

1                                   **PART III, OPERATING UNIT 15 UNIT-SPECIFIC CONDITIONS**

2   **331-C Storage Unit**

---

3   The 331-C Storage Unit is a dangerous waste storage unit located in the 300 Area. The unit is used for  
4   the collection, consolidation, packaging, storage, and preparation for transport and disposal of dangerous  
5   waste. The waste stored at the 331-C Storage Unit consist of listed waste, waste from nonspecific  
6   sources, characteristic waste, and state-only waste derived from research activities and facility operations.

7   This document sets forth the operating conditions for the 331-C Storage Unit.

8   **III.15.A           COMPLIANCE WITH PERMIT CONDITIONS**

9   The Permittees shall comply with all requirements set forth in the Hanford Facility Dangerous Waste  
10  Permit including all approved modifications. All chapters, subsections, figures, tables, and appendices  
11  included in the following unit-specific Permit Conditions are enforceable in their entirety.

12  In the event that the Part III-Unit-Specific Conditions for Operating Unit 15, 331-C Storage Unit conflict  
13  with the Part I-Standard Conditions and/or Part II-General Facility Conditions of the Permit, the unit-  
14  specific conditions for Operating Unit 15, 331-C Storage Unit prevail.

15  **OPERATING UNIT 15:**

- 16  Chapter 1.0    Part A Form, Revision 0, dated December 15, 2006
- 17  Chapter 2.0    Unit Description, dated January 2007
- 18  Chapter 3.0    Waste Analysis Plan, dated January 2007
- 19  Chapter 4.0    Process Information, dated January 2007
- 20  Chapter 6.0    Procedures to Prevent Hazards dated December 31, 2007(also refer to Permit  
21                   Attachment 33, §6.1)
- 22  Chapter 7.0    Contingency Plan, dated December 31, 2007
- 23  Chapter 8.0    Training Plan, dated January 2007
- 24  Chapter 11.0   Closure and Postclosure Requirements, dated January 2007
- 25  Chapter 12.0   Reporting and Recordkeeping (refer to Permit Attachment 33, Table 12.1)

26  **III.15.B           UNIT-SPECIFIC CONDITIONS 331-C STORAGE UNIT**

27  III.15.B.1    Portions of Permit Attachment 4, *Hanford Emergency Management Plan*,  
28                   (DOE/RL-94-02) that are not made enforceable by inclusion in the applicability matrix  
29                   for that document are not made enforceable by reference in this document.

1  
2  
3  
4  
5

This page intentionally left blank.

1	<b>Chapter 1.0</b>	<b>Part A</b>
2	1.0 PART A DANGEROUS WASTE PERMIT.....	1.1

---

1

**1.0 PART A DANGEROUS WASTE PERMIT**

2

The following is a chronology of the regulatory history of the 331-C Storage Unit.

3

- December 15, 2005, submitted original Part A Form to the Washington State Department of Ecology (Ecology) with Part B information and temporary authorization request.

4

5

- A temporary authorization was granted by Ecology on March 16, 2006.



WASHINGTON STATE  
 DEPARTMENT OF  
 ECOLOGY

**Dangerous Waste Permit Application  
 Part A Form**

Date Received	Reviewed by: <i>J. Wallace</i>	Date: 06/15/2006
Month Day Year	Approved by: <i>J.P. Davis</i>	Date: 06/26/2006
12/15/2005	Please refer to instructions for completing this form.	

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

- Request modification to a final status permit (commonly called a "Part B" permit)
  - Request a change under interim status
  - 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).
  - Establish interim status because of the wastes newly regulated on: \_\_\_\_\_ (Date)
- List waste codes: \_\_\_\_\_

**II. EPA/State ID Number**

WA 7890008967

**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. Land Type	C. Geographic Location		D. Facility Existence Date		
	Latitude (degrees, mins, secs)	Longitude (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

<b>VI. Facility contact (Person to be contacted regarding waste activities at facility)</b>											
<b>Name (last)</b>						<b>(first)</b>					
Klein						Keith					
<b>Job Title</b>						<b>Phone Number (area code and number)</b>					
Manager						(509) 376-7395*					
<b>Contact Address</b>											
<b>Street or P.O. Box</b>											
P.O. Box 550											
<b>City or Town</b>						<b>State</b>			<b>ZIP Code</b>		
Richland						WA			99352		
<b>VII. Facility Operator Information</b>											
<b>A. Name</b>						<b>Phone Number (area code and number)</b>					
Department of Energy* Owner/Operator Pacific Northwest National Laboratory** Co-Operator for 331-C Storage Unit						(509) 376-7395* (509) 376-1187**					
<b>Street or P.O. Box</b>											
P.O. Box 550* P.O. Box 999**											
<b>City or Town</b>						<b>State</b>			<b>ZIP Code</b>		
Richland						WA			99352		
<b>B. Operator Type</b>		F									
<b>C. Does the name in VII.A reflect a proposed change in operator?</b>						<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No					
If yes, provide the scheduled date for the change:						Month		Day		Year	
<b>D. Is the name listed in VII.A. also the owner? If yes, skip to Section VIII.C.</b>								<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No			
<b>VIII. Facility Owner Information</b>											
<b>A. Name</b>						<b>Phone Number (area code and number)</b>					
Keith A. Klein, Operator/Facility-Property Owner						(509) 376-7395*					
<b>Street or P.O. Box</b>											
P.O. Box 550											
<b>City or Town</b>						<b>State</b>			<b>ZIP Code</b>		
Richland						WA			99352		
<b>B. Operator Type</b>		F									
<b>C. Does the name in VII.A reflect a proposed change in operator?</b>						<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No					
If yes, provide the scheduled date for the change:						Month		Day		Year	
<b>IX. NAICS Codes (5/6 digit codes)</b>											
<b>A. First</b>						<b>B. Second</b>					
5	4	1	7	1	0	9	9	9	9	9	9
Research & Development in the Physical, Engineering, & Life Sciences						Unclassified Establishments					
<b>C. Third</b>						<b>D. Fourth</b>					



**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. Amount	2. Unit of Measure (enter code)						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	0	1	20,000	G	001	1							
2							2							
3							3							
4							4							
5							5							
6							6							
7							7							
8							8							
9							9							
1 0							1 0							
1 1							1 1							
1 2							1 2							
1 3							1 3							
1 4							1 4							
1 5							1 5							
1 6							1 6							
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							













EPA/State ID Number	W	A	7	8	9	0	0	0	8	9	6	7
---------------------	---	---	---	---	---	---	---	---	---	---	---	---

**Continuation of Section XIV. Description of Dangerous Waste**

Line Number	A. Dangerous Waste No. (enter code)			B. Estimated Annual Quantity of Waste	C. Unit of Measure (enter code)	D. Process								
						(1) Process Codes (enter)				(2) Process Description [If a code is not entered in D (1)]				
1	9	6	U 0 2 4	200	K	S	0	1						Includes Debris
1	9	7	U 0 2 5	200	K	S	0	1						Includes Debris
1	9	8	U 0 2 6	200	K	S	0	1						Includes Debris
1	9	9	U 0 2 7	200	K	S	0	1						Includes Debris
2	0	0	U 0 2 8	200	K	S	0	1						Includes Debris
2	0	1	U 0 2 9	200	K	S	0	1						Includes Debris
2	0	2	U 0 3 0	200	K	S	0	1						Includes Debris
2	0	3	U 0 3 1	200	K	S	0	1						Includes Debris
2	0	4	U 0 3 2	200	K	S	0	1						Includes Debris
2	0	5	U 0 3 3	200	K	S	0	1						Includes Debris
2	0	6	U 0 3 4	200	K	S	0	1						Includes Debris
2	0	7	U 0 3 5	200	K	S	0	1						Includes Debris
2	0	8	U 0 3 6	200	K	S	0	1						Includes Debris
2	0	9	U 0 3 7	200	K	S	0	1						Includes Debris
2	1	0	U 0 3 8	200	K	S	0	1						Includes Debris
2	1	1	U 0 3 9	200	K	S	0	1						Includes Debris
2	1	2	U 0 4 1	200	K	S	0	1						Includes Debris
2	1	3	U 0 4 2	200	K	S	0	1						Includes Debris
2	1	4	U 0 4 3	200	K	S	0	1						Includes Debris
2	1	5	U 0 4 4	200	K	S	0	1						Includes Debris
2	1	6	U 0 4 5	200	K	S	0	1						Includes Debris
2	1	7	U 0 4 6	200	K	S	0	1						Includes Debris
2	1	8	U 0 4 7	200	K	S	0	1						Includes Debris
2	1	9	U 0 4 8	200	K	S	0	1						Includes Debris
2	2	0	U 0 4 9	200	K	S	0	1						Includes Debris
2	2	1	U 0 5 0	200	K	S	0	1						Includes Debris
2	2	2	U 0 5 1	200	K	S	0	1						Includes Debris
2	2	3	U 0 5 2	200	K	S	0	1						Includes Debris
2	2	4	U 0 5 3	200	K	S	0	1						Includes Debris
2	2	5	U 0 5 5	200	K	S	0	1						Includes Debris
2	2	6	U 0 5 6	200	K	S	0	1						Includes Debris
2	2	7	U 0 5 7	200	K	S	0	1						Includes Debris
2	2	8	U 0 5 8	200	K	S	0	1						Includes Debris
2	2	9	U 0 5 9	200	K	S	0	1						Includes Debris



EPA/State ID Number	W	A	7	8	9	0	0	0	8	9	6	7
---------------------	---	---	---	---	---	---	---	---	---	---	---	---

**Continuation of Section XIV. Description of Dangerous Waste**

Line Number	A. Dangerous Waste No. (enter code)						B. Estimated Annual Quantity of Waste	C. Unit of Measure (enter code)	D. Process														
									(1) Process Codes (enter)					(2) Process Description [If a code is not entered in D (1)]									
2	6	4	U	0	9	6	200	K	S	0	1												Storage-Container
2	6	5	U	0	9	7	200	K	S	0	1												Includes Debris
2	6	6	U	0	9	8	200	K	S	0	1												Includes Debris
2	6	7	U	0	9	9	200	K	S	0	1												Includes Debris
2	6	8	U	1	0	1	200	K	S	0	1												Includes Debris
2	6	9	U	1	0	2	200	K	S	0	1												Includes Debris
2	7	0	U	1	0	3	200	K	S	0	1												Includes Debris
2	7	1	U	1	0	5	200	K	S	0	1												Includes Debris
2	7	2	U	1	0	6	200	K	S	0	1												Includes Debris
2	7	3	U	1	0	7	200	K	S	0	1												Includes Debris
2	7	4	U	1	0	8	200	K	S	0	1												Includes Debris
2	7	5	U	1	0	9	200	K	S	0	1												Includes Debris
2	7	6	U	1	1	0	200	K	S	0	1												Includes Debris
2	7	7	U	1	1	1	200	K	S	0	1												Includes Debris
2	7	8	U	1	1	2	200	K	S	0	1												Includes Debris
2	7	9	U	1	1	3	200	K	S	0	1												Includes Debris
2	8	0	U	1	1	4	200	K	S	0	1												Includes Debris
2	8	1	U	1	1	5	200	K	S	0	1												Includes Debris
2	8	2	U	1	1	6	200	K	S	0	1												Includes Debris
2	8	3	U	1	1	7	200	K	S	0	1												Includes Debris
2	8	4	U	1	1	8	200	K	S	0	1												Includes Debris
2	8	5	U	1	1	9	200	K	S	0	1												Includes Debris
2	8	6	U	1	2	0	200	K	S	0	1												Includes Debris
2	8	7	U	1	2	1	200	K	S	0	1												Includes Debris
2	8	8	U	1	2	2	200	K	S	0	1												Includes Debris
2	8	9	U	1	2	3	200	K	S	0	1												Includes Debris
2	9	0	U	1	2	4	200	K	S	0	1												Includes Debris
2	9	1	U	1	2	5	200	K	S	0	1												Includes Debris
2	9	2	U	1	2	6	200	K	S	0	1												Includes Debris
2	9	3	U	1	2	7	200	K	S	0	1												Includes Debris
2	9	4	U	1	2	8	200	K	S	0	1												Includes Debris
2	9	5	U	1	2	9	200	K	S	0	1												Includes Debris
2	9	6	U	1	3	0	200	K	S	0	1												Includes Debris
2	9	7	U	1	3	1	200	K	S	0	1												Includes Debris









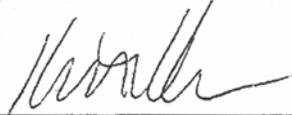
**XV. Map**  
 Attach to this application a topographic map of the area extending to at least one (1) mile beyond property boundaries. The map must show the outline of the facility; the location of each of its existing and proposed intake and discharge structures; each of its dangerous waste treatment, 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 ¼ 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).

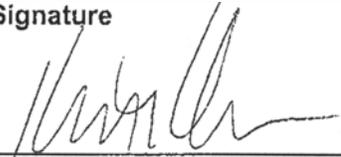
**XVIII. Certifications**

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.

