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DOE/RL-2006-35  
Revision 1  
Reissue

# Hanford Facility Dangerous Waste Permit Application, Waste Encapsulation and Storage Facility

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



**United States  
Department of Energy**  
P.O. Box 550  
Richland, Washington 99352

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Further Dissemination Unlimited

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*J. D. Aardal*  
Release Approval      10/04/2007  
Date

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## GLOSSARY

1		
2		
3		
4	AEA	<i>Atomic Energy Act of 1954</i>
5	ALARA	as low as reasonably achievable
6		
7	BED	Building Emergency Director
8		
9	CFR	Code of Federal Regulations
10		
11	DOE	U.S. Department of Energy
12	DOE-RL	U.S. Department of Energy, Richland Operations Office
13		
14	Ecology	Washington State Department of Ecology
15	EOC	Emergency Operations Center
16	ERP	emergency response procedures
17		
18	HF	Hanford Facility
19		
20	IC	Incident Commander
21	ICP	Incident Command Post
22	ICS	incident command system
23		
24	LDR	land disposal restriction
25		
26	MSDS	material safety data sheets
27		
28	PCB	polychlorinated biphenyl
29	POC	Patrol Operations Center
30		
31	TEDF	Treated Effluent Disposal Facility
32	Tri-Party Agreement	<i>Hanford Federal Facility Agreement and Consent Order</i>
33	TSD	treatment, storage, and/or disposal
34		
35	WAC	Washington Administrative Code
36	WAP	waste analysis plan
37	WESF	Waste Encapsulation and Storage Facility

**METRIC CONVERSION CHART**

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	0.03937	inches
inches	2.54	centimeters	centimeters	0.393701	inches
feet	0.3048	meters	meters	3.28084	feet
yards	0.9144	meters	meters	1.0936	yards
miles (statute)	1.60934	kilometers	kilometers	0.62137	miles (statute)
<b>Area</b>			<b>Area</b>		
square inches	6.4516	square centimeters	square centimeters	0.155	square inches
square feet	0.09290304	square meters	square meters	10.7639	square feet
square yards	0.8361274	square meters	square meters	1.19599	square yards
square miles	2.59	square kilometers	square kilometers	0.386102	square miles
acres	0.404687	hectares	hectares	2.47104	acres
<b>Mass (weight)</b>			<b>Mass (weight)</b>		
ounces (avoir)	28.34952	grams	grams	0.035274	ounces (avoir)
pounds	0.45359237	kilograms	kilograms	2.204623	pounds (avoir)
tons (short)	0.9071847	tons (metric)	tons (metric)	1.1023	tons (short)
<b>Volume</b>			<b>Volume</b>		
ounces (U.S., liquid)	29.57353	milliliters	milliliters	0.033814	ounces (U.S., liquid)
quarts (U.S., liquid)	0.9463529	liters	liters	1.0567	quarts (U.S., liquid)
gallons (U.S., liquid)	3.7854	liters	liters	0.26417	gallons (U.S., liquid)
cubic feet	0.02831685	cubic meters	cubic meters	35.3147	cubic feet
cubic yards	0.7645549	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
<b>Energy</b>			<b>Energy</b>		
kilowatt hour	3,412	British thermal unit	British thermal unit	0.000293	kilowatt hour
kilowatt	0.94782	British thermal unit per second	British thermal unit per second	1.055	kilowatt
<b>Force/Pressure</b>			<b>Force/Pressure</b>		
pounds (force) per square inch	6.894757	kilopascals	kilopascals	0.14504	pounds per square inch

Source: *Engineering Unit Conversions*, M. R. Lindeburg, PE., Third Ed., 1993, Professional Publications, Inc., Belmont, California.

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**CONTENTS**

2 1.0 PART A PERMIT APPLICATION [A] .....1-1  
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1           **HANFORD FACILITY DANGEROUS WASTE PERMIT APPLICATION,**  
2           **WASTE ENCAPSULATION AND STORAGE FACILITY**

3  
4  
5                   **1.0 PART A PERMIT APPLICATION [A]**

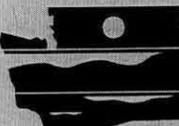
6 The Part A covers the Waste Encapsulation and Storage Facility (WESF) that is located on the Hanford  
7 Facility in the 200 West Area. The regulatory history of WESF can be found in the Hanford Facility  
8 Administrative Record. The following is the latest revision to the Part A:

- 9
- 10 • The Part A, Form 3, (Revision 3) was submitted on February 17, 2006. The Part A, Form 3, was  
11 revised to meet the new format in accordance with WAC 173-303-803. Dangerous waste number  
12 "WT01" (state-only – toxic) was deleted because only federal waste codes need to be identified in  
13 accordance with WAC 173-303-090. The Part A, Form 3, was approved by the Washington State  
14 Department of Ecology (Ecology) on February 17, 2006.
- 15  
16

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	WASHINGTON STATE DEPARTMENT OF <b>E C O L O G Y</b>	<h2 style="margin: 0;">Dangerous Waste Permit Application</h2> <h3 style="margin: 0;">Part A Form</h3>
--	---	--

Date Received	Reviewed by: <i>Kathy Casanova</i>	Date: 02/28/2006
Month Day Year	Approved by: <i>Michael P. Davis</i>	Date: 03/13/2006

Please refer to instructions for completing this form.

**I. This form is submitted to: (place an "X" in the appropriate box)**

<input checked="" type="checkbox"/>	Request modification to a final status permit (commonly called a "Part B" permit)
<input type="checkbox"/>	Request a change under interim status
<input type="checkbox"/>	Apply for a final status permit. This includes the application for the initial final status permit for a site or for a permit renewal (i.e., a new permit to replace an expiring permit).
<input type="checkbox"/>	Establish interim status because of the wastes newly regulated on: _____ (Date)

List waste codes: \_\_\_\_\_

**II. EPA/State ID Number**

W	A	7	8	9	0	0	0	8	9	6	7
---	---	---	---	---	---	---	---	---	---	---	---

**III. Name of Facility**

US Department of Energy - Hanford Facility

**IV. Facility Location (Physical address not P.O. Box or Route Number)**

**A. Street**

825 Jadwin

City or Town	State	ZIP Code
Richland	WA	99352

County Code (if known)	County Name
005	Benton

<b>B. Land Type</b>	<b>C. Geographic Location</b>	<b>D. Facility Existence Date</b>
	Latitude (degrees, mins, secs)	Month Day Year
F	S E E T O P O M A P	03 22 1943

**V. Facility Mailing Address**

**Street or P.O. Box**

P.O. Box 550

City or Town	State	ZIP Code
Richland	WA	99352

VI. Facility contact (Person to be contacted regarding waste activities at facility)													
Name (last)						(first)							
Klein						Keith							
Job Title						Phone Number (area code and number)							
Manager						(509) 376-7395*							
Contact Address													
Street or P.O. Box													
P.O. Box 550													
City or Town						State		ZIP Code					
Richland						WA		99352					
VII. Facility Operator Information													
A. Name						Phone Number (area code and number)							
Department of Energy * Owner/Operator Fluor Hanford** Co-Operator for Waste Encapsulation and Storage Facility						(509) 376-7395* (509) 375-3576 **							
Street or P.O. Box													
P.O. Box 550 *													
P.O. Box 1000 **													
City or Town						State		ZIP Code					
Richland						WA		99352					
B. Operator Type		F											
C. Does the name in VII.A reflect a proposed change in operator?						<input type="checkbox"/> Yes		<input checked="" type="checkbox"/> No					
If yes, provide the scheduled date for the change:						Month		Day		Year			
D. Is the name listed in VII.A. also the owner? If yes, skip to Section VIII.C.						<input type="checkbox"/> Yes		<input checked="" type="checkbox"/> No					
VIII. Facility Owner Information													
A. Name						Phone Number (area code and number)							
Keith A. Klein, Operator/Facility-Property Owner						(509) 376-7395*							
Street or P.O. Box													
P.O. Box 550													
City or Town						State		ZIP Code					
Richland						WA		99352					
B. Operator Type		F											
C. Does the name in VII.A reflect a proposed change in operator?						<input type="checkbox"/> Yes		<input checked="" type="checkbox"/> No					
If yes, provide the scheduled date for the change:						Month		Day		Year			
IX. NAICS Codes (5/6 digit codes)													
A. First						B. Second							
5	6	2	2	1		9	2	4	1	1	0	Waste Treatment & Disposal	Administration of Air & Water Resource & Solid Waste Management Programs
C. Third						D. Fourth							
5	4	1	7	1	0	9	9	9	9	9	9	Research & Development in the Physical, Engineering, & Life Sciences	Unclassified Establishments

**X. Other Environmental Permits (see instructions)**

A. Permit Type		B. Permit Number											C. Description	
E		A	I	R	-	0	2	-	1	2	1	8	WAC 246-247, Radiation Protection -- Air Emissions	
E		E	P	A	-	1	9	9	9	-8	-	1	2	40 CFR 61, Subpart H, NESHAPS

**XI. Nature of Business (provide a brief description that includes both dangerous waste and non-dangerous waste areas and activities)**

WESF was constructed on the west end of B Plant in 1974 to encapsulate and store cesium chloride and strontium fluoride salts that had been separated from Hanford's high-level radioactive tank waste. WESF had stored the encapsulated salts since operations began in 1974 and initiated mixed waste management activities on July 14, 1997. The waste is stored in stainless steel capsules whose maximum outer height is approximately 53 centimeters (~21 inches) and maximum diameter is approximately 8 centimeters (~3 inches). WESF is a two-story, 20,000 square-foot building 157 feet long and 40 feet high. It is constructed of steel reinforced concrete. It is partitioned into seven hot cells, the hot cell service area, operating areas, building service areas, and the pool cell area.

The seven hot cells are labeled A through G and activities within the hot cells are performed remotely using manipulators. Waste and drum load out is performed in hot cell A. Hot cells B through E were used to convert strontium nitrate and cesium carbonate into strontium fluoride and cesium chloride salts. Only hot cells F and G will remain active for cesium/strontium capsule storage. The hot cell service area is located on the south side of the hot cells and is used for access into hot cells A and G. The operating areas and other building service areas associated with the hot cells provide areas for instrumentation monitoring, utility support, or manipulator repair as required.

The pool cell area consists of 12 pools lined with stainless steel. Pools 9, 10, and 11 are outside the TSD unit boundary. Pool cells 1 through 8 and 12 can be used for capsule storage and are filled with water to a depth of approximately 13 feet. Each pool is equipped with a monitoring system to detect any leakage from capsules. The water cools the cesium/strontium capsules and provides radiation shielding. Pool cell 12 is used to move capsules from hot cell G and from pool cell to pool cell.

The maximum process design capacity for miscellaneous storage in pool cells 1 through 8 and 12 is approximately 4,484 liters (~1,185 gallons) and for Process cells A through G is approximately 56 liters (~15 gallons). The total maximum process design capacity for miscellaneous storage in the pool cells and process cells is approximately 4,540 liters (~1,200 gallons).

**EXAMPLE FOR COMPLETING ITEMS XII and XIII (shown in lines numbered X-1, X-2, and X-3 below):** A facility has two storage tanks that hold 1200 gallons and 400 gallons respectively. There is also treatment in tanks at 20 gallons/hr. Finally, a one-quarter acre area that is two meters deep will undergo *in situ vitrification*.

Section XII. Process Codes and Design Capacities							Section XIII. Other Process Codes							
Line Number	A. Process Codes (enter code)			B. Process Design Capacity		C. Process Total Number of Units	Line Number	A. Process Codes (enter code)			B. Process Design Capacity		C. Process Total Number of Units	D. Process Description
	1	2	3	1. Amount	2. Unit of Measure (enter code)			1	2	3	1. Amount	2. Unit of Measure (enter code)		
X 1	S	0	2	1,600	G	002	X 1	T	0	4	700	C	001	In situ vitrification
X 2	T	0	3	20	E	001								
X 3	T	0	4	700	C	001								
1	S	9	9	4,540	L	001	1							
2							2							
3							3							
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1 0							1 0							
1 1							1 1							
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1 5							1 5							
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1 7							1 7							
1 8							1 8							
1 9							1 9							
2 0							2 0							
2 1							2 1							
2 2							2 2							
2 3							2 3							
2 4							2 4							
2 5							2 5							

**XIV. Description of Dangerous Wastes**

**Example for completing this section:** A facility will receive three non-listed wastes, then store and treat them on-site. Two wastes are corrosive only, with the facility receiving and storing the wastes in containers. There will be about 200 pounds per year of each of these two wastes, which will be neutralized in a tank. The other waste is corrosive and ignitable and will be neutralized then blended into hazardous waste fuel. There will be about 100 pounds per year of that waste, which will be received in bulk and put into tanks.

