

ATTACHMENT B7
PERMITTEE LEVEL TRU WASTE CONFIRMATION PROCESSES

Waste Isolation Pilot Plant
Hazardous Waste Permit
April 1, 2010

(This page intentionally blank)

ATTACHMENT B7

PERMITTEE LEVEL TRU WASTE CONFIRMATION PROCESSES

TABLE OF CONTENTS

Introduction	1
B7-1 Permittee Confirmation of TRU Mixed Waste	1
B7-1a Permittees' Confirmation of a Representative Subpopulation of the Waste.....	1
B7-1a(1) Confirmation Training Requirements	2
B7-1b Radiography Methods Requirements.....	2
B7-1b(1) Radiography Training	3
B7-1b(2) Radiography Oversight.....	3
B7-1c Visual Examination Methods Requirements.....	4
B7-1c(1) Visual Examination Training	5
B7-1c(2) Visual Examination Oversight.....	5
B7-1d Quality Assurance Objectives (QAOs) for Radiography and Visual Examination.....	5
B7-1d(1) Radiography QAOs.....	5
B7-1d(2) Visual Examination QAOs	6
B7-1e Review and Validation of Radiography and Visual Examination Data Used for Waste Examination	7
B7-1e(1) Independent Technical Review.....	7
B7-1e(2) Permittee Management Review.....	7
B7-2 Noncompliant Waste Identified During Waste Confirmation	8

LIST OF FIGURES

Figure

Title

Figure B7-1 Overview of Waste Confirmation

1 The Permittees shall randomly select at least 7 percent of each waste stream shipment for
2 waste confirmation. This equates to a minimum of one container from each fourteen containers
3 in each waste stream in each designated shipment. If there are less than fourteen containers
4 from a waste stream in a particular shipment, a minimum of one container from the waste
5 stream shipped will be selected. If the random selection of containers in a shipment occurs prior
6 to loading the waste containers into the Shipping Package, the randomly selected containers
7 may be consolidated into a single Type B package consistent with transportation requirements.
8 Documentation of the random selection of containers for waste confirmation will be placed in the
9 WIPP facility operating record.

10 For each container selected for confirmation in accordance with the process above, the
11 Permittees will examine the respective nonconformance report (**NCR**) documentation to verify
12 NCRs have been dispositioned for the selected container as required by Permit Attachment B3,
13 Section B3-13.

14 B7-1a(1) Confirmation Training Requirements

15 Waste confirmation may be completed by performing actual radiography/visual examination on
16 the waste container(s) or by a review of radiography/visual examination media and records.

17 Waste confirmation personnel may be trained to either review of radiography/visual examination
18 media and records (Level 1) or to perform actual radiography/visual examination on the waste
19 container(s) (Level 2). Level 2 personnel may also perform waste confirmation by review of
20 media and records.

21 The Permittees management representative must be trained to the requirements of Level 2.

22 B7-1b Radiography Methods Requirements

23 Radiography has been developed by the Permittees specifically to aid in the examination and
24 identification of containerized waste. The Permittees shall describe all activities required to
25 achieve the radiography objectives in standard operating procedures (**SOPs**). These SOPs shall
26 include instructions specific to the radiography system(s) used by the Permittees at an off-site
27 facility (e.g., the generator/storage site). For example, to detect liquid, some systems require the
28 container to be rotated back and forth while other systems require the container to be tilted.

29 A radiography system (e.g., real time radiography, digital radiography/computed tomography)
30 normally consists of an X-ray-producing device, an imaging system, an enclosure for radiation
31 protection, a waste container handling system, a video and audio recording system, and an
32 operator control and data acquisition station. Although these six components are required, it is
33 expected there will be some variation within a given component between radiography systems.
34 The radiography system shall have controls or an equivalent process which allow the operator
35 to control image quality. On some radiography systems, it should be possible to vary the
36 voltage, typically between 150 to 400 kilovolts (**kV**), to provide an optimum degree of
37 penetration through the waste. For example, high-density material should be examined with the
38 X-ray device set on the maximum voltage. This ensures maximum penetration through the
39 waste container. Low-density material should be examined at lower voltage settings to improve
40 contrast and image definition. The imaging system typically utilizes either a fluorescent screen
41 and a low-light television camera or x-ray detectors to generate the image.