<b>Operator*</b> Name and Official Title (type or print) Keith A. Klein, Manager U.S. Department of Energy Richland Operations Office	<b>Signature</b> 	<b>Date Signed</b> 12/15/05
---	--	--------------------------------

<b>Co-Operator**</b> Name and Official Title (type or print) Roby D. Enge, Director Environment, Safety, Health and Quality Pacific Northwest National Laboratory	<b>Signature</b> 	<b>Date Signed</b> 11/30/05
---	--	--------------------------------

**Co-Operator\*\* – Address and Telephone Number**  
 3350 George Washington Way  
 P.O. Box 999  
 Richland, WA 99352  
 (509) 376-1187

<b>Facility-Property Owner*</b> Name and Official Title (type or print) Keith A. Klein, Manager U.S. Department of Energy Richland Operations Office	<b>Signature</b> 	<b>Date Signed</b> 12/15/05
--	--	--------------------------------

**Comments**

---

## 331-C Storage Unit

---



331-C Front

Photo Taken 2005



331-C East Side

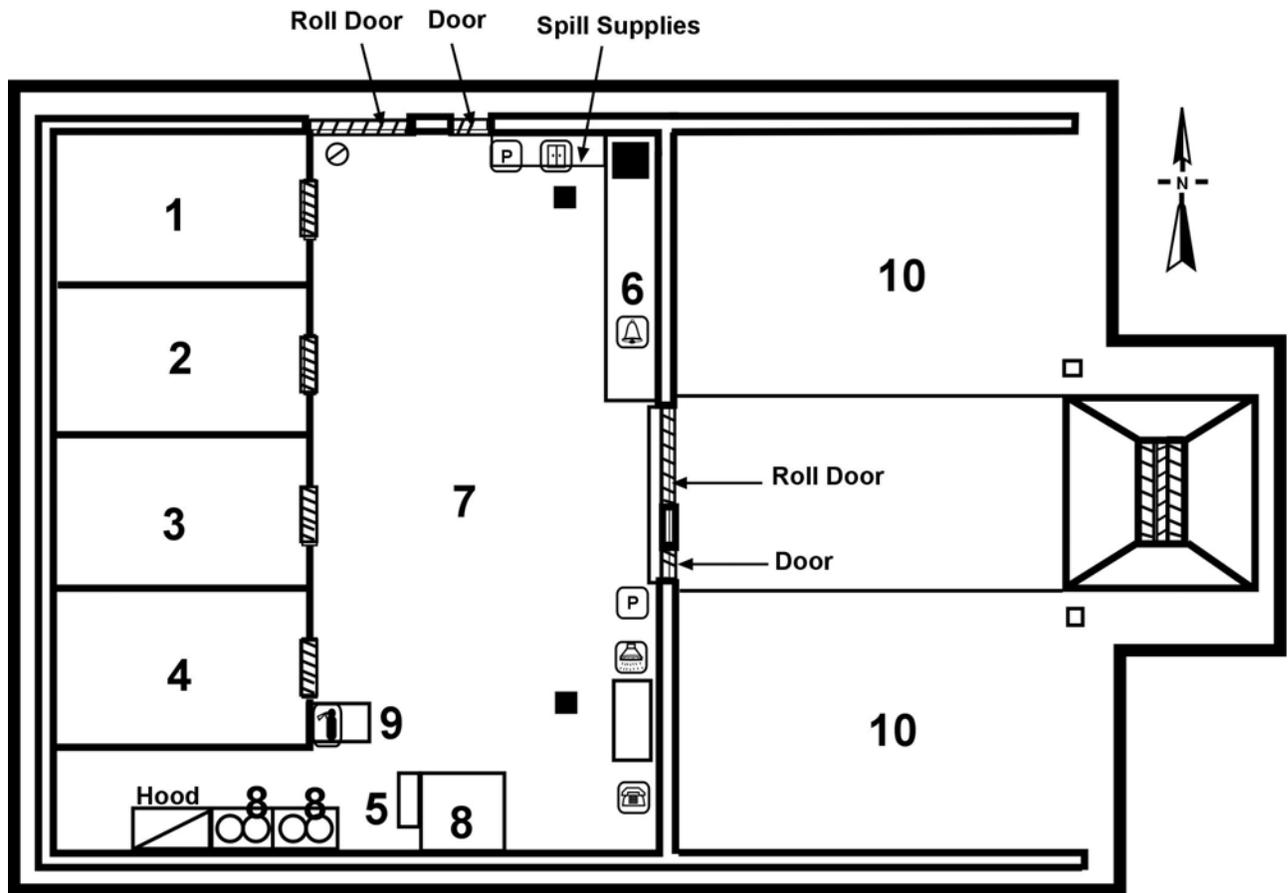
Photo Taken 2005



331-C Inside

Photo Taken 2005

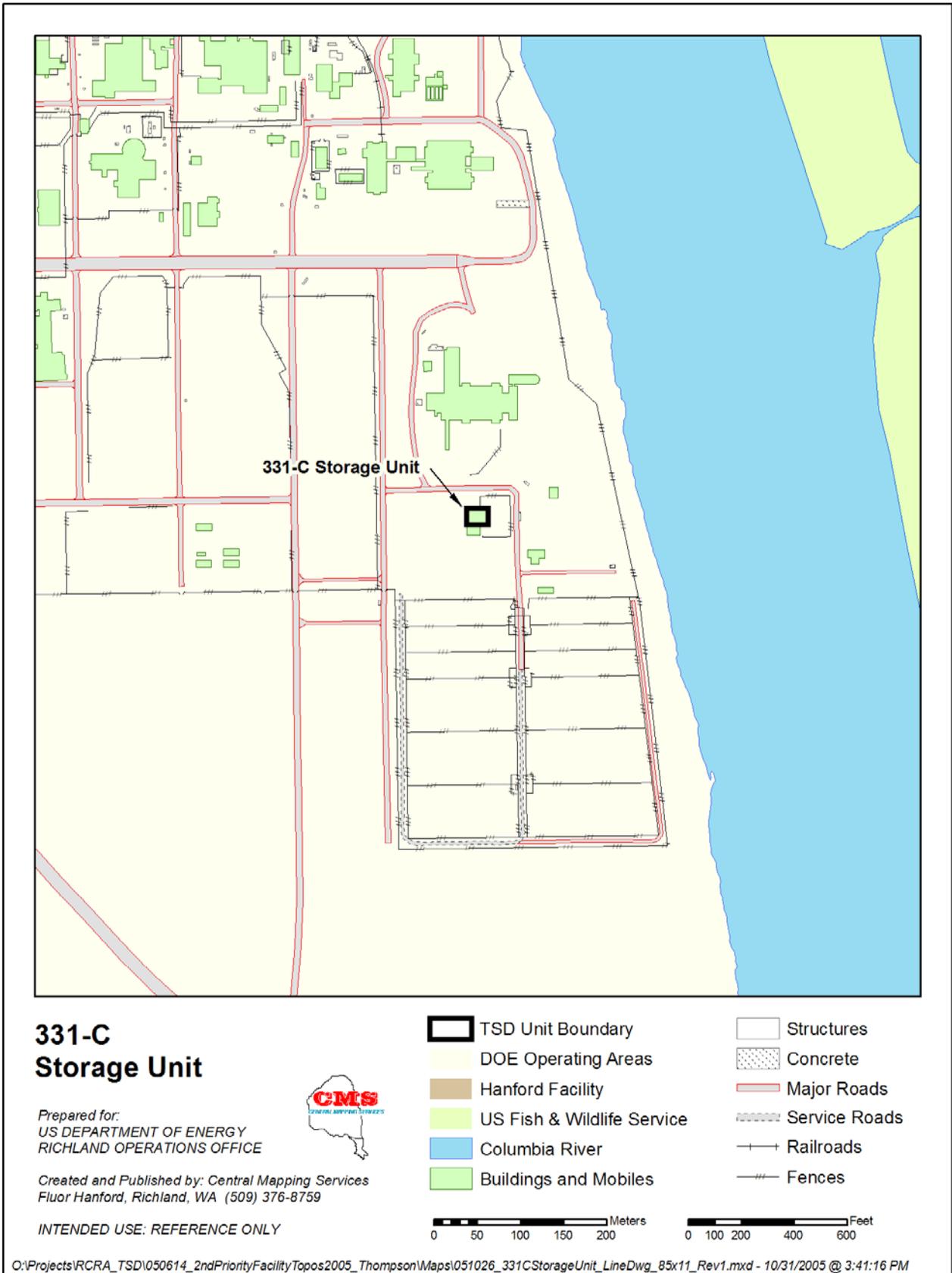
# 331-C Storage Unit



Legend			
	Emergency Equipment Cabinet		Phone
	Safety Shower/Eyewash		Fire Alarm Bell
	Emergency Lights		Collection Sump
	HVAC Shutoff		TSD Boundary
	Fire Alarm Pull Box		10 Lb. ABC Fire Extinguisher
			15 Lb. Or Larger Class D Fire Extinguisher

## Legend

1. Acids, Oxidizers
2. Poisons, Class 9
3. Alkaline, WSDW, Organic Peroxides
4. Organics Flammable and Compressed Aerosols
5. Compressed gases
6. Universal/Recycling Storage Area
7. Class 9, WSDW, Non-flammable and Compatible Waste
8. Flammable Storage
9. Explosive Magazine
10. Outdoor Non-regulated Drum Storage



1 **Chapter 2.0** **Unit Description and General Provisions**

---

2 2.0 UNIT DESCRIPTION AND GENERAL PROVISIONS ..... 2.1

3

4 2.1 331-C STORAGE UNIT..... 2.1

5

6 2.2 TOPOGRAPHIC MAP ..... 2.1

7

8 2.3 PERFORMANCE STANDARD ..... 2.2

9 2.3.1 Measures to Prevent Degradation of Groundwater Quality ..... 2.2

10 2.3.2 Measures to Prevent Degradation of Air Quality by Open Burning or Other Activities ..... 2.2

11 2.3.3 Measures to Prevent Degradation of Surface Water Quality ..... 2.2

12 2.3.4 Measures to Prevent Destruction or Impairment of Flora or Fauna Outside of the Unit ..... 2.3

13 2.3.5 Measures to Prevent Excessive Noise..... 2.3

14 2.3.6 Measures to Prevent Negative Aesthetic Impacts ..... 2.3

15 2.3.7 Measures to Prevent Unstable Hillside or Soils ..... 2.3

16 2.3.8 Measures to Prevent the Use of Processes That Do Not Treat, Detoxify, Recycle,  
17 Reclaim, and Recover Waste Material to the Extent Economically Feasible ..... 2.3

18 2.3.9 Measures to Prevent Endangerment to the Health of Employees or the Public Near the  
19 Unit ..... 2.3

20 2.3.10 Seismic Considerations..... 2.4

21 2.3.11 Traffic Information..... 2.4

22

23 2.4 BUFFER MONITORING ZONES..... 2.5

24 2.4.1 Ignitable or Reactive Waste Buffer Zone ..... 2.5

25 2.4.2 Reactive Waste Buffer Zone ..... 2.5

26

1  
2  
3  
4  
5

This page intentionally left blank.



## 1   **2.3   PERFORMANCE STANDARD**

2   The 331-C Storage Unit was designed to minimize the exposure of personnel to dangerous wastes and  
3   hazardous substances and to prevent dangerous wastes and hazardous substances from reaching the  
4   environment.

5   In addition, measures are taken to confirm that 331-C Storage Unit is maintained and operated, to  
6   the maximum extent practicable given the limits of technology, in a manner that prevents:

- 7   •   Degradation of groundwater quality
- 8   •   Degradation of air quality by open burning or other activities
- 9   •   Degradation of surface water quality
- 10  •   Destruction or impairment of flora or fauna outside of the unit
- 11  •   Excessive noise
- 12  •   Negative aesthetic impacts
- 13  •   Unstable hillsides or soils
- 14  •   Use of processes that do not treat, detoxify, recycle, reclaim, and recover waste material to  
15   the extent economically feasible
- 16  •   Endangerment to the health of employees or the public near the unit.

17  The measures taken to prevent each of the above negative effects from occurring are described in the  
18  following sections.

### 19  **2.3.1   Measures to Prevent Degradation of Groundwater Quality**

20  Degradation of groundwater quality is prevented by storing waste containers within an enclosed building  
21  with a sealed concrete floor. All drains and sumps in areas where wastes are stored are blocked to prevent  
22  release of spilled material to the environment. The 331-C Storage Unit accepts only those packages  
23  meeting applicable DOT requirements. Opening of containers is done only in areas with spill  
24  containment. Design and administrative controls significantly reduce the possibility of release of  
25  dangerous waste to the environment through soil or groundwater contamination.

### 26  **2.3.2   Measures to Prevent Degradation of Air Quality by Open Burning or Other Activities**

27  No open burning occurs at the 331-C Storage Unit. There is no vegetation around the 331-C Storage  
28  Unit, and the area around the unit is paved or graveled, thereby reducing the risk of fire or wind erosion.  
29  Combustible and flammable waste is packaged in a manner that reduces the potential for fire and stored in  
30  fireproof cabinets unless staged for shipment.