Line Number	A. Dangerous Waste No. (enter code)	B. Estimated Annual Quantity of Waste	C. Unit of Measure (enter code)	D. Processes									
				(1) Process Codes (enter)				(2) Process Description [If a code is not entered in D (1)]					
X 1	D 0 0 2	400	P	S	0	1	T	0	1				
X 2	D 0 0 1	100	P	S	0	2	T	0	1				
X 3	D 0 0 2												Included with above
	1 D 0 0 5	5,000	K	S	9	9							Includes Debris
	2 D 0 0 6		K	S	9	9							Includes Debris
	3 D 0 0 7		K	S	9	9							Includes Debris
	4 D 0 0 8		K	S	9	9							Includes Debris
	5 D 0 1 1		K	S	9	9							Includes Debris
	6												
	7												
	8												
	9												
	1 0												
	1 1												
	1 2												
	1 3												
	1 4												
	1 5												
	1 6												
	1 7												
	1 8												
	1 9												
	2 0												
	2 1												
	2 2												
	2 3												
	2 4												
	2 5												

**XV. Map**

Attach to this application a topographic map of the area extending to at least one (1) mile beyond property boundaries. The map must show the outline of the facility; the location of each of its existing and proposed intake and discharge structures; each of its dangerous waste treatment, storage, recycling, or disposal units; and each well where fluids are injected underground. Include all springs, rivers, and other surface water bodies in this map area, plus drinking water wells listed in public records or otherwise known to the applicant within 1/4 mile of the facility property boundary. The instructions provide additional information on meeting these requirements.

**XVI. Facility Drawing**

All existing facilities must include a scale drawing of the facility (refer to Instructions for more detail).

**XVII. Photographs**

All existing facilities must include photographs (aerial or ground-level) that clearly delineate all existing structures; existing storage, treatment, recycling, and disposal areas; and sites of future storage, treatment, recycling, or disposal areas (refer to Instructions for more detail).

**XVIII. Certifications**

I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations.

<p><b>Operator*</b>                  Name and Official Title (type or print)                  Keith A. Klein, Manager                  U.S. Department of Energy                  Richland Operations Office</p>	<p><b>Signature</b>  </p>	<p><b>Date Signed</b>                  2/17/06</p>
<p><b>Co-Operator**</b>                  Name and Official Title (type or print)                  Ronald G. Gallagher                  President and Chief Executive Officer                  Fluor Hanford</p>	<p><b>Signature</b>  </p>	<p><b>Date Signed</b>                  1/31/06</p>
<p><b>Co-Operator** – Address and Telephone Number</b>                  2420 Stevens Center                  P.O. Box 1000                  Richland, WA 99352                  (509) 376-3576</p>		
<p><b>Facility-Property Owner*</b>                  Name and Official Title (type or print)                  Keith A. Klein, Manager                  U.S. Department of Energy                  Richland Operations Office</p>	<p><b>Signature</b>  </p>	<p><b>Date Signed</b>                  2/17/06</p>

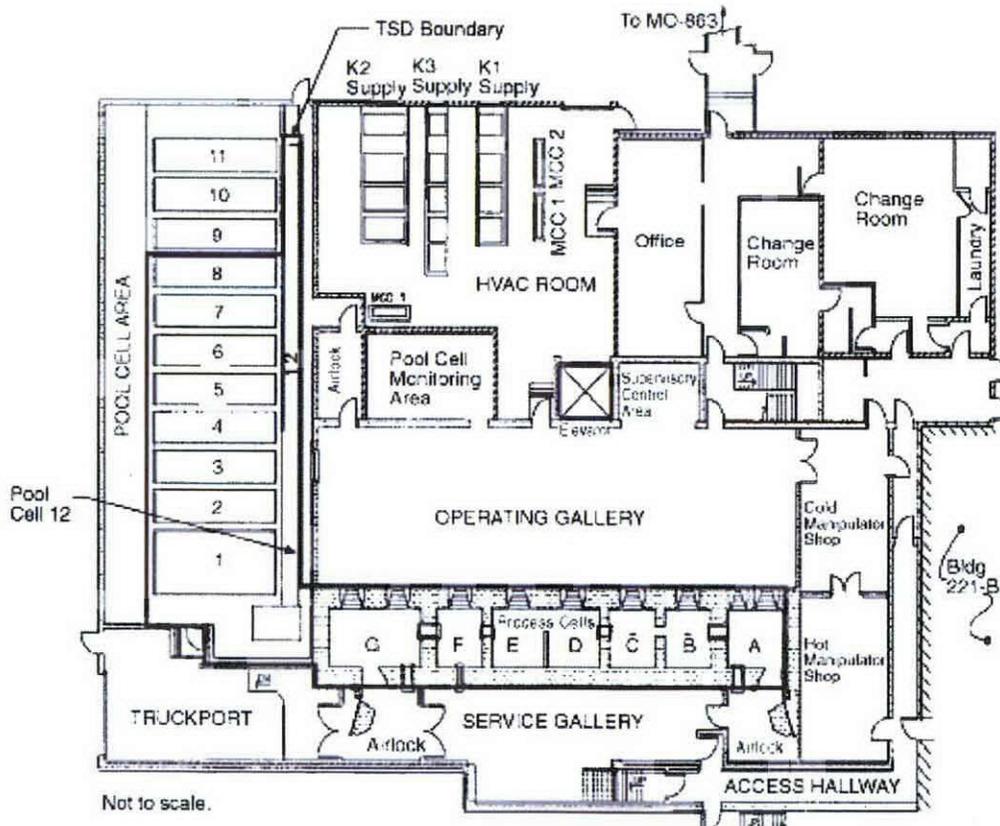
**Comments**

# Waste Encapsulation and Storage Facility



225-B Building

97110265-14CN  
PHOTO TAKEN 1997



Waste Encapsulation and Storage Facility Pool and Process Cells

H97110237.2

---

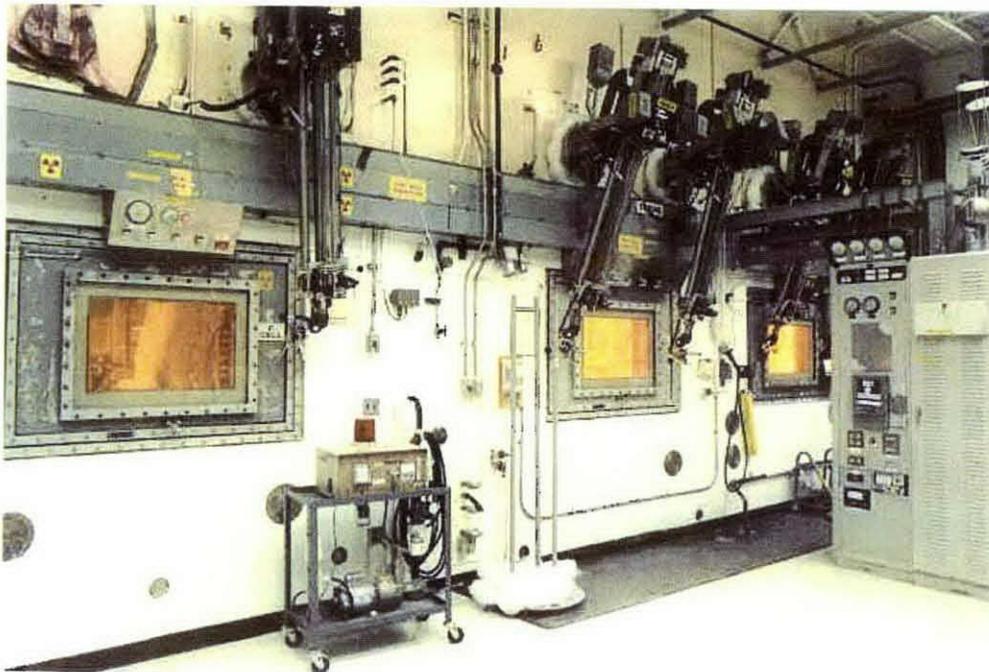
## Waste Encapsulation and Storage Facility

---



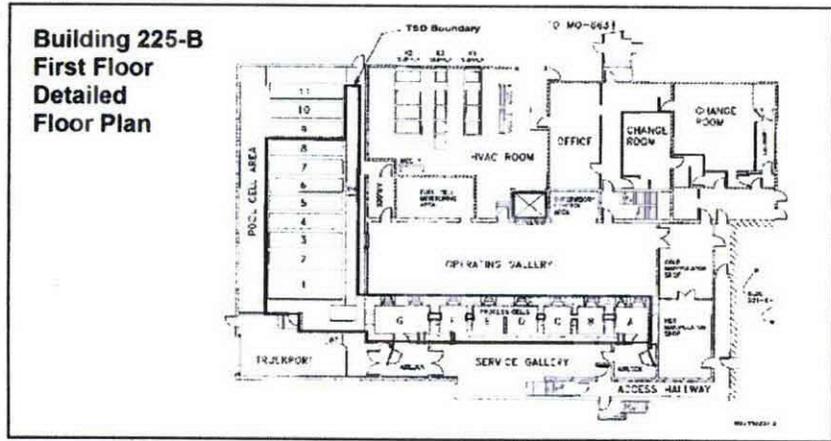
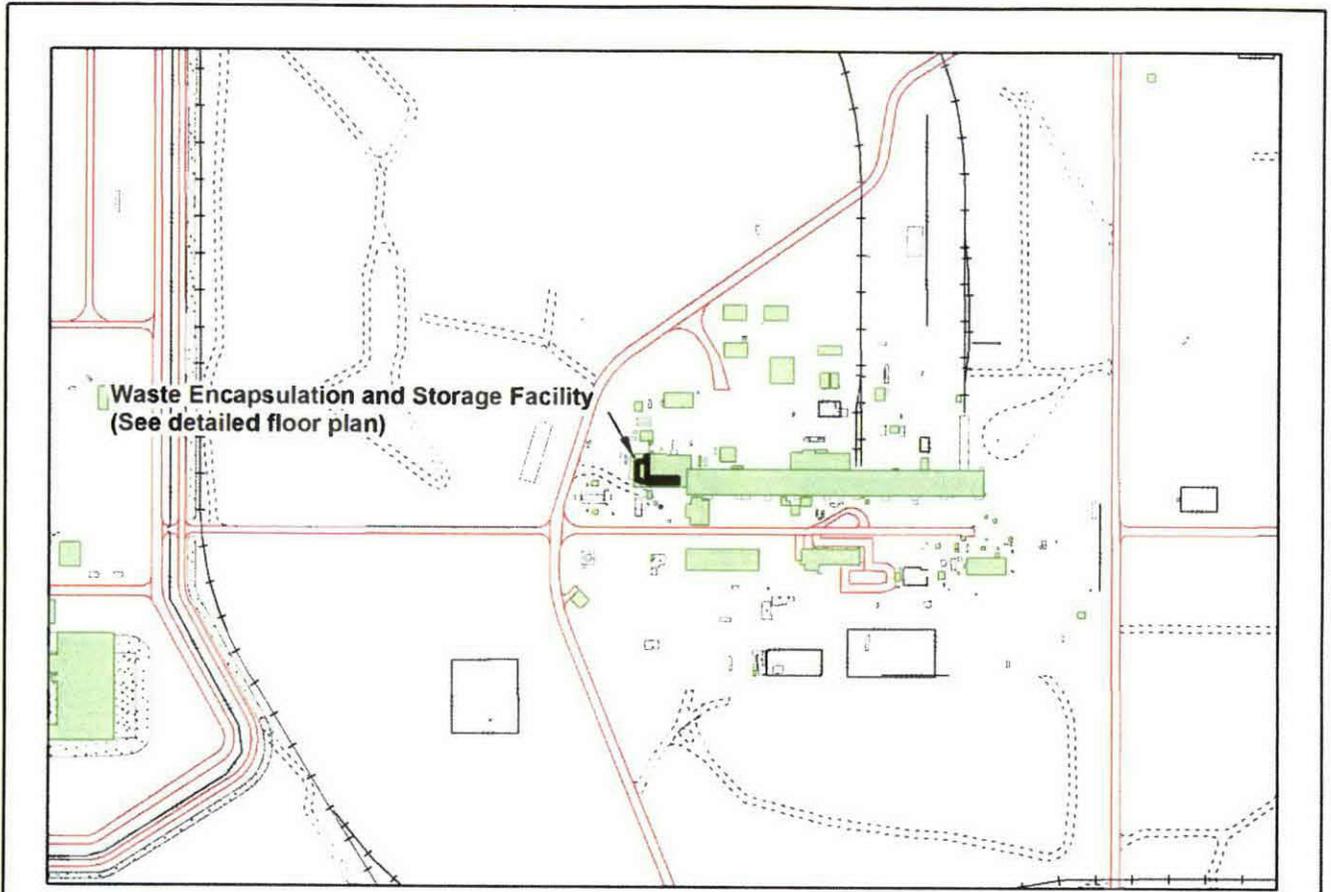
**Pool Cells**

