

# **Low-Level Burial Grounds Waste Analysis Plan**

Prepared for the U.S. Department of Energy  
Assistant Secretary for Environmental Management

Project Hanford Management Contractor for the  
U.S. Department of Energy under Contract DE-AC06-96RL13200

**Fluor Hanford**  
P.O. Box 1000  
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Page 1 of 21. ECN 635189Proj.  
ECN

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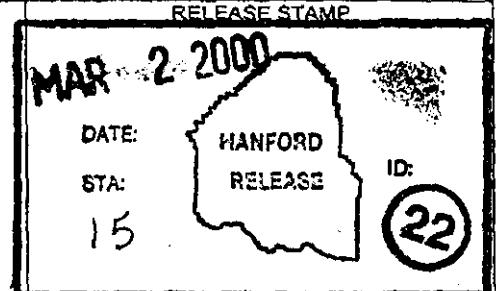
13b. Design Baseline Document?  Yes  No

This ECN cancels HNF-SD-EN-WAP-002.

14a. Justification (mark one)	14b. Justification Details
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Page 2 of 2

1. ECN (use no. from pg. 1)

635189

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## 18. Schedule Impact (days)

 YesAdditional  \$ NAAdditional  \$ NAImprovement  NA NoSavings  \$ NASavings  \$ NADelay  NA

19. Change Impact Review: Indicate the related documents (other than the engineering documents identified on Side 1) that will be affected by the change described in Block 13. Enter the affected document number in Block 20.

SDD/DD

Seismic/Stress Analysis

Tank Calibration Manual

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Stress/Design Report

Health Physics Procedure

Operating Specification

Interface Control Drawing

Spares Multiple Unit Listing

Criticality Specification

Calibration Procedure

Test Procedures/Specification

Conceptual Design Report

Installation Procedure

Component Index

Equipment Spec.

Maintenance Procedure

ASME Coded Item

Const. Spec.

Engineering Procedure

Human Factor Consideration

Procurement Spec.

Operating Instruction

Computer Software

Vendor Information

Operating Procedure

Electric Circuit Schedule

OM Manual

Operational Safety Requirement

ICRS Procedure

FSAR/SAR

IEFD Drawing

Process Control Manual/Plan

Safety Equipment List

Cell Arrangement Drawing

Process Flow Chart

Radiation Work Permit

Essential Material Specification

Purchase Requisition

Environmental Impact Statement

Fac. Proc. Samp. Schedule

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Date

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Date

Design Authority

Design Agent

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D. E. Saueressig

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HNF-SD-EN-WAP-002, Rev. 3

# Waste Analysis Plan for the Low-Level Burial Grounds

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Fluor Hanford  
Richland, WA 99352  
U.S. Department of Energy Contract DE-AC06-96RL13200

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**Key Words:** Low-Level Burial Grounds, mixed waste, waste acceptance, waste designation, waste characterization, QA/QC, sampling and analysis.

**Abstract:** This waste analysis plan (WAP) has been prepared for the Low-Level Burial Grounds which are located in the 200 East and West Areas of the Hanford Facility, Richland, Washington. This WAP documents the methods used to characterize, obtain and analyze representative samples of waste managed at this unit.

Cancelled - The requirements of this WAP are now in HNF-5841-0.

---

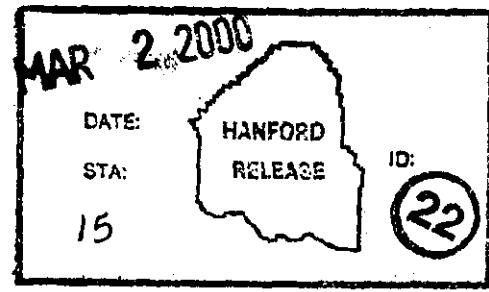
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**Document Number:** HNF-5841, Rev. 0

**Document Title:** Low-Level Burial Grounds Waste Analysis Plan

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# **Low-Level Burial Grounds Waste Analysis Plan**

**Date Published  
March 2000**

**Prepared for the U.S. Department of Energy  
Assistant Secretary for Environmental Management**

**Fluor Hanford**  
P.O. Box 1000  
Richland, Washington

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**TABLE**

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## GLOSSARY

1	ALARA	as low as reasonably achievable
2	AWMP	alternative waste management plan
3		
4	CAP	corrective action plan
5	COLIWASA	composite liquid waste sampler
6		
7	CFR	Code of Federal Regulations
8	CWC	Central Waste Complex
9		
10	DOE-RL	U.S. Department of Energy, Richland Operations Office
11		
12	Ecology	Washington State Department of Ecology
13		
14	HNF	Hanford Nuclear Facility (document identifier)
15		
16	LDR	land disposal restriction
17	LLBG	Low-Level Burial Grounds
18		
19	MSDS	material safety data sheet
20		
21	PCB	polychlorinated biphenyl
22	PES	performance evaluation system
23	pH	negative concentration logarithm of the hydrogen-ion concentration
24		
25	QA/QC	quality assurance and quality control
26		
27	RCRA	<i>Resource Conservation and Recovery Act of 1976</i>
28	RCW	Revised Code of Washington
29	RTR	real-time radiography
30		
31	SWITS	solid waste information tracking system
32	SWMU	solid waste management unit
33		
34	TRU	transuranic
35	TSD	treatment, storage, and/or disposal
36		
37	WAC	Washington Administrative Code
38	WAP	waste analysis plan
39	WRAP	Waste Receiving and Processing Facility
40	WSRd	waste specification record
41		
42	°C	degrees Celsius
43		
44		
45		

## METRIC CONVERSION CHART

The following conversion chart is provided to the reader as a tool to aid in conversion.

Into metric units			Out of metric units		
If you know	Multiply by	To get	If you know	Multiply by	To get
<b>Length</b>			<b>Length</b>		
inches	25.40	millimeters	millimeters	0.0393	inches
inches	2.54	centimeters	centimeters	0.393	inches
feet	0.3048	meters	meters	3.2808	feet
yards	0.914	meters	meters	1.09	yards
miles	1.609	kilometers	kilometers	0.62	miles
<b>Area</b>			<b>Area</b>		
square inches	6.4516	square centimeters	square centimeters	0.155	square inches
square feet	0.092	square meters	square meters	10.7639	square feet
square yards	0.836	square meters	square meters	1.20	square yards
square miles	2.59	square kilometers	square kilometers	0.39	square miles
acres	0.404	hectares	hectares	2.471	acres
<b>Mass (weight)</b>			<b>Mass (weight)</b>		
ounces	28.35	grams	grams	0.0352	ounces
pounds	0.453	kilograms	kilograms	2.2046	pounds
short ton	0.907	metric ton	metric ton	1.10	short ton
<b>Volume</b>			<b>Volume</b>		
fluid ounces	29.57	milliliters	milliliters	0.03	fluid ounces
quarts	0.95	liters	liters	1.057	quarts
gallons	3.79	liters	liters	0.26	gallons
cubic feet	0.03	cubic meters	cubic meters	35.3147	cubic feet
cubic yards	0.76	cubic meters	cubic meters	1.308	cubic yards
<b>Temperature</b>			<b>Temperature</b>		
Fahrenheit	subtract 32 then multiply by 5/9ths	Celsius	Celsius	multiply by 9/5ths, then add 32	Fahrenheit

Source: *Engineering Unit Conversions*, M. R. Lindeburg, PE., Second Ed., 1990, Professional Publications, Inc., Belmont, California.

## 1 1.0 UNIT DESCRIPTION

2 The purpose of this waste analysis plan (WAP) is to document the waste acceptance process, sampling  
3 methodologies, analytical techniques, and overall processes that are undertaken for waste accepted for storage  
4 and/or disposal at the Low-Level Burial Grounds (LLBG), which are located in the 200 East and 200 West  
5 Areas of the Hanford Facility, Richland, Washington. Because dangerous waste does not include the source,  
6 special nuclear, and by-product material components of mixed waste, radionuclides are not within the scope  
7 of this documentation. The information on radionuclides is provided only for general knowledge. The LLBG  
8 also receive nondangerous low-level radioactive waste for disposal. The requirements of this WAP are not  
9 applicable to this nondangerous low-level waste.

10  
11 This document has been revised to meet the interim status waste analysis plan requirements of Washington  
12 Administrative Code (WAC) 173-303-300(5).

### 13 14 15 1.1 DESCRIPTION OF PROCESSES AND ACTIVITIES

16 The LLBG are a land-based unit consisting of eight burial grounds located in the 200 East Area and  
17 200 West Area. Seven of the eight burial grounds (218-E-10, 218-E-12B, 218-W-3A, 218-W-3AE,  
18 218-W-4C, 218-W-5, and 218-W-6) are, or will be, used for the disposal of mixed waste and are subject to  
19 *Dangerous Waste Regulations*, Washington Administrative Code (WAC) 173-303. One burial ground  
20 (218-W-4B) is designated as a solid waste management unit (SWMU) (Figures 1-1 and 1-2).

21  
22 The 218-E-10, 218-E-12B, 218-W-3A, 218-W-3AE, 218-W-4C, 218-W-5 and 218-W-6 Burial Grounds are  
23 classified as landfills. The regulated portions of the LLBG cover a total area of approximately 49 hectares.

24  
25 The 218-E-10 and 218-E-12B Burial Grounds are located in the 200 East Area. The 218-W-3A,  
26 218-W-3AE, 218-W-4B, 218-W-4C, 218-W-5, and 218-W-6 Burial Grounds are located in the 200 West  
27 Area. The LLBG consist of various sizes and depths of lined and unlined disposal trenches. All mixed waste  
28 destined for disposal will meet land disposal restriction (LDR) requirements [WAC 173-303-140 and  
29 40 Code of Federal Regulations (CFR) 268] or other regulatory alternatives. The lined trenches have leachate  
30 collection and removal systems. The less-than-90-day leachate collection tanks are operated in accordance  
31 with the generator provisions of WAC 173-303-200 and are not subject to this WAP.

32  
33 Future trench development and configuration within a burial ground are subject to change as disposal  
34 techniques improve or as waste management needs dictate. Mixed waste is disposed in lined or in unlined  
35 trenches in accordance with applicable LDR requirements. An electronic database, which can be found  
36 within the LLBG operating organization, is maintained that documents each waste receipt, type of waste, and  
37 disposal location.

38

- 39 • The 218-E-10 Burial Ground (Figure 1-3) is approximately 36.1 hectares in size and began receiving  
40 waste in 1960. Examples of waste placed in this burial ground include failed equipment, rags, paper,  
41 rubber gloves, disposable supplies, broken tools, and post-August 19, 1987 *Resource Conservation and*  
42 *Recovery Act* RCRA of 1976 and state-only designated mixed waste.
- 43 • The 218-E-12B Burial Ground (Figure 1-4) is approximately 68 hectares in size and began receiving  
44 waste in 1967. Examples of waste placed in this burial ground include defueled reactor compartments  
45 (trench 94), low-level waste, and retrievable transuranic (TRU) waste.

46  
47

- 1     • The 218-W-3A Burial Ground (Figure 1-5) is approximately 20.4 hectares in size and began receiving  
2       waste in 1970. Examples of waste placed in this burial ground include ion exchange resins, failed  
3       equipment, tanks, pumps, ovens, agitators, heaters, hoods, jumpers, vehicles, accessories and  
4       post-August 19, 1987 RCRA and state-only designated mixed waste, and retrievable TRU waste.  
5
- 6     • The 218-W-3AE Burial Ground (Figure 1-6) is approximately 20 hectares in size and began receiving  
7       waste in 1981. Examples of waste placed in this burial ground include rags, paper, rubber gloves,  
8       disposable supplies, broken tools, and post-August 19, 1987 RCRA and state-only designated mixed  
9       waste.
- 10    • The 218-W-4B Burial Ground (Figure 1-7) is approximately 3.5 hectares in size and began receiving  
11       waste in 1968. Examples of waste placed in this burial ground include rags, paper, rubber gloves,  
12       disposable supplies, broken tools, alpha caissons, and retrievable TRU waste.
- 13    • The 218-W-4C Burial Ground (Figure 1-8) is approximately 20 hectares in size and began receiving  
14       waste in 1978. Examples of waste placed in this burial ground include contaminated soil,  
15       decommissioned pumps, pressure vessels, and post-August 19, 1987 RCRA and state-only designated  
16       mixed waste, and retrievable TRU waste.
- 17    • The 218-W-5 Burial Ground (Figure 1-9) is approximately 37.2 hectares in size and began receiving  
18       waste in 1986. Examples of waste placed in this burial ground include rags, paper, rubber gloves,  
19       disposable supplies, broken tools, and post-August 19, 1987 RCRA and state-only designated mixed  
20       waste. This burial ground currently contains double-lined mixed waste trenches (trenches 31 and 34)  
21       (Figure 1-10). Adjacent to the double-lined mixed waste trenches are leachate collection tanks operated in  
22       accordance with the generator provisions of WAC 173-303-200. Examples of waste to be placed in the  
23       double-lined mixed waste trenches include mixed waste that has been treated to meet LDR requirements  
24       (including containerized bulk waste) and macroencapsulated long-length contaminated equipment.  
25
- 26    • The 218-W-6 Burial Ground (Figure 1-11) is approximately 16 hectares in size, has not received any  
27       waste, and is reserved for future mixed waste disposal.

### 33    1.1.1   How Waste is Accepted, Moved, Processed, and Managed

34    The following sections and the flowchart (Figure 2-1) describe the different types of information and  
35       knowledge used for waste acceptance.

#### 37    1.1.1.1   Narrative Process Descriptions

38    The onsite generating unit, offsite generator, and the treatment, storage, and/or disposal (TSD) unit  
39       transferring waste to the LLBG is hereafter referred to as the 'generator'. All mixed waste is disposed in lined  
40       mixed waste trenches or other approved alternatives. Waste accepted either can be containerized or bulk  
41       solids.

42    Mixed waste that meets LDR requirements, as specified in 40 CFR 268 and WAC 173-303-140, is disposed  
43       in lined trenches with leachate collection and removal systems. The Hanford Facility is required to test  
44       certain mixed waste depending on the type of treatment standard to ensure that the waste or treatment  
45       residuals are in compliance with applicable LDR requirements. Such testing is performed according to the  
46       frequency specified in this WAP.

1 Defueled reactor compartments are disposed in Trench 94 of the 218-E-12B Burial Ground under an  
2 exemption allowed by WAC 173-303-665(2)(b).

3

#### 4 1.1.1.2 Waste Acceptance Process

5 The LLBG waste acceptance process consists of the following activities.

6

- 7 • Waste Stream Approval. The generator provides information concerning each waste stream on a waste  
8 profile sheet. The waste stream information is reviewed against the LLBG waste acceptance criteria.  
9 However, waste that previously was accepted at a Waste Management Project operated TSD unit does  
10 not require the development or redevelopment of a waste profile and is exempt from the waste stream  
11 approval function. If the waste stream information is sufficient and meets the applicable acceptance  
12 criteria, the waste stream is approved<sup>1</sup>. In addition, the initial verification frequency for the waste is  
13 determined in accordance with the requirements found in the performance evaluation program (PES)  
14 (Section 1.1.1.3). For a more complete description of the waste stream approval process, refer to Section  
15 2.1.1.