### 31  **2.3.3   Measures to Prevent Degradation of Surface Water Quality**

32  The potential for degradation of surface water quality is extremely low, due to the manner in which the  
33  Unit is designed and operated. All waste handling activities (i.e., loading/unloading, container opening,  
34  waste transfer) presenting the opportunity for spills are conducted inside the unit. All exits from storage  
35  areas of the 331-C Storage Unit are equipped with spill collection sumps to prevent spilled material from  
36  escaping. The Unit is 500 feet from, and has no pipes to the Columbia River.

**1 2.3.4 Measures to Prevent Destruction of Impairment of Flora or Fauna Outside of the Unit**

2 The 331-C Storage Unit is located in the southern portion the 300 Area. The 300 Area is highly  
3 developed, and areas not occupied by buildings are generally paved or graveled. As a result, flora or  
4 fauna are generally absent within the 300 Area except for several grassed areas. Measures to prevent  
5 destruction or impairment of flora or fauna outside the 300 Area are the same as those to prevent releases  
6 from the unit (i.e., all waste handling is performed within an enclosed area having spill collection sumps).

**7 2.3.5 Measures to Prevent Excessive Noise**

8 During normal operations at the 331-C Storage Unit, excessive noise is not generated. The major sources  
9 of noise are waste transport and handling equipment (e.g., forklifts, light vehicles). The noise generated  
10 at the 331-C Storage Unit is compatible with the types of activities generated at neighboring facilities in  
11 the 300 Area.

**12 2.3.6 Measures to Prevent Negative Aesthetic Impacts**

13 The 331-C Storage Unit does not injure or destroy the surrounding flora and fauna. The Unit stores waste  
14 in approved containers within the confines of the structure. The building's appearance is similar to  
15 neighboring facilities. For these reasons, the unit presents no negative aesthetic impacts.

**16 2.3.7 Measures to Prevent Unstable Hillsides or Soils**

17 There are no naturally unstable hillsides near the 331-C Storage Unit. The soil beneath and around the  
18 unit was compacted prior to construction.

**19 2.3.8 Measures to Prevent the Use of Processes That Do Not Treat, Detoxify, Recycle, Reclaim,  
20 and Recover Waste Material to the Extent Economically Feasible**

21 The 331-C Storage Unit was established, in part, to enhance DOE's and PNNL's efforts to eliminate or  
22 minimize dangerous waste generation, and to treat, detoxify, recycle, reclaim, and recover waste  
23 materials.

24 Offsite waste management options for dangerous wastes being shipped from the 331-C Storage Unit are  
25 evaluated according to the following order of preference:

- 26 1. Recycling, including solvent reprocessing, oil recycling, metals recovery, burning for energy  
27 recovery, etc.
- 28 2. Treatment, including incineration, volume and/or toxicity reduction, chemical destruction, etc.
- 29 3. Land disposal is viewed as the least favored option and is generally only used for treatment residues,  
30 spill cleanup residues, or when treatment is not feasible.

31 When permitted by law and/or contractual obligations, the 331-C Storage Unit staff tries to use this  
32 hierarchy without regard to minor variations in cost, e.g., if recycling is available but slightly more  
33 expensive than land disposal, recycling is utilized.

**34 2.3.9 Measures to Prevent Endangerment to the Health of Employees or the Public Near the Unit**

35 The 331-C Storage Unit is within the southern portion of the 300 Area, which is located approximately  
36 1 mile north of the corporate limits of the City of Richland. Public entry to the 300 Area is not allowed;  
37 members of the public, therefore, cannot enter the 331-C Storage Unit. Exposure of members of the

1 public or employees to dangerous and mixed waste constituents is prevented through administrative  
2 controls over the designation, packaging, loading, transporting, and storing of the wastes received at the  
3 331-C Storage Unit. In addition, physical controls exist (e.g., spill collection sumps) to prevent release of  
4 wastes or waste constituents in the event of a spill.

5 Employees are trained to handle and store waste packages (Chapter 8.0). The training includes dangerous  
6 waste awareness, emergency response, and workplace safety. Protective equipment, safety data, and  
7 hazardous materials information are supplied by operations management and are readily available for  
8 employee use.

9 A contingency plan, including emergency response procedures, is in place and is implemented for spill  
10 prevention, containment, and countermeasures to reduce safety and health hazards to employees, the  
11 environment, and the public. The contingency plan is described in Chapter 7.0.

### 12 **2.3.10 Seismic Considerations**

13 The 331-C Storage Unit was constructed according to the Uniform Building Code, 1976 edition. Zone  
14 2B was used for the Seismic Design and the load determinations. Currently the governing Code is the  
15 2003 International Building Code. Section 3403 addresses Additions, Alterations or Repairs and section  
16 3403.2 addresses the structural implications of an alteration, which is what was used during the building  
17 modification process. The International Building Code requires that alterations shall not increase the  
18 force on any element of an existing structure by more than 5% and if so, the element must be in  
19 compliance with Code (2003 IBC). Also, the strength of any element of the existing structure shall not be  
20 decreased unless it is shown to be in compliance with Code (2003 IBC). During the 331-C Storage Unit  
21 modification process that was completed in February of 2006, the shear bracing was revised from the  
22 center bay area, and both adjacent bays. This additional bracing nearly doubles the shear capacity of the  
23 wall. No additional mass or external load was added to the building, so there was no negative affect to  
24 the structure with respect to any condition, seismic included. Since there was no affected change to the  
25 loading conditions or reduced structural capacity of the building, compliance with the 1976 Uniform  
26 Building Code is considered compliant with the 2003 Uniform Building Code.

### 27 **2.3.11 Traffic Information**

28 The DOE-controlled Hanford Site is traversed by numerous primary and secondary roads. The DOE  
29 roadways inside the site, except for Routes 4S and 10 south of the Wye Barricade, are restricted to  
30 authorized personnel and cannot be accessed by the general public. The majority of the site traffic  
31 consists of light duty vehicles. The primary routes are constructed of bituminous asphalt with an  
32 underlying aggregate base in accordance with the U.S. Department of Transportation requirements. The  
33 secondary routes are constructed of layers of an oil and rock mixture with an underlying aggregate base.  
34 Currently, no load bearing capacities of these roads are available; however, loads are large as 140 pounds  
35 per square inch have been transported without observed damage to road surfaces.

36 Wastes generated at other onsite facilities outside the 300 area are transported over Government  
37 maintained roads. These roads are accessible to the general public only south of the Wye Barricade. In  
38 addition, waste shipments from the 331-C storage Unit to offsite treatment, disposal or recycling facilities  
39 are shipped over public accessible roads enroute to the consignee.

40 The loading/unloading areas at the 331-C Storage Unit are constructed of 8" thick reinforced 3000 psi  
41 concrete with #4 rebar set 12" on center each way. Heavy duty steel grating was installed over the  
42 containment sump with a uniform safe loading of 4,744 psf.

## 1    **2.4    BUFFER MONITORING ZONES**

2    Buffer and monitoring zones around the 331-C Storage Unit are described in the following sections.

### 3    **2.4.1    Ignitable or Reactive Waste Buffer Zone**

4    Ignitable and reactive wastes are stored in the 331-C Storage Unit in compliance with the requirements of  
5    the 1988 Uniform Fire Code, Article 79, Division II (International Conference of Building  
6    Officials 1991). Quantity limits for storage are established to comply with requirements for Class B  
7    occupancy. Structures surrounding the 331-C Storage Unit are laboratory and office buildings, which are  
8    occupied during normal working hours. The nearest adjacent facility is the 331 Building, which is  
9    approximately 350 ft north of the 331-C Storage Unit. The closest 300 Area boundary is to the east fence,  
10    which is approximately 450 ft east of the 331-C Storage Unit.

### 11   **2.4.2    Reactive Waste Buffer Zone**

12   Storage of certain reactive wastes listed in WAC 173-303-630(8)(a) occurs at the 331-C Storage Unit.  
13   These wastes have special storage requirements more stringent than those shown in Section 2.4.1. They  
14   are stored in accordance with this section and with the Uniform Building Code's Table 77.201, latest  
15   edition. The 1988 edition requires buffer zones in Class B occupancies of 44 inches for storage of such  
16   wastes, and the storage locations in the 331-C Storage Unit reflecting appropriate buffer zones are noted  
17   in Chapter 4.0. These wastes are only occasionally stored at the unit, depending on generation by  
18   individual research projects.

19   The occupancy storage limitations imposed by UBC for Class B occupancy are as follows:

- 20   • Explosives: 1 lb
- 21   • Organic Peroxide, unclassified, detonatable: 1 lb
- 22   • Pyrophoric: 4 lbs
- 23   • Unstable (reactive), Class 4: 1 lb.

24   These limits are allowed to be doubled when stored in flammable storage cabinets, as is done at the  
25   331-C Storage Unit; hence, the practical storage limits at the 331-C Storage Unit are double those shown  
26   here.

27

January 2007

1	<b>Chapter 3.0</b>	<b>Waste Analysis</b>
2	3.0	WASTE ANALYSIS ..... 3.1
3		
4	3.1	CHEMICAL, BIOLOGICAL, AND PHYSICAL ANALYSIS ..... 3.1
5	3.1.1	Waste in Piles..... 3.2
6	3.1.2	Landfilled Wastes ..... 3.2
7	3.1.3	Waste Incinerated and Waste Used in Performance Tests..... 3.2
8		
9	3.2	WASTE ANALYSIS PLAN..... 3.3
10	3.2.1	Facility Description..... 3.3
11	3.2.2	Description of Facility Processes and Activities..... 3.3
12	3.2.3	Identification/EPA Classification and Quantities of Hazardous Wastes Managed within the
13		331-C Storage Unit ..... 3.6
14	3.2.4	Description of Hazardous Waste Management Units ..... 3.7
15		
16	3.3	SELECTING WASTE ANALYSIS PARAMETERS ..... 3.7
17	3.3.1	Parameter Selection Process ..... 3.7
18	3.3.2	Criteria and Rational for Parameter Selection ..... 3.8
19	3.3.3	Special Parameter Selection Requirements..... 3.9
20		
21	3.4	SELECTING SAMPLING PROCEDURES ..... 3.9
22	3.4.1	Sampling Strategies and Equipment ..... 3.9
23	3.4.2	Sampling Preservation and Storage ..... 3.10
24	3.4.3	Sampling QA/QC Procedures ..... 3.10
25	3.4.4	Health and Safety Protocols..... 3.14
26		
27	3.5	SELECTING A LABORATORY, AND LABORATORY TESTING AND ANALYTICAL
28		METHODS ..... 3.14
29	3.5.1	Selecting a Laboratory ..... 3.14
30	3.5.2	Selecting Testing and Analytical Methods ..... 3.15
31		
32	3.6	SELECTING WASTE RE-EVALUATION FREQUENCIES..... 3.15
33		
34	3.7	SPECIAL PROCEDURAL REQUIREMENTS ..... 3.16
35	3.7.1	Procedures for Receiving Waste From off-site Generators ..... 3.16
36	3.7.2	Procedures for Ignitable, Reactive, and Incompatible Wastes..... 3.17
37	3.7.3	Procedures to Ensure Compliance with LDR Requirements ..... 3.18
38		
39	3.8	MANIFEST SYSTEM..... 3.19
40	3.8.1	Procedures for Receiving Shipments ..... 3.20
41	3.8.2	Response to Significant Discrepancies ..... 3.20
42	3.8.3	Provisions for Nonacceptance of Shipment..... 3.21
43	3.8.4	Unmanifested Waste ..... 3.21

44 **Tables**

---

45	Table 3.1. Summary of Test Parameters, Rationales, and Methods.....	3.22
----	---	------

46  
47

January 2007

WA7890008967, Operating Unit 15  
331-C Storage Unit

1  
2  
3  
4  
5

This page intentionally left blank.

### 1 3.0 WASTE ANALYSIS

2 The purpose of this Waste Analysis Plan (WAP) is to document the waste acceptance process, sampling  
3 methodologies, analytical techniques, and processes that are undertaken for sampling and analysis of  
4 dangerous waste managed in the 331-C Storage Unit.

5 This chapter also provides information on the chemical, biological, and physical characteristics of the  
6 waste stored at the 331-C Storage Unit.

#### 7 3.1 CHEMICAL, BIOLOGICAL, AND PHYSICAL ANALYSIS

8 The dangerous waste stored at the 331-C Storage Unit can be categorized as originating from four basic  
9 sources:

- 10 • Listed Waste from specific and nonspecific sources
- 11 • Discarded commercial chemical products
- 12 • Waste from chemicals synthesized or created in research laboratories
- 13 • Discarded commercial products exhibiting dangerous waste characteristics and/or criteria.

14 Each of these waste categories is discussed below, including waste descriptions, hazard characteristics,  
15 and bases for hazard designations. This information includes that which must be known to treat, store, or  
16 dispose of the waste, as required under WAC 173-303-806(4)(a)(ii).

17 Listed Waste from Specific and Nonspecific Sources. Wastes from specific and nonspecific sources  
18 consist of those listed wastes identified in WAC 173-303-9904. Chapter 1.0 identifies the waste from this  
19 category with their estimated annual management quantities.