97110265-8CN  
PHOTO TAKEN 1997



**Process Cells**

97110265-2CN  
PHOTO TAKEN 1997



**Waste Encapsulation and Storage Facility**

Prepared for:  
 US DEPARTMENT OF ENERGY  
 RICHLAND OPERATIONS OFFICE



Created and Published by: Central Mapping Services  
 Fluor Hanford, Richland, WA (509) 376-8759

INTENDED USE: REFERENCE ONLY

- TSD Unit Boundary
- DOE Operating Areas
- Hanford Facility
- Major Roads
- Service Roads
- Buildings and Mobiles
- Structures
- Concrete
- Railroads
- Fences



O:\Projects\RCRA\_TSD\050614\_2ndPriorityFacilityTopos2005\_Thompson\Maps\050921\_WasteEncapAndStorageFacility\_LineDwg\_85x11\_Rev1.mxd - 1/11/2006 @ 2:00:14 PM

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25 Figure 2-2. Hot Cell Area (Looking South)..... F2-2  
26

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## 2.0 FACILITY DESCRIPTION AND GENERAL PROVISIONS [B AND E]

This chapter briefly describes the WESF location and provides an overview of WESF operations, including the following:

- General description
- Topography
- Traffic information.

WESF is located in the 200 East Area on the west end of the B Plant Complex in the 225B Building on the Hanford Facility. A more detailed discussion of the waste types and known characteristics of WESF and the identification of the methods of storage are provided in Chapters 1.0, Part A; 3.0, Waste Analysis Plan; and 4.0, Process Description; respectively, in this unit-specific permit application.

WESF was built to encapsulate and store cesium chloride and strontium fluoride salts that have been separated from Hanford Facility tank farm waste generated during chemical processing of defense fuel on the Hanford Facility. WESF has stored the encapsulated salts since operations began in 1974 and initiated mixed waste activities on July 14, 1997.

The primary mission of WESF is the storage of encapsulated cesium and strontium capsules until transfer into a treatment facility or stored in a national repository.

### 2.1 WASTE ENCAPSULATION AND STORAGE FACILITY UNIT DESCRIPTION [B-1 and B-1a]

Descriptions of WESF structures that are located within the storage boundary are provided in the following sections.

#### 2.1.1 225B Building

WESF consists of the 225B Building and several support buildings (i.e., offices, maintenance areas, and change rooms) and systems (i.e., fire system, water systems, and ventilation). The 225B Building is a 1,858 square meter (20,000 square foot) building two-story structure that is 48 meters (157 feet) long by 30 meters (97 feet) wide by 12 meters (40 feet) high at the outside dimensions and is constructed of steel-reinforced concrete. WESF is portioned into the pool cell area and hot cell area.

#### 2.1.2 Pool Cell Area

The pool cell area is 10 meters (34 feet) wide by 22 meters (72 feet) long by 4 meters (13 feet) high and is located on the west side of the 225B Building (Figure 2-1). The pool cell area consists of 12 pools, and only Pool Cells 1 through 8 and 12 can be used for capsule storage. Pool Cells 9, 10, and 11 are outside the WESF unit boundary (refer to Chapter 1.0, Part A of this unit-specific permit application) and are not used for the storage of capsules.

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**1 2.1.3 Hot Cell Area**

2 The hot cell area is 4 meters (14 feet) wide by 26 meters (84 feet) long by 5 meters (16 feet) high and is  
3 located on the south side of the 225B Building (Figure 2-2). The hot cell area consists of seven hot cells.  
4 Hot Cell A was used to remove low-level waste and Hot Cells B through E were used to convert  
5 strontium nitrate and cesium carbonate into strontium fluoride and cesium chloride salts. Only Hot Cells  
6 F and G will remain active for cesium/strontium capsule storage.  
7  
8

**9 2.2 TOPOGRAPHIC MAP [B-2]**

10 Refer to Chapter 1.0, Part A form in this unit-specific permit application for topographic map.  
11

**12 2.3 WASTE ENCAPSULATION AND STORAGE FACILITY ROADWAYS [B-4]**

14 General traffic information for the Hanford Facility is presented in the *Hanford Facility Resource*  
15 *Conservation and Recovery Act Permit* (Permit) Attachment 33, Chapter 2.0, Section 2.4.  
16

17 Approximately 25 personnel are working at WESF and parking for personnel is provided. Existing paved  
18 roads will provide satisfactory all-weather access during operations.  
19

**20 2.4 RELEASES FROM SOLID WASTE MANAGEMENT UNITS [E]**

22 Information concerning the solid waste management units can be found in Chapter 1.0, Part A  
23 topographic map in this unit-specific permit application.  
24

**25 2.5 SEISMIC CONSIDERATION [B-3]**

27 WESF is located in seismic Zone 2B of the Uniform Building Code as discussed in the Permit  
28 Attachment 33, Chapter 2.0, Section 2.3. The pool cell and hot cell areas within WESF that are addressed  
29 in this unit-specific permit application meet the seismic criteria consideration, and are able to withstand  
30 and exceed the maximum horizontal acceleration requirements for an 0.12 gravity operation basis  
31 (HNF-SD-WM-DB-034, 1997).  
32

33 No active faults, or evidence of a fault that has had displacement during Holocene times, have been found  
34 at the Hanford Site (Permit Attachment 33, Chapter 2.0, Section 2.3).  
35  
36

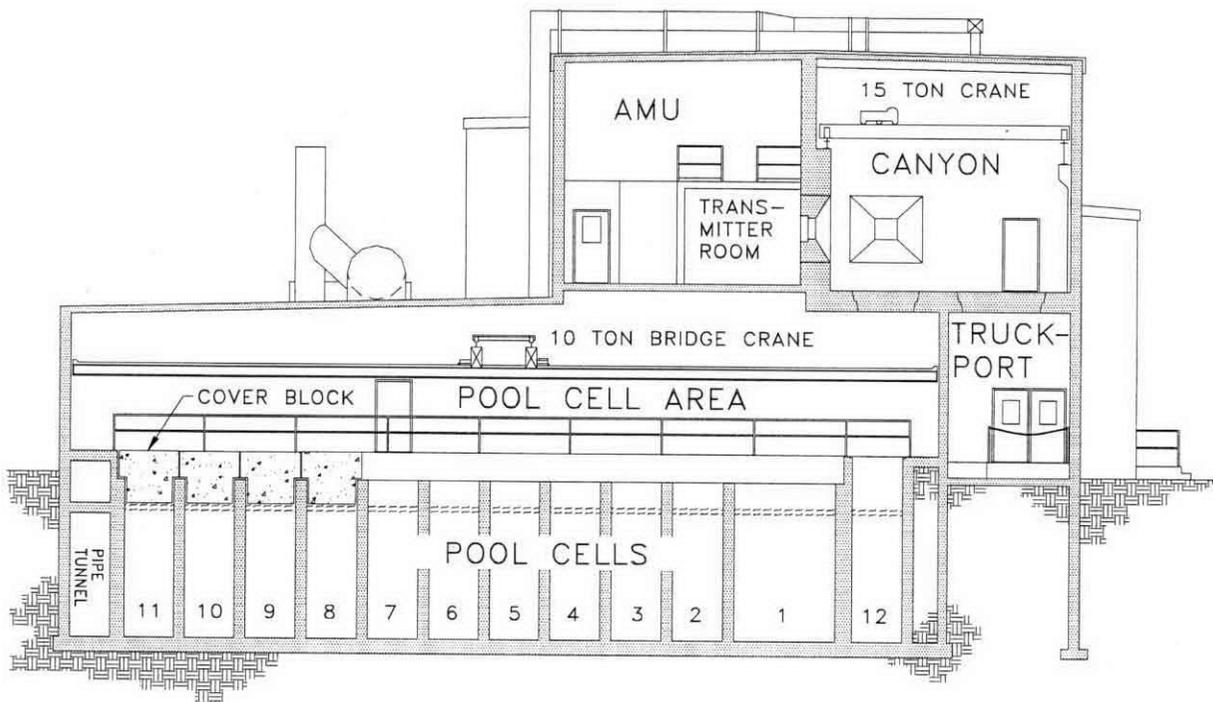


Figure 2-1. Pool Cell Area (Looking East).

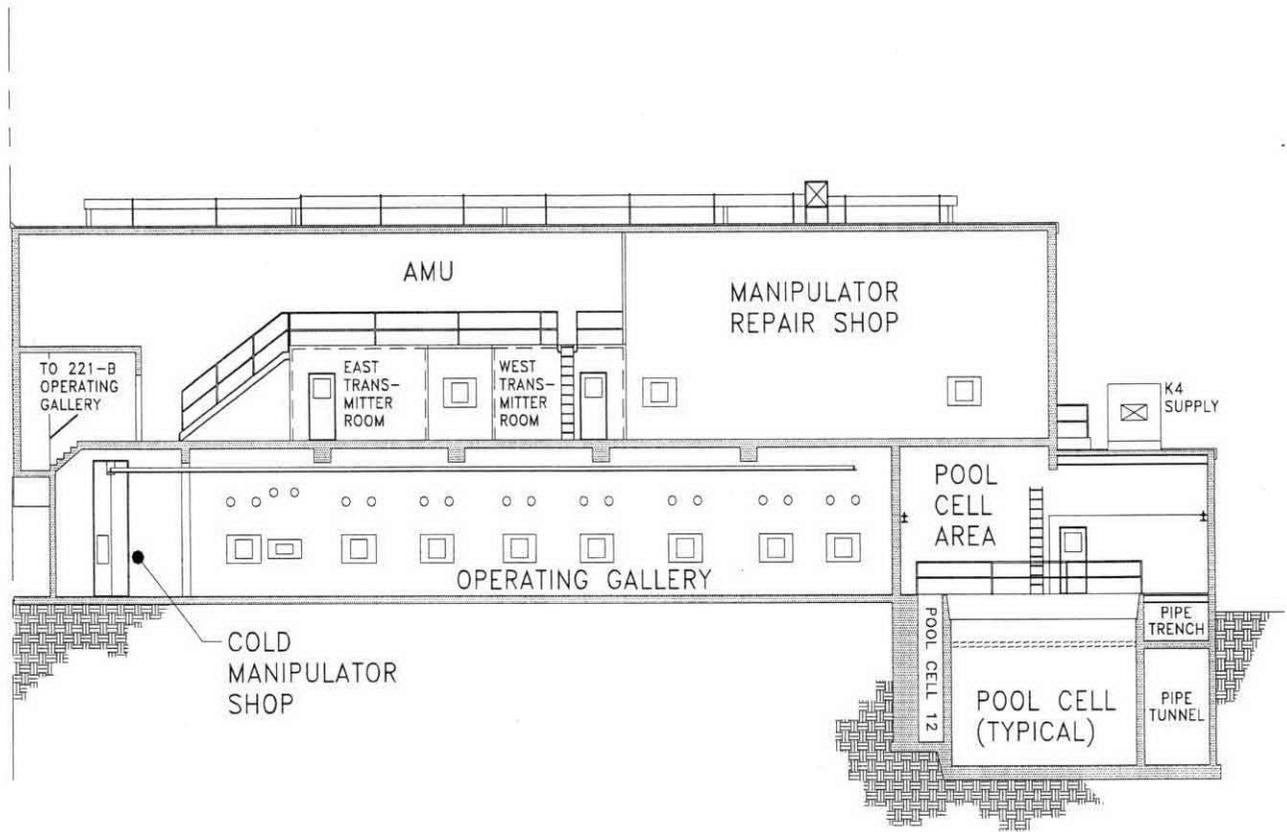


Figure 2-2. Hot Cell Area (Looking South).