1 To perform radiography, the waste container is scanned while the operator views the television
2 screen. A video and audio recording is made of the waste container scan and is maintained in
3 the WIPP facility operating record as a non-permanent record. A radiography data form is also
4 used to document the Waste Matrix Code, ensure that the waste container contains no
5 ignitable, corrosive, or reactive waste by documenting the absence of liquid in excess of TSDF-
6 WAC limits or compressed gases, and verify that the physical form of the waste is consistent
7 with the waste stream description documented on the WSPF. Containers whose contents
8 prevent full examination of the remaining contents shall be subject to visual examination unless
9 the Permittees certify that visual examination would provide no additional relevant information
10 for that container based on the acceptable knowledge information for the waste stream. Such
11 certification shall be documented in the WIPP facility operating record.

12 For containers that have been characterized using radiography by the generator/storage sites in
13 accordance with the method in Attachment B1, Section B1-3, the Permittees may perform
14 confirmation by review of the generator/storage site's radiography audio/video recordings.

15 For containers which contain classified shapes and undergo radiography, the radiography will
16 occur at a facility with appropriate security provisions and the video and audio recording will be
17 considered classified. The radiography data forms will not contain classified information.

18 B7-1b(1) Radiography Training

19 The radiography system involves qualitative and semiquantitative evaluations of visual displays.
20 Operator training and experience are the most important considerations for ensuring quality
21 controls in regard to the operation of the radiography system and for interpretation and
22 disposition of radiography results. Only trained personnel shall be allowed to operate
23 radiography equipment.

24 The Permittee radiography operators performing waste confirmation shall be trained in
25 accordance with the requirements of Permit Attachment H1.

26 B7-1b(2) Radiography Oversight

27 The Permittees shall be responsible for monitoring the quality of the radiography data and
28 calling for corrective action, when necessary.

29 A training drum with internal containers of various sizes shall be scanned biennially by each
30 Level 2 operator. The video and audio media shall then be reviewed by a radiography subject
31 matter expert to ensure that operators' interpretations remain consistent and accurate. Imaging
32 system characteristics shall be verified on a routine basis.

33 Independent replicate scans and replicate observations of the video output of the radiography
34 process shall be performed under uniform conditions and procedures. Independent replicate
35 scans shall be performed on one waste container per day or once per shipment, whichever is
36 less frequent. Independent observations of one scan (not the replicate scan) shall also be made
37 once per day or once per shipment, whichever is less frequent, by a qualified radiography
38 operator other than the individual who performed the first examination. When confirmation is
39 performed by review of audio/video recorded scans produced by the generator/storage site as
40 specified in Permit Attachment B1, Section B1-3, independent observations shall be performed
41 on two waste containers per shipment or two containers per day, whichever is less frequent.

1 B7-1c Visual Examination Methods Requirements

2 Visual examination (**VE**) may also be used as a waste confirmation method by the Permittees.
3 VE shall be conducted by the Permittees in accordance with written SOPs to describe the
4 contents of a waste container. Visual examination shall be conducted to identify and describe all
5 waste items, packaging materials, and waste material parameters. VE may be used by the
6 Permittees to examine a statistically representative subpopulation of the waste certified for
7 shipment to WIPP to confirm that the waste contains no ignitable, corrosive, or reactive waste.
8 This is achieved by confirming that the waste contains no liquid in excess of TSDf-WAC limits
9 or compressed gases, and that the physical form of the waste matches the waste stream
10 description documented on the WSPF. During packaging, the waste container contents are
11 directly examined by trained personnel. This form of waste confirmation may be performed by
12 the Permittees at a generator/storage site. The VE may be documented on video and audio
13 media, or by using a second operator to provide additional verification by reviewing the contents
14 of the waste container to ensure correct reporting. When VE is performed using a second
15 operator, each operator performing the VE shall observe for themselves the waste being placed
16 in the waste container or the contents within the examined waste container when waste is not
17 removed. The results of all VE shall be documented on VE data forms.