20 Halogenated and nonhalogenated solvents are in the form of spent solvents. Degreasing solvents (F001),  
21 as well as spent halogenated solvents (F002), are used primarily in research, although some commercial  
22 applications do exist (e.g., printing, duplicating). Spent non-halogenated solvents (F003, F004, and F005)  
23 also come primarily from research laboratories, although some is generated through maintenance  
24 applications. Manufacturing activities are not performed at Hanford; therefore, dangerous waste from  
25 specific sources (WAC 173-303-9904 "K" Waste) typically is not generated at PNNL. However, small  
26 quantities of K-listed waste have been generated from treatability studies and sample characterization  
27 activities at PNNL from time to time and could be stored at the 331-C Storage Unit. WPCB state source  
28 waste (PCB electrical equipment waste) has been generated in limited amounts in the past and could be  
29 stored at the 331-C Storage Unit if future generation activities occur.

30 F-listed waste is designated based on process knowledge (e.g., information from container labels or  
31 material safety data sheets, process information). Sampling may be performed if the generating unit does  
32 not have sufficient information to document the composition and characteristics of the waste. The waste  
33 generator is responsible for specifying the characteristics of the waste based on knowledge of the  
34 chemical products used (i.e., information supplied by the manufacturer) and the process generating the  
35 waste. These listed wastes are all designated as based on the criteria given in WAC 173-303-070. These  
36 wastes are also subject to LDR regulations under 40 CFR 268, and WAC-173-303-140 including disposal  
37 prohibitions and treatment standards.

38 Discarded Chemical Products. Discarded chemical products consist of those products described in  
39 WAC 173-303-081. Chapter 1.0, of the 331-C Storage Unit application, identifies all of the discarded  
40 chemical products listed in WAC 173-303-9903 and specifies an estimated maximum annual management  
41 quantity, based on prior experience. Chapter 1.0 lists all of these waste codes, however, because the wide  
42 variety of research activities conducted at Hanford presents the potential to generate any of these wastes.

January 2007

1 These wastes (P waste and U waste) are typically received at the 331-C Storage Unit in the  
2 manufacturer's original container. These containers typically consist of glass and polyethylene jars or  
3 bottles and metal cans that have a volume equal to or less than 4 liters.

4 Wastes in this category are designated based on the generator's knowledge. As these waste are usually in  
5 original containers, information on the container label is verified by generator knowledge (i.e., knowledge  
6 that material is in its original container) and is used to identify contents. Waste in "as procured"  
7 containers (i.e., original container with intact label) are not sampled. These listed wastes contain those  
8 designated as DW as well as those designated as EHW. These wastes are also subject to LDR regulations  
9 under 40 CFR 268, including disposal prohibitions and treatment standards.

10 Waste from Chemicals Synthesized or Created in Research Laboratories. Waste from chemicals  
11 synthesized or created in research laboratories typically consist of organics in quantities of 100 g or less,  
12 received in small containers.

13 These wastes are designated based on the generator's knowledge or based on sampling and analysis. The  
14 generator's knowledge is used if the generating unit has kept accurate records of the identities and  
15 concentrations of constituents present in the waste (e.g., log sheets for accumulation containers). If  
16 information available from the generating unit is inadequate for waste designation, the waste is sampled,  
17 and the results of the analysis are used for designation. These wastes include those designated as state  
18 only dangerous waste under WAC 173-303-100 and those designated as characteristic dangerous waste  
19 under WAC 173-303-090. Chapter 1.0, of the 331-C Storage Unit application, includes all categories of  
20 toxic and persistent waste (i.e., both DW and EHW). The wide variety of research activities conducted at  
21 Hanford presents the potential that these wastes could be generated and requires subsequent management  
22 at the 331-C Storage Unit.

23 The wastes in this category include those designated as either DW or EHW. These wastes could also be  
24 federal LDR wastes regulated under 40 CFR 268 as well as state LDR wastes regulated under  
25 WAC 173-303-140 (e.g., organic/carbonaceous wastes).

26 Discarded Chemical Products Exhibiting Dangerous Waste Characteristics and/or Criteria. Many  
27 discarded chemical products handled in the 331-C Storage Unit are not listed in WAC 173-303-9903 but  
28 are still designated as dangerous waste since they exhibit at least one dangerous waste characteristic  
29 and/or criterion (described in WAC 173-303-090 and WAC 173-303-100). These wastes are included  
30 with those listed in Chapter 1.0, under waste codes D001 through D043, WT01, WT02, WP01, WP02,  
31 and WP03.

32 Waste in this category is designated based on the generator's knowledge. As these wastes are usually in  
33 their original containers, information on the container label is verified by the generator's knowledge and  
34 is used to identify the contents. These wastes contain those designated as DW as well as those designated  
35 as EHW. These wastes could also be federal LDR waste regulated under 40 CFR 268 as well as state  
36 LDR waste regulated under WAC 173-303-140 (e.g., organic/carbonaceous waste).

### 37 **3.1.1 Waste in Piles**

38 This section does not apply to the 331-C Storage Unit because these wastes are not stored in piles.

### 39 **3.1.2 Landfilled Wastes**

40 This section does not apply to the 331-C Storage Unit because these wastes are not placed in landfills.

### 41 **3.1.3 Waste Incinerated and Waste Used in Performance Tests**

42 This section does not apply to the 331-C Storage Unit because these wastes are not incinerated.

January 2007

1 **3.2 WASTE ANALYSIS PLAN**

2 This section describes the processes used to obtain the information necessary to manage waste in  
3 accordance with the requirements of WAC 173-303.

4 **3.2.1 Facility Description**

5 The 331-C Storage Unit is a dangerous waste storage unit owned and operated by DOE and co-operated  
6 by PNNL. The unit is used for the collection, consolidation, packaging, storage, and preparation for  
7 transport and disposal of dangerous waste. It is an integral part of the Hanford Site's waste management  
8 system.

9 The 331-C Storage Unit is a one-story metal building with an adjacent covered area constructed in the  
10 early 1970s. The unit is located in the southern portion of the 300 Area, as shown in Chapter 1.0, and was  
11 formerly used for equipment storage. Unit upgrades were completed in 2006 to meet requirements for  
12 storage of dangerous waste. Waste storage under temporary authorization is expected to begin in  
13 February 2006 contingent on Ecology approval.

14 **3.2.2 Description of Facility Processes and Activities**

15 Varieties of small volume chemical wastes are generated by PNNL's research laboratory activities. These  
16 wastes are brought to the 331-C Storage Unit and segregated by compatibility for storage in the unit until  
17 enough waste is accumulated to fill a labpack or bulking container, usually a 30 or 55-gallon drum. When  
18 a sufficient number of shipping containers of waste have accumulated, they are shipped to recycling  
19 facilities, or permitted treatment or disposal facilities.

20 Dangerous wastes are stored in Room 1 of the building and in the covered area adjacent to the building.  
21 The indoor storage area has been equipped with a secondary containment system to facilitate storage of  
22 containerized wastes. In addition, four storage "cells" have been constructed within the bay area for  
23 segregated storage of incompatible waste streams. Each of the cells is 12' x 18', enclosed by 6 inch high  
24 angle iron bolted and sealed to the floor and a grated containment trench at the opening of each cell to  
25 prevent any migration of waste spills. Each cell has its own separate secondary containment system.  
26 Drum-quantity storage for incompatible wastes is allowed in these cells and in separate areas of the  
27 building. A detailed description of these areas is given in Chapter 4.0.

28 Knowledge from the generator is generally sufficient to meet the requirements for a "detailed chemical,  
29 physical, and/or biological analysis" of wastes accepted at the 331-C Storage Unit for the following  
30 reasons:

- 31 • Wastes stored at the 331-C Storage Unit are generated on the Hanford Site and/or by PNNL research  
32 programs who maintain effective administrative control over individual waste generating units (i.e.,  
33 the same organization generates the waste and operates the storage unit).
- 34 • Wastes stored at the 331-C Storage Unit may be discarded chemical products for which knowledge of  
35 waste characteristics is available without further analysis.
- 36 • Most of the waste stored at the 331-C Storage Unit is a result from research activities that are  
37 carefully controlled and documented; this documentation includes information on chemical  
38 constituents.
- 39 • To confirm the sufficiency and reliability of the knowledge provided by generators, onsite visits of  
40 the generating unit's areas are performed to familiarize waste management staff with the generator's  
41 processes. Data provided by the operations generating the waste, including waste characteristics and  
42 inventory information, are reviewed during these visits to check for proper characterization and  
43 identify any special requirements for safe management of the waste. Other methods for confirmation  
44 noted in WAC 173-303-300(2)(a) may be used instead of or in conjunction with onsite visits and data  
45 review in special situations.

January 2007

1 Because of the importance of administrative controls for the purposes of waste analysis, processes for  
2 management of wastes from the time of generation through storage at the 331-C Storage Unit are  
3 described below. These processes demonstrate how sufficient knowledge is obtained to manage properly  
4 dangerous waste at the 331-C Storage Unit. In the event that such knowledge is not available, the  
5 331-C Storage Unit requires sampling and analysis prior to shipment to the storage unit.

6 The 331-C Storage Unit personnel shall collect from the generator the information pursuant to  
7 40 CFR 268.7(a) regarding LDR wastes, the appropriate treatment standards, whether the waste meets the  
8 treatment standards, and the certification that the waste meets the treatment standards, if necessary, as  
9 well as any waste analysis data that supports the generator's determinations. If this information is not  
10 supplied by the generator, then the 331-C Storage Unit personnel shall be responsible for completion and  
11 transmittal of all subsequent information regarding LDR wastes, pursuant to 40 CFR 268.7(b). All waste  
12 streams must be reevaluated when the generator and/or the 331-C Storage Unit personnel have reason to  
13 believe the process generating the waste, or the characteristic or the chemical constituents of the waste  
14 stream, has changed to determine compliance with LDR requirements in 40 CFR 268. Due to the  
15 reevaluation policy above and the evaluation of wastes whenever they are submitted (i.e. "standing  
16 profiles" are not typically used), an annual re-evaluation of waste streams is not performed. Re-  
17 evaluation will also be performed on offsite waste when a mismatch between the waste received and the  
18 description on the shipping paper or manifest occurs.

19 Volumetric Description of Waste. A wide range of waste volumes is collected from research and support  
20 activities. Typically, the largest unit container collected is a DOT container <0.46 m<sup>3</sup>, while the smallest  
21 is a trace amount in a small vial. Each secondary containment sump at the entrances to the unit has a  
22 capacity of 168 gallons. No bulk containers in excess of 168 gallons will be accepted at the unit without  
23 management approval and an additional secondary containment system provided.

24 Large volume containers (greater than 4 L) commonly contain chemicals, such as those listed in  
25 WAC 173-303-9903 and -9904 and in 40 CFR 261.33, or commercial products, which exhibit one or  
26 more of the dangerous waste characteristics or criteria. Most of the containers generally contain  
27 chemicals for which information is easily accessible to determine dangerous designation. This  
28 information is generally obtained from the container label, for those wastes in original containers, or from  
29 the material safety data sheet (MSDS) for the product.

30 Notification for Storing of Waste: The waste analysis process begins when the waste management  
31 organization is notified of the presence of a chemical waste. The generating unit completes and transmits  
32 an electronic disposal request to accomplish this notification. The form describes the volume and  
33 chemical composition of waste in each waste container for disposal. Hazard and compatibility  
34 information is obtained for each item on the disposal request form to verify the safety of the waste  
35 management organization staff that collect and transport the waste and to verify safe and appropriate  
36 storage in the 331-C Storage Unit.

37 The compatibility and hazard class are determined using reference material that may include Condensed  
38 Chemical Dictionary, Merck Index, 49 CFR, NIOSH, Sigma-Aldrich, or any other creditable reference  
39 material that is applicable. The priority of hazard designation for those substances with multiple hazards  
40 or for mixtures is the same used by the DOT in 49 CFR 173.2.a.

41 Disposal Requests and other information used for determining waste designations and compatibility must  
42 meet four distinct needs of the dangerous waste manager and sample collector. They must enable each to:

- 43 • Identify those wastes that are designated dangerous in accordance with WAC 173-303 and whether  
44 those wastes are DW or EHW
- 45 • Determine whether the waste is restricted from land disposal under 40 CFR 268 or  
46 WAC 173-303-140 and whether it complies with applicable treatment standards under 40 CFR 268 or  
47 WAC 173-303-140
- 48 • Identify and verify specific morphological characteristics of waste in solid or solution form

January 2007

- Outline how to safely handle, transport, analyze, store, and dispose of the waste product or sample.

Physical Analysis. Visual validation as a physical analysis activity is strongly relied upon to confirm the nature of a waste collected or sampled, and to determine the accuracy of the disposal request information received from the generating unit. It is impractical for the waste management organization to analyze chemically each container or vial of waste accepted for storage in the 331-C Storage Unit since the amount handled can exceed 10,000 containers per year. A more realistic approach to reducing risks to safety and the environment, and one implemented at the 331-C Storage Unit, includes trained and experienced personnel performing a visual inspection of the waste and direct inquiry of the generator. The waste is inspected to verify that it matches the description on the disposal request. If the waste is a discarded product, the contents of the container are inspected to verify that they match the description of the product. For other waste, e.g., spent solvents, waste descriptions are compared with the products in use at the generating unit. Generators are queried concerning the source of the waste and the materials used in the process generating the waste. This information is compared to the description of the waste on the disposal request. If, after visual inspection of the waste and interrogation of the generating unit personnel, any doubt remains as to the identity of the waste, the waste is sampled and analyzed by the generator.

