a two-phased process. Phase I will occur prior to configuring
29 shipments of TRU mixed waste. Phase II will occur after configuration of shipments of TRU
30 mixed waste but before it is disposed at the WIPP facility. Figure C-3 presents Phase I and a
31 portion of Phase II of the TRU mixed waste screening process. Permit Attachment C7 presents
32 the TRU mixed waste confirmation portion of Phase II activities.

33 C-5a Phase I Waste Stream Screening and Verification

34 The first phase of the waste screening and verification process will occur before TRU mixed
35 waste is shipped to the WIPP facility. Before the Permittees begin the process of accepting TRU
36 mixed waste from a generator/storage site, an initial audit of that generator/storage site will be
37 conducted as part of the Audit and Surveillance Program (Permit Attachment C6). The RCRA
38 portion of the generator/storage site audit program will provide on-site verification of
39 characterization procedures; BDR preparation; and recordkeeping to ensure that all applicable
40 provisions of the WAP requirements are met. Another portion of the Phase I verification is the
41 WSPF approval process. At the WIPP facility, this process includes verification that all of the
42 required elements of the WSPF and the CIS are present (Permit Attachment C3) and that the

1 waste characterization information meet acceptance criteria required for compliance with the
2 WAP (Section C3-6b(1)).

3 A generator/storage site must first prepare a QAPjP, which includes applicable WAP
4 requirements, and submit it to DOE for review and approval (Permit Attachment C5). Once
5 approved, a copy of the QAPjP is provided to NMED for examination. The generator/storage
6 site will implement the specific parameters of the QAPjP after it is approved. An initial audit will
7 be performed after QAPjP implementation and prior to the generator/storage site being certified
8 for shipment of waste to WIPP. Additional audits, focusing on the results of waste
9 characterization, will be performed at least annually. DOE has the right to conduct unannounced
10 audits and to examine any records that are related to the scope of the audit. See Section C-
11 5a(3) and Permit Attachment C6 for further information regarding audits.

12 When the required waste stream characterization data have been collected by a
13 generator/storage site and the initial generator/storage site audit has been successfully
14 completed, the generator/storage Site Project Manager will verify that waste stream
15 characterization meets the applicable WAP requirements as a part of the project level
16 verification (Section C3-4b). If the waste characterization does not meet the applicable
17 requirements of the WAP, the mixed waste stream cannot be managed, stored, or disposed at
18 WIPP until those requirements are met. The Site Project Manager will then complete a WSPF
19 and submit it to the Permittees, along with the accompanying CIS for that waste stream (Section
20 C3-6b(1)). All data necessary to check the accuracy of the WSPF will be transmitted to the
21 Permittees for verification. This provides notification that the generator/storage site considers
22 that the waste stream (identified by the waste stream identification number) has been
23 adequately characterized for disposal prior to shipment to WIPP. The Permittees will compare
24 radiographic and visual examination data obtained subsequent to submittal and approval of the
25 WSPF (and prior to submittal) with characterization information presented on this form. If the
26 Permittees determine (through the data comparison) that the characterization information is
27 adequate, DOE will approve the WSPF. Prior to the first shipment of containers from the
28 approved waste stream, the approved WSPF and accompanying CIS will be provided to NMED.
29 If the data comparison indicates that analyzed containers have hazardous wastes not present
30 on the WSPF, or a different Waste Matrix Code applies, the WSPF is in error and shall be
31 resubmitted. Ongoing WSPF examination is discussed in detail in Section C-5a(2).

32 Audits of generator/storage sites will be conducted as part of the Audit and Surveillance
33 Program (Permit Attachment C6). The RCRA portion of the generator/storage site audit program
34 will provide on-site verification of waste characterization procedures; BDR preparation; and
35 record keeping to ensure that all applicable provisions of the WAP requirements are met. As
36 part of the waste characterization data submittal, the generator/storage site will also transmit the
37 data on a container basis via the WWIS. This data submittal can occur at any time as the data
38 are being collected, but will be complete for each container prior to shipment of that container.
39 The WWIS will conduct internal edit/limit checks as the data are entered, and the data will be
40 available to the Permittees as supporting information for WSPF review. NMED will have read-
41 only access to the WWIS as necessary to determine compliance with the WAP. The initial
42 WSPF check performed by the Permittees will include WWIS data submitted by the
43 generator/storage site for each waste container submitted for the WSPF review and the CIS.
44 The Permittees will compare ongoing characterization data obtained and submitted via the
45 WWIS to the approved WSPF. If this comparison shows that containers have hazardous wastes
46 not reported on the WSPF, or a different Waste Matrix Code applies, the data are rejected and

1 the waste containers are not accepted for shipment until a new or revised WSPF is submitted to
2 the Permittees and approved by DOE.