18 In order to keep radiation doses as low as reasonably achievable at generator/storage sites, the
19 Permittees may use their own trained VE operators to perform VE for waste confirmation by
20 reviewing video media prepared by the generator/storage site during their VE of the waste. If the
21 Permittees perform waste confirmation by review of video media, the video record of the VE
22 must be sufficiently complete for the Permittees to confirm the Waste Matrix Code and waste
23 stream description, and verify the waste contains no liquid in excess of TSDf-WAC limits or
24 compressed gases. Generator/storage site VE video/audio media subject to review by the
25 Permittees shall meet the following minimum requirements:

- 26 • The video/audio media shall record the waste packaging event for the container such
27 that all waste items placed into the container are recorded in sufficient detail and shall
28 contain an inventory of waste items in sufficient detail that a trained Permittee VE
29 operator can identify the associated waste material parameters.
- 30 • The video/audio media shall capture the waste container identification number.
- 31 • The personnel loading the waste container shall be identified on the video/audio media
32 or on packaging records traceable to the loading of the waste container.
- 33 • The date of loading of the waste container will be recorded on the video/audio media
34 or on packaging records traceable to the loading of the waste container.

35 The Permittees may also use their own trained VE operators to perform VE for waste
36 confirmation by reviewing VE data forms or packaging logs prepared by the generator during
37 their packaging of the waste. To be acceptable, the generator/storage site VE data must be
38 signed by two generator/storage site personnel who witnessed the packaging of the waste and
39 must provide sufficient information for the Permittees to determine that the waste container
40 contents match the waste stream description on the WSPF and the waste contains no liquid in
41 excess of TSDf-WAC limits or compressed gases. The Permittees will document their review of
42 generator/storage site VE data on Permittee VE data forms. Generator/storage site VE forms or

1 packaging records subject to review by the Permittees shall meet the following minimum
2 requirements:

- 3 • At least two generator site personnel shall approve the data forms or packaging
4 records attesting to the contents of the waste container.
- 5 • The data forms or packaging records shall contain an inventory of waste items in
6 sufficient detail that a trained Permittee VE operator can identify the associated waste
7 material parameters.
- 8 • The waste container identification number shall be recorded on the data forms or
9 packaging records.

10 Visual examination video media of containers which contain classified shapes shall be
11 considered classified information. Visual examination data forms will not contain classified
12 information.

13 B7-1c(1) Visual Examination Training

14 The Permittees' VE operators performing waste confirmation shall be trained in accordance with
15 the requirements of Permit Attachment H1.

16 B7-1c(2) Visual Examination Oversight

17 The Permittees shall designate at least one VE expert. The VE expert shall be familiar with the
18 processes that were used to generate the waste streams being confirmed using VE. The VE
19 expert shall be responsible for the overall direction and implementation of the Permittees' VE
20 program. The Permittees shall specify the selection, qualification, and training requirements of
21 the visual examination expert in an SOP.

22 B7-1d Quality Assurance Objectives (QAOs) for Radiography and Visual Examination

23 The QAOs the Permittees must meet for radiography and visual examination are detailed in this
24 section. If the QAOs described below are not met, then corrective action as specified in Permit
25 Attachment B3, Section B3-13 shall be taken.

26 B7-1d(1) Radiography QAOs

27 The QAOs for radiography are detailed in this section. If the QAOs described below are not met,
28 then corrective action shall be taken.

29 Data to meet these objectives must be obtained from a video and audio recorded scan provided
30 by trained radiography operators. Results must also be recorded on a radiography data form.
31 The precision, accuracy, representativeness, completeness, and comparability objectives for
32 radiography data are presented below.

33 Precision

34 Precision is maintained by reconciling any discrepancies between two radiography operators
35 with regard to the waste stream waste confirmation, identification of liquid in excess of TSDf-

1 WAC limits, and identification of compressed gases through independent replicate scans and
2 independent observations.

3 Accuracy

4 Accuracy is obtained by using a target to tune the image for maximum sharpness and by
5 requiring operators to successfully identify 100 percent of the required items in a training
6 container during their initial qualification and subsequent requalification.

7 Representativeness

8 Representativeness is ensured by performing radiography on a random sample of waste
9 containers from each waste stream in each shipment.

10 Completeness

11 A video and audio media recording of the radiography examination and a validated radiography
12 data form will be obtained for 100 percent of the waste containers subject to radiography.

13 Comparability

14 The comparability of radiography data from different operators shall be enhanced by using
15 standardized radiography procedures and operator qualifications.

16 B7-1d(2) Visual Examination QAOs

17 Results must be recorded on a VE data form. The precision, accuracy, representativeness,
18 completeness, and comparability objectives for VE data are presented below.

19 Precision

20 Precision is maintained by reconciling any discrepancies between the operator and the
21 independent technical reviewer with regard to the waste stream waste confirmation,
22 identification of liquid in excess of TSDF-WAC limits, and identification of compressed gases.