16

- 17 • Waste Shipment Approval. The generator provides specific data for each waste container. The container  
18 data are reviewed against the waste profile sheet data and the LLBG acceptance criteria before being  
19 approved for shipment. In addition, the LLBG operating organization or its representative, hereafter  
20 referred to the 'LLBG operating organization', determines if any of the containers require verification  
21 based on the verification frequency as determined by PES. For a more complete description of the waste  
22 transfer/shipment approval process, refer to Section 2.1.2.

23

- 24 • Verification. Verification activities include container receipt inspection and also could include physical  
25 screening and/or chemical screening. All containers received at the LLBG are receipt inspected before  
26 acceptance, and a percentage of waste containers are selected for physical and/or chemical screening  
27 during the waste shipment approval process. These containers can be inspected visually, verified by  
28 nondestructive examination (NDE), or sampled for field or laboratory analysis to confirm that the waste  
29 matches the waste profile and container data information supplied by the generator. Any discrepancies  
30 between the verification results and the waste profile sheet must be resolved before final acceptance at  
31 LLBG in accordance with the conformance issue resolution process found in Section 1.1.1.3.3.

32

##### 33 1.1.1.2.1 Types of Acceptable Knowledge

34 When collecting documentation on a waste stream or container, the LLBG operating organization must  
35 determine if the information provided by the generator is acceptable knowledge. Acceptable knowledge  
36 requirements are met using any one or combination of the following types of information:

37

- 38 • Mass balance from a controlled process that has a specified output for a specified input
- 39 • Material safety data sheet (MSDS) on unused chemical products
- 40 • Test data from a surrogate sample
- 41 • Analytical data on the waste or a waste from a similar process.

42

---

<sup>1</sup> Approved waste profiles are retained in the LLBG operating record and will be made available upon request.

1 In addition, acceptable knowledge requirements can be met using a combination of analytical data or  
2 screening results and one or more of the following:

- 4 • Interview information
- 5 • Logbooks
- 6 • Procurement records
- 7 • Qualified analytical data
- 8 • Radiation work package
- 9 • Procedures and/or methods
- 10 • Process flow charts
- 11 • Inventory sheets
- 12 • Vendor information
- 13 • Mass balance from an uncontrolled process (e.g., spill cleanup)
- 14 • Mass balance from a process with variable inputs and outputs (e.g., washing/cleaning methods).

16 If the information is sufficient to quantify the constituents of regulatory concern and determine waste  
17 characteristics as required by the regulations and LLBG acceptance criteria, the information is considered  
18 acceptable knowledge. The LLBG acceptance criteria are defined as the requirements found in this WAP and  
19 the associated Part A, Form 3 (DOE/RL-88-20).

### 21 1.1.1.3 Description of Performance Evaluation System

22 The PES determines the initial physical screening frequency of each generator waste stream. PES provides a  
23 periodic status of an individual generator's performance for waste received. Also, a PES provides a  
24 mechanism for determining corrective actions, resolving waste acceptance issues, and physical screening  
25 adjustments when a problem has been discovered.

#### 27 1.1.1.3.1 Initial Physical Screening Frequency Determination

28 The initial physical screening frequency is determined based on the following process.

- 30 • LLBG operating organization reviews the generator profile information to determine the relative potential  
31 for misdesignation or inappropriate segregation based on all relevant information, including any previous  
32 experience with the generator. Based on this review, LLBG operating organization identifies any  
33 concerns associated with the following criteria:
  - 35 – documented waste management program
  - 36 – waste stream characterization information
  - 37 – potential for inappropriate segregation.
- 39 • Based on the identification of concerns during the review, the LLBG operating organization establishes  
40 the initial physical screening frequency for the generator's waste stream based on the following criteria:
  - 42 – Initial physical screening frequency of, at a minimum, 20 percent: No concerns identified
  - 43 – Initial physical screening frequency of, at a minimum, 50 percent: Concern(s) identified in one  
44 criterion
  - 45 – Initial physical screening frequency of 100 percent: Concerns identified in two or more criteria.

1    **1.1.1.3.2    Monthly Performance Evaluation**

2    A monthly performance evaluation is used to trend a generator's performance and is used to raise the  
3    generator's overall group of streams physical screening frequency based on the type of issue. The evaluation  
4    should be objective and should consider the conformance issues documented during the preshipment review  
5    and verification functions. The LLBG operating organization will: (1) perform monthly evaluations based  
6    on deficiencies and conformance issues identified, (2) evaluate unsatisfactory performance for corrective  
7    actions, and (3) adjust physical screening rates accordingly.

8   

9    **1.1.1.3.3    Conformance Issue Resolution**

10   Conformance issues identified during verification could result in a waste container that does not meet the  
11   LLBG waste acceptance criteria. If a possible conformance issue is identified, the following actions are taken  
12   to resolve the issue.

13  

- 14   • LLBG operating organization compiles all information concerning the possible conformance issue(s).
- 15
- 16   • The generator is notified and requested to supply additional knowledge to assist in the resolution of the  
17   concern(s). If the generator supplies information that alleviates the concern(s) identified, no further  
18   action is required.
- 19
- 20   • Upon determination that a conformance issue has been identified, the LLBG operating organization  
21   personnel and the generator discuss the conformance issue and identify the appropriate course of action  
22   to resolve the container/shipment in question, i.e., pick another sample set, return the container/shipment,  
23   divert the container/shipment to another TSD unit and resolve the issue, or the generator resolves the  
24   issue at the TSD unit. If the conformance issue(s) results in the failure of a shipment, the physical  
25   screening frequency for all stream(s) that could exhibit a similar issue (or issues) from the generator are  
26   adjusted to 100 percent until the issue(s) adequately can be addressed.
- 27
- 28   • On resolution of the initial conformance issue, LLBG operating organization requests the generator to  
29   provide a corrective action plan (CAP) that clearly states the reason for the failure and describes the  
30   actions to be completed to prevent re-occurrence. The generator could request a reduction in verification  
31   of additional streams that the generator believes are unaffected. This request must be accompanied by a  
32   justification that identifies why this stream(s) would not exhibit the same conformance issue.
- 33
- 34   • LLBG operating organization reviews the CAP and stream justification for adequacy. If the stream  
35   justification is adequate, the LLBG operating organization could provide an alternative frequency as  
36   denoted in Section 1.1.1.3.2.

37  

38   **1.1.1.3.4    Process for Reducing the Physical Screening Frequency**

39   Screening rate frequencies and changes to those frequencies could be applied to a specific waste stream, to a  
40   specific contractor, or to a specific offsite generator based on the circumstances surrounding the conformance  
41   issue. After the initial screening frequency for a given waste stream has been established or increased, the  
42   physical screening frequency can be reduced in accordance with the following process.

43  

44   The physical screening frequency will be reduced in three steps. Reduction for all steps is based on the ability  
45   to demonstrate that five containers from the waste stream in question pass verification. In addition, reduction  
46   to the minimum frequency requires that the LLBG operating organization documents an acceptable  
47   evaluation of the CAP. At no time will the physical screening frequency be reduced below 5 percent for waste  
48   generated onsite or below 10 percent for offsite generators.

- Step 1. Reduce frequency by a maximum of 66 percent after five containers from the waste stream in question pass verification.
- Step 2. Reduce frequency established in Step 1 by a maximum of 50 percent or to the minimum allowable, whichever results in a greater frequency after five containers from the waste stream in question pass verification.
- Step 3. Reduce frequency to the minimum allowable after five containers from the waste stream in question pass verification. The LLBG operating organization documents an acceptable evaluation of the CAP.

#### 1.1.2 Process Flow Diagram

Refer to Figure 2-1 for the waste analysis plan flowchart and Section 1.1 for description.

#### 1.1.3 Operating Conditions

Waste can be sent to the LLBG in a variety of container configurations, including drums, boxes, macroencapsulated items, and bulk waste that has sufficiently low concentrations of chemical and radiological constituents to be handled safely. For containerized waste, the container weight must be known and proper handling procedures are imposed to ensure safe operations. The waste container radiation dose must be known and procedures must ensure that personnel exposure is kept as low as is reasonably achievable (ALARA). The quantity of fissile material within the waste must be determined and must be low enough to prevent a criticality hazard. Free liquids are not allowed in waste, except that certain incidental liquids could be allowed as described in Section 1.2. Waste containers must be at least 90 percent full. Containers of waste that could develop pressure before placement in the disposal unit must be vented. Radionuclide and dangerous waste constituent inventories in waste containers must be kept low enough to ensure that personnel exposure limits are not exceeded.

The Part A, Form 3, permit application for LLBG identifies dangerous waste numbers, quantities, and design capacity (DOE/RL-88-21).

Dangerous and/or mixed waste with waste numbers not identified on the LLBG Part A, Form 3, will not be managed at LLBG. Additionally, waste for which LLBG are unable to obtain the information required by WAC 173-303-300 will not be managed in LLBG.

### 1.2 IDENTIFICATION AND CLASSIFICATION OF WASTE

Mixed waste is acceptable for disposal in the LLBG except for the following waste types.

- Waste is not accepted for disposal when the waste contains free-standing liquid unless all free-standing liquid:
  - Has been removed by decanting or other methods
  - Has been mixed with sorbent or stabilized (solidified) so that free-standing liquid is no longer observed
  - Has been otherwise eliminated

1     – Container is very small, such as an ampoule  
2     – Container is a labpack and is disposed in accordance with WAC 173-303-161 or 40 CFR 264.316  
3     – Container is designed to hold free liquids for use other than storage, such as a battery or capacitor.

4  
5     There could be cases in which small amounts of residual liquids are present in mixed waste containers  
6     because condensate has formed following packaging or free liquids remain in debris items (e.g., pumps,  
7     tubing) even after draining. When it is not practical to remove this residual liquid or impossible to  
8     sample to determine if liquids are present, the liquid must be eliminated to the maximum extent practical  
9     by draining and placing a quantity of sorbent sufficient to sorb all residual liquids in the bottom of the  
10    container or dispersed among the waste.

11  
12    Free liquid is determined by SW-846, Method 9095 (Paint Filter Liquids Test)  
13    [WAC 173-303-140(4)(b) and 40 CFR 264.314(d)] only for waste that has the potential for free liquid  
14    formation.

15  
16    • Gaseous waste is not accepted for disposal if the waste is packaged at a pressure in excess of  
17    1.5 atmospheres at 20°C.  
18  
19    • Pyrophoric waste is not accepted for disposal. Waste containing less than 1 weight percent pyrophoric  
20    material partially or completely dispersed in each package is not considered pyrophoric for the purposes  
21    of this requirement.  
22  
23    • Solid acid waste is not accepted for disposal [WAC 173-303-140(4)(c)].  
24  
25    • Untreated extremely hazardous waste is not accepted for disposal. Extremely hazardous waste that has  
26    been treated could be disposed in accordance with the Revised Code of Washington  
27    (RCW) 70.105.050(2).  
28  
29    • Untreated organic/carbonaceous waste is not accepted for disposal [WAC 173-303-140(4)(d)], except as  
30    allowed by WAC 173-303-140(4)(d)(iii).  
31  
32    • Waste not meeting the applicable treatment standards is not accepted for disposal [40 CFR 268 and  
33    WAC 173-303-140(4)].  
34  
35    • Mixed waste that is incompatible with the liner system is not accepted in the LLBG. Table 1-1 provides  
36    a list of chemicals that have been shown to be incompatible with the liner material in concentrated form.  
37    In general, mixed waste that meets federal and state treatment standards is compatible with the LLBG  
38    liner system. Waste streams are evaluated during preshipment review to ensure that the waste streams do  
39    not contain constituents incompatible with the liner system in concentration sufficient to degrade the  
40    liner.  
41

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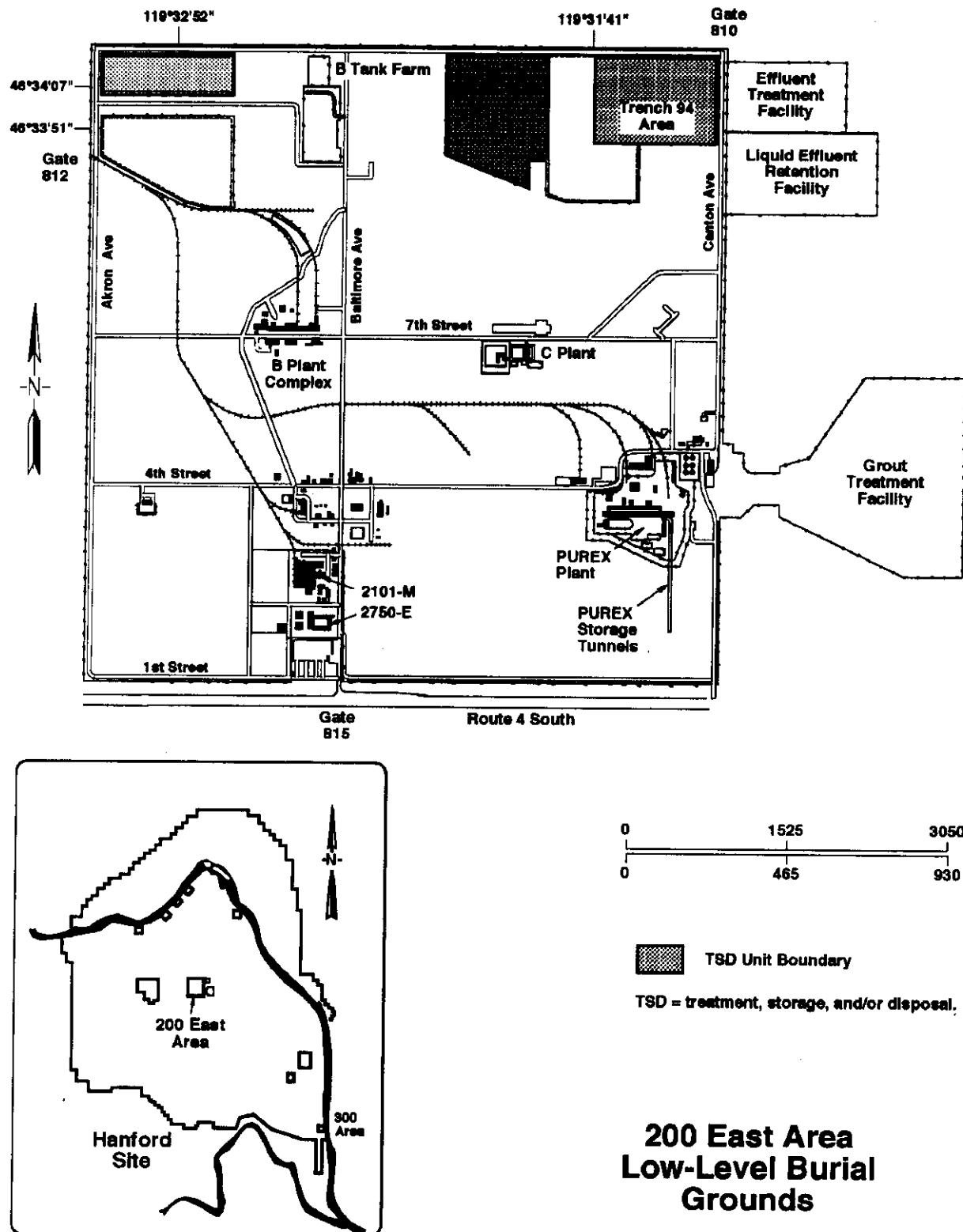
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Figure 1-1. Locations of Low-Level Burial Grounds in the 200 East Area.