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

11 C-5a(1) WWIS Description

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

17 The Permittees will coordinate the data transmission with each generator/storage site. Actual
18 data transmission will use appropriate technology to ensure the integrity of the data
19 transmissions. The Permittees will require sites with large waste inventories and large
20 databases to populate a data structure provided by the Permittees that contains the required
21 data dictionary fields that are appropriate for the waste stream (or waste streams) at that site.
22 The Permittees will access these data via the Internet to ensure an efficient transfer of this data.
23 Small quantity sites will be given a similar data structure by the Permittees that is tailored to
24 their types of waste. Sites with very small quantities of waste will be provided with the ability to
25 assemble the data interactively to this data structure on the WWIS.

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 if any of the supplied data fails to meet the requirements of the
29 edit and limit checks via an appropriate error message. The generator/storage site will be
30 required to correct the discrepancy with the waste or the waste data and re-transmit the
31 corrected data prior to acceptance of the data by the WWIS. The Permittees will review data
32 reported for each container of each shipment prior to providing notification to the shipping
33 generator/storage site that the shipment is acceptable. Read-only access to the WWIS will be
34 provided to NMED. Table C-3 contains a listing of the data fields contained in the WWIS that are
35 required as part of this Permit.

36 The WWIS will generate the following:

- 37 • Waste Emplacement Report

38 This report will be added to the operating record to track the quantities of waste, date
39 of emplacement, and location of authorized containers or container assemblies in the
40 repository. The Permittees will document the specific panel room or drift that an
41 individual waste container is placed in as well as the row/column/height coordinates
42 location of the container or containers assembly. This report will be generated on a

1 weekly basis. Locations of containers or container assemblies will also be placed on a
2 map separate from the WWIS. Reports and maps that are included as part of the
3 operating record will be retained at the WIPP site, for the life of the facility.

4 • Shipment Summary Report

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

10 • Waste Container Data Report

11 This report will be generated on a waste stream basis and will be used by the
12 Permittees during the WSPF review and DOE approval process. This report will
13 contain the data listed in the Characterization Module on Table C-3. This report will be
14 generated and attached to the WSPF for inclusion in the facility operating record and
15 will be kept for the life of the facility.

16 • Reports of Change Log

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

22 Access to the WWIS will be controlled by the Permittees' Data Administrator (**DA**) who will
23 control the WWIS users based on approval from management personnel. Training for the WWIS
24 Data Administrator job position will be in accordance with the WWIS Retrieval Characterization
25 Transportation Data Administrator Task Card on file at the WIPP facility.

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

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

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

37 The Permittees will verify the completeness and accuracy of the Waste Stream Profile Form
38 (Section C3-6b(1)). Figure C-2 includes the waste characterization and waste stream approval
39 process. The assignment of the waste stream description, Waste Matrix Code Group, and

1 Summary Category Groups; the acceptable knowledge summary documentation; the methods
2 used for characterization; the DOE certification, and appropriate designation of EPA hazardous
3 waste number(s) will be examined by the Permittees. If the WSPF is inaccurate, efforts will be
4 made to resolve discrepancies by contacting the generator/storage site in order for the waste
5 stream to be eligible for shipment to the WIPP facility. If discrepancies in the waste stream are
6 detected at the generator/storage site, the generator/storage site will implement a non-
7 conformance program to identify, document, and report discrepancies (Permit Attachment C3).

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

11 The EPA hazardous waste numbers for the wastes that appear on the Waste Stream Profile
12 Form will be compared to those in Table C-5 to ensure that only approved wastes are accepted
13 for management, storage, or disposal at WIPP. Some of the waste may also be identified by
14 unique state hazardous waste codes or numbers. These wastes are acceptable at WIPP as
15 long as the TSDF-WAC are met. The CIS will be reviewed by the Permittees to verify that the
16 waste has been classified correctly with respect to the assigned EPA hazardous waste
17 numbers. The Permittees will verify that the applicable requirements of the TSDF-WAC have
18 been met by the generator/storage site.