23 Accuracy

24 Accuracy is maintained by requiring operators to pass a comprehensive examination and
25 demonstrate satisfactory performance in the presence of the VE expert during their initial
26 qualification and subsequent requalification.

27 Representativeness

28 Representativeness is ensured by performing VE on a random sample of waste containers
29 within each waste stream in each shipment.

30 Completeness

31 A validated VE data form will be obtained for 100 percent of the waste containers subject to VE.

1 Comparability

2 The comparability of VE data from different operators shall be enhanced by using standardized
3 VE procedures and operator qualifications.

4 B7-1e Review and Validation of Radiography and Visual Examination Data Used for Waste
5 Examination

6 This section describes the requirements for review and validation of radiography and VE data by
7 the Permittees.

8 B7-1e(1) Independent Technical Review

9 The radiography and/or VE confirmation data for each shipment shall receive an independent
10 technical review. This review will be performed before the affected waste shipment is shipped to
11 the WIPP facility. The review shall be performed by an individual other than the data generator
12 who is qualified to have performed the work. The review will be performed in accordance with
13 approved Permittee SOPs and will be documented on a review checklist. The reviewer(s) must
14 approve the data as evidenced by signature, and as a consequence, ensure the following:

- 15 • Data generation and reduction were conducted in a technically correct manner in
16 accordance with the methods used (procedure with revision). Data were reported in
17 the proper units and correct number of significant figures.
- 18 • The data have been reviewed for transcription errors.
- 19 • Radiography video and audio media recordings have been reviewed (independent
20 observation) on a waste container basis at a minimum of once per shipment or once
21 per day of operation, whichever is less frequent. The radiography video/audio
22 recording will be reviewed against the data reported on the Permittees' radiography
23 form to ensure that the data are correct and complete. If review of radiography scans
24 recorded by the generator/storage site was used to perform confirmation, two
25 observations must be performed for each shipment or two observations per day,
26 whichever is less frequent.

27 B7-1e(2) Permittee Management Review

28 The radiography and/or visual examination data for each shipment shall receive a Permittee
29 management review. This review will be performed before the affected waste shipment is
30 disposed of at the WIPP. The review shall be performed by a designated member of Permittee
31 management. The review will be performed in accordance with approved Permittee SOPs and
32 will be documented on a review checklist. The reviewer(s) must approve the data as evidenced
33 by signature, and as a consequence, ensure the following:

- 34 • The data are technically reasonable based on the technique used.
- 35 • The data have received independent technical review.

- 1 • The data indicate that the waste examined contained no ignitable, corrosive, or
2 reactive waste and that the physical form of the waste was consistent with the waste
3 stream description in the WSPF.
- 4 • QC checks have been performed (e.g., replicate scans, image quality checks).
- 5 • The data meet the established QAOs

6 Upon completion of the Permittee management review, the waste confirmation data for the
7 shipment shall be submitted to the WIPP facility operating record as non-permanent records.
8 Waste confirmation data includes radiography and VE data forms, video/audio media, and
9 review checklists.

10 B7-2 Noncompliant Waste Identified During Waste Confirmation

11 If the Permittees identify noncompliant waste during waste confirmation at a generator/storage
12 site (i.e., the waste does not match the waste stream description documented in the WSPF or
13 there is liquid in excess of TSDf-WAC limits or compressed gases) the waste will not be
14 shipped. The Permittees will suspend further shipments of the affected waste stream and issue
15 a CAR to the generator/storage site. Shipments of affected waste streams shall not resume until
16 the CAR has been closed. NMED will be notified within 24 hours of any suspension of waste
17 stream shipments due to the identification of noncompliant waste during waste confirmation.

18 As part of the corrective action plan in response to the CAR, the generator/storage site will
19 evaluate whether the waste characterization information documented in the Characterization
20 Information Summary and/or WSPF for the waste stream must be updated because the results
21 of waste confirmation for the waste stream indicated that the TRU mixed waste being examined
22 did not match the waste stream description. The generator/storage site will thoroughly evaluate
23 the potential impacts on waste that has been shipped to WIPP. The Permittees will evaluate the
24 potential that prohibited items were shipped to WIPP and what remedial actions should occur, if
25 any. The results of these evaluations will be provided to NMED before shipments of affected
26 waste streams resume. If the Characterization Information Summary and/or WSPF requires
27 revision, shipments of the affected waste stream shall not resume until the revised waste stream
28 waste characterization information has been reviewed and approved by the Permittees.