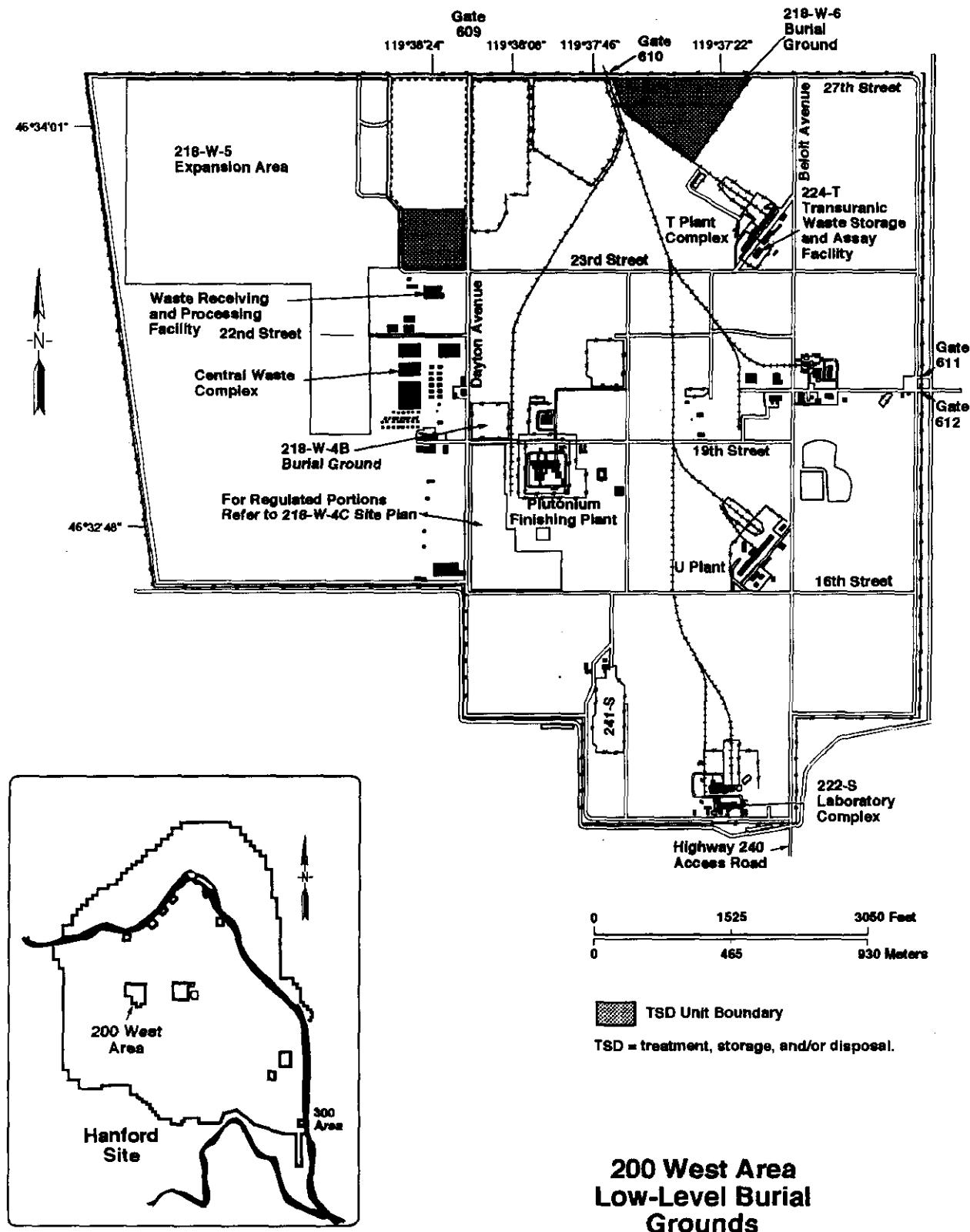
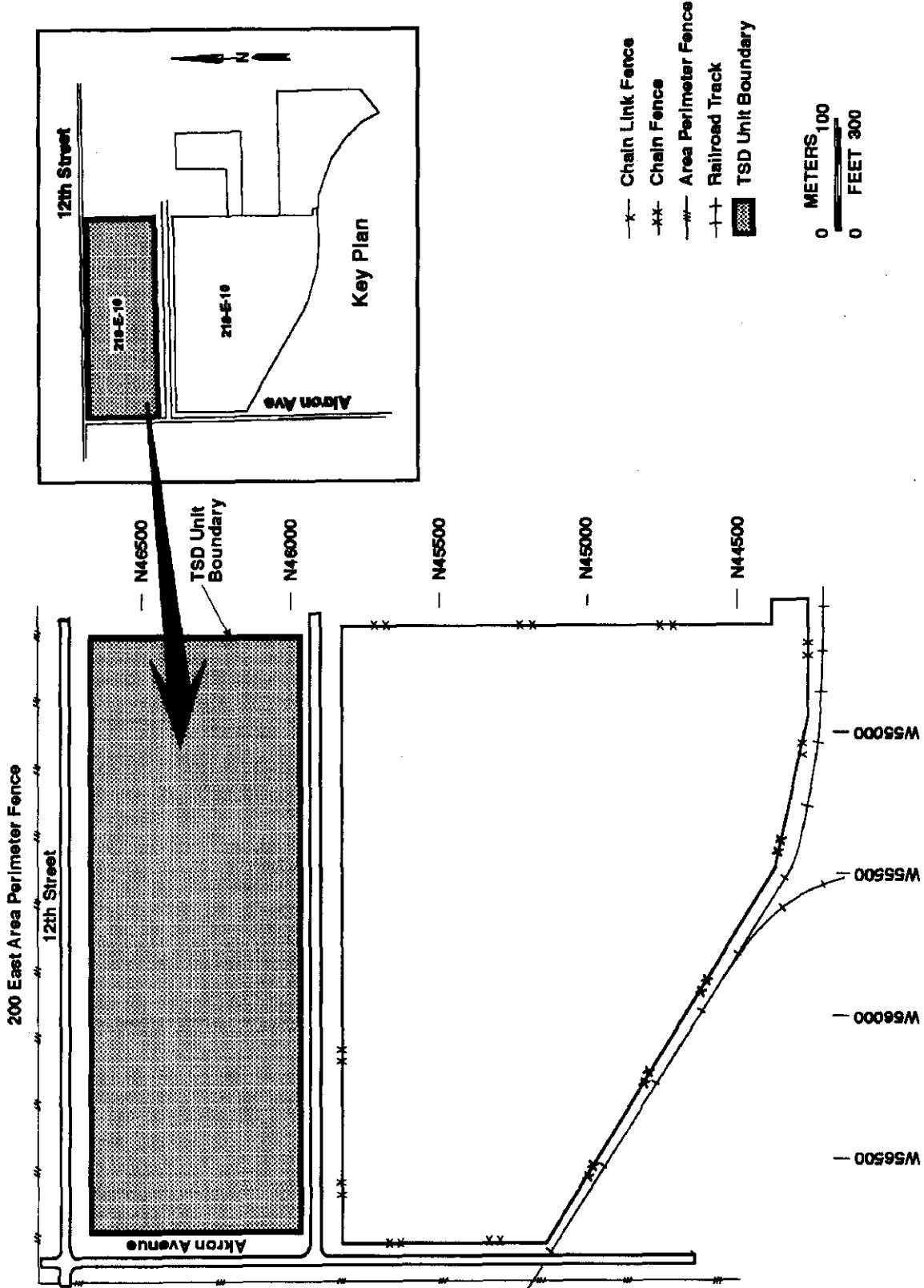
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Figure 1-2. Locations of Low-Level Burial Grounds in the 200 West Area.

## 218-E-10 Burial Ground



W and N numbers are Hanford Site Coordinate System points.  
 TSD = treatment, storage, and/or disposal.

Figure 1-3. 218-E-10 Burial Ground.

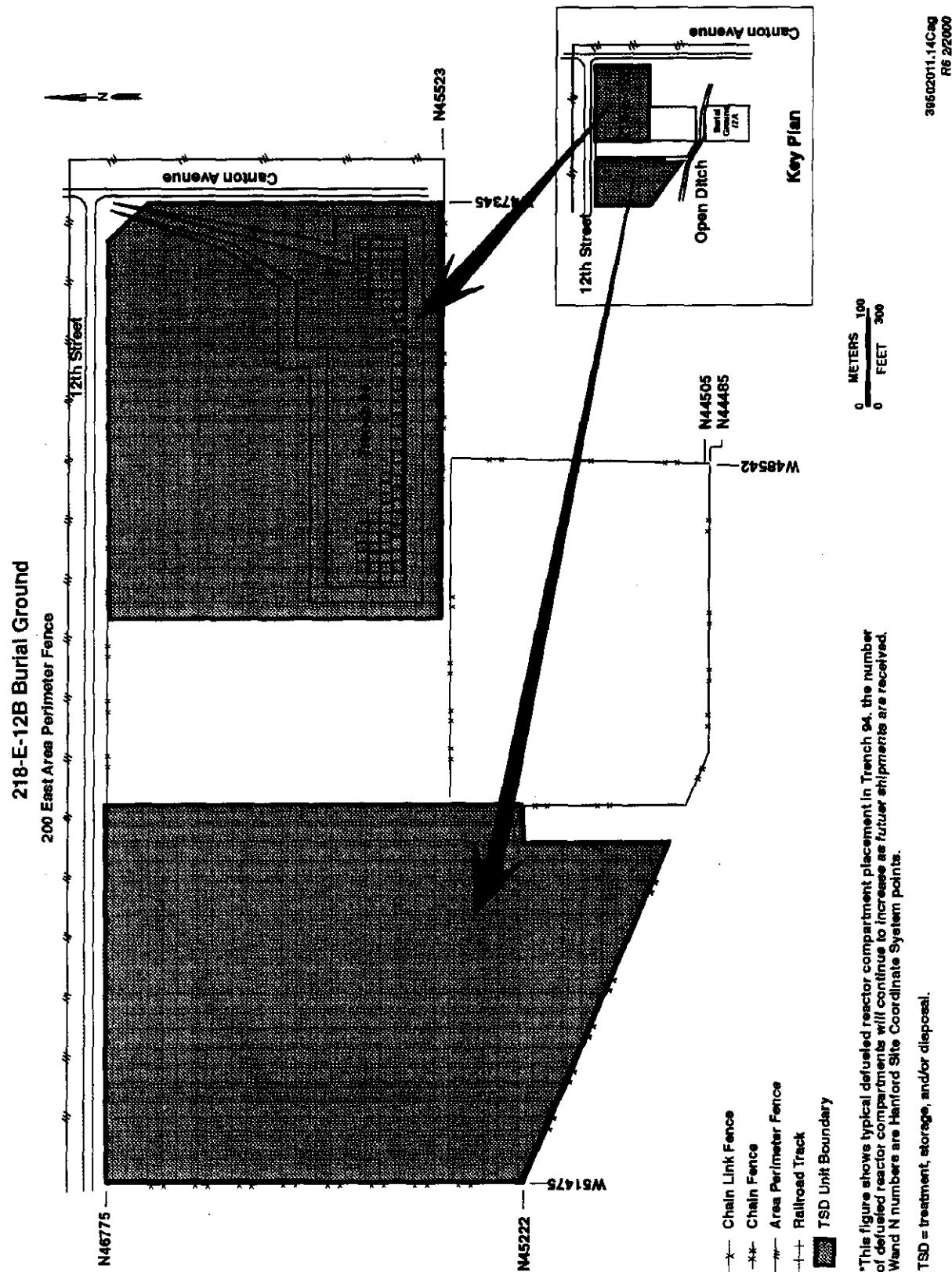
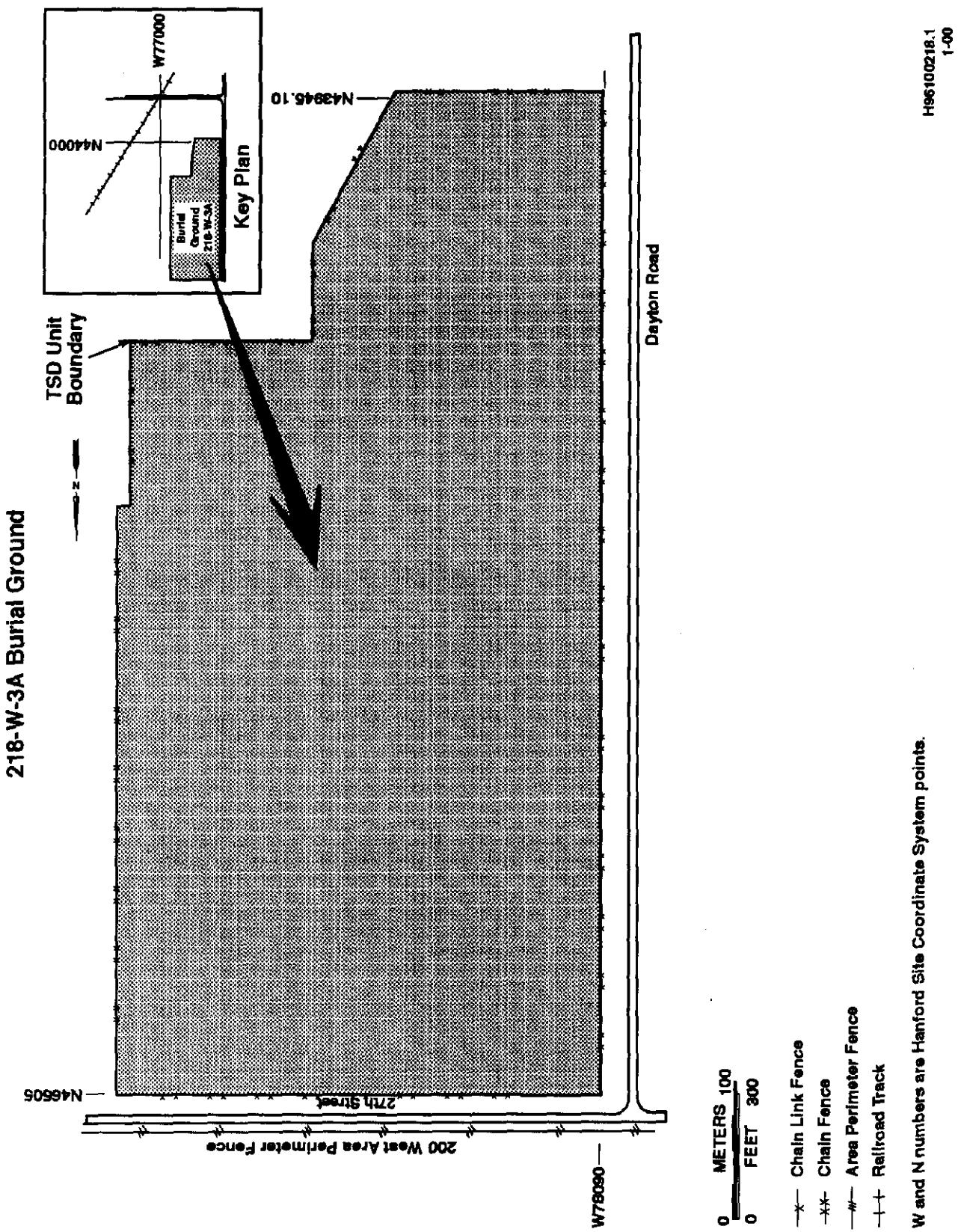


Figure 1-4. 218-E-12B Burial Ground.