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

22 The Permittees will also verify that three different types of data specified below are available for
23 every container holding TRU mixed waste before that waste is managed, stored, or disposed at
24 WIPP: 1) an assignment of the waste stream's waste description (by Waste Matrix Codes) and
25 Waste Matrix Code Group; 2) a determination of ignitability, reactivity, and corrosivity; and 3) a
26 determination of compatibility. The verification of waste stream description will be performed by
27 reviewing the WWIS for consistency in the waste stream description and WSPF. The CIS will
28 indicate if the waste has been checked for the characteristics of ignitability, corrosivity, and
29 reactivity. The final verification of waste compatibility will be performed using Appendix C1 of the
30 WIPP RCRA Part B Permit Application (DOE, 1997), the compatibility study.

31 Any container with unresolved discrepancies associated with hazardous waste characterization
32 will not be managed, stored, or disposed at the WIPP facility until the discrepancies are
33 resolved. If the discrepancies cannot be resolved, DOE will revoke the approval status of the
34 waste stream, suspend shipments of the waste stream, and notify NMED. Waste stream
35 approval will not be reinstated until the generator/storage site demonstrates all corrective
36 actions have been implemented and the generator/storage site waste characterization program
37 is reassessed by DOE.

38 C-5a(3) Audit and Surveillance Program

39 An important part of the Permittees' verification process is the Audit and Surveillance Program.
40 The focus of this audit program is compliance with this WAP and the Permit. This audit program
41 addresses all AK implementation and testing activities, from waste stream classification
42 assignment through waste container certification, and ensures compliance with SOPs and the
43 WAP. Audits will ensure that containers and their associated documentation are adequately

1 tracked throughout the waste handling process. Operator qualifications will be verified, and
2 implementation of QA/QC procedures will be surveyed. A final report that includes
3 generator/storage site audit results and applicable WAP-related corrective action report (**CAR**)
4 resolution will be provided to NMED for approval, and will be kept in the WIPP facility operating
5 record until closure of the WIPP facility.

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

17 C-5b Phase II Waste Shipment Screening and Verification

18 As presented in Figure C-3, Phase II of the waste shipment screening and verification process
19 begins with confirmation of the waste pursuant to Permit Attachment C7 after waste shipments
20 are configured. After the waste shipment has arrived, the Permittees will screen the shipments
21 to determine the completeness and accuracy of the EPA Hazardous Waste Manifest and the
22 land disposal restriction notice completeness. The Permittees will verify there are no waste
23 shipment irregularities and the waste containers are in good condition. Only those waste
24 containers that are from shipments that have been confirmed pursuant to Permit Attachment C7
25 and that pass all Phase II waste screening and verification determinations will be emplaced at
26 WIPP. For each container shipped, the Permittees shall ensure that the generator/storage sites
27 provide the following information:

28 Hazardous Waste Manifest Information:

- 29 Generator/storage site name and EPA ID
- 30 Generator/storage site contact name and phone number
- 31 Quantity of waste
- 32 List of up to six state and/or federal hazardous waste numbers in each line item
- 33 Listing of all shipping container IDs (Shipping Package serial number)
- 34 • Signature of authorized generator representative

35 Specific Waste Container information:

- 36 Waste Stream Identification Number
- 37 List of Hazardous Waste Numbers per Container
- 38 Certification Data
- 39 • Shipping Data (Assembly numbers, ship date, shipping category, etc.)

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

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

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

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

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

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

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

- 29 • Package Inner Containment Vessel or shipping cask closure date
- 30 • Package (container or canister) receipt date
- 31 • Overpack identification number (if appropriate)
- 32 • Package (container or canister) emplacement date
- 33 • Package (container or canister) emplacement location

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

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

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

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

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

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

25 Land Disposal Restriction Notice Information:

- 26 • EPA Hazardous Waste Number(s) and Manifest Numbers of first shipment of a mixed
27 waste stream
- 28 • Statement: this waste is not prohibited from land disposal
- 29 • Date the waste is subject to prohibition

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

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

1 C-5b(3) Verification

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

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

8 The Permittees will verify that the containers (as identified by their container ID numbers) are
9 the containers for which accepted data already exists in the WWIS. A check will be performed
10 by the Permittees comparing the data on the WWIS Shipment Summary Report for the
11 shipment to the actual shipping papers (including the EPA Hazardous Waste Manifest). This
12 check also verifies that the containers included in the shipment are those for which approved
13 shipping data already exist in the WWIS Transportation Data Module (Table C-3). For standard
14 waste boxes (**SWBs**) and ten drum overpacks (**TDOPs**), this check will include comparing the
15 barcode on the container with the container number on the shipping papers and the data on the
16 WWIS Shipment Summary Report. For 7-pack assemblies, one of the seven container barcodes
17 will be read by the barcode reader and compared to the assembly information for this container
18 on the WWIS Shipment Summary Report. This will automatically identify the remaining six
19 containers in the assembly. This process enables the Permittees to identify all of the containers
20 in the assembly with minimum radiological exposure. If all of the container IDs and the
21 information on the shipping papers agree with the WWIS Shipment Summary Report, and the
22 shipment was subject to waste confirmation by the Permittees prior to shipment to WIPP
23 pursuant to Permit Attachment C7, the containers will be approved for storage and disposal at
24 the WIPP facility.