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1

### 3.0 WASTE ANALYSIS PLAN

2 The purpose of this waste analysis plan (WAP) is to document waste analysis activities associated with  
3 the WESF to comply with *Washington Administrative Code* (WAC) 173-303-300(1), (2), (3), (4), (5), and  
4 (6). Descriptions required by WAC 173-303-300(5) are contained in the following sections of this  
5 chapter.

6  
7 Please note that source, special nuclear, and byproduct materials, as defined in the *Atomic Energy Act*  
8 (AEA) of 1954, are regulated at U.S. Department of Energy (DOE) facilities exclusively by DOE acting  
9 pursuant to its AEA authority. These materials are not subject to regulation by the State of Washington.  
10 All information contained herein and related to, or describing AEA-regulated materials and process in any  
11 manner, may not be used to create conditions or other restrictions set forth in any permit, license, order, or  
12 any other enforceable instrument. DOE asserts that pursuant to the AEA, it has sole and exclusive  
13 responsibility and authority to regulate source, special nuclear, and byproduct materials at DOE-owned  
14 nuclear facilities. Information contained herein on radionuclides is provided for process description  
15 purposes only.

16  
17 The primary mission of WESF is to store mixed waste capsules that contain dangerous waste and AEA  
18 material. The mixed waste capsules will be stored at WESF until transfer into a treatment facility or  
19 stored in a national repository.

20  
21 Only mixed waste packaged in capsules as identified in the *Hanford Federal Facility Agreement and*  
22 *Consent Order* (Tri-Party Agreement, Ecology et al. 2003) Milestone M-92-03 are stored at WESF. No  
23 waste has been received into WESF since the return of the capsules completing Tri-Party Agreement  
24 Milestone M-92-04 on September 28, 1998. There are no future plans to place additional waste into  
25 WESF.

### 3.1 UNIT DESCRIPTION

26  
27  
28  
29 WESF is located in the 200 East Area on the Hanford Facility. WESF is operated as a miscellaneous  
30 storage unit in accordance with the provision of WAC 173-303-680.

#### 3.1.1 Description of Unit Processes and Activities

31  
32  
33  
34 WESF (225B Building) is a two-story building constructed of steel reinforced concrete, and is partitioned  
35 into the hot cell area, service areas and the pool cell area. The WESF unit boundary includes the hot  
36 cells and Pool Cells 1 through 8, and 12.

37  
38 The seven hot cells are labeled A through G and activities within the hot cells are performed remotely  
39 using manipulators. Only Hot Cells F and G are active at the present time for cesium/strontium capsule  
40 storage. Hot Cells A through E are not used. The pool cell area consists of 12 pools lined with stainless  
41 steel. Each pool is equipped with a monitoring system to detect any leakage from capsules. Pool Cells 1  
42 through 8 and 12 can be used for capsule storage and are filled with water to a depth of approximately  
43 4 meters (13 feet). The water provides cooling and shielding for the capsules.

44  
45 Only one mixed waste stream is managed at WESF, which consists of the cesium chloride and strontium  
46 fluoride salts that are stored within the capsules.

47  
48 Additional information is located in Chapter 1.0, Part A form in this unit-specific permit application.

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**3.1.2 Capsule Description**

The mixed waste is stored in capsules consisting of sealed stainless steel tubes that provide containment of the mixed waste. The maximum outer containment height is approximately 53 centimeters (~21 inches) with a maximum diameter of approximately 8 centimeters (~3 inches). Additional information on capsule design can be found in Chapter 4.0 of this unit-specific permit application.

**3.1.3 Waste Prohibited for Storage**

The following waste are prohibited from management in the WESF:

- Dangerous and/or mixed waste not identified in Chapter 1.0, Part A form of this unit-specific permit application
- Reactive waste defined in WAC 173-303-090(7)(a)
- Corrosive waste defined in WAC 173-303-090(6)(a)(i) and (ii)
- Ignitable waste defined in WAC 173-303-090(5)(a)
- Waste incompatible with the mixed waste in the capsules as defined in WAC 173-303-040 or the materials of construction of the capsules currently managed at WESF
- Polychlorinated biphenyl (PCB) waste.

**3.2 CONFIRMATION PROCESS**

WAC 173-303-300(3) and 300(6) require information be obtained, documented, and/or reported regarding waste accepted into WESF. All of the waste in storage at WESF originated at WESF. WESF will not receive and does not anticipate receiving additional waste from an onsite and/or offsite facility; therefore, no additional information or analysis is required to meet WAC 173-303-300(3) and 300(6).

Waste is designated by waste designation 'D' (WAC 173-303) using manufacturers product information, material safety data sheets (MSDS), and laboratory analysis. Waste also is characterized in accordance with the requirements of 40 CFR 261 and 761.

Designation for waste types that are stored at WESF:

<u>Number</u>	<u>Reference</u>
D004 through D008 and D011	WAC 173-303-090(8).

**3.2.1 Pre-transfer Review**

All of the waste in storage at WESF originated at WESF. WESF does not receive mixed waste from an onsite and/or offsite facility at this time; therefore, no pre-shipment review, waste profile documentation, and/or waste transfer approval is required. Any additional waste accepted into WESF will require a revision to this chapter and a modification of the sitewide permit.

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### 3.2.2 Verification of Waste

Only mixed waste packaged in capsules as identified in the Tri-Party Agreement Milestone M-92-03 are stored at WESF. No waste has been received into WESF since the return of the capsules to meet Tri-Party Agreement Milestone M-92-04. There are no plans to place additional waste into WESF.

### 3.2.3 Waste Acceptance Criteria

WESF will not receive and does not anticipate receiving additional waste from an onsite and/or offsite facility; therefore, no additional information or analysis is required to meet WAC 173-303-300(3) and 300(6).

## 3.3 SELECTING WASTE ANALYSIS PARAMETERS

The parameter for safe storage of the capsules is corrosion of the capsules from contact with impurities contained in the mixed waste salts. Studies were completed and confirmed that corrosion is not a factor in the safe storage of the capsules under current storage conditions (WMP-16937). The information from this study and the conclusion that corrosion is not a factor for storage of mixed waste capsules meets the intent of WAC 173-303-300(5)(a) and (b). WAC 173-303-610(4)(d) does not apply to WESF.

There are no future plans to place additional waste into WESF. Since waste currently in WESF have already been designated according to applicable WAC requirements, no additional waste is expected to be managed at WESF, no treatment will be conducted at WESF, and no waste analysis parameters need be identified at this time. Should circumstances change, and one of the enumerated activities become planned, the Permittee will seek appropriate modifications to this chapter and the sitewide permit through the permit modification process.

## 3.4 SELECTING SAMPLING PROCESSES

Periodic re-analysis of WESF mixed waste that is managed based on WAC 173-303-300(5)(d) is not planned because the capsules are sealed and no changes can be made to the mixed waste within the capsules. Therefore, no actions are necessary to demonstrate compliance with WAC 173-303-300(4)(a).

The capsules are sealed tubes whose constituents have been determined via the confirmation process in Section 3.2. No additional waste is planned or scheduled for storage at WESF. Therefore, no actions are necessary to demonstrate compliance with requirements of WAC 173-303-300(5)(c),(d), (e), and (g).

Since WESF exclusively manages mixed waste in miscellaneous units, WESF is exempt from the requirements of Subpart CC, air emissions standards for tanks, surface impoundments, and containers. An exemption to the air emission standards of Subpart CC in accordance with Section 40 CFR 264.1082 or with 40 CFR 265.1083 is not being requested; therefore, WAC 173-303-300(5)(i) does not apply.

### 3.5 SELECTING A LABORATORY, LABORATORY TESTING, AND ANALYTICAL METHODS

There are no plans to conduct analytical testing of waste currently managed by WESF, nor to manage additional waste at WESF or to treat waste at WESF. Therefore, there is no need to select laboratory testing methods or analytical methods.

### 3.6 SELECTING WASTE RE-EVALUATION FREQUENCIES

There are no plans to conduct analytical testing of waste currently managed at WESF. Therefore, there is no need to select a waste re-evaluation frequency.

### 3.7 SPECIAL PROCEDURAL REQUIREMENTS

Special procedural requirements [WAC 173-303-300(5)(f)] for WESF are described in Sections 3.7.1 and 3.7.2.

#### 3.7.1 Procedures for Ignitable, Reactive, and Incompatible Waste

Ignitable, reactive, and/or incompatible waste (refer to Section 3.1.3) is prohibited at WESF. No procedures relating to these waste types are necessary.

#### 3.7.2 Provisions for Complying with Federal and State Land Disposal Restriction Requirements

Dangerous and/or mixed waste destined for disposal is subject to the land disposal restrictions (LDR) of WAC 173-303-140, which incorporates 40 CFR 268 by reference. WESF will not conduct any LDR treatment of waste in storage. Therefore, WESF is not required to comply with LDR requirements applicable to facilities that treat their waste in compliance with WAC 173-303-140. Storage of waste in WESF that does not comply with the LDR treatment standards of WAC 173-303-140 are addressed through the Hanford Site LDR report.

### 3.8 RECORDKEEPING

Recordkeeping requirements that are applicable to this chapter are described in DOE/RL-91-28, Chapter 12.0, Section 2.3, and as follows:

- Confirmation process records described in Section 3.2 of this chapter will be maintained in accordance with Permit Condition III.1.b.
- LDR records will be maintained in accordance with WAC 173-303-380(1)(o) in the WESF unit-specific portion of the Hanford Facility Operating Record.

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## 4.0 PROCESS INFORMATION [D]

This chapter discusses the processes used to store waste at WESF. Only one waste stream is managed at WESF, which consists of the cesium chloride and strontium fluoride salts that are stored within capsules. The two areas that could store capsules are the pool cells and hot cells.

Please note that source, special nuclear, and byproduct materials, as defined in the AEA, are regulated at DOE facilities exclusively by DOE acting pursuant to its AEA authority. These materials are not subject to regulation by the State of Washington. All information contained herein and related to, or describing AEA-regulated materials and process in any manner, may not be used to create conditions or other restrictions set forth in any permit, license, order, or any other enforceable instrument. DOE asserts that pursuant to the AEA, it has sole and exclusive responsibility and authority to regulate source, special nuclear, and byproduct materials at DOE-owned nuclear facilities. Information contained herein on radionuclides is provided for process description purposes only.

WESF will be permitted as a miscellaneous storage unit under WAC 173-303-680. The design of the stainless steel capsules precludes the mixed waste from contact with the pool cell water and monitoring equipment is installed to detect leakage of the mixed waste from the storage capsules. There is no potential for incidental rain water to enter into the pool cells or hot cells. The hot cells currently have an active managed fire suppression system. No unintended water is allowed within the pool cell and hot cell operating areas including fire suppression water.

WESF pool cells and hot cells have been designed and built to isolate and maintain confinement of the mixed waste during normal storage conditions and in the event of a natural or man-made accident over the design life of WESF. A physical description of WESF is provided in Chapter 2.0 in this permit application.