Waste Collection at the Generating Unit. When satisfactory information has been obtained from the Disposal Request Form, waste management organization staff visits the generator storage area and makes a final inspection of the waste containers to determine whether the disposal request form and contents label information match completely. If the information on the disposal request matches with the container labeling and visual inspection, the waste is approved for storage. If discrepancies are found, the generator is required to resubmit the disposal request with accurate information. Unknown or unidentified materials are sampled for identification of constituents and remain in the 90-day accumulation area until the composition has been determined.

Labeling and Marking. After inspection of the waste at the generating unit, the approved waste is assigned a unique identification number, cell location, and hazard classification. Waste meeting Washington dangerous waste criteria under 173-303-100 are marked "Toxic" (for waste designated WT01 or WT02), and/or "Persistent" (for waste designated WP01, WP02, or WP03), in accordance with WAC 173-303-630(3). In addition, each waste container is labeled with a list of constituents and major risk(s). This computerized information helps the waste handlers verify safe handling, storage, retrieval, and transportation of dangerous waste.

Transportation. The labeled containers are transported to the 331-C Storage Unit by PNNL staff trained in applicable DOT requirements and emergency response. Waste is transported using a truck or light utility vehicle. For transport on roads accessible to the public, the vehicles are placarded in compliance with DOT regulations and documented in compliance with WAC 173-303-180, and Hanford Facility RCRA Permit Conditions II.P and/or II.Q as applicable.

Waste Handling, Storage, and Tracking at the 331-C Storage Unit. Waste received at the 331-C Storage Unit is put into 10 separate hazard classifications based on the 1988 Uniform Fire Code, Article 79, Division II (International Conference of Building Officials 1991) and the DOT Segregation Table for Hazardous Materials (49 CFR 174.81):

1. Acids, Oxidizers
2. Poisons, Class 9
3. Alkaline, WSDW, Organic Peroxides
4. Organics, Flammables, and compressed Aerosols
5. Compressed gases
6. Universal/Recycling
7. Class 9, WSDW, Non-flammable and compatible waste
8. Flammable
9. Explosive Magazine

January 2007

10. Outdoor, Non-regulated

Each hazard class has designated and clearly identified locations within the 331-C Storage Unit. Containers of dangerous wastes (10 gallons or less) are stored in a specific storage cabinet or shelf designed for that hazard class. The cabinets are located inside the appropriate storage cell (i.e., acid storage cabinet in acid cell). DOT-approved containers (typically 10 gallons and larger but less than 0.46 m<sup>3</sup>) are segregated by hazard class and can be stored in an appropriate storage cell or on the main bay floor in the 331-C Storage Unit.

Storage limits for all chemicals are listed in Table 4-2. This table is incorporated into this section by reference.

Recordkeeping and Inventory Control. A computer tracking system has been developed to verify that complete records of current inventory, packaging, and shipping data are maintained. Records of the initial waste disposal request, waste analysis result (if required), waste designation, and shipping manifests are maintained. As wastes are received for disposal, the containers are labeled with the information described in the Labeling and Marking section above, including a unique computer identification number.

The endpoint of the process for most waste is proper packaging and transport of the waste to an approved recycler or treatment/disposal facility. Some commercial chemical products, however, are redistributed to other users. Final computer verification of the history and ultimate disposal of each waste container is entered when the material is shipped from the 331-C Storage Unit.

Current waste quantities in inventory are periodically verified and reported to the Unit Operations Supervisor. The inventory is checked by hazard class, which also provides a measure of current inventory versus established limits.

If it is determined that the 331-C Storage Unit inventory is within 5 percent of the limit for a given hazard classification, additional waste of that hazard class is not accepted into the 331-C Storage Unit until the inventory has been reduced. The unit-operating supervisor must approve exceptions.

Unknown Waste and Waste Constituent Verification. Containers with unknown waste compositions are not normally accepted at the 331-C Storage Unit. In the event that the 331-C Storage Unit staff is required to respond to a critical need of a generating unit in the future and pick up an unknown waste, it will be sampled at the unit and analyzed in accordance with PNNL's waste pending analysis process, which incorporates Ecology guidance (Technical Information Memorandum 82-5) for that process.

If, for any reason, 331-C Storage Unit personnel believe that more stringent analysis of non-reagent grade chemical waste is needed (e.g., mixtures), they will request that the generator have the waste analyzed by an approved analytical laboratory. Reasons for this request may be the questionable appearance of the waste, reevaluation in accordance with the criteria given in this section, or historically unreliable information from a particular generator. There is no established frequency for this sampling and analysis; it is conducted on an as-needed basis. This analysis must follow test procedures given in WAC-173-303-110(3). Analytical laboratories in the area with these capabilities include commercial, Hanford Site, and Battelle-operated laboratories. The generator must also provide the laboratory analysis confirming the waste composition when the waste management organization picks up the waste. This analysis will become part of the 331-C Storage Unit Operating Record.

**3.2.3 Identification/EPA Classification and Quantities of Hazardous Wastes Managed within the 331-C Storage Unit**

Refer to Section 3.1 for a description of the types and quantities of wastes managed at the 331-C Storage Unit.

January 2007

1 **3.2.4 Description of Hazardous Waste Management Units**

2 The 331-C Storage Unit Waste Management Units are described in Chapter 4.0.

3 **3.3 SELECTING WASTE ANALYSIS PARAMETERS**

4 State and federal regulations [WAC 173-303-300(2) and (5)(a); WAC 173-303-140; 40 CFR 268.7(a)]  
5 require that information be obtained, documented, and/or reported on wastes received by a TSD unit.  
6 These requirements include verifying that only waste that meets 331-C Storage Unit unit-specific Permit  
7 requirements are accepted, and reporting the information required by WAC 173-303-380. In addition to  
8 providing a general description of the waste, the focus of the information collected for regulatory  
9 purposes is to verify that the 331-C Storage Unit is permitted to accept and store the waste.

10 The 331-C Storage Unit only accepts wastes that have been characterized properly. Before receipt or  
11 acceptance of waste at the 331-C Storage Unit, generators must supply adequate information to  
12 characterize and manage wastes properly.

13 One of the most important aspects of operating the 331-C Storage Unit in a safe manner is to prevent the  
14 mixing of incompatible wastes. For the purposes of this document, waste is considered compatible if,  
15 when mixed, waste does not (1) generate extreme heat or pressure, fire, or explosion, or violent reaction;  
16 (2) produce uncontrolled toxic mists, dusts, or gases in sufficient quantities to threaten human health; (3)  
17 produce uncontrolled flammable fumes or gases in sufficient quantities to pose a risk of fire or  
18 explosions; (4) damage the structural integrity of the device or facility containing the waste; or  
19 (5) through other like means threaten human health or the environment.

20 Sampling and laboratory analysis could be required to verify or establish waste characteristics for waste  
21 that is stored at the 331-C Storage Unit. The following are instances where sampling and laboratory  
22 analysis is required:

- 23 • inadequate information on PNNL-generated waste
- 24 • 5 percent waste verification for PNNL-generated waste
- 25 • 10 percent waste verification for non-PNNL-generated waste
- 26 • identification and characterization for unknown waste and spills within the unit

27 **3.3.1 Parameter Selection Process**

28 The selection of analytical parameters is based on the State of Washington's *Dangerous Waste*  
29 *Regulations*, WAC 173-303-300 and *EPA Waste Analysis at Facilities That Generate, Treat, Store, and*  
30 *Dispose of Hazardous Wastes, A Guidance Manual* (EPA 1994).

31 At least five percent of the waste containers received at 331-C during a federal fiscal year (October 1  
32 through September 30) will undergo confirmation of designation pursuant to Sections 3.2.2 and 3.2.3.  
33 The number of containers needed to meet the five percent requirement is five percent of the average of  
34 containers for the previous three months. For example if 200 containers are received in January, 180 in  
35 February, and 220 in March, then 10 containers of received waste must undergo confirmation of  
36 designation in April. All non-PNNL generating units, which ship more than 20 containers through  
37 331-C Storage Unit in a fiscal year, will have at least one container sampled and analyzed. Containers,  
38 for which there is insufficient process knowledge, or analytical information to designate without sampling  
39 and analysis, may not be counted as part of the five percent requirement unless there is additional  
40 confirmation of designation independent of the generator designation. The generating unit's staff shall  
41 not select the waste containers to be sampled and analyzed other than identifying containers for which  
42 insufficient information is available to designate.

43 Containers of the following are exempt from the confirmation calculation above: Laboratory reagents or  
44 other unused products such as paint, lubricants, solvent, or cleaning products, whether received for  
45 redistribution, recycling, or as waste. To qualify for this exemption, such materials must be received at  
46 the 331-C Storage Unit in their original containers.

January 2007

1 Prior to acceptance of wastes at the 331-C Storage Unit, confirmation of designation may be required.  
2 Wastes that shall undergo confirmation of designation may be divided into two groups; those that easily  
3 yield a representative sample (Category I) and those that do not (Category II). The steps for each type are  
4 outlined below along with a description of which wastes fall into each category:

5 Category I. If a waste that easily yields a representative sample is received, a representative sample will  
6 be taken from the waste containers selected. If more than one phase is present, each phase must be tested  
7 individually. The following field tests will be performed as appropriate for the waste stream:

- 8 • Reactivity–oxidizer, cyanide, and sulfide tests. These tests will not be performed on materials known  
9 to be organic peroxides, ethers, and/or water reactive compounds.
- 10 • Flashpoint/explosivity–Closed cup flashpoint measurement instrument.
- 11 • pH–by pH meter or pH paper (SW-846-9041)<sup>1, 2</sup>. This test will not be performed on non-aqueous  
12 materials.
- 13 • Halogenated organic compounds.
- 14 • Volatile organic compounds–by photo or flame ionization tester<sup>1</sup>, by gas chromatography with or  
15 without mass spectrometry, or by melting point and/or boiling point determination.

16 If the sample data observed meets the parameters specified in their documentation, the confirmation of  
17 designation is complete, and the waste may be accepted. If not, the waste is rejected and returned to the  
18 generating unit for additional characterization. The waste will be required to be resubmitted with a  
19 revised Disposal Request following the additional characterization activity.

20 When mathematically possible, the Permittees shall perform confirmation on an equal number of  
21 Category I and Category II containers.

22 Category II. If a representative sample is not easily obtained (for example, discarded machinery or shop  
23 rags), or if the waste is a labpack or discarded laboratory reagent container, the following steps will be  
24 performed:

- 25 a. Visually verify the waste. Examine each selected container to verify that it matches the data provided  
26 on the Disposal Request form(s) provided to document the waste. Labpacks and combination  
27 packages that are accepted from non-PNNL generators must be removed from the outer container. If  
28 the waste matches the description specified in its documentation, confirmation of designation is  
29 complete, and the waste may be accepted. If not, the waste is rejected and returned to the generating  
30 unit, and the generating unit revises and resubmits the documentation to reflect the actual contents. If  
31 necessary, the waste shall be re-designated utilizing the designation methods identified in  
32 WAC 173-303-070 through 173-303-100.

### 33 **3.3.2 Criteria and Rational for Parameter Selection**

34 Waste-testing methods, parameters, and the rationale for these parameters are summarized in Table 3-1.  
35 Waste testing methods and references to these methods are as specified in WAC 173-303-110(3) (e.g.,  
36 *Test Methods for Evaluating Solid Waste, Physical/Chemical Methods*, EPA SW-846 and *Chemical*  
37 *Testing Methods for Designating Dangerous Waste*, Ecology Publication 97-407) or approved by Ecology  
38 in accordance with WAC 173-303-110(5). These methods are summarized in Table 3-1.

39 Testing parameters for each type of waste were selected to obtain data sufficient to designate the waste  
40 properly under WAC 173-303-070, meet requirements for Land Disposal Restrictions, and manage the

---

<sup>1</sup>Theses instruments are field calibrated or <sup>1</sup>checked for accuracy daily when in use.

<sup>2</sup> The pH paper must have a distinct color change every 0.5-pH units, and each batch of paper must be calibrated against certified pH buffers or by comparison with a pH meter calibrated with certified pH buffers.

January 2007

1 waste properly. If information on the source of the waste is available, then all parameters might not be  
2 required, e.g., exclusion of testing for pesticides from a metal-machining operation.

3 Some of the parameters that are considered for waste received at the 331-C Storage Unit are as follows.

- 4 • Physical description—used to determine the general characteristics of the waste. This facilitates  
5 subjective comparison of the sampled waste with previous waste descriptions or samples. A physical  
6 description is also used to verify the observational presence or absence of free liquids.
- 7 • pH—used to identify the pH and corrosive nature of an aqueous or solid waste to aid in establishing  
8 compatibility strategies and to indicate if the waste is acceptable for storage in the 331-C Storage  
9 Unit.
- 10 • Cyanide—used to indicate whether the waste produces hydrogen cyanide upon acidification below  
11 pH 2.
- 12 • Sulfide screen—used to indicate if the waste produces hydrogen sulfide upon acidification below pH 2.
- 13 • Halogenated hydrocarbon content screen—used to indicate whether chlorinated hydrocarbons or  
14 polychlorinated biphenyls (PCBs) are present in waste and to determine if the waste needs to be  
15 managed in accordance with the regulations prescribed in the *Toxic Substance Control Act of 1976*.
- 16 • Ignitability—used to identify waste that must be managed and protected from sources of ignition or  
17 open flame.
- 18 • Testing kits—used to determine waste characteristics and verify generator knowledge. The testing  
19 procedures for each test are included in the appropriate test kit.