25 C-6 Permittees' Waste Shipment Screening QA/QC

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

34 C-7 Records Management and Reporting

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

38 All waste characterization data for each TRU mixed waste container transmitted to WIPP shall
39 be maintained by the Permittees for the active life of the WIPP facility plus two years. The active
40 life of the WIPP facility is defined as the period from the initial receipt of TRU mixed waste at the
41 facility until NMED receives certification of final closure of the facility. After their active life, the

1 records shall be retired to the WIPP Records Archive facility and maintained for 30 years. These
2 records will then be offered to the National Archives. However, this disposition requirement does
3 not preclude the inclusion of these records in the permanent marker system or other
4 requirements for institutional control.

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

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

- 10 • Completed WIPP WSPFs and accompanying CIS, including individual container data
11 as transferred on the WWIS (or received as hard-copy) and any discrepancy-related
12 documentation as specified in Section C-5a
- 13 • Radiography and visual examination records (data sheets, packaging logs, and video
14 and audio recordings) of waste confirmation activities
- 15 • Completed Waste Receipt Checklists and discrepancy-related documentation as
16 specified in Section C-5b
- 17 • WIPP WWIS Waste Emplacement Report as specified in Section C-5a(1)
- 18 • Audit reports and corrective action reports from the Audit and Surveillance Program
19 audits as specified in Section C-5a(3) and Permit Attachment C6
- 20 • CARs and closure information for corrective actions taken due to nonconforming waste
21 being identified during waste confirmation by the Permittees

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

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

26 C-7a General Requirements

27 Records shall be legible

28 Corrections shall be made with a single line through the incorrect information, and the date
29 and initial of the person making the correction shall be added

30 Black ink is encouraged, unless a copy test has been conducted to ensure the other color
31 ink will copy

32 Use of highlighters on records is discouraged

33 Records shall be reviewed for completeness

- Records shall be validated by the cognizant manager or designee

C-7b Records Storage

Active records shall be stored when not in use

Quality records shall be kept in a one-hour (certified) fire-rated container or a copy of a record shall be stored separately (sufficiently remote from the original) in order to prevent destruction of both copies as a result of a single event such as fire or natural disaster

- Unauthorized access to the records is controlled by locking the storage container or controlling personnel access to the storage area

C-8 Reporting

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

1 C-9 List of References

2 U.S. Department of Energy (DOE), 2009, "Waste Data System User's Manual", DOE/WIPP 09-
3 3427, U.S. Department of Energy.

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

6 U.S. Environmental Protection Agency (EPA), April 1994, "Waste Analysis at Facilities that
7 Generate, Treat, Store, and Dispose of Hazardous Waste, a Guidance Manual," OSWER
8 9938.4-03, Office of Solid Waste and Emergency Response, Washington, D.C.

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

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TABLES

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

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

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

Lifetime Records

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

Non-Permanent Records

- Nonconformance documentation
- Variance documentation
- Assessment documentation
- Gas canister tags
- Methods performance documentation
- Performance Demonstration Program documentation
- Sampling equipment certifications
- Calculations and related software documentation
- Training/qualification documentation
- QAPjPs (generator/storage sites) documentation (all revisions)
- Calibration documentation
- Analytical raw data
- Procurement documentation
- QA procedures (all revisions)
- Technical implementing procedures (all revisions)
- Audio/video recording (radiography, visual, etc.)