### 4.1 STORAGE UNIT DESCRIPTION

This section discusses WESF processes that will be involved in the storage operations. All of the mixed waste in storage at WESF originated at WESF. WESF does not receive mixed waste from an onsite and/or offsite facility.

The pool cell area consists of 12 pools lined with stainless steel. Only Pool Cells 1 through 8 and 12 can be used for capsule storage. The mixed waste capsules are currently stored in Pool Cells 1, 3 through 7, and 12. The pool cells are filled with water to a depth of approximately 4 meters (13 feet) to provide cooling and shielding for the capsules. The hot cell area consists of seven hot cells labeled A through G. The hot cells are constructed of reinforced concrete for shielding and have viewing windows. Activities within the hot cells are performed remotely using manipulators. Only Hot Cells F and G are active for mixed waste capsule storage. Capsules are not normally stored in Hot Cells F or G but could be placed in either cell for storage or evaluation.

#### 4.1.1 Description of Capsules

The mixed waste salt forms of cesium chloride and strontium fluoride are stored in three types of capsules at WESF: mixed waste capsules of cesium salts, Type W overpack mixed waste capsules, and mixed waste capsules of strontium salts. The cesium salts are stored in both the mixed waste cesium capsules and Type W overpack capsules.

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#### 1 4.1.1.1 Cesium Capsules

2 The standard mixed waste cesium capsule consists of a double capsule configuration with one capsule  
3 placed inside another as shown in Figure 4-1. Both the cesium inner and outer capsules and end caps are  
4 made of 316L stainless steel. The inner capsule dimensions are 5.7 centimeters (2.25 inches) in diameter  
5 by 50.1 centimeters (19.725 inches) long. The outer capsule is 6.7 centimeters (2.625 inches) in diameter  
6 by 52.8 centimeters (20.725 inches) long. There are a total of 1,312 standard mixed waste cesium  
7 capsules in storage.

8

#### 9 4.1.1.2 Type W Capsules

10 The Type W overpack mixed waste cesium capsule (Figure 4-2) is a 316L stainless steel capsule used to  
11 contain standard mixed waste cesium capsules that had swollen as a result of thermal cycling, cesium  
12 chloride that had been reconfigured into pencils or pellets for use as irradiators, or the contents of  
13 capsules that had been cut up for examination purposes. The Type W overpack capsule is 8.3 centimeters  
14 (3.25 inches) in diameter by 55.4 centimeters (21.8 inches) long.

15

#### 16 4.1.1.3 Strontium Capsules

17 Two types of material are used to encapsulate the strontium fluoride. Like the standard cesium capsule,  
18 the strontium capsule consists of a capsule within a capsule as shown in Figure 4-3. The inner capsule is  
19 Hastelloy C-276™. The outer capsule for the majority of strontium capsules is 316L stainless steel and  
20 the remaining capsules have a Hastelloy C-276™ outer capsule. The inner capsule is 5.7 centimeters  
21 (2.25 inches) in diameter by 48.4 centimeters (19.05 inches) long. The outer capsule is 6.7 centimeters  
22 (2.625 inches) in diameter by 55.4 centimeters (21.8 inches) long.

23

24

#### 25 4.1.2 Capsule Management Practices

26 Pool Cells 1 and 3 through 7 are the primary pool cells used for capsule storage and each of these pools  
27 contains one small (13-by-13 grid) and two large (18-by-21 grid) capsule storage racks. Capsules are  
28 placed vertically in the storage racks and are stored in approximately 4 meters (13 feet) of water for  
29 shielding and cooling.

30

31 One or more capsules may be moved from the pool cells to the hot cells for inspection or storage. Using  
32 long handled tongs, the capsule can be moved under water from its storage pool location into Pool Cell 12  
33 through a transfer port located approximately 1 meter (3 feet) above the pool cell floor. The capsule can  
34 then be temporarily stored on the floor or in a rack in Pool Cell 12 or be immediately moved to the hot  
35 cells. Capsules are transferred individually to and from Hot Cell G through a transfer chute. The capsule  
36 transfer chute is equipped with a trolley device for lowering and raising the capsule. Once in Hot Cell G,  
37 the capsules can be transferred into Hot Cell F using manipulators.

38

39

#### 40 4.1.2.1 Removal of Mixed Waste Storage Capsules

41 Removal of mixed waste capsules stored within WESF will not be conducted routinely. It is planned that  
42 the mixed waste capsules will remain in WESF for storage until a final disposition option becomes  
43 available (refer to Chapter 2.0 in this unit-specific permit application).

44

---

™ Hastelloy C-276 is a trademark of Haynes International, Inc., Kokomo, Indiana.

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**1 4.1.2.2 Pool Cell Water**

2 Deionized water from the WESF deionized water system is added to the pool cells periodically to  
3 maintain water level due to evaporation.  
4  
5

**6 4.1.3 Capsule Labeling**

7 The WESF capsules will not be labeled with traditional hazardous waste labels but will meet the intent of  
8 WAC 173-303-320 with an alternative to standard labeling requirements. A unique alphanumeric  
9 identifier has been etched into each capsule. The etched identifier ensures the number is always legible,  
10 cannot be removed or damaged by heat or radiation, and does not degrade over time. This identifier will  
11 be cross-referenced to detailed information for each mixed waste capsule. Signs are posted at the  
12 personnel entrances to the areas storing mixed waste, identifying any potential hazards in the area to  
13 satisfy WAC 173-303-320 and WAC 173-303-630.  
14  
15

**16 4.1.4 Containment Requirements for Storing Capsules**

17 The design of the pool cell and hot cell areas that are directly involved with the handling and storage of  
18 mixed waste are built to keep exposures to these as low as reasonably achievable (ALARA). The pool  
19 cell and hot cell areas are built to isolate and maintain confinement of the mixed waste during normal  
20 storage conditions and in the event of a natural or man-made accident.  
21

22 WESF does not store any capsules with free liquids, waste that exhibit ignitability or reactivity, or waste  
23 designated F020 through F023, F026, or F027 (refer to Section 4.0 of this unit-specific chapter).  
24  
25

**26 4.2 PREVENTION OF REACTION OF IGNITABLE, REACTIVE, AND  
27 INCOMPATIBLE WASTE IN WESF**

28 WESF does not store ignitable, reactive, or waste incompatible with the mixed waste in accordance with  
29 the waste analysis plan (Chapter 3.0 of this unit-specific permit application). The WESF capsules do not  
30 contain or generate materials that are explosive, pyrophoric, or chemically reactive. The capsule  
31 materials preclude chemical, electrochemical, or other reactions (such as internal corrosion). The WESF  
32 capsules will not exhibit the characteristics of ignitability or reactivity as defined in WAC 173-303-040  
33 and WAC 173-303-090(5).  
34  
35

**36 4.3 ANALYSIS OF MISCELLANEOUS UNIT REGULATORY REQUIREMENTS  
37 PURSUANT TO WAC 173-303-680**

38 WAC 173-303-680 requires "a miscellaneous unit must be located, designed, constructed, operated,  
39 maintained and closed in a manner that will ensure protection of the human health and the environment.  
40 Permits for miscellaneous units are to contain such terms and provisions as necessary to protect the  
41 human health and the environment....." Waste management process descriptions provided above describe  
42 all essential elements of waste management practices necessary to support the required demonstrations  
43 and to develop the necessary permit conditions, including requirements of WAC 173-303-680(3).  
44

45 WAC 173-303-680(2)(a) through (c) requires consideration of the potential release or migration of waste  
46 or waste constituents to groundwater, surface water, and air. Since mixed waste managed at WESF are in

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1 sealed capsules with little or any potential for release outside of the outer capsule, explicit consideration  
2 of these WAC sections are not necessary. WESF is not seeking to be permitted as a disposal unit, so  
3 consideration of postclosure care requirements of WAC 173-303-680(4) is also not necessary.  
4  
5

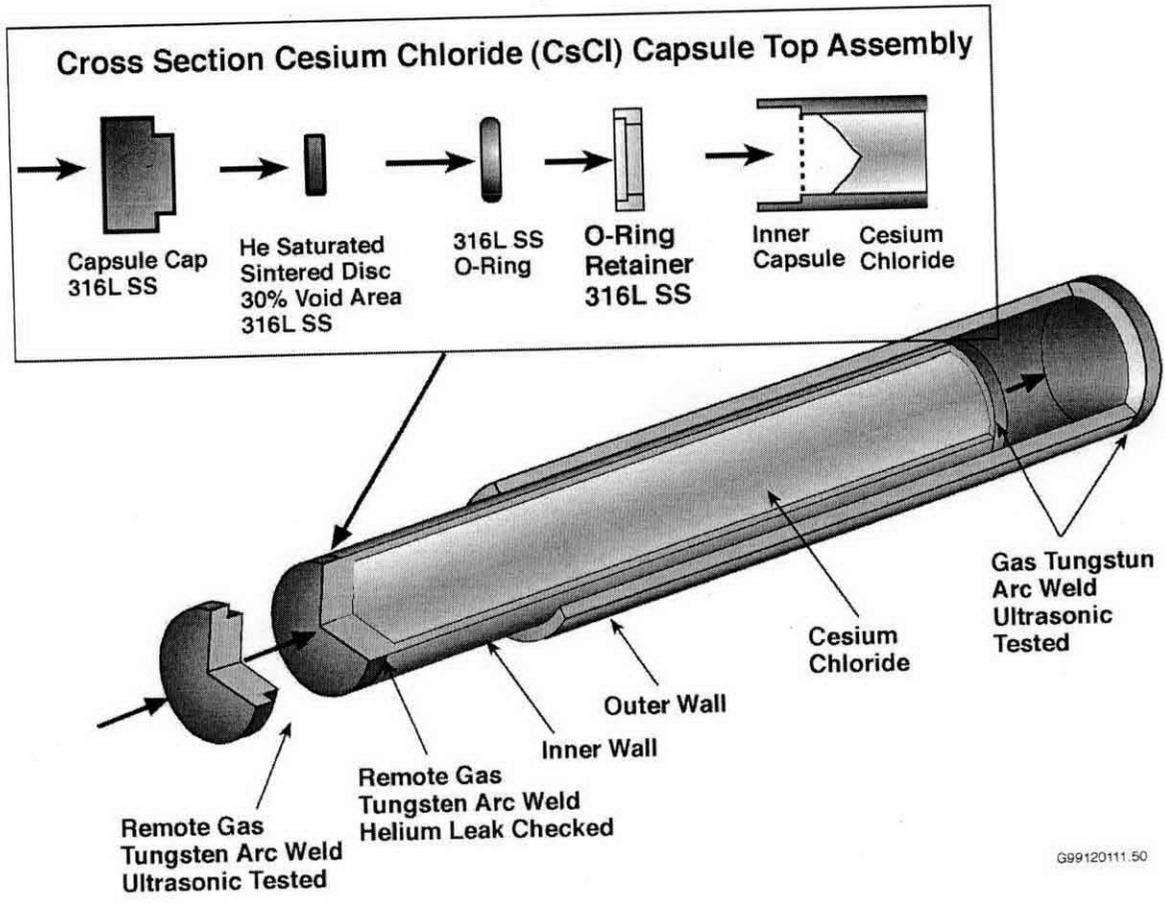


Figure 4-1. Cesium Capsule.