### 20 **3.3.3 Special Parameter Selection Requirements**

21 The 331-C Storage Unit does not have any process vents that manage hazardous waste with organic  
22 concentrations of at least 10 parts per million by weight percent, or pumps, or compressors used more  
23 than 300 hours per year that come into contact with hazardous waste with an organic concentration of at  
24 least 10 percent by weight.

25 A variety of small volume chemical wastes is generated by PNNL's research laboratory activities. These  
26 containers typically range in sizes from 10 ml to 20 gallon. These wastes are brought to the  
27 331-C Storage Unit and segregated by compatibility for storage in the unit until enough waste is  
28 accumulated to fill a labpack or bulking container, usually a 30- to 55-gallon drum. All containers having  
29 a design capacity greater than 0.1 m<sup>3</sup> to less than or equal to 0.46 m<sup>3</sup> are equipped with a cover and  
30 complies with all applicable Department of Transportation regulations on packaging hazardous waste for  
31 transport under 49 CFR part 178.

32 DOT approved intermediate bulk packaging may be utilized for some solid wastes. These containers  
33 range in size from 0.1 cu yard (27 cu ft) to 1.6 cu yard (43 cu ft) and are approved for solid waste only.

## 34 **3.4 SELECTING SAMPLING PROCEDURES**

### 35 **3.4.1 Sampling Strategies and Equipment**

36 Sample collection methods conform to the representative sample methods referenced in  
37 WAC 173-303-110(2). The summary of test parameters, rationales, and testing methods are identified in  
38 Table 3-1.

39 Representative samples of liquid waste from containers (vertical "core sections") are typically obtained  
40 using a composite liquid waste sampler (COLIWASA) or tubing, as appropriate. The sampler is long  
41 enough to reach the bottom of the container in order to provide a representative sample of all phases of  
42 the containerized liquid waste. If a liquid waste has more than one phase, each phase is separated for  
43 individual testing, depending on the waste management pathways of the phases.

January 2007

1 Other waste types that might require sampling are sludges, powders, and granules. In general, nonviscous  
2 sludges are sampled using a COLIWASA. Highly viscous sludges and cohesive solids are sampled using  
3 a trier, as specified in SW-846. Dry powders and granules are sampled using a thief, also as specified in  
4 SW-846.

5 Samplers are constructed of material compatible with the waste. In general, aqueous liquids are sampled  
6 using polyethylene samplers, organic liquids using glass samplers, and solids using polyethylene  
7 samplers. Disposable samplers are used whenever possible to eliminate the potential for cross-  
8 contamination. If non-disposable sampling equipment is used, it is decontaminated between samples.

9 Representative sampling may be requested by unit staff to verify proper waste identification. Unit  
10 personnel or the generating unit producing the waste may perform sampling. The number of grab  
11 samples collected from a container depends on the amount of waste present and on the homogeneity of  
12 the waste as determined by observation. In some cases, there will be only one container of waste present.  
13 In such cases, only one vertical composite sample will be collected (e.g., COLIWASA). If more than one  
14 container is present, a random number of samples will be collected and analyzed statistically using the  
15 procedures specified in Section 9.2 of SW-846.

16 In all instances, sampling methods will conform to the representative sample method referenced in  
17 WAC 173-303-110(2), i.e., ASTM standards for solids and SW-846 for liquids. The specific sampling  
18 methods and equipment used varies with the chemical and physical nature of the waste material and the  
19 sampling circumstances.

#### 20 **3.4.2 Sampling Preservation and Storage**

21 All sample containers, preservation techniques, and hold times follow SW-846 protocol. Many samples  
22 are analyzed at the 331-C Storage Unit utilizing prepackaged test kits and are not preserved.

#### 23 **3.4.3 Sampling QA/QC Procedures**

24 Pacific Northwest National Laboratory is committed to maintaining a high standard of quality for all of its  
25 activities. A crucial element in maintaining that standard is a quality-assurance program that provides  
26 management controls for conducting activities in a planned and controlled manner and enabling the  
27 verification of those activities.

28 The QA/QC objective of the 331-C Storage Unit is to control and characterize errors associated with  
29 collected data and to illustrate that waste testing has been performed according to specification in this  
30 waste analysis plan.

31 The 331-C Storage Unit will verify that precision and accuracy are maintained throughout the waste  
32 analysis process. For analysis using SW-846 methods, the program will follow the QA/QC guidance set  
33 forth in SW-846 at a minimum. Good laboratory practices that encompass sampling, sampling handling,  
34 housekeeping, and safety are followed throughout the process. There are many elements of QA/QC  
35 associated with the sampling processes at the 331-C Storage Unit. These practices verify that all data and  
36 the decisions based on that data are technically sound, statistically valid, and properly documented.

37 Activities pertaining to waste analysis include, but are not limited to, the preparation, review, and control  
38 of procedures and the selection of analytical laboratories. The Laboratory's QA standards-based  
39 management system subject area has administrative procedures that establish requirements and provide  
40 guidance for the preparation of analytical and technical (i.e., sampling, chain-of-custody, work processes)  
41 procedures, as well as other administrative procedures. Procedures undergo a review cycle and, once  
42 issued, are controlled to verify that only current copies are used.

43 The primary purpose of waste testing is to verify that the waste is properly characterized in lieu of  
44 process-knowledge data in compliance with RCRA requirements for general waste analysis  
45 [WAC 173-303-300(2); 40 CFR 264.13]. Waste testing also is performed to verify the safe management  
46 of waste being stored, the proper disposition of residuals from incidents that might occur, and control of

January 2007

1 the acceptance of waste for storage. The specific objectives of the waste-sampling and analysis program  
2 at the 331-C Storage Unit are as follows:

- 3 • Identify the presence of waste that is substantially different from waste currently stored.
- 4 • Provide a detailed chemical and physical analysis of a representative sample of the waste before the  
5 waste is accepted at or transferred from the 331-C Storage Unit to an offsite TSD facility to ensure  
6 proper management and disposal.
- 7 • Provide an analysis that is accurate and up-to-date to ensure that waste is properly treated and  
8 disposed of.
- 9 • Ensure safe management of waste undergoing storage at the 331-C Storage Unit.
- 10 • Ensure proper disposal of residuals.
- 11 • Ensure compliance with LDRs.
- 12 • Identify and reject waste that does not meet the 331-C Storage Unit's acceptance requirements  
13 (e.g., incomplete information).
- 14 • Identify and reject waste that does not meet specifications for the 331-C Storage Unit  
15 (i.e., Chapter 1.0, listing, restricted from storage at the 331-C Storage Unit).

#### 16 **QA/QC Objectives**

17 The objective of the QA/QC program is to control and characterize any errors associated with the  
18 collected data. Quality-assurance activities, such as the use of standard methods for locating and  
19 collecting samples, are intended to limit the introduction of error. Quality-control activities, such as the  
20 collection of duplicate samples and the inclusion of blanks in sample sets, are intended to provide the  
21 information required to characterize any errors in the data. Other QC activities, such as planning the QC  
22 program and auditing ongoing and completed activities, verify that the specified methods are followed  
23 and that the QA information needed for characterizing error is obtained.

- 24 • Field inspections—performed and documented by 331-C Storage Unit staff or designee, depending on  
25 the activity. The inspections primarily are visual examinations but might include measurements of  
26 materials and equipment used, techniques employed, and the final products. The purpose of these  
27 inspections is to verify that a specific guideline, specification, or procedure for the activity is  
28 completed successfully.
- 29 • Field-testing—performed onsite by 331-C Storage Unit staff (or designee) according to specified  
30 procedures or protocol identified by the manufacture's instructions supplied in the field test kits.
- 31 • Laboratory analyses—performed by onsite or offsite laboratories on samples of waste. The purpose of  
32 the laboratory analyses is to determine constituents or characteristics present and the concentration or  
33 level.

#### 34 **Sampling Objectives**

35 The data-quality objectives (DQO) for the waste sampling and data analyses are as follows:

- 36 • Determine if waste samples are representative of the contents of the containers at the time the samples  
37 were taken.
- 38 • Determine if waste samples are representative of long-term operations affecting the 331-C Storage  
39 Unit.
- 40 • Determine if waste accepted for storage is within the Permit documentation limitations.

January 2007

- 1 • Determine if waste accepted for storage meets the requirements of the 331-C Storage Unit waste-  
2 acceptance criteria.
- 3 • Determine if waste accepted for storage meets the information provided by the generator.

#### 4 **Data Collection/Sampling Objectives**

5 The acquired data need to be scientifically sound, of known quality, and thoroughly documented. The  
6 DQOs for the data assessment will be used to determine compliance with national quality standards,  
7 which are as follows:

- 8 • Precision—The precision will be the agreement between the collected samples (duplicates) for the  
9 same parameters, at the same location, and from the same collection vessel.
- 10 • Representativeness—The representativeness will address the degree to which the data accurately and  
11 precisely represent a real characterization of the population, parameter variation at a sampling point,  
12 sampling conditions, and the environmental condition at the time of sampling. The issue of  
13 representativeness will be addressed for the following points:
- 14 • Based on the generating process, the waste stream, and its volume, an adequate number of sampling  
15 locations are selected.

16 The representativeness of selected media has been defined accurately

- 17 • The sampling and analytical methodologies are appropriate.
- 18 • The environmental conditions at the time of sampling are documented.
- 19 • Completeness—The completeness will be defined as the capability of the sampling and analytical  
20 methodologies to measure the contaminants present in the waste accurately.
- 21 • Comparability—The comparability of the data generated will be defined as the data that are gathered  
22 using standardized sampling methods, standardized analyses methods, and quality-controlled data-  
23 reduction and validation methods.

#### 24 **Analytical Objectives**

25 Analytical data will be communicated clearly and documented to verify that laboratory data-quality  
26 objects are achieved.

#### 27 **Field Quality Assurance and Quality Control**

28 Internal QA/QC checks will be performed by submitting QA and QC samples to the analytical laboratory.  
29 The number of field QA samples will be approximately 5 percent of the total number of field samples  
30 taken. The 5-percent criterion commonly is accepted for a minimum number of QA/QC samples. The  
31 types and frequency of collection for field QA samples are as follows:

- 32 • Field Blanks—A sample of analyte-free media taken from the laboratory to the sampling site and  
33 returned to the laboratory unopened. Field blanks are prepared and preserved using sample containers  
34 from the same lot as the other samples collected that day. A sample blank is used to document  
35 contamination attributable to shipping and field-handling procedures. This type of blank is useful in  
36 documenting contamination of volatile organics samples.
- 37 • Field Duplicates—defined as independent samples collected in such a manner that the samples are  
38 equally representative of the variables of interest at a given point in space and time. The laboratory  
39 will use the field duplicate as laboratory duplicate and/or matrix spikes. Thus, for the duplicate  
40 sample, there will be the normal sample analysis, the field duplicate, and the laboratory duplicates  
41 (inorganic analysis). Duplicate samples will provide an estimate of sampling precision.

January 2007

1 **Laboratory Quality Assurance and Quality Control**

2 All analytical work, whether performed by independent laboratories, is defined and controlled by a  
3 Statement of Work, prepared in accordance with administrative procedures. The daily quality of  
4 analytical data generated in the analytical laboratories will be controlled by the implementation of an  
5 analytical laboratory QA plan. At a minimum, the plan will document the following:

- 6 • sample custody and management practices
- 7 • requirements for sample preparation and analytical procedures
- 8 • instrument maintenance and calibration requirements
- 9 • internal QA/QC measures, including the use of method blanks
- 10 • required sample preservation protocols
- 11 • analysis capabilities.

12 The types of internal quality-control checks are as follows:

- 13 • Method Blanks—Method blanks usually consist of laboratory reagent-grade water treated in the same  
14 manner as the sample (i.e., digested, extracted, distilled) that is analyzed and reported as a standard  
15 sample would be reported.
- 16 • Method Blank Spike—A method blank spike is a sample of laboratory reagent-grade water fortified  
17 (spiked) with the analytes of interest, which is prepared and analyzed with the associated sample  
18 batch.
- 19 • Laboratory Control Sample—A QC sample introduced into a process to monitor the performance of  
20 the system.
- 21 • Matrix Spikes—An aliquot of sample spiked with a known concentration of target analyte(s). The  
22 spiking occurs prior to sample preparation and analysis. Matrix spikes will be performed on 5 percent  
23 of the samples (1 in 20) or one per batch of samples.
- 24 • Laboratory Duplicate Samples—Duplicate samples are obtained by splitting a field sample into two  
25 separate aliquots and performing two separate analyses on the aliquots. The analyses of laboratory  
26 duplicates monitor the precision of the analytical method for the sample matrix; however, the  
27 analyses might be affected by nonhomogeneity of the sample, in particular, by nonaqueous samples.  
28 Duplicates are performed only in association with selected protocols. Duplicates are performed only  
29 in association with selected protocols. Laboratory duplicates are performed on 5 percent of the  
30 samples (1 in 20) or one per batch of samples. If the precision value exceeds the control limit, then  
31 the sample set must be reanalyzed for the parameter in question.
- 32 • Known QC Check Sample—This is a reference QC sample as denoted by SW-846 of known  
33 concentration, obtained from the EPA, the National Institute of Standards and Technology, or an  
34 EPA-approved commercial source. This QC sample is taken to check the accuracy of an analytical  
35 procedure. The QC sample is particularly applicable when a minor revision or adjustment has been  
36 made to an analytical procedure or instrument. The results of a QC-check standard analysis are  
37 compared with the true values, and the percent recovery of the check standard is calculated.