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

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

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

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Table C-4
Waste Tanks Subject to Exclusion

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

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Table C-5
Listing of Permitted Hazardous Waste Numbers

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

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

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FIGURES

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WASTE STREAM PROFILE FORM

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

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

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

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

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

Required Program Information
Map of site: _____
Facility mission description: _____
Description of operations that generate waste: _____

Waste Identification/categorization schemes: _____
Types and quantities of waste generated: _____
Correlation of waste streams generated from the same building and process, as applicable _____

Waste certification procedures: _____

Required Waste Stream Information
Area(s) and building(s) from which waste stream was generated: _____
Waste stream volume and time period of generation: _____
Waste generating process description for each building: _____
Waste process flow diagrams: _____

Material inputs or other information identifying chemical/radionuclide content and physical waste form: _____

Waste material parameter estimates per unit of waste: _____

- Which Defense Activity generated the waste (check all that apply)
- Weapons activities including defense inertial confinement fusion
 - Naval reactors development
 - Verification and control technology
 - Defense research and development
 - Defense nuclear waste and material by products management
 - Defense nuclear material production
 - Defense nuclear waste and materials security and safeguards and security investigations

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

WASTE STREAM PROFILE FORM

Supplemental Documentation

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

Confirmation Information⁽²⁾

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

Radiography: _____

Visual Examination: _____

Waste characterization procedures used (procedure number, revision number, date): _____