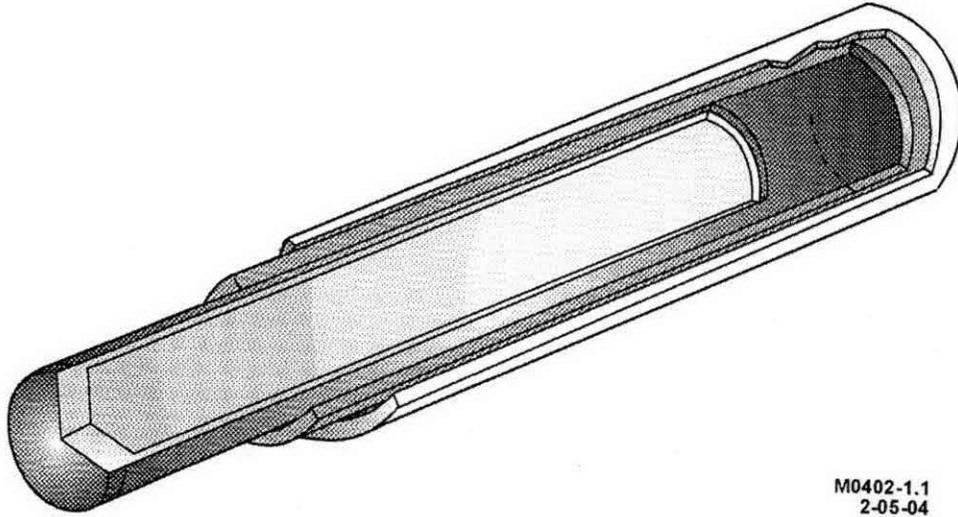


Figure 4-2. Type W Overpack Capsule (Typical).

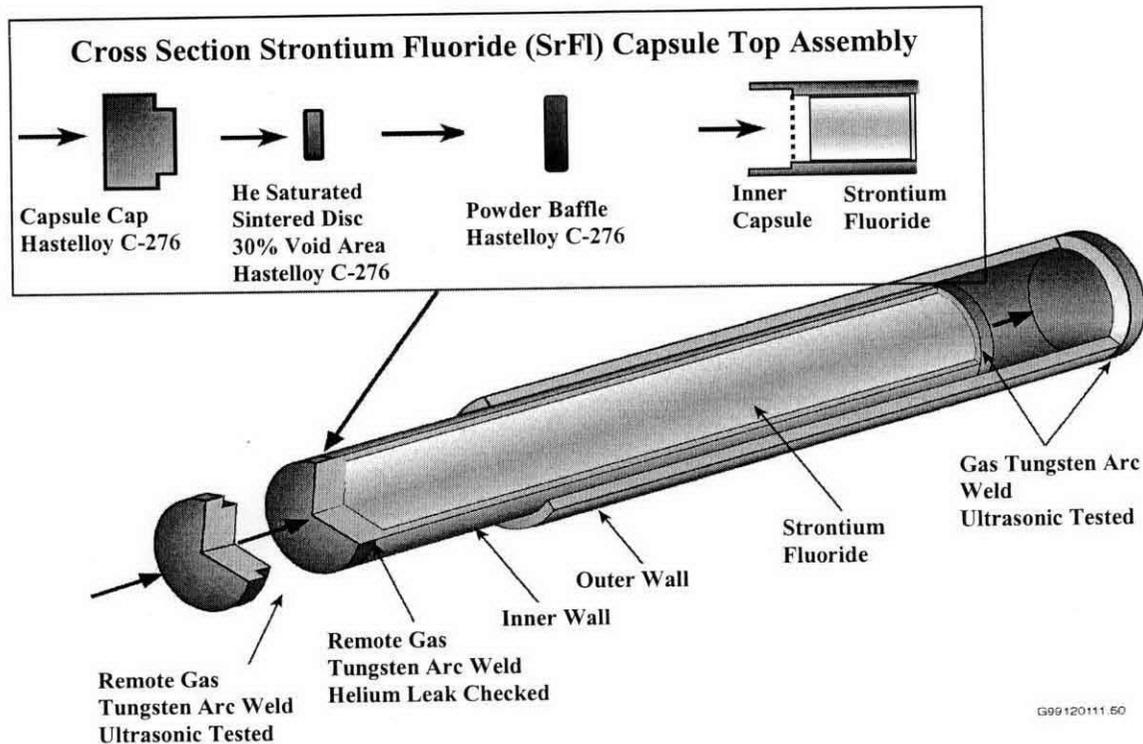


Figure 4-3. Strontium Capsule.

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**5.0 GROUNDWATER MONITORING FOR LAND-BASED UNITS [D-10]**1  
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WESF is not operated as a dangerous or mixed waste surface impoundment, waste pile, land treatment unit, or landfill as defined in WAC 173-303-645. Therefore, groundwater monitoring is not required. Further, as a miscellaneous unit, WESF is not authorized to treat, store, or dispose of dangerous waste on the land, so groundwater monitoring is not required for WESF. Hazardous material spills must be cleaned up immediately as stipulated in the contingency plan (Chapter 7.0 of this unit-specific permit application). The "Contingency Plan" and closure plans for the storage pools and the hot cells are based on closure by removal or decontamination, so postclosure groundwater monitoring requirements do not apply.

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39			

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**1 6.0 PROCEDURES TO PREVENT HAZARDS [F]**

2 This chapter discusses security; inspection plan; preparedness and prevention requirements; preventive  
3 procedures, structures, and equipment; and prevention of reaction of ignitable, reactive, and incompatible  
4 waste as related to WESF.

5  
6 WESF is operated to minimize exposure of human health and the environment to the mixed waste  
7 capsules. Shielding, contamination control, control of toxic or dangerous material, and safety and  
8 security procedures will be used to keep exposure ALARA. Shielding will be provided to comply with  
9 the ALARA as required by 10 CFR 835.

10  
11 The mixed waste is in solid form and placed in stainless steel capsules.

**12  
13  
14 6.1 SECURITY [F-1]**

15 Refer to Permit Attachment 33, Section 6.1 Security.

**16  
17  
18 6.1.1 Security Procedures and Equipment [F-1a]**

19 Because WESF is located within the portion of the Hanford Facility controlled by the 24-hour  
20 surveillance system, WAC 173-303-310(2)(c) does not apply. In lieu of the signage described in Permit  
21 Attachment 33, Section 6.1.1, entrances to portions of WESF used to manage waste are posted with a  
22 sign, in English, reading, "DANGER WASTE STORAGE - MAJOR RISK: TOXIC." Signs will be  
23 visible from all angles of approach, and will be legible from a distance of at least 7.6 meters (24.9 feet)  
24 and meets the intent of WAC 173-303-310.

**25  
26  
27 6.1.2 Waiver [F-1(b)]**

28 Waiver of the security procedures and equipment requirements for WESF are not requested; therefore,  
29 WAC 173-303-310(1)(a) and (b) are not applicable to WESF.

**30  
31  
32 6.2 INSPECTION PLAN [F-2]**

33 This section describes the method and schedule for inspections at WESF. These inspections will help  
34 ensure that situations do not exist that might cause or lead to the release of mixed waste to the  
35 environment or that might pose a threat to human health and environment. Deficiencies identified by  
36 inspections must be corrected on a schedule that prevents hazards to personnel, the public, and the  
37 environment.

**38  
39  
40 6.2.1 General Inspection Requirements [F-2a, F-2b]**

41 The content and frequency of inspections are described in this section. The schedule and inspection  
42 records are kept in the inspection logbooks and retained by WESF operations personnel. Inspection  
43 records will be retained in accordance with Hanford Facility RCRA Permit Condition II.I.1. and will  
44 contain the following information:

- 1
- 2 • Date and time of inspection
- 3 • Printed name and the hand written signature of the inspector
- 4 • Notation of the observations made
- 5 • Date and nature of any repairs or remedial actions taken.
- 6

7 The inspection checklists will consist of a listing of items to be assessed during each inspection. A  
8 'yes/no' response will be made for each listed item. Any deficiencies identified and recorded during the  
9 inspection will be reported to WESF management. WESF management will review and determine  
10 corrective actions to be taken.

#### 11

#### 12 **6.2.1.1 Types of Potential Problems [F-2a(1), (2), (4), and (5)]**

13 Types of problems looked for during an inspection are provided in Table 6-1. All of the waste in storage  
14 at WESF originated at WESF. WESF does not receive mixed waste from an onsite and/or offsite facility.  
15 Because the mixed waste is in a solid form within a stainless steel capsule, spills are not probable.  
16 Therefore, spills are not considered among the types of problems that should be addressed through  
17 inspections.

#### 18

#### 19 **6.2.1.2 Inspection Schedule [F-2a(3)]**

20 The mixed waste capsules are sealed. Frequent inspection of individual mixed waste capsules that require  
21 removal of capsules from storage racks is not feasible because of ALARA concerns and the storage  
22 configuration as described in Chapter 4.0 of this permit application.

23  
24 The solid form of mixed waste is sealed in the stainless steel capsules; this makes a leak unlikely.  
25 Therefore, frequent capsule inspection is not necessary and removal of the capsules only introduces  
26 additional risk for potential capsule damage. Refer to Table 6-1 for proposed inspection frequencies.

#### 27

#### 28

#### 29 **6.2.2 Schedule for Remedial Action for Problems Revealed [F-2c]**

30 In accordance with WAC 173-303-320(3) the WESF operating organization will remedy any problems  
31 revealed by the inspection on a schedule that prevents hazards to human health and the environment.  
32 Where a hazard is imminent or already has occurred, immediate action will be taken. Immediate actions  
33 will be implemented based on the contingency plan (Chapter 7.0 of this permit application),

#### 34

#### 35

#### 36 **6.2.3 Specific Process or Waste Type Inspection Requirements [F-2d]**

37 Due to the design of the capsules and storage restrictions, the capsules can not be routinely inspected by  
38 direct visual means. Inspections of other types of equipment that provide confidence to detect leakage of  
39 the capsules are provided in Table 6-1.

#### 40

#### 41

#### 42 **6.3 PREPAREDNESS AND PREVENTION REQUIREMENTS [F-3, F-3a, F-3b]**

43 The following sections describe the preparedness and prevention measures to be taken at WESF.

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**1 6.3.1 Equipment Requirements [F-3a]**

2 The following sections describe the internal and external communications systems and the emergency  
3 equipment required that can be activated by the WESF BED. Hanford Facility-wide equipment is  
4 identified in Permit Attachment 4, *Hanford Emergency Management Plan* (DOE/RL-94-02).

**7 6.3.2 Internal Communication [F-3a(1)]**

8 At WESF, telephones capable of public address are used for internal communication and are located  
9 throughout the facility.

10  
11 Personnel at WESF will have voice communication or equivalent (e.g., hand signals) during work  
12 assignments to maintain external communications with shift supervisors. Supervision will contact the  
13 Hanford Facility emergency telephone number (911) (373-3800 for cellular telephones) if assistance is  
14 needed.

15  
16 The onsite internal communication systems provide immediate emergency instruction to personnel. The  
17 onsite internal communication system includes telephones, various alarms systems, PAX system, and  
18 two-way radios.

**21 6.3.3 External Communications [F-3a(2)]**

22 WESF is equipped with devices for summoning emergency assistance from the Hanford Fire Department  
23 and/or emergency response teams as necessary. External communication is made via fire alarms, a  
24 telephone communication system, or two-way radios (hand-held and vehicle-mounted radios) as  
25 described in Permit Attachment 4, *Hanford Emergency Management Plan* (DOE/RL-94-02). A telephone  
26 communication system and two-way radios can be used to access a supervisor, who contacts the Hanford  
27 Site emergency network if assistance is needed. Refer to Chapter 7.0, Section 7.4.3 of this permit  
28 application for communication equipment requirements.

**31 6.3.4 Emergency Equipment [F-3a(3)]**

32 Emergency equipment will be available for use at WESF as required by WAC 173-303-340(1). A list of  
33 equipment is included in the contingency plan (Chapter 7.0 in this permit application).

**36 6.3.5 Water for Fire Control [F-3a(4)]**

37 The pool cell area does not use water for fire control. The hot cell area currently has a manually activated  
38 fire suppression system. Incidental combustibles within WESF are administratively controlled to  
39 minimize fire hazards in these areas of the facility.