29 If a generator/storage site certifies noncompliant waste more than once during a running 90-day
30 period, the Permittees will suspend acceptance of that site's waste until the Permittees find that
31 all corrective actions have been implemented and the site complies with all applicable
32 requirements of the WAP.

33

1

FIGURES

2

1

(This page intentionally blank)

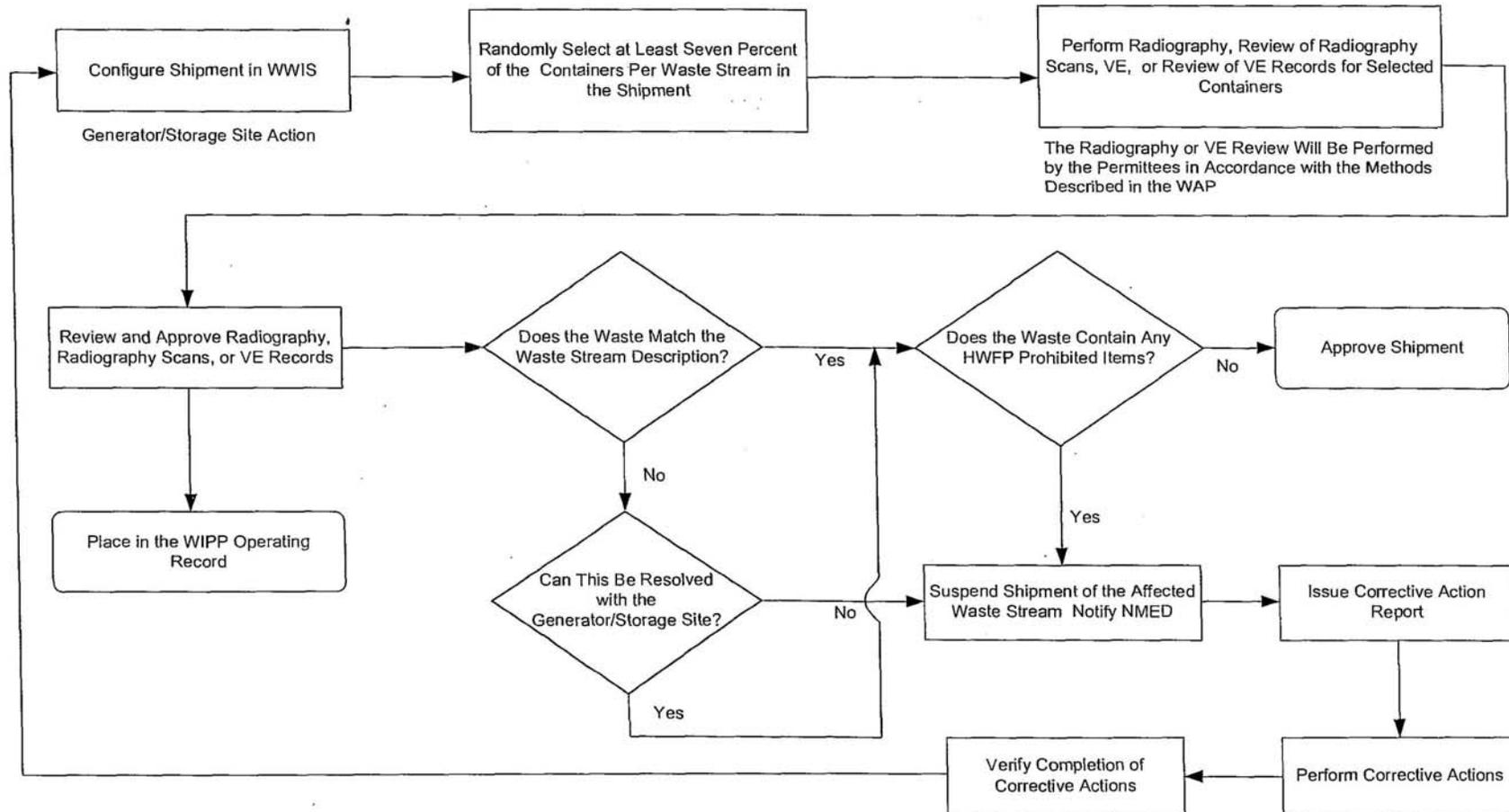


Figure B7-1
Overview of Waste Confirmation