Waste Stream Profile Form Certification

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

Signature of Site Project Manager

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

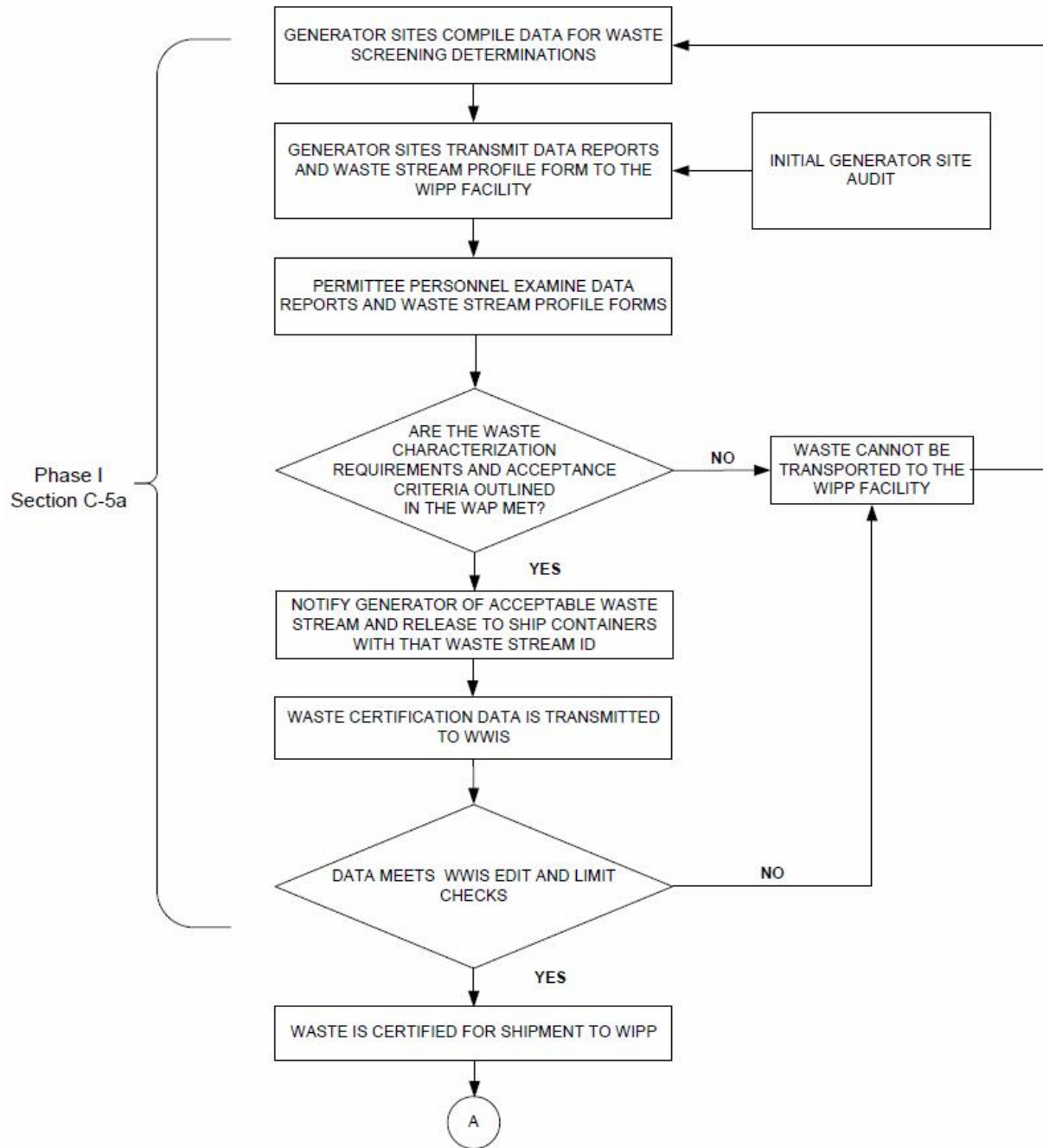


Figure C-3
TRU Mixed Waste Screening and Verification

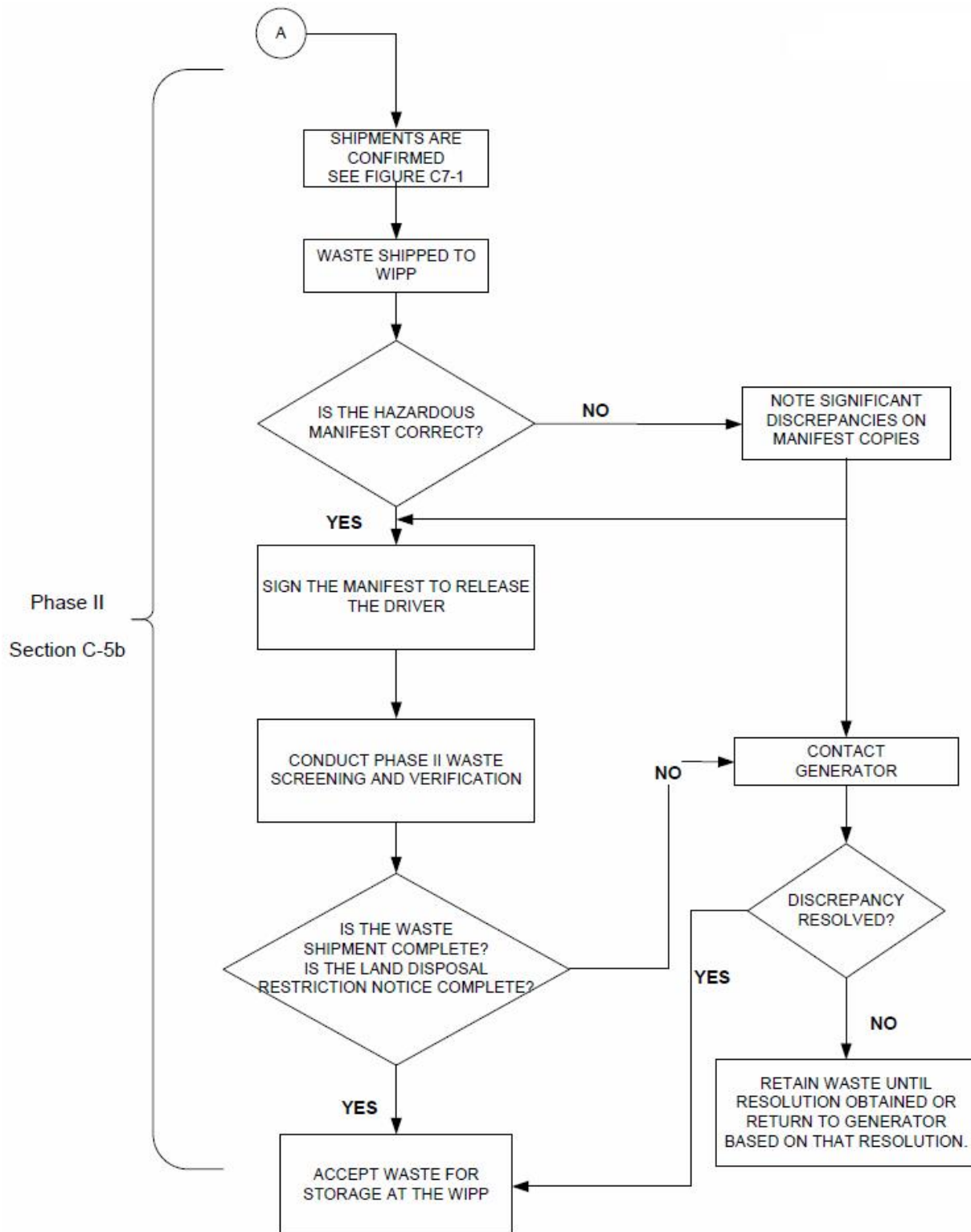


Figure C-3
TRU Mixed Waste Screening and Verification (Continued)