38 PNNL Analytical Chemistry Laboratory QA/QC

39 PNNL's analytical chemistry laboratory may need to be used to analyze samples of potentially radioactive  
40 dangerous waste. It has a rigorous QA plan that verifies that data produced are defensible, scientifically  
41 valid, and of known precision and accuracy, and meets the requirements of its clients.

42 **Offsite Laboratory QA/QC**

43 When it is necessary to send samples to an independent laboratory, contracts are not awarded until a pre-  
44 award evaluation of the prospective laboratory has been performed. The pre-award evaluation process

January 2007

1 involves the submittal of its QA plan to PNNL QA staff and the unit-operating supervisor. It also may  
2 involve a site visit by QA personnel and a technical expert, or may consist of a review of the prospective  
3 laboratories' QA/QC documents and records of surveillances/inspections, audits, non-conformances, and  
4 corrective actions maintained by PNNL or other Hanford Facility contractors.

## 5 **Recordkeeping**

6 Records associated with the waste-analysis plan and waste-verification program are maintained by the  
7 waste-management organization. A copy of the Disposal Request for each waste stream accepted at the  
8 331-C Storage Unit is maintained as part of the operating record. Generators maintain their sampling and  
9 analysis records. The waste-analysis plan will be revised whenever regulation changes affect the waste-  
10 analysis plan.

11 Staff of the 331-C Storage Unit has a goal of continuous improvement by verifying that all analytical data  
12 produced are of known accuracy and precision, exceed all industry standards, and are scientifically valid.  
13 Using the above practices and following the appropriate 331-C Storage Unit operating procedures, staff  
14 can monitor and verify that progress is being made in the quality of the data produced.

### 15 **3.4.4 Health and Safety Protocols**

16 During all sampling activities, precautions will be taken to verify that waste containers do not expel gases  
17 and/or pressurized liquids. All personnel will be properly trained in safety and handling techniques.

## 18 **3.5 SELECTING A LABORATORY, AND LABORATORY TESTING AND ANALYTICAL** 19 **METHODS**

### 20 **3.5.1 Selecting a Laboratory**

21 Laboratory selection is limited. Preference will be given to any PNNL facility or other laboratories on the  
22 Hanford Facility that exhibit demonstrated experience and capabilities in three major areas:

- 23 • comprehensive written QA/QC program based on DOE-RL requirements specifically for that  
24 laboratory
- 25 • audited for effective implementation of QA/QC program
- 26 • participate in performance-evaluation samples to demonstrate analytical proficiency.

27 All laboratories (onsite or offsite) are required to have the following QA/QC documentation:

- 28 • Daily analytical data generated in the contracted analytical laboratories are controlled by the  
29 implementation of an analytical laboratory QA plan.
- 30 • Before commencement of the contract for analytical work, the laboratory will have its QA plan  
31 available for review. At a minimum, the QA plan will document the following:
  - 32 • sample custody and management practices
  - 33 • requirements for sample preparation and analytical procedures
  - 34 • instrument maintenance and calibration requirements
  - 35 • internal QA/QC measures, including the use of method blanks
  - 36 • required sample preservation protocols

January 2007

- 1 • analysis capabilities.

2 **3.5.2 Selecting Testing and Analytical Methods**

3 PNNL waste generators collect information through process knowledge and/or sampling and analysis to  
4 provide the information needed to fill out a Disposal Request form and to determine compatibility, safety,  
5 and operating information. As needed, 331-C Storage Unit staff also will conduct analyses to determine  
6 completeness of information and if the waste meets the acceptance criteria for disposal, treatment, or  
7 storage at one of the Hanford Facility-permitted treatment/storage/disposal areas or that of one of the  
8 offsite TSD facilities. Testing and analytical methods will depend on the type of analysis sought and the  
9 reason for needing the information.

10 Chemists and/or appropriate personnel working under approved QA guidelines perform all testing.  
11 Analytical methods will be selected from those that are described in Section 3.3.1.

12 **3.6 SELECTING WASTE RE-EVALUATION FREQUENCIES**

13 Some analysis will be needed to verify that waste streams received by the 331-C Storage Unit conform to  
14 the information on the generator provided Waste Disposal Request and or the waste analysis sheet  
15 supplied by the generator. If discrepancies are found between information on the Disposal Request,  
16 hazardous-waste manifest, shipping papers, waste- analysis documentation, and verification analysis, then  
17 the discrepancy will be resolved by:

- 18 • returning waste to the generator, or sample and analyze the materials in accordance with  
19 WAC 173-303-110; and/or  
20 • reassessing and re-designating the waste, repackaging and labeling as necessary, or return to the  
21 generator.

22 Periodic re-evaluation provides verification that the results from the initial verification are still valid.  
23 Periodic re-evaluation also checks for changes in the waste stream.

24 **Exceptions to physical screening for verification are:**

25 Analysis and characterization, as required by WAC 173-303-300(2), are performed on each waste before  
26 acceptance at the 331-C Storage Unit to determine waste designation and characteristics. The  
27 characterization of the waste, based on this information, is reviewed each time a waste is accepted. The  
28 generator must update the information when the waste stream changes or if the following occurs.

- 29 • The 331-C Storage Unit personnel have reason to suspect a change in the waste, based on  
30 inconsistencies in packaging, labeling, or visual inspection of the waste.  
31 • The information submitted previously does not match the characteristics of the waste submitted.

32 Sampling and laboratory analysis could be required to verify or establish waste characteristics for waste  
33 that is stored at the 331-C Storage Unit. The following are instances where sampling and laboratory  
34 analysis are required:

- 35 • inadequate information on PNNL-generated waste  
36 • waste streams generated onsite will be verified at 5 percent of each waste stream  
37 • inadequate information before waste was shipped or discrepancy discovered

January 2007

- 1 • waste streams received from offsite generators will be verified at 10 percent of each waste stream
- 2 applied per generator, per shipment
- 3 • identification and characterization for unknown waste and spills.

### 4 **3.7 SPECIAL PROCEDURAL REQUIREMENTS**

#### 5 **3.7.1 Procedures for Receiving Waste From off-site Generators**

6 Most of the waste stored at the 331-C Storage Unit is generated on the Hanford Site and/or by PNNL  
7 research programs within the 300 Area. Additional requirements for waste generated outside the  
8 300 Area include proper manifesting (if appropriate) to the 331-C Storage Unit and proper packaging for  
9 transport over public roadways. Although PNNL waste generated outside of the 300 Area is considered  
10 to be generated offsite since it may be transported to the 331-C Storage Unit on roads accessible to the  
11 public, it is under the same administrative controls as wastes that are generated onsite (i.e., in the  
12 300 Area).

13 The generator is responsible for identifying waste composition accurately, and PNNL waste operations  
14 will arrange for the transport of the waste. The 331-C Storage Unit maintains a copy of any pertinent  
15 operating record in accordance with WAC 173-303 and the timeframes described in DOE/RL-91-28,  
16 Chapter 12, Table 12.1. The waste-tracking methods are as follows.

- 17 • **Inspection of Shipping Papers/Documentation**—The necessary shipment papers for the entire  
18 shipment are verified (i.e., signatures are dated, all waste containers included in the shipment are  
19 accounted for and correctly indicated on the shipment documentation, there is consistency throughout  
20 the different shipment documentation, and the documentation matches the labels on the containers).
- 21 • **Inspection of Waste Containers**—The condition of waste containers is checked to verify that the  
22 containers are in good condition (i.e., free of holes and punctures).
- 23 • **Inspection of Container Labeling**—Shipment documentation is used to verify that the containers are  
24 labeled with the appropriate "Hazardous/Dangerous Waste" labeling and associated markings  
25 according to the contents of the waste container.
- 26 • **Acceptance of Waste Containers**—The 331-C Storage Unit personnel signs the shipment documents  
27 and retains a copy.

28 If shipment will be received from or destined offsite, then a uniform hazardous waste manifest will be  
29 prepared identifying the 331-C Storage Unit as the receiving unit (Hanford Facility RCRA Permit  
30 Condition II.P). The 331-C Storage Unit operations staff will sign and date the manifest to certify that the  
31 dangerous waste covered by the manifest was received. The transporter will be given at least one copy of  
32 the signed manifest. A copy of the manifest will be returned to the generator within 30 days of receipt at  
33 the 331-C Storage Unit. A copy of the manifest also will be retained in the 331-C Storage Unit operating  
34 record.

35 For onsite waste transfers subject to the Hanford Facility RCRA Permit Condition II.Q.1, documentation  
36 meeting that requirement will be prepared and will accompany the shipment. The documentation will be  
37 maintained in the Operating Record. Onsite transfers traveling on public or private rights-of-way within  
38 or along the border of contiguous Hanford Site property may also be tracked using an alternate tracking  
39 system as allowed by Hanford Facility RCRA Permit Condition II.P.2.

## 1     **Response to Significant Discrepancies**

2     The primary concern during acceptance of containers for storage is improper packaging or manifest  
3     discrepancies. Containers with such discrepancies are not accepted at the 331-C Storage Unit until the  
4     discrepancy has been resolved. Depending on the nature of the condition, such discrepancies can be  
5     resolved using one or more of the following alternatives.

- 6     • Incorrect or incomplete entries on the uniform hazardous waste manifest can be corrected or  
7     completed with concurrence of the onsite generator or offsite generator. Corrections are made by  
8     drawing a single line through the incorrect entry. Corrected entries are initialed and dated by the  
9     individual making the correction.
- 10    • The waste packages can be held and the onsite generator or offsite waste generator requested to  
11    provide written instructions for use in correcting the condition before the waste is accepted.
- 12    • Waste packages can be returned as unacceptable.
- 13    • If a noncompliant dangerous waste package is received from an offsite waste generator, the waste  
14    package is non-returnable because of condition, packaging, etc., and if an agreement cannot be  
15    reached among the involved parties to resolve the noncompliant condition, then the issue will be  
16    referred to DOE-RL and Ecology for resolution. Ecology will be notified in writing if a discrepancy  
17    is not resolved within 15 days after receiving a noncompliant shipment. Pending resolution, such  
18    waste packages, although not accepted, might be placed in the 331-C Storage Unit. The package(s)  
19    will be segregated from other waste, and an entry will be made into the 331-C Storage Unit logbook  
20    describing the actions that were taken to store the packages in a safe manor until a resolution has been  
21    reached.

## 22    **Activation of Contingency Plan for Damaged Shipment**

23    If waste shipments arrive at the 331-C Storage Unit in a condition that presents a hazard to public health  
24    or the environment, the Building Emergency Procedure is implemented as described in Chapter 7.0 for  
25    the 331-C Storage Unit.

## 26    **3.7.2 Procedures for Ignitable, Reactive, and Incompatible Wastes**

27    Ignitable, reactive, and incompatible wastes are stored in compliance with Uniform Fire Code Division II  
28    regulations for Container and Portable Tank Storage Inside Buildings (International Conference of  
29    Building Officials 1988). Containers of ignitable, reactive, and incompatible wastes are stored in  
30    individual flammable material storage cabinets within the storage cells or in a flammable cabinet in the  
31    bay area.

32    Chapter 6 describes precautions used at 331-C Storage Unit so that incompatible wastes are not stored  
33    together. Chemical wastes stored in 331-C Storage Unit are separated by chemical makeup and hazard  
34    class and stored in areas having appropriate secondary containment, as described in Chapter 4.

35    As shown in Chapter 4, each storage area has individual storage configurations; secondary containment  
36    structures are provided to verify that incompatible materials will not commingle if spilled. Further  
37    segregation is provided by chemical storage cabinets located throughout the unit in various areas as  
38    shown in Chapter 4. Cabinet types are noted in those figures, and capacities are described in Table 4-1.  
39    Incompatible wastes are never placed in the same container or in unwashed containers that previously  
40    held incompatible waste.

January 2007

1 Compliance with WAC 173-303-395(1)(b) is assured by utilizing this system and the procedure for  
2 handling ignitable or reactive waste and mixing of incompatible waste, as described in Chapter 6.

### 3 **3.7.3 Procedures to Ensure Compliance with LDR Requirements**

#### 4 **LDR Waste-Analysis Requirements**

5 The *Hazardous and Solid Waste Amendments of 1984* prohibit the land disposal of certain types of wastes  
6 that are subject to RCRA. Most of the waste types stored at the 331-C Storage Unit falls within the  
7 purview of these land-disposal restrictions (LDRs). Information presented below describes how  
8 generators and 331-C Storage Unit personnel characterize, document, and certify waste subject to LDR  
9 requirements.