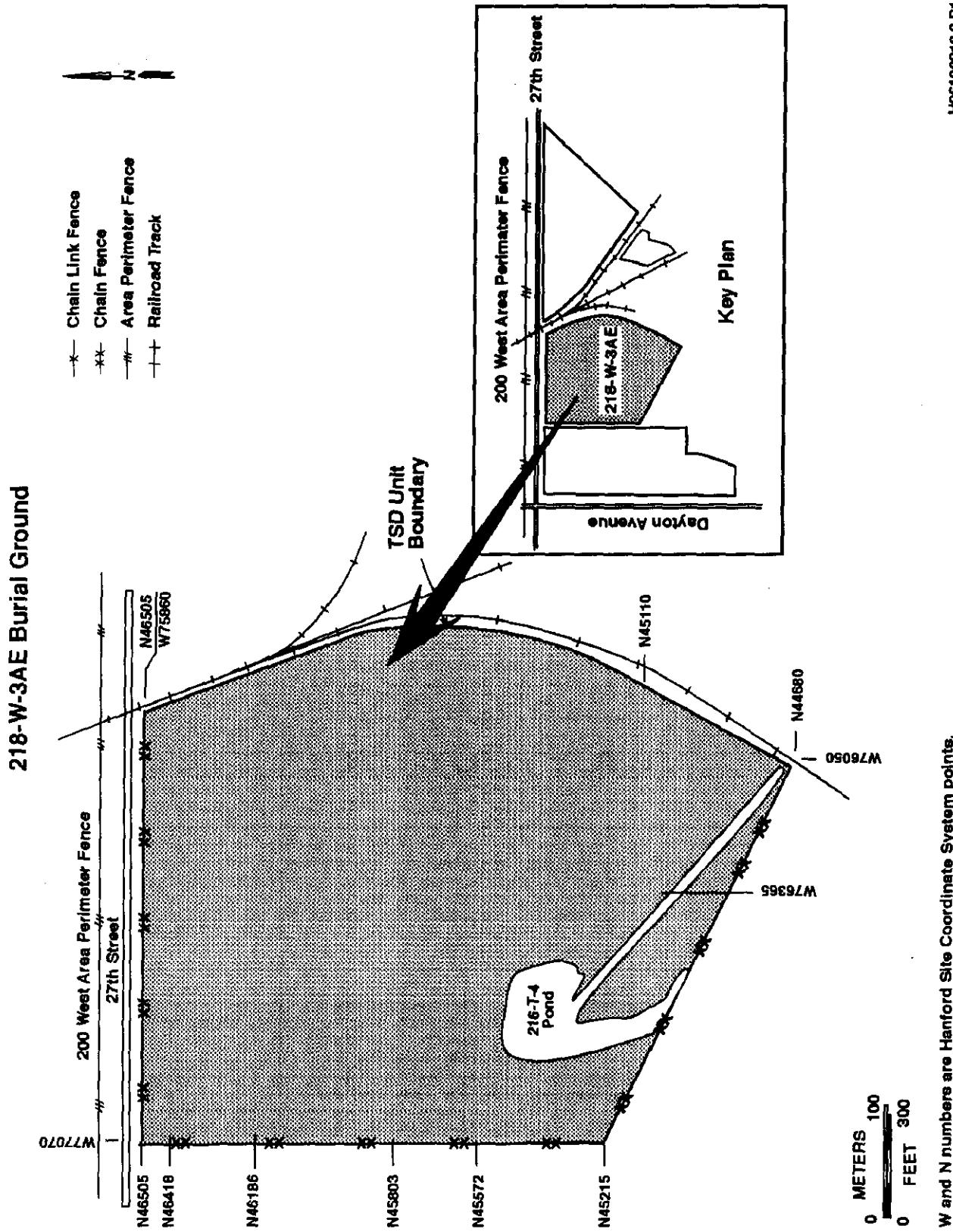


Figure 1-6. 218-W-3AE Burial Ground.

## 218-W-4B Burial Ground

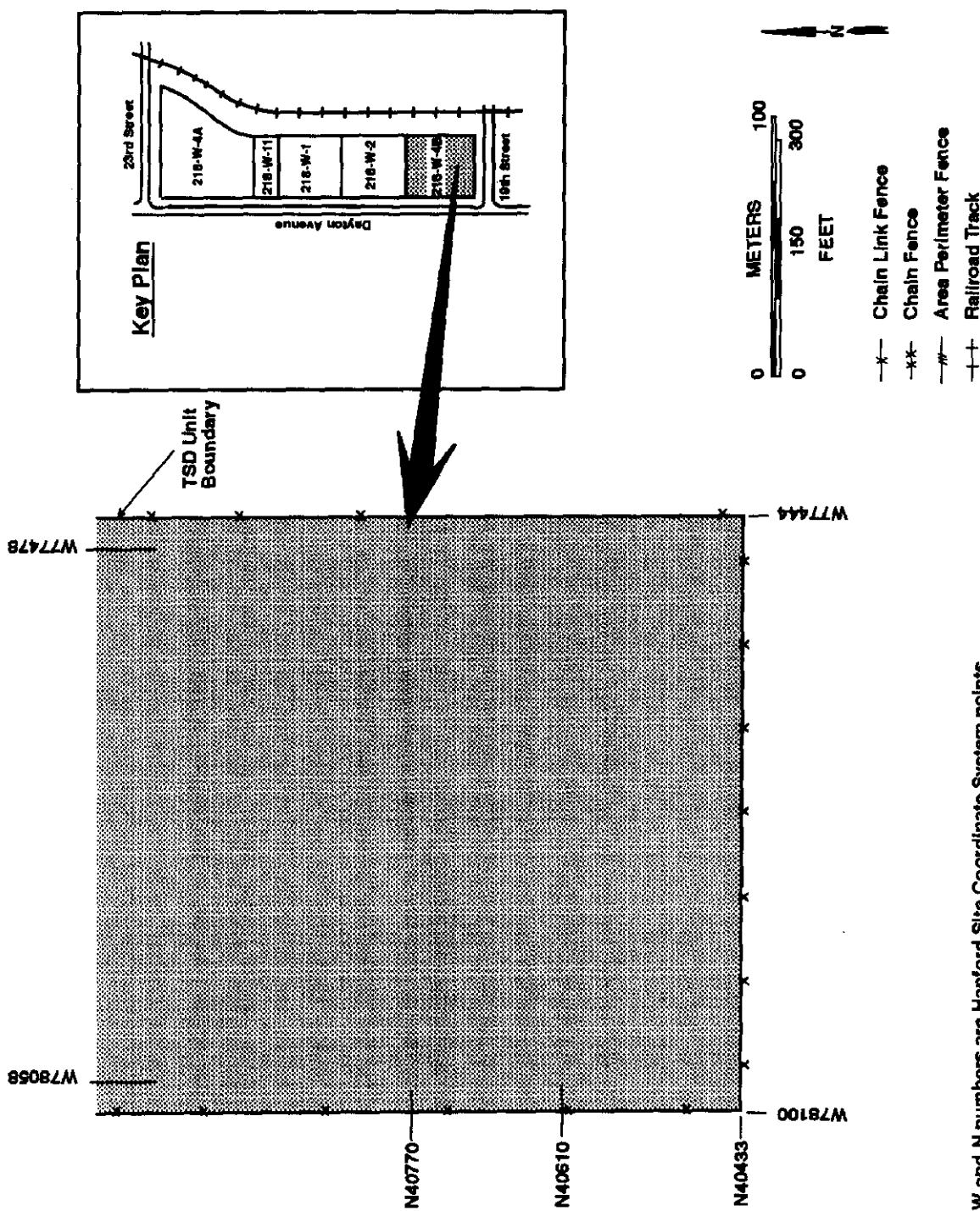


Figure 1-7. 218-W-4B Burial Ground.

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## 218-W-4C Burial Ground

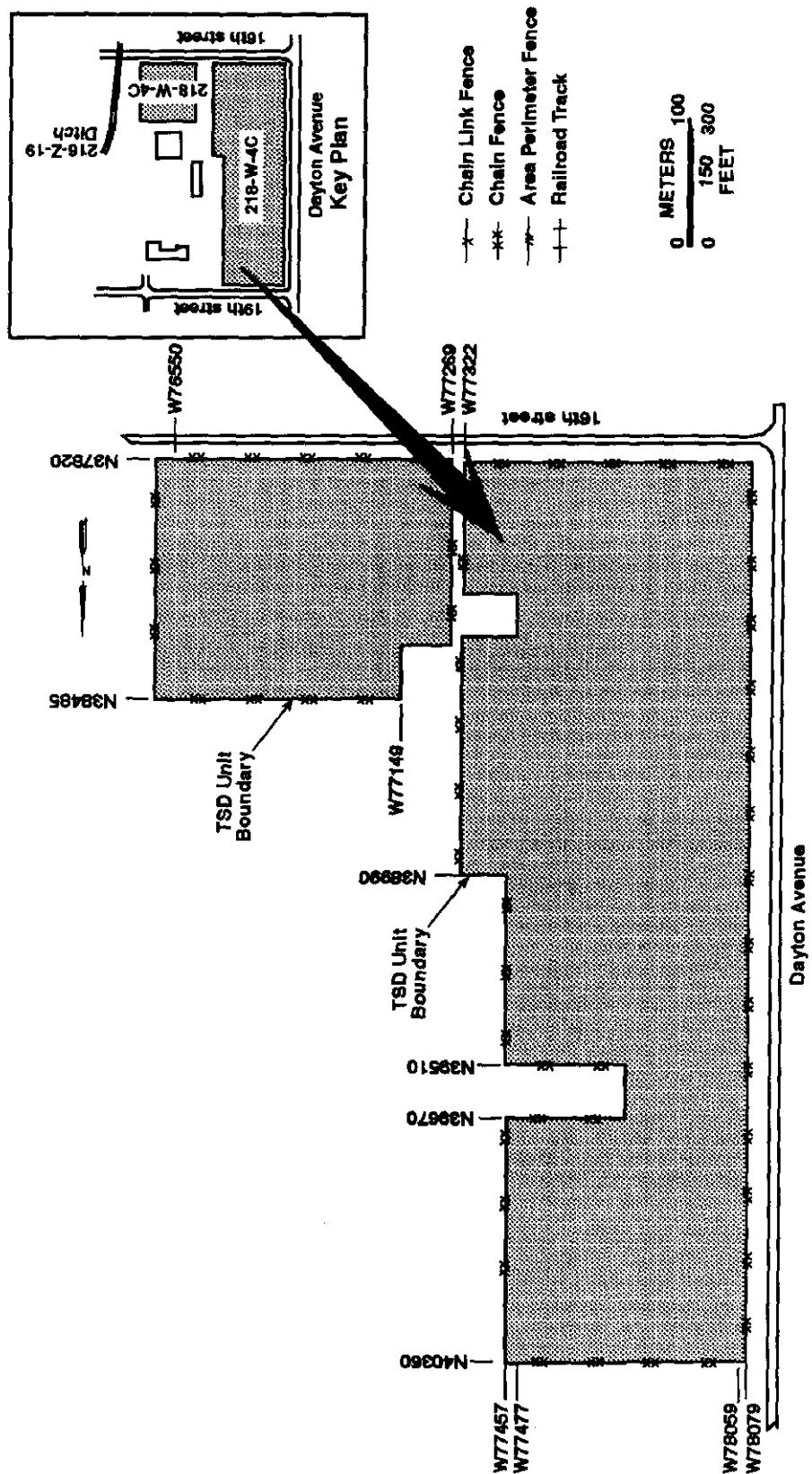


Figure 1-8. 218-W-4C Burial Ground.