**42 6.4 PREVENTIVE PROCEDURES, STRUCTURES, AND EQUIPMENT [F-4]**

43 The following sections describe preventive procedures, structures, and equipment.  
44  
45

**1 6.4.1 Unloading Operations [F-4a]**

2 All of the waste in storage at WESF originated at WESF. WESF does not receive mixed waste from an  
3 onsite and/or offsite facility; therefore, no unloading operations inspections are required. Any additional  
4 waste accepted into WESF will require a modification of this chapter and sitewide permit.  
5  
6

**7 6.4.2 Run-Off [F-4b]**

8 Because the mixed waste capsules are stored in pool cells within the 225B Building and pool level is  
9 controlled as described in Chapter 4.0 in this permit application, run-on is not considered a relevant factor  
10 in evaluating the protectiveness of waste storage activities at WESF. However, normal building design  
11 and construction practices at WESF do address precipitation control. The WESF roof, walls, and  
12 foundation prevent precipitation run-on from entering the pool cell and hot cell areas; therefore, no  
13 precipitation can contact the waste. Because no precipitation can enter the building to contact the waste,  
14 no run-off is expected.  
15  
16

**17 6.4.3 Water Supplies [F-4c]**

18 Pool cell levels are monitored. Deionized water is supplied to the pool cell area for filling the pool cells  
19 as required. The pool cell area has a sanitary water supply and the hot cell area has deionized water and  
20 raw water for fire suppression. The rest of WESF has water supplied for the support areas within the  
21 225B Building.  
22  
23

**24 6.4.4 Equipment and Power Failure [F-4d]**

25 Loss of electrical power does not constitute an emergency situation and would not result in a release of  
26 mixed waste. WESF will not be occupied during power outages except for personnel providing a  
27 response action. Rechargeable battery-powered lighting units will provide emergency illumination.  
28 Emergency communication equipment will be available to summon emergency assistance in the event of  
29 a power loss.  
30  
31

**32 6.4.5 Personal Protection Equipment [F-4e]**

33 Personnel will be trained in the use of applicable personal protection equipment. Examples of frequently  
34 used personal protection equipment include clothing (i.e., cloth coveralls, cloth and rubber shoe cover,  
35 cloth and rubber gloves and cloth caps), hard hats, safety shoes, and safety glasses (if required).  
36

37 In addition, various types of respiratory protection devices will be available if required. Personnel will be  
38 directed to use a particular type of respiratory device, depending on the specific respiratory hazard that  
39 might exist. Chapter 7.0 in this permit application identifies appropriate respiratory protective equipment.  
40  
41

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1 **6.5 PREVENTION OF REACTION OF IGNITABLE, REACTIVE, AND**  
2 **INCOMPATIBLE WASTE [F-5]**

3 WESF does not store ignitable waste, reactive waste, or waste found incompatible with the mixed waste  
4 capsules (refer to Chapter 3.0 in this permit application).

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Table 6-1. WAC 173-303-320(2) Inspection Schedule.

Requirement description	Inspection frequency	Types of potential problems
Data from leak detection equipment monitors leakage of the capsules (not pool cell water)	Monthly	Observe annunciator panel in WESF operation gallery to determine if lights are operating.
Security devices: "Danger Waste storage – major risk: toxic" signs	Weekly	Signs are posted and legible.
Safety and emergency equipment: emergency lighting	Monthly	Equipment is present and functional.
Annual inspection of 225B Building	Annually	Walk around outside of building and identify any structural damage.

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## 7.0 CONTINGENCY PLAN [G]

### **OFFICIAL USE ONLY**

#### **CONTACT:**

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3100 Port of Benton, Richland, WA 99354  
509-372-7894

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1

**8.0 PERSONNEL TRAINING [H]**

2 This chapter discusses personnel training requirements based on WAC 173-303 and HF RCRA Permit  
 3 [Dangerous Waste (DW) Portion]. In accordance with WAC 173-303-806(4)(a)(xii), the *Hanford*  
 4 *Facility Dangerous Waste Part B Permit Application* must contain two items: (1) “an outline of both the  
 5 introductory and continuing training programs by owners or to prepare persons to operate or maintain the  
 6 TSD facility in a safe manner as required to demonstrate compliance with WAC 173-303-330” and (2) “a  
 7 brief description of how training will be designed to meet actual job tasks in accordance with the  
 8 requirements in WAC 173-303-330(1)(d).” The HF RCRA Permit (DW Portions), Condition II.C  
 9 (Personnel Training) contains training requirements applicable to Hanford Facility personnel and  
 10 non-Facility personnel.

11

12 Compliance with these requirements at WESF is contained in the HF RCRA Permit, DOE/RL-91-28,  
 13 Chapter 8.0 and Chapter 8.0 of this permit application. Chapter 8.0 of this permit application  
 14 supplements DOE/RL-91-28, Chapter 8.0.

15

16

17

**8.1 OUTLINE OF INTRODUCTORY AND CONTINUING TRAINING PROGRAMS**

18 The introductory and continuing training programs are designed to prepare personnel to manage and  
 19 maintain the TSD unit in a safe, effective, and environmentally sound manner. In addition to preparing  
 20 personnel to manage and maintain TSD units under normal conditions, the training programs ensure that  
 21 personnel are prepared to respond in a prompt and effective manner should abnormal or emergency  
 22 conditions occur. Emergency response training is consistent with the description of actions contained in  
 23 Chapter 7.0, Contingency Plan, in this permit application. The introductory and continuing training  
 24 programs contain the following objectives:

25

26 • Instruct Hanford Facility personnel to perform their duties in a way that ensures Hanford Facility  
 27 compliance with WAC 173-303

28

29 • Instruct Hanford Facility personnel on the dangerous waste management procedures (including  
 30 implementation of the contingency plan) relevant to the job titles/positions in which they are  
 31 employed

32

33 • Ensure Hanford Facility personnel can respond effectively to emergencies.

34

35

36

**8.1.1 Introductory Training**

37 Introductory training includes general Hanford Facility training and TSD unit-specific training. General  
 38 Hanford Facility training is described in DOE/RL-91-28, Section 8.1, and is provided in accordance with  
 39 the Permit Condition II.C.2. TSD unit-specific training is provided to Hanford Facility personnel  
 40 allowing those personnel to work unescorted, and in some cases is required for escorted access. Hanford  
 41 Facility personnel cannot perform a task for which they are not trained properly, except to gain required  
 42 experience while under the direct supervision of a supervisor or coworker who is properly trained.  
 43 Hanford Facility waste management personnel must be trained within 6 months after their employment at  
 44 or assignment to the Hanford Facility, or to a new job title/position on the Hanford Facility, whichever is  
 45 later.

46

47 General Hanford Facility training: A description is provided in DOE/RL-91-28, Section 8.1.

48

1 Contingency Plan training: Hanford Facility personnel receive training on applicable portions of the  
2 *Hanford Emergency Management Plan* Permit Attachment 4 in General Hanford Facility training. In  
3 addition, Hanford Facility personnel receive training on content of the description of actions contained in  
4 contingency plan documentation in Chapter 7.0 of this permit application to be able to effectively respond  
5 to emergencies.  
6

7 Emergency Coordinator training: Hanford Facility personnel who perform emergency coordinator duties  
8 in WAC 173-303-360 (e.g., Building Emergency Director) in the Hanford Incident Command System  
9 receive training on implementation of the contingency plan and fulfilling the position within the Hanford  
10 Incident Command System. These Hanford Facility personnel also must become thoroughly familiar  
11 with applicable contingency plan documentation, operations, activities, location, and properties of all  
12 waste handled, location of all records, and the unit/building layout.  
13

14 Operations training: Dangerous waste management operations training (e.g., waste designation training,  
15 shippers training) is determined on a unit-by-unit basis and considers the type of waste management unit  
16 (e.g., container management unit) and the type of activities performed at the waste management unit (e.g.,  
17 sampling). For example, training provided for management of dangerous waste in containers is different  
18 than the training provided for management of dangerous waste in a tank system. Common training  
19 required for compliance within similar waste management units can be provided in general training and  
20 supplemented at the TSD unit. Training provided for TSD unit-specific operations is identified in the  
21 training plan documentation based on: (1) whether a general training course exists, (2) whether the  
22 training needs to ensure waste management unit compliance with WAC 173-303, and (3) training  
23 commitments agreed to with Ecology.  
24  
25

## 26 **8.1.2 Continuing Training**

27 Continuing training meets the requirements for WAC 173-303-330(1)(b) and includes general Hanford  
28 Facility training and TSD unit-specific training.  
29

30 General Hanford Facility training: Annual refresher training is provided for General Hanford Facility  
31 training. A description is provided in DOE/RL-91-28, Section 8.1.  
32

33 Contingency Plan training: Annual refresher training is provided for contingency plan training (refer to  
34 description in Chapter 8.0, Section 8.1.1 of this permit application).  
35

36 Emergency Coordinator training: Annual refresher training is provided for Emergency Coordinator  
37 training (refer to description in Chapter 8.0, Section 8.1.1 of this permit application).  
38

39 Operations training: Refresher training occurs on many frequencies (i.e., annual, every other year, every  
40 3 years) for operations training. When justified, some training will not contain a refresher course and will  
41 be identified as a one-time only training course. The TSD unit-specific training plan documentation  
42 specifies the frequency for each training course. Refer to description in Chapter 8.0, Section 8.1.1 in this  
43 permit application.  
44  
45

## 46 **8.2 DESCRIPTION OF TRAINING DESIGN**

47 Proper design of a training program ensures personnel who perform duties on the Hanford Facility related  
48 to WAC 173-303-330(1)(d) are trained to perform their duties in compliance with WAC 173-303. Actual  
49 job tasks, referred to as duties, are used to determine training requirements. The first step taken to ensure  
50 Hanford Facility personnel have received the proper training is to determine and document the waste

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1 management duties by job title/position. The second step compares waste management duties to general  
 2 waste management unit training curriculum. If general waste management unit training curriculum does  
 3 not address the waste management duties, the training curriculum is supplemented and/or on-the-job  
 4 training is provided. The third step summarizes the content of a training course necessary to ensure that  
 5 the training provided to each job title/position addresses associated waste management duties. The last  
 6 step is to assign training curriculum to Hanford Facility personnel based on the previous evaluation. The  
 7 training plan documentation contains this process.

8  
 9 Waste management duties include those specified in Chapter 8.0, Section 8.1 of this permit application as  
 10 well as those contained in WAC 173-303-330(1)(d). Training elements of WAC 173-303-330(1)(d)  
 11 applicable to the WESF operations include the following:

- 12
- 13 • Procedures for using, inspecting, repairing, and replacing emergency and monitoring equipment
- 14 • Communications or alarm systems
- 15 • Response to fires or explosions.
- 16

17 Hanford Facility personnel who perform these duties receive training pertaining to their duties. The  
 18 training plan documentation described in Chapter 8.0, Section 8.3 of this permit application contains  
 19 specific information regarding the types of training Hanford Facility personnel receive based on the  
 20 outline in Chapter 8.0, Section 8.1 of this permit application.

### 21 22 23 **8.3 DESCRIPTION OF TRAINING PLAN**

24 In accordance with Permit Condition II.C.3, the unit-specific portion of the *Hanford Facility Dangerous*  
 25 *Waste Permit Application* must contain a description of the training plan. Training plan documentation is  
 26 maintained outside of a Hanford Facility dangerous waste Part B permit application and the Permit.  
 27 Therefore, changes made to training plan documentation are not subject to the HF RCRA Permit  
 28 modification process. However, the training plan documentation is prepared to comply with  
 29 WAC 173-303-330(2).

30  
 31 Documentation prepared to meet the training plan consists of hard copy and/or electronic media as  
 32 provided by Permit Condition II.C.1. The training plan documentation consists of one or more  
 33 documents and/or a training database with all the components identified in the core document.

34  
 35 A description of how training plan documentation meets the three items in WAC 173-303-330(2) is as  
 36 follows.

- 37
- 38 1. -330(2)(a): "The job title, job description, and name of the employee filling each job. The job  
 39 description must include requisite skills, education, other qualifications, and duties for each position."
- 40

41 Description: The specific Hanford Facility personnel job title/position is correlated to the waste  
 42 management duties. Waste management duties relating to WAC 173-303 are correlated to training  
 43 courses to ensure training is properly assigned.

44  
 45 Only names of Hanford Facility personnel who carry out job duties relating to TSD unit waste  
 46 management operations at WESF are maintained. Names are maintained within the training plan  
 47 documentation. A list of Hanford Facility personnel assigned to WESF is available on request.