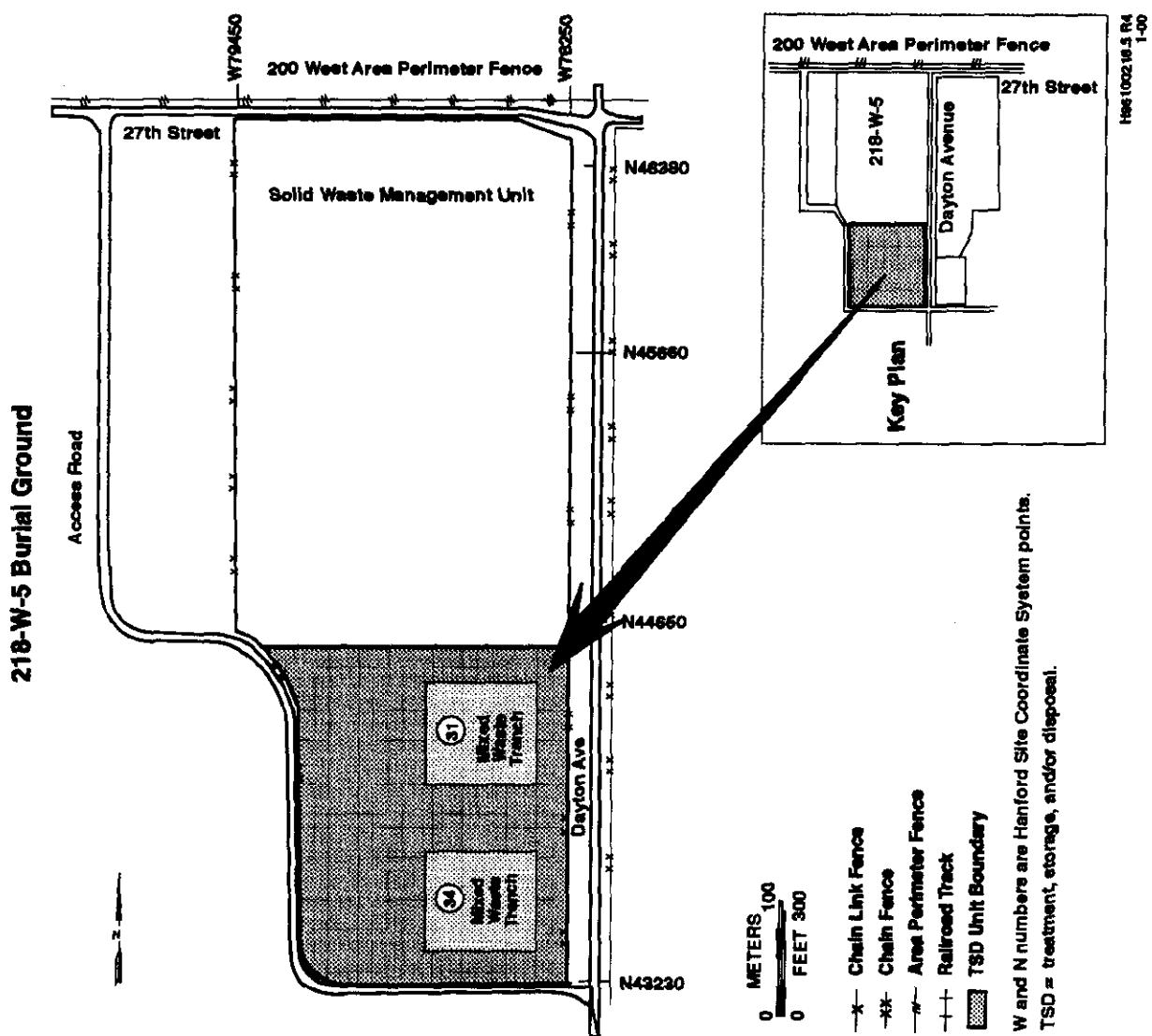
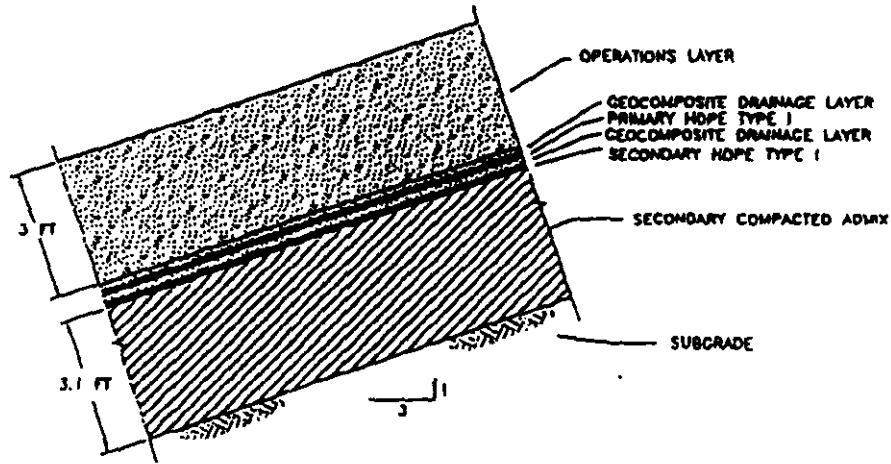
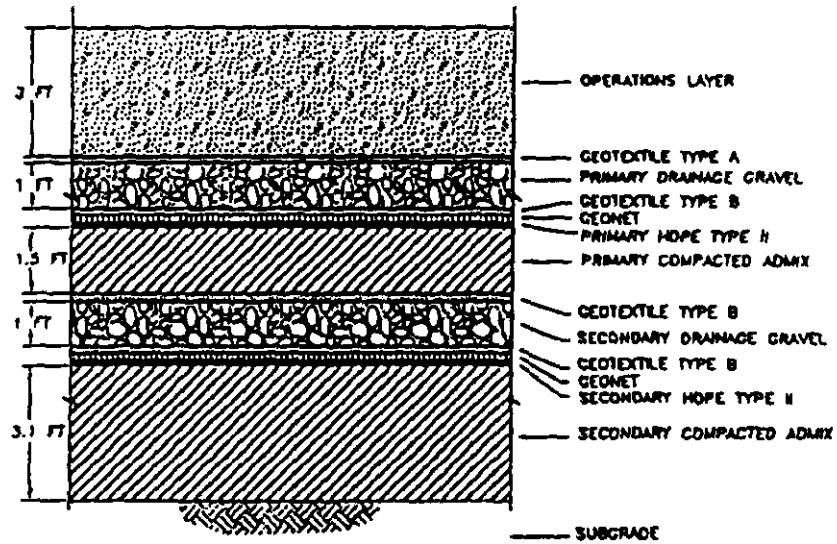


Figure 1-9. 218-W-5 Burial Ground.



### SIDESLOPE LINER DETAIL



### BASE LINER DETAIL

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Figure 1-10. Typical Resource Conservation and Recovery Act-Compliant Liner System.

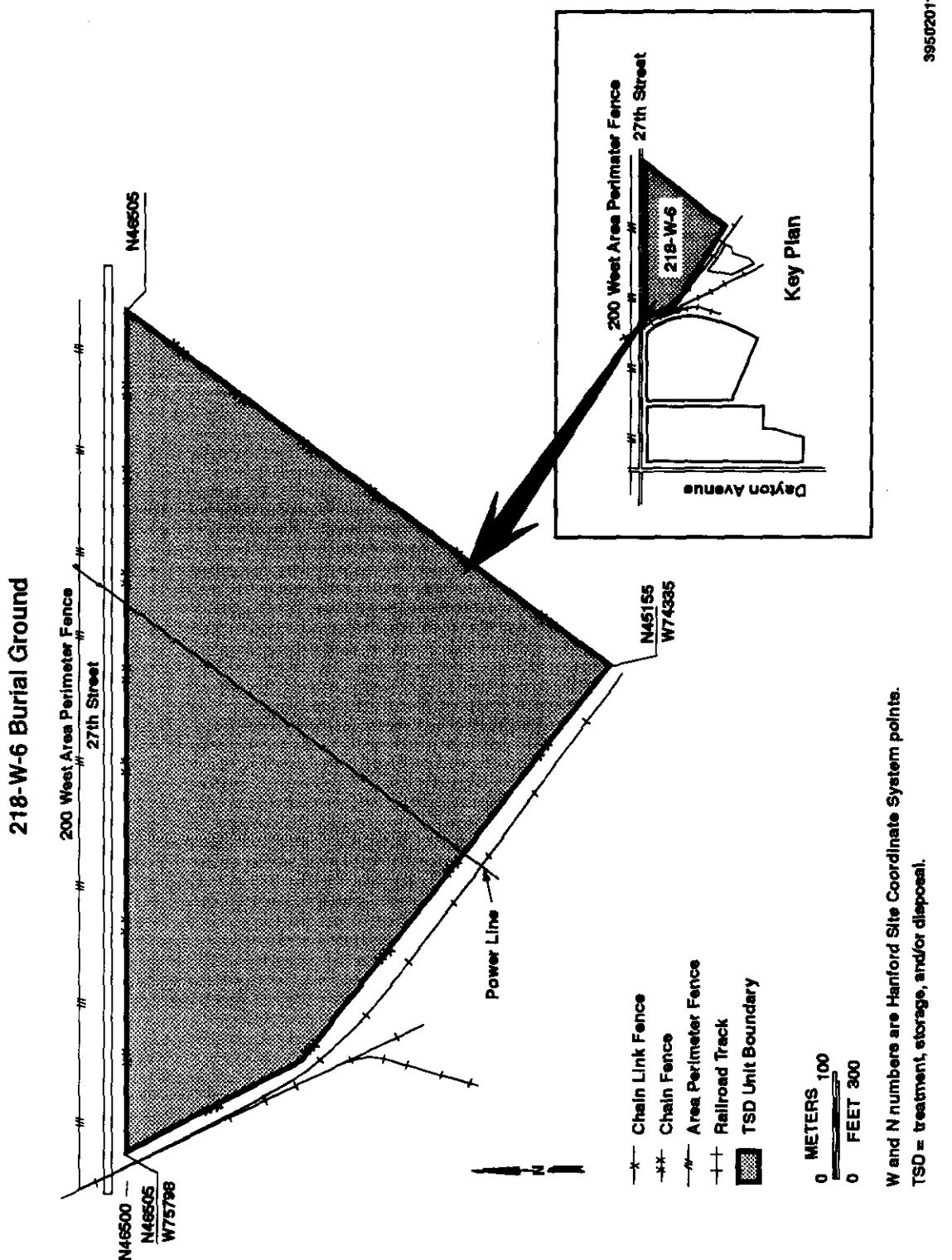


Figure 1-11. 218-W-6 Burial Ground.

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Table 1-1. Chemicals Incompatible with the High-Density Polyethylene Liner (in concentrated form).

Amyl chloride	Elemental chlorine
Aqua regia	Elemental fluorine
Bromic acid	Ethyl chloride
Bromobenzene	Ethylene trichloride
Bromoform	Nitrobenzene
Calcium bisulfite	Perchlorobenzene
Calcium sulfide	Propylene dichloride
Diethyl benzene	Sulfur trioxide
Diethyl ether	Sulfuric acid (fuming)
Elemental bromine	Thionyl chloride
	Vinylidene chloride.

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## 2.0 CONFIRMATION PROCESS

2 The confirmation process includes completing the appropriate pre-shipment reviews and verification steps  
3 and/or parameters.

### 2.1 PRE-SHIPMENT REVIEW

7 Pre-shipment review takes place before waste can be scheduled for transfer or shipment to the LLBG. The  
8 review focuses on whether the waste stream is defined accurately, meets the LLBG waste acceptance criteria,  
9 and the LDR status determined correctly. Only waste determined to be acceptable for disposal is scheduled.  
10 This determination is based on the information provided by the generator. Except for transfers among Waste  
11 Management Project operated TSD units, the pre-shipment review consists of the waste stream approval and  
12 the waste shipment approval process. Previously accepted waste that is transferred from one Waste  
13 Management Project operated TSD unit to another does not require development or approval of a profile.  
14 The following sections discuss the pre-shipment review process. The information obtained from the  
15 generator during the pre-shipment review, at a minimum, includes all information necessary to safely store  
16 and/or dispose of the waste. The pre-shipment review ensures the waste has been characterized and the data  
17 provided qualify as 'acceptable knowledge' (Section 2.1.3).

#### 2.1.1 Waste Stream Approval Process

21 The waste stream approval process consists of reviewing stream information supplied on a waste stream  
22 profile and attached analysis. At a minimum, the profile requests the following information:

- 24 • Generator information (e.g., name, address, point-of-contact, telephone number)
- 25 • Waste stream name
- 26 • Waste generating process description
- 27 • Radiological knowledge (e.g., classification, reportable radionuclides, characterization method)
- 28 • Chemical characterization information (e.g., characterization method(s), chemicals present, concentration  
29 ranges)
- 30 • Designation information
- 31 • LDR information including identification of underlying hazardous constituents if applicable
- 32 • Waste type information (e.g., physical state, sorbents used, stabilizing agents used)
- 33 • Packaging information (e.g., container type, maximum weight, size)
- 34 • Attachments could consist of container drawings, process flow information, analytical data, etc.

45 In some cases, such as variable waste streams, the profile information can be general in nature. In these  
46 cases, more detailed information will be gathered during the waste shipment approval process. This

1 information is reviewed against the LLBG waste acceptance criteria to ensure the waste is acceptable for  
2 receipt. If discrepancies are found during this review, additional information is requested that could include  
3 analytical data or a sample to be analyzed. If the waste cannot be received, the LLBG operating organization  
4 will pursue acceptance of the waste at an alternative TSD unit or request the generator to pursue acceptance  
5 at an offsite facility.

6  
7 On determination that the waste is acceptable, the LLBG operating organization assigns the profile to a waste  
8 management path and establishes a waste verification frequency based on the requirements found in  
9 Sections 1.1.1.3 and 2.2.2.2.

10  
11  
12 **2.1.2 Waste Shipment Approval Process**

13 For each waste transfer or shipment that is a candidate for disposal in the LLBG, the generator provides the  
14 following information:

15  
16 • Container identification number  
17 • Profile number (except for waste transfers of previously accepted waste)  
18 • Waste description  
19 • Generator information (e.g., name, address, point-of-contact, telephone number)  
20 • Container information (e.g., type, size, weight)  
21 • Waste numbers  
22 • LDR certification (when required)  
23 • Extremely hazardous waste or dangerous waste  
24 • Dose rate information  
25 • Reportable radionuclides and quantities  
26 • Waste composition  
27 • Packaging materials and quantities.

28  
29 The pertinent information is entered into Solid Waste Information Tracking System (SWITS). Figure 2-1 is  
30 the waste acceptance process.

31  
32 Where potential nonconformances exist in the information provided (i.e., waste characteristics do not match  
33 the waste profile information/LLBG waste acceptance criteria, or additional constituents are expected to be  
34 present that do not appear on the documentation), the generator is contacted by the LLBG operating  
35 organization. Refer to Section 6.0 for discussion on repeat and review frequency.

36  
37 For each container, a technical review, physical screening determination, and chemical screening  
38 determination are performed as follows.

39  
40 • **Technical review.** Individual container data on waste not previously accepted are compared to the waste  
41 profile data to ensure the waste to be transferred/shipped to LLBG is as described by the waste profile.  
42 Every transfer or shipment is reviewed to ensure the waste meets the LLBG waste acceptance criteria.

43  
44 Based on waste identification information provided, the waste designation is reviewed to ensure  
45 consistency with waste designations per WAC 173-303-070, to ensure that the waste is not prohibited  
46 from disposal in accordance with WAC 173-303-140, and for technical accuracy to ensure the waste  
47 meets the waste acceptance criteria.

1      If the transfer or shipment information is found to be acceptable, the LLBG operating organization  
2      determines if any of the waste containers will be physically or chemically screened.  
3

4      • **Physical screening determination.** Containers are chosen based on the methodology described in this  
5      section. The first criterion is based on whether pre-shipment review activities (document and  
6      characterization review) identify areas of potential concerns. The second criterion is reviewing the  
7      current physical screening percentage to ensure that the minimum physical screening confirmation rates  
8      and stream criteria required by this WAP are met.  
9

10     – The number of containers initially selected for physical screening constitutes a sample set.  
11

12     – Individual containers within a transfer or shipment are selected based on a review of the contents  
13      listed in the associated documentation.  
14

15     – Containers are selected at random unless variability within the stream is noted. In this case,  
16      containers representing variations are selected (e.g., wood debris versus metallic debris).  
17

18     • **Chemical screening determination.** Individual containers within a transfer or shipment are selected  
19      based on a review of the contents listed in the associated documentation. Containers are selected at  
20      random unless variability within the stream is noted. In this case, containers representing different  
21      variations are selected (e.g., used oil, spent solvent).  
22

23      On determining whether the transfer or shipment will be verified, the transfer or shipment is scheduled.  
24

### 26      2.1.3      Acceptable Knowledge Requirements

27      The LLBG operating organization ensures that all information used to make waste management decisions are  
28      based on adequate characterization data, as described in the following sections. The LLBG operating  
29      organization evaluates the data to ensure that the data are adequate acceptable knowledge for management of  
30      the waste.  
31

#### 32      2.1.3.1      General Acceptable Knowledge Requirements

33      Adequate acceptable knowledge includes (1) general waste knowledge requirements, (2) LDR waste  
34      knowledge requirements, and/or (3) waste knowledge exceptions.  
35

36      (1) **General Waste Knowledge Requirements.** At a minimum, the generator supplies enough information  
37      for the waste to be managed at the LLBG. The minimum level of acceptable knowledge consists of  
38      designation data where the constituents causing a waste number to be assigned are quantified, and the  
39      data address any LLBG operational parameters necessary for proper management of the waste.  
40

41      Where the available information does not qualify as acceptable knowledge or is not sufficient to  
42      characterize a waste for management, the sampling and testing methods outlined in WAC 173-303-110  
43      must be used to determine whether a waste designates as toxic characteristic, corrosive, and/or contains  
44      free liquids.  
45

46      If a generator's process knowledge indicates that constituents, which if present in the waste might cause  
47      the waste to be regulated, are input to a process but not expected to be in the waste, sampling and  
48      analysis must be performed to ensure the constituents are not present above regulatory limits in the  
49      waste. This requirement can be met through chemical screening as long as the constituents of concern

1 can be measured by the screening method. Sampling and analysis are required only for initial  
2 characterization of the waste stream.