48  
 49 Information on requisite skills, education, and other qualifications for job titles/positions is addressed  
 50 by providing a reference where this information is maintained (e.g., Human Resources). Specific

1 information concerning job title, requisite skills, education, and other qualifications for personnel can  
2 be provided on request.

3  
4 2. -330(2)(b): "A written description of the type and amount of both introductory and continuing  
5 training required for each position."  
6

7 Description: In addition to the outline provided in Section 8.1 of this permit application, training  
8 courses developed to comply with the introductory and continuing training programs are identified  
9 and described in the training plan documentation. The type and amount of training is specified in the  
10 training plan documentation as shown in Table 8-1.

11  
12 3. -330(2)(c): "Records documenting that personnel have received and completed the training required  
13 by this section. The Department may require, on a case-by-case basis, that training records include  
14 employee initials or signature to verify that training was received."  
15

16 Description: Training records are maintained consistent with DOE/RL-91-28, Section 8.3.

Table 8-1. Waste Encapsulation and Storage Facility Training Matrix.

Hanford Facility RCRA Permit, Attachment 33, Chapter 8.0 Training Category	Training Category*				
	General Hanford Facility training	Contingency Plan training	Emergency Coordinator training	Operations training	
WESF DWTP implementing plan	Orientation Program	Emergency Response (contingency plan)	Emergency Coordinator Training	General Waste Management	Miscellaneous Storage Unit Management
<b>Job title/position</b>					
Nuclear Chemical Operator	X	X			X
Shift Operations Manager (SOM)	X	X	X		
Environmental Compliance Officer	X			X	

\* Refer to the WESF Dangerous Waste Training Plan for a complete description of coursework in each training category.

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## 9.0 EXPOSURE INFORMATION REPORT

2 WESF does not store, treat, or dispose of hazardous waste in a surface impoundment or landfill as defined  
3 in 40 CFR 270.10. Therefore, exposure information report requirements under RCRA, Section 3019, are  
4 not applicable.  
5

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1 **10.0 WASTE MINIMIZATION [D-9]**

2 To fulfill the requirements of 40 CFR 264.73(b)(9), WAC 173-303-380(1)(q), and Hanford Facility  
3 RCRA Permit Condition II.Z a certification that WESF has a waste minimization and pollution  
4 prevention program in place will be entered annually into the WESF operating record (refer to  
5 Chapter 12.0, Reporting and Recordkeeping of this permit application).  
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## 11.0 CLOSURE AND FINANCIAL ASSURANCE [I AND I-1]

2 This chapter presents the closure plan for WESF. Closure of WESF will comply with WAC 173-303-610  
3 regulations for TSD units. As a miscellaneous storage unit managing mixed waste in sealed capsules, the  
4 WESF is not anticipated to become contaminated by the dangerous component of the mixed waste.  
5

6 This chapter describes the performance standards that will be met and closure activities that will be  
7 conducted to achieve clean closure for the WESF pool cell and hot cell areas.  
8

9 Please note that source, special nuclear, and byproduct materials, as defined in the AEA, are regulated at  
10 DOE facilities exclusively by DOE acting pursuant to its AEA authority. These materials are not subject  
11 to regulation by the State of Washington. All information contained herein and related to, or describing  
12 AEA-regulated materials and process in any manner, may not be used to create conditions or other  
13 restrictions set forth in any permit, license, order, or any other enforceable instrument. DOE asserts that  
14 pursuant to the AEA, it has sole and exclusive responsibility and authority to regulate source, special  
15 nuclear, and byproduct materials at DOE-owned nuclear facilities. Information contained herein on  
16 radionuclides is provided for process description purposes only.  
17

18 WESF is operated as a clean, well-maintained unit. Detailed records are maintained of the materials  
19 stored at WESF. For closure, the unit will be divided into two components: (1) the WESF pool cell area,  
20 consisting of Pool Cells 1 through 8, and 12 (Pool Cells 9, 10, and 11 are outside the TSD unit boundary);  
21 and, (2) WESF hot cell area. For the pool cell and hot cell areas, the closure approach will be closure by  
22 removal or decontamination ("clean close"). Consistent with the criteria that must be met to clean close a  
23 TSD unit, no waste will be closed in place and therefore no post-closure activities will be necessary.  
24 Clean closure will be based on process knowledge indicating that there have been no releases of material  
25 from the capsules during permitted storage.  
26  
27

### 11.1 CLOSURE PLAN [I-1]

29 The following sections address closure performance standards and activities.  
30  
31

#### 11.1.1 Closure Performance Standard [I-1a]

33 This plan has been developed to close the pool cells and hot cells in a manner that meets the closure  
34 performance standards of WAC 173-303-610(2). Clean closure is based on confirmation of no spills or  
35 leaks of mixed waste from the cesium and strontium capsules.  
36

37 The clean closure performance standards are removal of all mixed waste capsules and demonstration,  
38 using process knowledge, that no releases of mixed waste from the capsules have occurred. No new  
39 mixed waste streams or mixed waste volume will be generated during the process since the wastes are in  
40 sealed capsules.  
41

42 With no identified releases of mixed waste, no soil contamination could occur and therefore no soil  
43 remediation is required.  
44

45 If monitoring or inspection of cesium and strontium capsules or of pool cell water indicates a release of  
46 mixed waste from one or more capsules, the Permittee will seek modification of the sitewide permit to  
47 appropriately modify this closure plan. This permit modification request will be in accordance with  
48 WAC 173-303-610(3)(b).

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**11.1.2 Closure Activities [I-1b]**

Closure of the WESF pool cells and hot cells will ensure that the pool cell and hot cell areas are not contaminated with mixed waste or waste residues (contamination is not expected).

Closure activities will entail the following.

- Remove inventory of cesium and strontium capsules from the pool cell and hot cell areas and transfer of the capsules when a final disposition option becomes available.
- Verify that the water in the pools is not contaminated with mixed waste or mixed waste residues.
- Transfer pool water to the Treated Effluent Disposal Facility (TEDF) or other treatment and/or disposal facility with necessary authorization and capability to treat pool water at time of closure, if necessary.
- Hot cell area unit operating records will be reviewed to confirm that no spills/releases have occurred from any cesium or strontium capsules while in storage.
- Obtain an independent professional engineer certification that closure activities were completed in accordance with the approved closure plan.

**11.1.3 Maximum Extent of Operation [I-1b(1) and I-1c]**

The closure plan is limited to the TSD area for Pool Cells 1 through 8 and 12 and Hot Cells F and G in the 225B Building. The waste is stored in capsules in Pool Cells 1, 3 through 7 and 12. The capsules are stainless steel with maximum outer height of approximately 53 centimeters (~21 inches) and maximum diameter of approximately 8 centimeters (~3 inches). Some of the cesium capsules are overpacked. There are a total of 1,936 capsules of which 601 are strontium fluoride and 1,335 are cesium chloride. The mixed waste constituents are barium, cadmium, chromium, lead, and silver.

**11.1.4 Remove Waste Inventory [I-1b(2)]**

The capsules will be removed from the pool cell and hot cell areas at the time of closure, no waste will remain at (in) WESF. The capsules will be relocated to a permitted TSD unit or to a national repository.

The capsules are stored in 4 meters (13 feet) of shielding water in Pool Cells 1 and 3 through 7. To move a capsule into G Cell, it is first moved through transfer ports into Pool Cell 12. The transfer ports connect Pool Cells 1 through 8 to Pool Cell 12. A transfer port has a ball valve that can be opened and closed to transfer capsules or water between each of the pool cells and Pool Cell 12. The transfer port is located approximately 1 meter (3 feet) above the pool cell floor. Once in Pool Cell 12, the capsule is moved down Pool Cell 12 with tongs towards Hot Cell G and placed on a capsule transfer cart equipped with a trolley device for raising the capsules into Hot Cell G. Capsules are transferred individually to Hot Cell G through the capsule transfer chute between Hot Cell G and Pool Cell 12.

1 Capsules will be shipped from WESF in casks approved by DOE and/or the Nuclear Regulatory  
2 Commission. The cask provides shielding and confinement as well as impact, puncture, and thermal  
3 protections during transport.  
4

#### 5 **11.1.4.1 Verify Performance Standard [I-1b(4)]**

6 Verification of no releases to the pool cell and hot cell areas will be determined by evaluation of the  
7 operation records, logbooks, and personnel interviews to verify if there have been any leaking capsules.  
8 If, based on the findings during these reviews a determination has been made that no releases have  
9 occurred, the pool cell and hot cell areas will have met the performance standards.  
10

#### 11 **11.1.4.2 Review Records**

12 WESF records of the operating life of this TSD unit (WESF became active in July 1997) will be reviewed  
13 to ensure that there is no documentation indicating a leak of a capsule while in the pool cells. The records  
14 to be reviewed include the following:  
15

- 16 • Analytical results from monitoring activities
- 17 • Visual examinations of the capsules conducted throughout the storage period.  
18

### 19 **11.2 SCHEDULE FOR CLOSURE [I-1F]**

20  
21 Closure activities will begin after a determination is made on disposition of the cesium and strontium  
22 capsules. At that time, a schedule for closure will be proposed and submitted in accordance with Permit  
23 Condition II.J.3.  
24

### 25 **11.3 CERTIFICATION OF CLOSURE**

26  
27 The independent registered professional engineer certification of closure will certify that the unit has been  
28 closed in accordance with the specifications in the final approved closure plan to include any approved  
29 permit modifications. The independent registered professional engineer will provide a signed statement  
30 that meets the applicable requirements of WAC 173-303-610(6), certifying that the closure activities were  
31 performed in accordance with the specifications in the approved closure plan. The independent registered  
32 professional engineer certification is to confirm that the activities took place and the unit closed in  
33 accordance with the approved closure plan. A copy of the independent registered professional engineer  
34 certification will be transmitted to Ecology by registered mail within sixty (60) days following  
35 completion of WESF closure activities and placed in the Administrative Record.  
36

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## 12.0 REPORTING AND RECORDKEEPING

2 Reports and records applicable to WESF are summarized in the Permit, Attachment 33, Chapter 12.0,  
3 Table 12.1.  
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**13.0 OTHER FEDERAL AND STATE LAWS [J]**

WAC 173-303-806(4)(a)(xix) states: *Applicants may be required to submit such information as may be necessary to enforce the department to carry out its duties under state or federal laws as required.* WESF operations are consistent with requirements of other federal and state laws.

The Permittees will submit information as requested by Ecology that will allow Ecology to carry out its duties under other state and federal laws.

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**14.0 PART B CERTIFICATION [K]**

2 The following certification, required by WAC 173-303-810(13), for all applications and reports  
3 submitted to Ecology is hereby included:

4

5 I certify under penalty of law that this document and all attachments were prepared under my direction or  
6 supervision in accordance with a system designed to assure that qualified personnel properly gather and  
7 evaluate the information submitted. Based on my inquiry of the person or persons who manage the  
8 system, or those persons directly responsible for gathering the information, the information submitted is,  
9 to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are  
10 significant penalties for submitting false information, including the possibility of fine and imprisonment  
11 for knowing violations.

12

13

14

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16

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18



19  
20 Owner/Operator  
21 David A. Brockman, Manager  
22 U.S. Department of Energy,  
23 Richland Operations Office

11/26/07  
Date

24

25

26

27

28

29



30 Co-operator  
31 Cornelius M. Murphy  
32 President and Chief Executive Officer  
33 Fluor Hanford

10/1/07  
Date

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**15.0 REFERENCES**

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3 *Information Portion*, U.S. Department of Energy, Richland Operations Office, Richland,  
4 Washington.
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7 Richland Operations Office, Richland, Washington.
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9 Ecology, 2006, *Hanford Facility Resource Conservation and Recovery Act Permit, Dangerous Waste*  
10 *Portion, Revision 8, for the Treatment, Storage, and Disposal of Dangerous Waste*, Permit Number  
11 WA7890008967, Washington State Department of Ecology, Nuclear Waste Program, Olympia,  
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19 *Encapsulation and Storage Facility*, Fluor Hanford, Richland, Washington.
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22 Washington.
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