3  
4 (2) **LDR Waste Knowledge Requirements.** Waste can be placed in the LLBG only if the waste meets all  
5 applicable treatment standards. The LLBG operating record contains all information required to  
6 document that the appropriate treatment standards have been met. For waste that does not meet all  
7 applicable treatment standards, the waste is transferred to another TSD unit for proper disposition.

8  
9 For the purposes of this WAP, a representative sample is required to demonstrate compliance with a  
10 concentration-based treatment standard (refer to Section 4.0). Corroborative testing for the sample could  
11 be accomplished in the following manner.

12  
13 • Generators could use onsite laboratories or other laboratories to certify that the waste meets LDR  
14 requirements.

15  
16 • The LLBG operating organization uses these analytical data ensure that the applicable requirements  
17 found in 40 CFR 268.7 and WAC 173-303-140(4) are met.

18  
19 (3) **Waste Knowledge Exceptions.** During TRU waste retrieval from existing LLBG trenches, the waste  
20 can be transferred to onsite treatment and/or storage units provided the waste meets the waste acceptance  
21 criteria for the receiving unit. In addition, hazardous debris, as defined in WAC 173-303-040, that is  
22 managed in accordance with 40 CFR 268.45 is not required to be sampled to meet federal and state-only  
23 LDR regulations.

24  
25 **2.1.3.2 Methodology to Ensure Compliance with Land Disposal Restrictions Requirements**

26 All generators are subject to LDR requirements and are required to submit all notifications and certifications  
27 described in WAC 173-303-380(1)(l) or (m), as applicable. The following are general requirements for  
28 offsite notifications or onsite information and supporting documentation.

29  
30 • The waste is subject to LDR and the generator or treatment facility has treated the waste. The generator  
31 or treatment facility supplies the appropriate LDR certification information (40 CFR 268).

32  
33 • The waste is subject to LDR and the generator has determined that the waste meets the LDR as  
34 generated. The generator develops the certification based on process knowledge, and/or analytical data,  
35 and supplies the appropriate LDR certification information necessary to demonstrate compliance with the  
36 LDR treatment standards of 40 CFR 268 and WAC 173-303-140. State-only LDRs do not require this  
37 type of certification.

38  
39 • The waste is subject to an exemption from a prohibition on landfill disposal. The generator submits a  
40 notice stating the waste is not prohibited from land disposal as required by 40 CFR 268.7(a)(3) and  
41 WAC 173-303-140(6).

42 When demonstrating that a concentration-based treatment standard has been met, a representative sample of  
43 the waste must be submitted by the generator or treatment facility for analysis.

## 1 2.2 VERIFICATION

2 Verification is an evaluation performed by the LLBG operating organization to substantiate that the waste  
3 received at LLBG is the same as represented by the analysis supplied by the generator for the pre-shipment  
4 review. Verification is performed on waste received by LLBG. Verification includes container receipt  
5 inspection, physical screening, and chemical screening. Waste is not accepted by the LLBG operating  
6 organization until required elements of verification have been completed, including evaluation of any data  
7 obtained from verification activities.

8 All discrepancies identified during the verification process are resolved in accordance with Section 1.1.1.3.3.

### 12 2.2.1 Receipt Inspection

13 The container receipt inspection is a mandatory element of the confirmation process. Therefore, 100 percent  
14 of the transfers/shipments are inspected for damage and to ensure the waste containers are those indicated on  
15 the documentation. This activity is a mechanism for identifying any document discrepancies and damaged  
16 containers before acceptance. The container receipt inspection is performed by the LLBG operating  
17 organization at the LLBG or at another location. The LLBG operating organization ensures that the  
18 transfer/shipment: (1) is received in good condition, (2) is the waste indicated on the manifest or shipping  
19 papers, (3) has not been opened improperly after physical and/or chemical screening was performed, and (4)  
20 is complete.

21 For bulk shipments and remote-handled waste, the transfer/shipment is inspected to ensure the waste is that  
22 denoted in the documentation.

### 26 2.2.2 Physical Screening Process

27 Physical screening is considered an additional verification element. This section describes the requirement  
28 pertaining to methods, frequency, and exceptions concerning the use of physical screening as a verification  
29 activity. Physical screening could be performed before the waste is transferred/shipped to LLBG. When  
30 screening is performed at a location not within the Waste Management Project [e.g., Waste Receiving and  
31 Processing Facility (WRAP), CWC, T Plant Complex], unique tamper resistant seals are applied to each  
32 container examined. Selection, interpretation, and performance of the appropriate physical screening  
33 method(s) are conducted by qualified personnel.

34 Waste received before the establishment of a verification program must be verified when initially transferred  
35 to the LLBG. However, waste stored within the Waste Management Project that has been processed through  
36 a physical screening program does not require additional physical screening (i.e., current waste specification  
37 program, backlog confirmation program, 183-H Solar Evaporation Basins sampling program).

#### 40 2.2.2.1 Physical Screening Methods

41 Each of the following physical screening methods, listed in order of preference, complies with the requirement  
42 to verify a waste. If a method other than 1 or 2 is used, the reasoning behind the method chosen must be  
43 documented in the operating record (refer to Section 3.1 for the criteria for choosing a physical screening  
44 method).

45

- 46 1. Visual inspection (opening the container)
- 47 2. Nondestructive examination (NDE) [real-time radiography (RTR)]

- 1 3. Nondestructive assay (NDA)
- 2 4. Dose rate profile.

4 Refer to Section 2.2.5 for quality control pertaining to physical screening.

### 6 2.2.2.2 Physical Screening Frequency

The minimum physical screening frequency is 5 percent for onsite generating units, applied per waste stream per subcontractor per year<sup>2</sup>. For offsite generators, the minimum physical screening frequency is 10 percent per waste stream per generator per year. The LLBG operating organization adjusts the physical screening frequency for generators based on objective performance criteria (refer to Section 1.1.2).

12 In the event that one of the containers in the original sample set fails, a second sample set of equal size, or a  
13 minimum of three additional containers, is selected. First and second sample sets are selected using the  
14 rationale described in pre-shipment review section (Section 2.1). A second failure in either the first or second  
15 sample set constitutes failure of the transfer/shipment. If the second sample set passes the inspection, the  
16 single failed container is considered an anomaly and the remainder of the transfer/shipment passes  
17 verification. All failed containers and transfers/shipments are dispositioned by the PES as described in  
18 Section 1.1.1.3.

When physical screening is performed at a location not within the Waste Management Project, tamper-resistant seals are applied to each outer container examined.

### 23 2.2.2.3 Physical Screening Exceptions

24 The following are exceptions to the physical screening process outlined previously have been developed.

- Shielded, classified, TRU waste retrieved from the LLBG, and remote-handled mixed waste are not required to be physically screened; however, the LLBG operating organization must perform a more rigorous documentation review and obtain the raw data used to characterize the waste (<1 percent of current waste receipts). For classified waste, it is necessary to have an appropriate U.S. Department of Energy (DOE) security clearance and a need to know the information as defined by the classifying organization or agency.
- Waste that physically cannot be screened at the LLBG or at an associated screening facility must be physically screened at the generator location (e.g., large components, containers that cannot be opened, are greater than 20 millirem per hour at 30 centimeters, contain greater than 10 nanocuries per gram of TRU radionuclides, or will not fit into the NDE unit). If no location can be found to perform the physical screening, no screening is required.
- Waste that is packaged by a Waste Management Project TSD operating organization (e.g., CWC, T Plant, WRAP) is considered to have met the physical screening requirements denoted in this WAP. On closure of the container, tamper-resistant seals must be applied to ensure the integrity of the contents.

<sup>2</sup> The term waste stream as referred to in the context of physical screening frequency refers to general waste groupings for treatment/disposal and should not be equated to the waste streams referred to in the waste profile discussion.

1    **2.2.3    Chemical Screening Process**

2    Chemical screening is considered an additional verification element. This section describes methods,  
3    frequency, and exceptions for chemical screening. Chemical screening could be performed by the LLBG  
4    operating organization before the waste is transferred/shipped to LLBG. After chemical screening is  
5    performed, tamper-resistant seals are applied on each outer container screened. The requirements described  
6    for tamper-resistant seals used for physical screening apply to chemical screening as well.

7  
8    Selection, interpretation, and performance of the appropriate chemical screening method(s) are conducted by  
9    qualified personnel. Unless otherwise noted, tests are qualitative not quantitative. The objective of chemical  
10   screening is to obtain reasonable assurance that the waste received is consistent with the description of the  
11   waste on the waste profile, and to provide information that will be used to safely manage the waste. The  
12   following tests are selected depending on the waste matrix and the applicability of the method. A minimum  
13   of three listed screening tests, including pH screening, are conducted on each sample. If less than five of the  
14   following methods are selected, the rationale is recorded by the qualified analyst.

15  
16   The following tests are conducted on all samples collected for chemical screening:

17  
18   • pH  
19   • Oxidizer  
20   • Water reactivity  
21   • Paint filter liquids test

22  
23   Additionally, the following tests could be performed as needed:

24  
25   • HOC (chlor-n-oil/water/soil)  
26   • Ignitability/headspace screening for volatile compounds.  
27   • Sulfide  
28   • Cyanide  
29   • Peroxide

30  
31  
32  
33   Refer to Section 2.2.5.2 for quality control pertaining to chemical screening.

34  
35   **2.2.3.1    Chemical Screening Frequency**

36   At a minimum, 10 percent of the waste containers verified by physical screening (Section 2.2.2.2) must be  
37   screened chemically. Although grab samples are acceptable, the LLBG operating organization obtains a  
38   representative sample.

39  
40   Small containers of mixed waste (labpacks), not otherwise identified in the exceptions, packaged in  
41   accordance with 40 CFR 265.316 and WAC 173-303-161 are screened chemically in accordance with the  
42   waste stream's chemical screening frequency as determined by PES (Section 1.1.1.3). Inner containers are  
43   segregated by physical appearance. At least one container from each group (or three containers if all similar)  
44   are screened chemically.

45  
46   **2.2.3.2    Chemical Screening Exceptions**

47   The following are cases in which chemical screening is not required:

- Small containers of waste in overpacked containers (labpacks) packaged in accordance with WAC 173-303-161 and not prohibited under the LDR provisions of WAC 173-303-140.
- Waste exempted from the physical screening requirements (Section 2.2.2.3) is exempted from chemical screening
- Commercial chemical products in the original product container(s) (e.g., off-specification, outdated, or unused products)
- Chemical containing equipment (mixed waste) removed from service (i.e., ballasts, batteries)
- Hazardous debris as defined in WAC 173-303-040
- Waste containing asbestos
- Waste, environmental media, and/or debris from the cleanup of spills or release of single substance or commercial product or otherwise known material (e.g., material for which a MSDS can be provided)
- Confirmed noninfectious mixed waste (i.e., xylene, acetone, ethyl alcohol, isopropyl alcohol) generated from laboratory tissue preparation, slide staining, or fixing processes.

Other special cases could be exempted from chemical screening on a case-by-case basis.

#### **2.2.4 Sampling for Confirmation Screening**

Sampling is performed in accordance with WAC 173-303-110(2). A representative sample is obtained for chemical screening. The chemical screening methods described in Section 3.0 do not require any sample preservation methods because the screening tests are performed at the time and location of sampling, or as soon as possible thereafter. During the interim period, the samples are stored in a manner that maintains chain of custody and protects the sample composition.

The equipment requirements in Section 4.0, Table 4-1, apply to sampling for chemical screening. In addition, the following sampling equipment could be used in sampling for chemical screening: (1) for liquids and slurries – dip, tank, bomb, and bailer samplers, as well as tube-type samplers (e.g., thin-walled Shelby tubes, split spoons, probes, pipettes); and for sludges and solids – tube-type samplers (as previously mentioned) and augers; and for small containers, a spoon could be used in place of a scoop.

#### **2.2.5 Quality Assurance and Quality Control for Confirmation Process**

The following quality assurance (QA) and quality control (QC) elements are used by the LLBG operating organization to ensure confirmation activities provide sufficient data to provide an indication that waste received is as described in the transfer/shipment documentation.

##### **2.2.5.1 Physical Screening Quality Control**

This section describes the QC used by the LLBG operating organization or its representative to ensure that quality data are obtained when performing physical screening methods identified in Section 2.2.2, except

1 visual inspection. Visual inspection does not consist of the use of instrumentation or chemical tests.  
2 Therefore, QC for visual inspection depends on appropriate training for the individual(s) performing the test.  
3 For the remaining physical screening tools (NDE, NDA, and dose rate profile), QC for these methods is  
4 incorporated in accordance with manufacturer's instructions or site-specific protocols. If any results are  
5 questionable, those affected containers must be re-evaluated and handled appropriately.  
6

7 **2.2.5.2 Chemical Screening Quality Control**

8 This section describes the QC used by the LLBG operating organization or its representative to ensure that  
9 appropriate data are obtained when performing chemical screening methods identified in Section 2.2.3.  
10

11 The following applies for all chemical screening parameters.  
12

- 13 • Each lot will be evaluated to determine that the lot is useable. Unstable reagents will be accounted for  
14 when determining the usability of the lot.  
15
- 16 • For each lot, the source, concentration, date of receipt, lot number, and manufacturer/preparer (as  
17 applicable) will be maintained in a logbook.  
18
- 19 • For individual chemical screening parameters, QC checks will be performed in accordance with  
20 manufacturer's instructions or site-specific protocols.  
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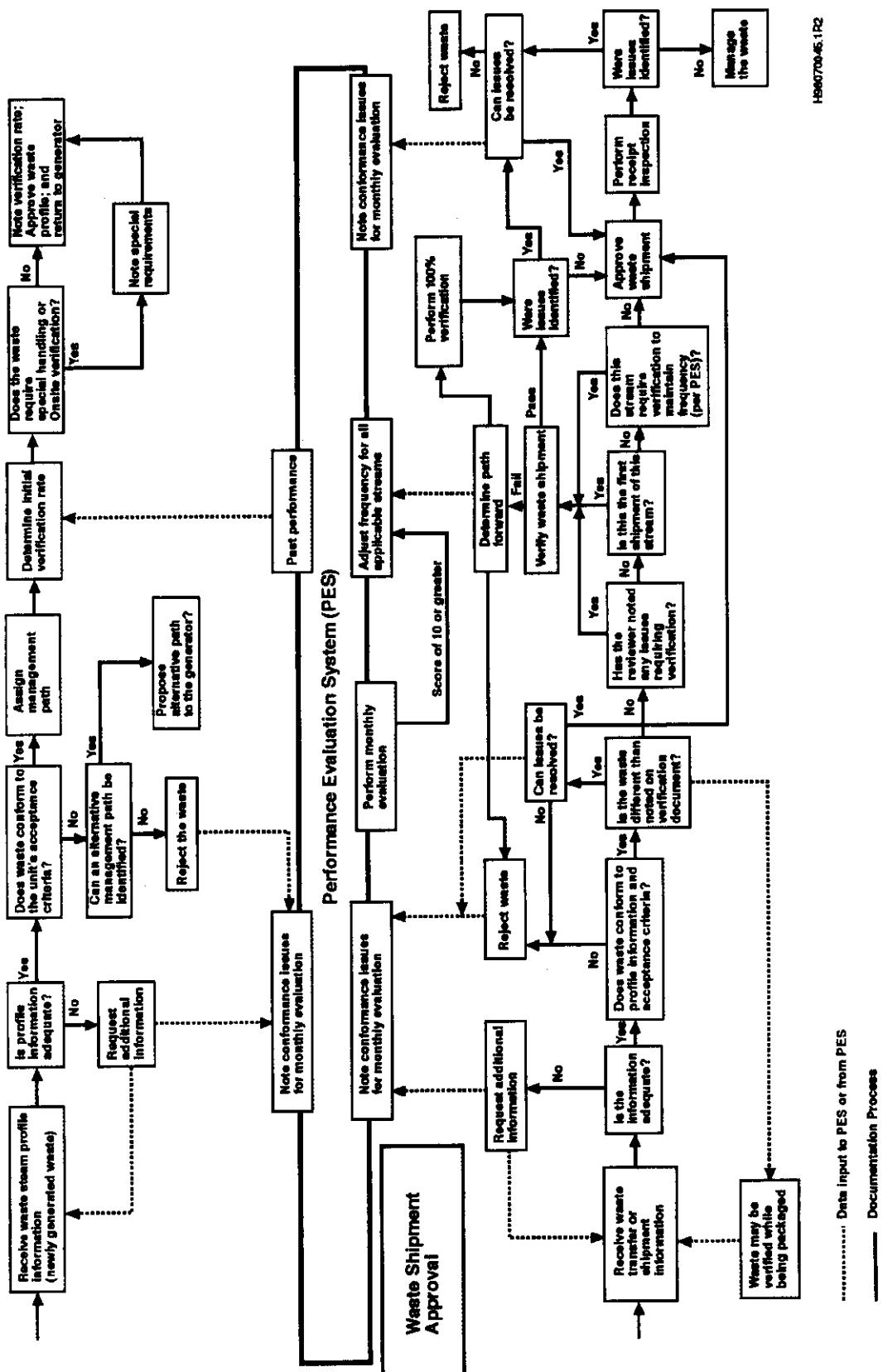


Figure 2-1. Waste Acceptance Process.

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### 1           3.0 SELECTING WASTE ANALYSIS PARAMETERS

2       Physical and chemical screening parameters for verification must be chosen from those in Sections 3.1 and  
3       3.2. Other sampling and analysis parameters are addressed in Section 3.3.

4

5

#### 6       3.1 PHYSICAL SCREENING PARAMETERS

7       The following methods are approved for use in performing physical screening. These methods are listed in  
8       order of preference. If a method other than 1 or 2 is used, the reasoning behind the method selection will be  
9       documented.

10      (1) Visual inspection (preferred method for physical screening):

11       **Rationale.** This method meets the requirement to ensure consistency between waste containers and  
12       the accompanying transfer/shipment documentation.

13       **Method:** The container is opened and the contents are removed as needed for visual examination.  
14       Homogenous loose solids are probed to determine the presence of material not documented, or for  
15       improperly sorbed liquids. Visual observations are compared with the applicable profile information  
16       and the container specific information in the transfer/shipment documentation.

17       **Failure criteria:** A container fails the inspection for any of the following reasons: (a) undocumented  
18       or improperly packaged waste; (b) discovery of prohibited articles or materials listed in Section 1.2;  
19       (c) discovery of material not consistent with the applicable waste stream profile; and (d) variability  
20       greater than 25 percent by volume in listed constituents (e.g., paper, plastic, cloth, metal).

21      (2) NDE:

22       **Rationale.** This method meets the requirement to ensure consistency between waste containers and  
23       the accompanying transfer/shipment documentation. This method also is subject to the QC checks  
24       listed in Section 2.2.5.1. Containers that are not easily amenable to visual inspection because of  
25       physical or radiological content, or facility availability, can be examined safely and economically.

26       **Method:** The container is scanned with a NDE system. Data are observed on a video monitor and  
27       captured on video tape. Personnel experienced with the interpretation of NDE imagery record their  
28       observations. These observations are compared to the contents listed on the transfer/shipment  
29       documentation.

30       **Failure criteria:** A container fails the inspection for any of the following reasons: (a) undocumented,  
31       improperly packaged, or inadequately sorbed liquids; (b) discovery of prohibited articles listed in  
32       Section 1.2; (c) image data not consistent with the applicable waste stream profile; and (d) variability  
33       greater than 25 percent by volume in listed constituents (e.g., paper, plastic, cloth, metal).

34      (3) NDA:

35       **Rationale.** This method is available for obtaining data that can be compared with accompanying  
36       transfer/shipment documentation for consistency on containers that cannot be opened for visual  
37       inspection, and cannot be examined by NDE (e.g., high container dose rate, shielding). The reason for  
38       selection of this method is documented.

1                   **Method.** Radioactive waste is assayed in one or both of two different assay systems. The assay  
2                   systems include gamma energy analysis (GEA) and imaging passive/active neutron (IPAN). Gamma  
3                   emitting radionuclides are detected in the GEA assay system. This instrument determines the type and  
4                   quantity of radionuclides based on their gamma energy spectrum. IPAN uses passive and active  
5                   neutron detection to determine the presence of fissionable radionuclides. Passive detection results are  
6                   equated with Pu-240 and active detection results are equated with Pu-239. The curie amount of low  
7                   energy gamma emitting radionuclides, other fissile and non-fissile alpha emitting radionuclides, and  
8                   beta emitting radionuclides are calculated from the GEA and IPAN data and the generator supplied  
9                   radionuclide information. Radionuclide ratios are calculated by dividing the activity of each  
10                  radionuclide reported by the activity of the most prominent radionuclide.

11  
12                   **Failure criteria.** A container fails the assay if the difference between the reported radionuclide ratios  
13                  and the measured ratios and the reported and measured curie amounts exceed 50 percent. The failure  
14                  criteria are adjusted based on the density of the waste and the amount of fissionable material present.  
15

16                  (4) Dose rate profile:

17  
18                   **Rationale.** This method is used to obtain data that can be compared for consistency with the  
19                  transfer/shipment documentation for a container. This method is used only when the previous three  
20                  methods cannot be performed for technological or ALARA reasons (e.g., container size, weight,  
21                  shielding, dose rate). The reason for selection of this method is documented.  
22

23  
24                   **Method.** A portable dose rate meter is used to determine the contact dose rate at six evenly  
25                  distributed points on the exterior of the waste package. The six readings obtained are recorded and  
26                  averaged. The average reading is compared with the container contact dose rate recorded on the  
27                  transfer/shipment documentation.  
28

29                   **Failure criteria.** If the average dose rate observed during the dose rate profile examination differs  
30                  from that recorded on the transfer/shipment documentation by more than 100 percent, the container  
31                  fails.  
32  
33

34                  **3.2 CHEMICAL SCREENING PARAMETERS**

35                  The following methods are approved for use in performing chemical screening.  
36

37                  (1) Ignitability and/or headspace volatile organic compound screening:

38  
39                   **Rationale:** To determine the potential ignitability and the presence or absence of volatile organic  
40                  compounds in waste, and to ensure personnel adequately are protected. This method is used when  
41                  containers are opened for inspection. This method can be applied to any matrix.  
42

43                   **Method:** A sample of the headspace gases in a container is analyzed by one or more of the following  
44                  types of portable instrumentation: organic vapor monitor, colorimetric gas sampling tubes, or a lower  
45                  explosive level meter.  
46

47                   **Tolerance:** High organic vapor readings in matrices not documented as having volatile organic  
48                  content constitute failure.  
49

## 1    (2) Peroxide screen:

2  
3    **Rationale:** To determine the presence of organic peroxides in solvent wastes, to alert personnel to  
4    potential hazards and to confirm consistency with the transfer/shipment documentation. The test is  
5    sensitive to low parts per million ranges.

6  
7    **Method:** A peroxide test strip is dampened with a pipette sample of liquid waste. Solids are tested  
8    by first wetting the test strip with water and contacting a small sample of the waste. A blue color  
9    change indicates a positive reaction. The color change can be compared with a chart on the packaging  
10   to determine an approximate organic peroxide concentration.

11  
12    **Tolerance:** Peroxide concentrations greater than 20 parts per million in liquid waste constituents that  
13    are known organic peroxide formers not documented as having been stabilized constitutes failure.

## 14    (3) Paint filter liquids test:

15  
16    **Rationale:** To verify the presence or absence of free liquid in solid or semisolid material.

17  
18    **Method:** To a standard paint filter, 100 cubic centimeters or 100 grams of waste are added and  
19    allowed to settle for 5 minutes. Any liquid passing through the filter signifies failure of the test.

20  
21    **Tolerance:** Failure of the test constitutes failure of the container. Small quantities of condensate  
22    trapped in inner plastic liner folds are acceptable.

## 23    (4) pH screen:

24  
25    **Rationale:** To identify the pH and corrosive nature of an aqueous or solid waste and to confirm  
26    consistency with the transfer/shipment documentation.

27  
28    **Method:** Full range pH paper is used for the initial screening. If the initial screen indicates a pH  
29    below 4 or above 10, a pH meter could be used, or a narrow range pH paper. Solids are mixed with an  
30    equal weight of water and the liquid portion of the solution is tested.

31  
32    **Tolerance:** pH paper for this test has a sensitivity of +/- 1.0 pH units. If the pH of a matrix appears  
33    to exceed regulatory limits (<2.0 or >12.5) in waste not documented as being regulated for this  
34    property, the container fails the test.

## 35    (5) Oxidizer screen:

36  
37    **Rationale:** To determine if a waste exhibits oxidizing properties to confirm consistency with the  
38    transfer/shipment documentation. This test can be applied to waste liquids, solids, and semisolids.

39  
40    **Method:** Acidified potassium iodide (KI) test paper is applied to solid or liquid waste. A darkening  
41    of the paper is a positive indication.

42  
43    **Tolerance:** This method is very sensitive to oxidizing properties. A positive indication in a waste  
44    that cannot be explained by documented constituents constitutes failure.

## 45    (6) Water reactivity screen:

1           **Rationale:** To determine if the waste has the potential to vigorously react with water, form gases, or  
2           other reaction products. This information is used to confirm consistency with the transfer/shipment  
3           documentation.

4  
5           **Method:** Water is added to a sample of solid or liquid waste. The solution is observed for evidence  
6           or fuming, bubbling, spattering, or temperature change. These reactions are considered to be positive  
7           evidence that the waste is water reactive.

8  
9           **Tolerance:** A positive indication in a waste that cannot be explained by documented constituents  
10          constitutes a failure.

11          (7) Cyanide screen:

12  
13          **Rationale:** To indicate if waste could release hydrogen cyanide upon acidification near pH 2. This  
14          information is used to confirm consistency with the transfer/shipment documentation.

15  
16          **Method:** To a test tube or watch dish containing approximately 2 milligrams of sample, an equal  
17          amount of freshly prepared ferrous ammonium citrate is added. 3 Normal hydrochloric acid is used to  
18          reduce the pH of the solution to near 2.0. A deep blue color indicates the presence of cyanide.

19  
20          **Tolerance:** A positive indication in a waste that cannot be explained by documented constituents  
21          constitutes a failure.

22          (8) Sulfide screen:

23  
24          **Rationale:** To indicate if the waste could release hydrogen sulfide upon acidification near pH 2. This  
25          information is used to confirm consistency with the transfer/shipment documentation.

26  
27          **Method:** Approximately 2 milligrams of sample is added to a watch dish or test tube and enough  
28          3 Normal hydrochloric acid is added to bring the pH down to near 2.0. A sulfide test strip is placed in  
29          the solution. If the test strip turns brown or silvery black, the presence of sulfides in the sample is  
30          indicated.

31  
32          **Tolerance:** A positive indication in a waste that cannot be explained by documented constituents  
33          constitutes a failure.

34          (9) HOC screen:

35  
36          **Rationale:** To indicate whether polychlorinated biphenyls (PCBs) or other chlorinated solvents are  
37          present in the waste. This information is used to confirm consistency with the transfer/shipment  
38          documentation, and to determine if the waste needs to be managed in accordance with the regulations  
39          prescribed in the *Toxic Substance Control Act of 1976*.

40  
41          **Methods:** Field organic chlorine tests appropriate to the matrix, such as those offered by the Dexsil  
42          Corporation (e.g. Chlor-N-Oil, Chlor-N-Soil) are used. These screening tests are available with  
43          several detection limits. At a minimum, the 50 parts per million test is performed on oily matrices.

44  
45          **Tolerance:** A positive indication of chlorinated organics in a waste not documented as having  
46          chlorinated organic content constitutes failure.

1    **3.3 OTHER ANALYSIS PARAMETERS**

2    Parameters needed to meet other waste characterization needs for waste managed at LLBG are identified in  
3    Appendix A.

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## 4.0 SELECTING SAMPLING PROCESSES

2 Specific sampling processes and techniques depend on both the nature of the material and the type of  
3 packaging. This section describes the sampling methodology used to obtain representative samples.

### 4.1 SAMPLING STRATEGIES

7 Table 4-1 contains waste forms and sample equipment used to sample referenced waste. Sampling of these  
8 waste forms is performed in accordance with Table 4-1.

### 4.2 SAMPLING METHODS

12 The appropriate personnel are responsible for arranging all sampling and laboratory support for sample  
13 analysis. Samples are processed at one of several laboratories qualified to perform analysis of waste samples  
14 (refer to Section 5.0). Sampling methods are those described in WAC 173-303 110(2).

15 The basic sampling sequence is as follows:

- 18 • Obtain a unique sample number and complete the sample tag before sampling
- 20 • Obtain a precleaned sampler and sample bottles
- 22 • Attach sample label to sample bottles
- 24 • For sampling liquid waste, a sampler or pipette will be used to sample for two phase liquids.  
25 Homogeneous liquids in small containers will be poured into a sample bottle
- 27 • For sampling solid waste, a scoop, trier, or hand auger will be used to obtain a sample of the waste. For  
28 large containers of waste, composite several augers or scoops to ensure samples are representative
- 30 • Fill sample containers in the following sequence: volatile organics, semivolatile organics, metals,  
31 ignitability, pH (corrosivity)
- 33 • For solid waste, wipe the exterior surfaces of the sample bottles with a dry rag
- 35 • Attach sample labels to outer plastic bags
- 37 • Place samples in an appropriate receptacle for transfer to the laboratory
- 39 • Complete the chain-of-custody forms
- 41 • Seal and mark the receptacle in accordance with WAC 173-303-071(3)(1)
- 43 • Transfer receptacle to the analytical laboratory as appropriate to meet sample holding times
- 45 • Properly clean and decontaminate nondisposable sampling equipment or package for return to central  
46 sampling equipment decontamination area according to onsite requirements.

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### **4.3 SELECTING SAMPLING EQUIPMENT**

4 Sampling equipment selection is detailed in Table 4-1. Waste sampling equipment is maintained and  
5 decontaminated as necessary by the LLBG operating organization.

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7  
8

### **4.4 SAMPLE PRESERVATION**

9 Sample preservation follows SW-846 protocol or other approved sample preservation methods for waste in  
10 accordance with 62 FR 62079.

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### **4.5 ESTABLISHING QUALITY ASSURANCE/QUALITY CONTROL PROCEDURES FOR SAMPLING**

15 The sampling team ensures all samples are labeled with a unique identifier.

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Sample collectors prepare a permanent log of sampling activities. Log entries include as appropriate: date of collection, time of collection, location, batch number, sample number, copy of the chain-of-custody form, sampling methodology, container description, waste matrix (liquid), description of generating process (e.g., decontamination activities), number and volume of samples, field observations, field measurements (e.g., pH, percent lower explosive limit), laboratory destination and laboratory number, and signature. These logs entries are made by the appropriate personnel<sup>3</sup> while the sampling is performed. The logs are permanent records of the TSD unit and must be retained in the Operating Record. If sampling is conducted in a posted radiological zone, the logbook entries could be made by a person who is outside the zone or by the sampler immediately after the sampling is completed. The sampling logs are retained in accordance with standard industrial practices. A chain-of-custody record accompanies samples at all times. The record contains a unique sample number for each sample, date and time of collection, sample type, sample location, methods of transfer, and signatures (or electronic equivalent, e.g., signature password) of the collector and all subsequent custodians.

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During all sampling activities, strict compliance with applicable industrial hygiene and safety standards is mandatory. If sampling personnel accidentally contact waste material, decontamination of sampling personnel is performed immediately. Transportation of samples is performed in accordance with all applicable onsite and U.S. Department of Transportation requirements.

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The following QA/QC elements are used by the LLBG operating organization to ensure sampling activities for designation purposes result in acceptable laboratory data:

- Representative sampling methods as defined by WAC 173-303-110(2), 40 CFR 261 Appendix I, and/or SW-846 Chapter 9
- Appropriate sample containers and equipment
- Samples numbered

---

<sup>3</sup> 'appropriate personnel' are defined as sampling personnel or a person directed by a sampler.

- 1     ● Traceable labeling system
- 2
- 3     ● Field QA/QC samples (applicable sampling and analysis plan)
- 4
- 5     ● Equipment calibration (current as appropriate)
- 6
- 7     ● Chain of custody.
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Table 4-1. Low-Level Burial Ground Chemical Screening Sampling Equipment.

Waste form	Reference in SW-846	
	Waste type	Equipment*
Liquids	Free-flowing liquids and slurries	COLIWASA, SW-846, Chapter 9, glass thief or pipet
Solidified liquids	Sludges	Trier, SW-846, Chapter 9, scoops and shovels
Sludges	Sludges	Trier, SW-846, Chapter 9, scoops and shovels
Soils	Sand or packed powders and granules	Auger, SW-846, Chapter 9, scoops and shovels
Absorbents	Large-grained solids	Large trier, SW-846, Chapter 9, scoops and shovels
Wet absorbents	Moist powders or granules	Trier, SW-846, Chapter 9, scoops and shovels
Process solids and salts	Moist powders or granules	Trier, SW-846, Chapter 9, scoops and shovels
	Dry powders or granules	Thief, SW-846, Chapter 9, scoops and shovels
	Sand or packed powders and granules	Auger, SW-846, Chapter 9, scoops and shovels
	Large-grained solids	Large trier, SW-846, Chapter 9, scoops and shovels
Ion exchange resins	Moist powders or granules	Trier, SW-846, Chapter 9, scoops and shovels
	Dry powders or granules	Thief, SW-846, Chapter 9, scoops and shovels
	Sand or packed powders and granules	Auger, SW-846, Chapter 9, scoops and shovels

COLIWASA = composite liquid waste sampler.

\* other ASTM approved equipment could be used to collect samples.

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## 1           **5.0 SAMPLING AND ANALYTICAL PROGRAM**

2    QC will be applied in implementing both sampling and analytical techniques. Specific performance standards  
3    for QA and QC methods for individual sampling and analysis activities are dynamic and are revised as  
4    warranted to reflect technological advances in available, appropriate techniques. These performance  
5    standards are described in policies maintained at LLBG and are available for review on request.

6  
7    These sampling and analytical quality policies help ensure that the sample obtained provides precise and  
8    accurate analytical results for the waste being sampled. The analytical results are used by LLBG operating  
9    organization to decide whether or not to accept a particular waste. On acceptance, results are used to  
10   determine the appropriate method of treatment and storage and that incompatible waste is not combined  
11   inadvertently. Just as these analytical results are important, so is the quality of the sampling program.

### 12 13           **5.1 SAMPLING PROGRAM**

14  
15    Sampling procedures for LLBG operations are described in Section 2.2.4. Selection of sample collection  
16    devices depends on the type of sample, the sample container, the sampling location, and the nature and  
17    distribution of regulated constituents in the waste. In general, the methodologies used correspond to those  
18    referenced by 40 CFR Part 261, Appendix I. The selection and use of the sample collection device are  
19    supervised or performed by qualified personnel.

20  
21    Sampling equipment are constructed of materials that nonreactive with the waste being sampled. Materials  
22    such as glass, polyvinyl chloride plastic, aluminum, or stainless steel could be used. Care is taken in the  
23    selection and use of the sample collection device to prevent contamination of the sample and to ensure  
24    compatibility with the waste being sampled. Individual container samples that are related and compatible  
25    could be composited before analysis.

### 26 27           **5.2 ANALYTICAL PROGRAM**

28  
29    A program of analytical QC practices and methods has been developed on the Hanford Site to ensure that  
30    precision and accuracy are maintained throughout the laboratories. Good laboratory practices that encompass  
31    sampling, sample handling, housekeeping, and safety are maintained at onsite laboratories.

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1                   **6.0 SELECTING WASTE RE-EVALUATION FREQUENCIES**

2       The re-evaluation (repeat and review) frequency to review profile information is yearly, or more often if the  
3       waste generation process changes.

4       The LLBG operating organization re-evaluates a waste profile if the following occurs.

5                   • A generator notifies the LLBG operating organization that the generating process has changed.  
6  
7                   • Inspection or analysis indicates that the waste received at LLBG does not match the profile and/or  
8                   transfer/shipment documentation.

9       When a waste profile is re-evaluated, the LLBG operating organization could request the generator to do one  
10                   of the following:

11                   • Verify the current waste profile is accurate  
12                   • Supply a new waste profile  
13                   • Submit a sample for parameter analysis.

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## 1           **7.0 SPECIAL PROCEDURAL REQUIREMENTS**

2    This section discusses any special process requirements for receiving mixed waste at the LLBG.

### 5    **7.1 PROCEDURES FOR RECEIVING WASTE GENERATED ONSITE**

6    In general, mixed waste received from onsite generator units is managed in the same manner as waste  
7    received from offsite generators. Differences include, but are not limited to, the following: (1) physical and  
8    chemical screening frequencies for verification (minimum percentages of 5 percent for waste from onsite  
9    generating units and 10 percent for waste from offsite generators (note that chemical screening frequency  
10   depends on the physical screening frequency), (2) transfer/shipment documentation (Uniform Hazardous  
11   Waste Manifest are used for waste from offsite generators and waste tracking forms are used for waste from  
12   onsite generating units), and (3) LDR documentation requirements (notification for waste from offsite  
13   generators and the information contained in the notice for waste from onsite generating units).

### 14 15   **7.2 PROCEDURES FOR RECEIVING WASTE GENERATED OFFSITE**

17   Mixed waste received from offsite is handled in the same manner as mixed waste received from onsite, with  
18   the exception of those items described in Section 7.1 and defueled reactor compartments disposed in trench  
19   94 of the 218-E-12B Burial Ground, which are transported directly from the generator to trench 94.

### 22   **7.3 PROCEDURES FOR IGNITABLE, REACTIVE, AND INCOMPATIBLE WASTE**

23   The LLBG do not accept ignitable, reactive, or incompatible waste (refer to Section 1.2). The LLBG  
24   operating organization ensures that ignitable, reactive, or incompatible waste is not accepted at the LLBG in  
25   the following manner.

26    • Pre-shipment review and chemical screening ensures ignitable and reactive waste is not accepted.  
27    • Pre-shipment review ensures waste incompatible with the liner is not accepted in the lined trenches.

### 31   **7.4 PROVISIONS FOR COMPLYING WITH FEDERAL AND STATE LAND 32       DISPOSAL RESTRICTION REQUIREMENTS**

33   Sections 1.1.4.1.2 and 2.1.2 describe compliance with federal and state LDR requirements.

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## 8.0 RECORDKEEPING

2 Recordkeeping requirements that are applicable to this WAP are described in Chapter 12.0, Table 12-1, of  
3 the *Hanford Facility Dangerous Waste Permit Application, General Information Portion* (DOE/RL-91-28)  
4 and within this WAP.

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## 9.0 REFERENCES

2     DOE/RL-88-21, *Hanford Facility Dangerous Waste Part A Permit Application*, U.S. Department of  
3         Energy, Richland Operations Office, Richland, Washington.

4     DOE/RL-91-28, *Hanford Facility Dangerous Waste Permit Application, General Information Portion*,  
5         U.S. Department of Energy, Richland Operations Office, Richland, Washington, revised periodically.

6     SW-846, *Test Methods for Evaluating Solid Waste, Physical/Chemical Methods*, latest edition,  
7         U.S. Environmental Protection Agency, Washington, D.C.

8     EPA-600/4-7-020, *Methods for Chemical Analysis of Water and Wastes*, U.S. Environmental Protection  
9         Agency, Environmental Monitoring and Support Laboratory, Cincinnati, Ohio.

10     62 FR 62079, *Mixed Waste Testing Guidance*, November 20, 1997.

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1 APPENDIX A  
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**ANALYTICAL PARAMETRES, METHODS, AND RATIONALE FOR WASTE  
RECEIVED AT LOW-LEVEL BURIAL GROUNDS**

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Analytical Parameters, Methods, and Rationale for Waste Received at  
Low-Level Burial Grounds

HNF-5841

Parameter	Analytical method <sup>a</sup>	Media type	Rationale for selection of waste acceptance parameters	Rationale for analysis
Flashpoint	1010/1020	Liquid	To provide documentation for waste designation and LDR requirements	To determine regulatory status as D001 waste, to provide proper waste designation and applicability of LDR requirements
pH	Liquid Solid	9040 9045c	Liquid, sludge Solid	To indicate the degree of corrosivity for safe handling, to provide for proper waste designation, and to identify waste that might compromise container integrity
Hydroxide	9040		Liquid	To provide documentation to support designation and LDR requirements.
Water reactivity	Field method		Liquid, sludge	To determine whether the waste has a potential to violently react with water to form gases or generate heat
Free liquids	9095A		Liquid, sludge, solid	To determine whether the waste contains free liquids and meets state LDRs
Cyanide	9010B/9012A		Liquid, sludge, solid	For proper waste designation and applicability of LDR
Sulfide	9030B		Liquid, sludge, solid	For proper waste designation and applicability of LDR
				Organic analyses

Analytical Parameters, Methods, and Rationale for Waste Received at  
Low-Level Burial Grounds

HNF-5841

Parameter	Analytical method <sup>a</sup>	Media type	Rationale for selection of waste acceptance parameters	Rationale for analysis
PCBs	8081A/8082	Liquid, sludge, solid	To determine proper waste designation for management of waste in accordance with the <i>Toxic Substance Control Act of 1976 (TSCA)</i> and WAC 173-303.	To provide proper waste designation and to meet TSCA and LDR requirements.
Total organic carbon	9060	Liquid, sludge, solid	To determine applicability of LDR and applicability to state-only requirements.	To provide proper waste designation and applicability of LDR requirements; to determine state-only LDR requirements
Total organic halides	9020B/9021/9022	Liquid, sludge	To determine proper waste designation and applicability to state-only requirements.	To provide proper waste designation and applicability to state-only requirements.
Persistent constituents	9075/9076/9077/9211/9212/9214/9250/9251/9253			
Total suspended solids	160.2 <sup>b</sup>	Liquid, sludge	To determine applicability of LDR and status as a wastewater	To provide applicability of LDR and status as a wastewater.
Volatile organic compounds	1311/8260B	Liquid, sludge, solid	To determine proper waste designation, applicability of LDRs	To provide proper waste designation, regulatory status, and to meet LDR requirements.
Semivolatile organic compounds	1311/8270A	Liquid, sludge, solid	To determine proper waste designation, applicability of LDRs	To provide proper waste designation, regulatory status, and to meet LDR requirements.
Chlorinated herbicides	8151A	Liquid	Not applicable	To provide proper waste designation and applicability to state-only requirements.
				Inorganic analyses

Analytical Parameters, Methods, and Rationale for Waste Received at  
Low-Level Burial Grounds

HNF-5841

Parameter	Analytical method <sup>a</sup>	Media type	Rationale for selection of waste acceptance parameters	Rationale for analysis
<b>Arsenic</b>	1311/6010B	Liquid, sludge, solid	To provide for proper waste designation, applicability of LDRs	To determine proper waste designation, regulatory status as a toxic characteristic waste, and to meet LDR requirements.
<b>Barium</b>	1311/6010B	Liquid, sludge, solid	To provide for proper waste designation, applicability of LDRs	To determine proper waste designation, regulatory status as a toxic characteristic waste, and to meet LDR requirements.
<b>Cadmium</b>	1311/6010B	Liquid, sludge, solid	To provide for proper waste designation, applicability of LDRs	To determine proper waste designation, regulatory status as a toxic characteristic waste, and to meet LDR requirements.
<b>Chromium</b>	1311/6010B	Liquid, sludge, solid	To provide for proper waste designation, applicability of LDRs	To determine proper waste designation, regulatory status as a toxic characteristic waste, and to meet LDR requirements.
<b>Lead</b>	1311/6010	Liquid, sludge, solid	To provide for proper waste designation, applicability of LDRs	To determine proper waste designation, regulatory status as a toxic characteristic waste, and to meet LDR requirements.
<b>Mercury</b>	1311/7470	Liquid, sludge, solid	To provide for proper waste designation, applicability of LDRs	To determine proper waste designation, regulatory status as a toxic characteristic waste, and to meet LDR requirements.
<b>Silver</b>	1311/6010	Liquid, sludge, solid	To provide for proper waste designation, applicability of LDRs	To determine proper waste designation, regulatory status as a toxic characteristic waste, and to meet LDR requirements.

Analytical Parameters, Methods, and Rationale for Waste Received at  
Low-Level Burial Grounds

Parameter	Analytical method <sup>a</sup>	Media type	Rationale for selection of waste acceptance parameters	Rationale for analysis
Selenium	1311/6010	Liquid, sludge, solid	To provide for proper waste designation, applicability of LDRs	To determine proper waste designation, regulatory status as a toxic characteristic waste, and to meet LDR requirements.
Nickel	6010	Liquid, sludge, solid	To determine applicability of LDRs	To meet LDR requirements.

<sup>a</sup> EPA SW-846, unless otherwise noted.

<sup>b</sup> EPA-600/4-7-020, unless otherwise noted.

LDR = land disposal restriction.

PCB = polychlorinated biphenyls.

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