10 Waste must be analyzed using the Toxicity Characteristic Leaching Procedure (TCLP) in accordance with  
11 Appendix II of 40 CFR 261, as amended, in order to provide sufficient information for proper  
12 management and for decisions regarding LDR pursuant to 40 CFR 268.

#### 13 **Waste Characterization**

14 Before being received at the 331-C Storage Unit, the RCRA waste characteristics, the level of toxicity  
15 characteristics, and the presence of listed wastes are determined during the physical and chemical  
16 analyses process. This information allows waste-management personnel to make all federal and  
17 applicable state LDR determinations accurately and complete appropriate notifications and certifications.

#### 18 **Sampling and Analytical Procedures**

19 The LDR characterization and analysis is generally performed as part of the waste-characterization and  
20 analysis process. If waste is sampled and analyzed for LDR characterization, then only EPA or  
21 equivalent methods are used to provide sufficient information for proper management and for decisions  
22 regarding LDRs pursuant to 40 CFR 268.

#### 23 **Frequency of Analysis**

24 Before acceptance and during the waste-characterization and analysis process, all LDR characterizations  
25 and designations are made. The characterization and analysis process is performed when a Disposal  
26 Request is submitted for waste pick-up, unless there is insufficient data, or if the waste stream has  
27 changed. Instances where sampling and laboratory analysis may be required to determine accurate LDR  
28 determinations include the following:

- 29 • when waste-management personnel have reason to suspect a change in the waste based on  
30 inconsistencies on the Disposal Request, packaging, or labeling of the waste
- 31 • when the information submitted previously by a generator does not match the characteristics of the  
32 waste that was submitted
- 33 • when the offsite TSD facility rejects the waste because the fingerprint samples are inconsistent with  
34 the waste profile provided by the 331-C Storage Unit that was established using generator  
35 information.

36 Dangerous waste types listed in Table 3-1 are sampled as needed on an individual container or batch basis  
37 before they are collected from the point of generation or prior to shipment offsite. After the dangerous  
38 constituents have been characterized, these waste streams will not be analyzed again until process or raw  
39 material changes occur.

#### 40 **Documentation and Certification**

41 The 331-C Storage Unit has and will continue to receive and store LDR waste. Because 331-C Storage  
42 Unit personnel determine designations and characterization, including LDR determinations, qualified staff  
43 for PNNL-generated waste prepare all notifications and certifications, as required by 40 CFR 268. The  
44 331-C Storage Unit staff collects from the generator(s) the information pursuant to 40 CFR 268 regarding

January 2007

1 LDR waste. The notifications and certifications are submitted to onsite and offsite TSD units during the  
2 waste-shipment process. Additionally, any necessary LDR variances are prepared and submitted by  
3 PNNL qualified staff.

4 The 331-C Storage Unit staff requires applicable LDR information/notifications from non-PNNL  
5 generators.

6 Where an LDR waste does not meet the applicable treatment standards set forth in 40 CFR 268,  
7 Subpart D, or exceeds the prohibition levels set forth in 40 CFR 268.32 or Section 3004(d) of RCRA, the  
8 331-C Storage Unit provides to the onsite and offsite TSD a written notice that includes the following  
9 information:

- 10 • EPA hazardous-waste number
- 11 • the corresponding treatment standards and all applicable prohibitions set forth in WAC 173-303,  
12 40 CFR 268.32, or RCRA Section 3004(d)
- 13 • the manifest number associated with the waste
- 14 • all available waste-characterization data
- 15 • identification of underlying hazardous constituents.

16 In instances where 331-C Storage Unit staff determines that a restricted waste is being managed that can  
17 be land-disposed without further treatment, 331-C Storage Unit staff submits a written notice and  
18 certification to the onsite or offsite TSD where the waste is being shipped, stating that the waste meets  
19 applicable treatment standards set forth in WAC 173-303-140 (40 CFR 268, Subpart D), and the  
20 applicable prohibition levels set forth in 40 CFR 268.32 or RCRA Section 3004(d). The notice includes  
21 the following information:

- 22 • EPA hazardous-waste number
- 23 • corresponding treatment standards and applicable prohibitions
- 24 • waste-tracking number associated with the waste
- 25 • all available waste-characterization data
- 26 • identification of underlying hazardous constituents.

27 The certification accompanying any of the notices previously described is signed by an authorized  
28 representative of the generator and states the following:

29 I certify under penalty of law that I personally have examined and am familiar with the waste through  
30 analysis and testing or through knowledge of the waste to support this certification that the waste  
31 complies with the treatment standards specified in 40 CFR Part 268 Subpart D and all applicable  
32 prohibitions set forth in 40 CFR 268.32 or RCRA Section 3004(d). I believe that the information I  
33 submitted is true, accurate, and complete. I am aware that there are significant penalties for submitting a  
34 false certification, including the possibility of a fine and imprisonment.

35 Copies of all notices and certifications described are retained at the TSD unit for at least 5 years from the  
36 date that the waste was last sent to an onsite or offsite TSD unit. After that time, the notices and  
37 certifications are sent to Records Storage.

### 38 **3.8 MANIFEST SYSTEM**

39 The Hanford Site has one EPA/state identification number, as required by WAC 173-303-060, and all  
40 TSD units on the Hanford Site (such as the 331-C Storage Unit) are considered part of one dangerous  
41 waste facility. Therefore, onsite shipments of dangerous waste are not subject to the manifesting  
42 requirements specified in WAC 173-303-370 and -180. The 331-C Storage Unit has an onsite waste  
43 tracking system akin to a manifest system, which is voluntarily used for transporting waste on the  
44 Hanford Facility.

January 2007

1 A uniform hazardous waste manifest is used for all off-site shipments of dangerous waste received at the  
2 331-C Storage Unit, as well as for all off-site shipments of dangerous waste from the 331-C Storage Unit.  
3 In addition to the uniform hazardous waste manifest, wastes subject to land disposal restrictions that are  
4 shipped from the 331-C Storage Unit to off-site treatment, storage, or disposal facilities are accompanied  
5 by the applicable notifications and certifications required under 40 CFR 268.

6 The following sections provide information on receiving shipments, response to manifest discrepancies,  
7 and provisions for nonacceptance of shipments.

### 8 **3.8.1 Procedures for Receiving Shipments**

9 The following are procedures used prior to transport of wastes to the 331-C Storage Unit. First, the  
10 generator must submit a chemical disposal/recycle request form to the waste management organization.  
11 This request form is then reviewed and either approved or rejected. Typical causes of rejection include  
12 missing or insufficient information in any of the data fields or lack of specific information on waste  
13 composition. Upon approval, the waste management organization reviews the form to determine the  
14 dangerous waste designation, waste compatibility class for storage, and containerization and labeling  
15 requirements.

16 Waste Management personnel verify the information contained on the request form, such as number,  
17 sizes, and types of containers, location of waste, etc., check for proper containerization of waste, and then  
18 inspect the waste at the generating unit. If discrepancies are noted during the inspection, Waste  
19 Management personnel will not pick up the waste. Typical discrepancies include waste not as described  
20 on request form or lack of supporting data to verify waste characteristics. In such cases, deficiencies will  
21 be explained to the generating unit responsible person, who will then be responsible for correcting them.

22 If the waste is found to be acceptable for transport, Waste Management staff will check to verify that  
23 required labels are in place and transport (or arrange for transport of) the waste to the 331-C Storage Unit.  
24 If transport will be over public roadways or highways, a uniform hazardous waste manifest will be  
25 prepared identifying PNNL as the transporter and the 331-C Storage Unit as the receiving TSD unit.  
26 Alternate tracking systems may be used in certain cases as allowed by Hanford Facility RCRA Permit  
27 Condition II.P.2. A copy of all such manifests or alternate tracking documents is returned to the  
28 generating unit within 30 days of receipt at the 331-C Storage Unit. A copy of the manifest or alternate  
29 document is also retained at the 331-C Storage Unit.

### 30 **3.8.2 Response to Significant Discrepancies**

31 Waste shipments received at the 331-C Storage Unit containing manifest discrepancies are not accepted  
32 unless the discrepancy or discrepancies can be resolved with the generating unit at the time the shipment  
33 arrives. Manifest discrepancies requiring such resolution include:

- 34 • Variations exceeding 10 percent in weight for bulk shipments such as tank trucks or tank cars  
35 (generally not applicable to 331-C Storage Unit since most shipments are in drums or other  
36 containers);
- 37 • Any inaccuracy in piece counts in containerized shipments (underage or overage);
- 38 • Type mismatches (i.e., the waste is not as described on the request form; obvious inaccuracies  
39 such as waste acid substituted for waste solvent).

40 Manifest information will also be considered incorrect if the written description of wastes does not agree  
41 with visual observations, or if observed weights or volumes differ by more than 10 percent from those  
42 described on the manifest.

43 If a discrepancy is noted, the generating unit will be contacted immediately. The waste will not be  
44 accepted for storage until the discrepancy is resolved. The generating unit will be asked to identify the  
45 source of the discrepancy (e.g., error in estimating volume or weight, incorrect identification of waste,

January 2007

1 etc.). Once the cause of the discrepancy is identified, and the generating unit and the waste management  
2 organization have concurred as to resolution of the discrepancy, the manifest will be corrected.  
3 Corrections will be made by drawing a single line through the incorrect entry and entering the correct  
4 information. Corrected entries will be initialed and dated by the individual making the correction. Once  
5 the manifest has been corrected, the discrepancy will be considered resolved.

6 Certain manifest discrepancies may be discovered after receipt, such as analytical data indicating  
7 incorrect designation, which may result in incorrect naming of the shipment on the manifest. Such  
8 discrepancies will be managed as noted above; if, however, the discrepancy cannot be resolved within  
9 15 days of receipt of the shipment, the 331-C Storage Unit will file the report required by WAC 173-303-  
10 370(4)(b) as described in Chapter 12.0, Section 12.4.1.1.1.

### 11 **3.8.3 Provisions for Nonacceptance of Shipment**

12 Provisions for nonacceptance of shipments are discussed in the following sections.

#### 13 **3.8.3.1 Nonacceptance of Undamaged Shipment**

14 All wastes are inspected by staff from the waste management organization prior to shipment and are  
15 transported to the 331-C Storage Unit by waste management organization staff. This procedure is  
16 designed to prevent receipt of nonacceptable wastes. Waste management organization staff will refuse to  
17 accept or transport wastes, which are nonacceptable at the 331-C Storage Unit.

#### 18 **3.8.3.2 Activation of BEP/Contingency Plan for Damaged Shipment**

19 All wastes are inspected by staff from the waste management organization prior to shipment and are  
20 primarily transported to the 331-C Storage Unit by waste management organization staff. Damaged  
21 containers will not be accepted from the generator and will not be transported. The only opportunity for  
22 receipt of damaged containers, therefore, would be if containers were damaged during transportation. If a  
23 shipment of waste is damaged during transportation, and arrives in a condition that presents a hazard to  
24 public health or to the environment, the facility BEP/contingency plan will be implemented as described  
25 in Chapter 7.0.

#### 26 **3.8.4 Unmanifested Waste**

27 Waste generated within the Hanford Site is not transported over public highways and is not subject to  
28 manifest requirements under WAC 173-303. Such waste may be received at the 331-C Storage Unit  
29 without a manifest. However, a completed and approved disposal request form must accompany all  
30 wastes (including unmanifested waste).

31 If transport is by public roadways or highways, a manifest or alternate tracking system (if appropriate per  
32 Hanford Facility RCRA Permit Condition II.P.2) must be used. Shipments requiring a manifest that do  
33 not have one, will either be rejected or at the sole discretion of the unit operator the unit will accept the  
34 waste and file an unmanifested waste report as described in WAC 173-303-390(1) and detailed in  
35 Chapter 12.0.

1 Table 3.1. Summary of Test Parameters, Rationales, and Methods

Parameter <sup>(a)</sup>	Method <sup>(b)</sup>	Rationale for Selection
<b>Physical Screening</b>		
Visual inspection	Field method—observe phases, presence of solids in waste	Confirm that waste matches that described on waste acceptance documentation; identify waste prohibited by LDR requirements related to downstream TSD unit acceptance criteria
<b>Chemical Screening</b>		
Water miscibility/separable organics <sup>c</sup>	Water mix screen ASTM Method D5232-92	Confirm that waste matches that described on waste acceptance documentation; identify separable organics; identify waste prohibited by LDR requirements related to downstream TSD unit acceptance criteria
Oxidizer	Oxidizer Screen	Confirm that waste matches that described on waste acceptance documentation; verify compliance with WAC 173-303-395(1)(b)
pH	pH screen SW-846 Method 9041	Confirm that waste matches that described on waste acceptance documentation; verify compliance with WAC 173-303-395(1)(b)
Cyanides	Cyanide screen	Confirm that waste matches that described on waste acceptance documentation; verify compliance with WAC 173-303-395(1)(b)
Sulfides	Sulfide screen	Confirm that waste matches that described on waste acceptance documentation; verify compliance with WAC 173-303-395(1)(b)
Flashpoint	Flashpoint measurement instrument	Confirm that waste matches that described on waste acceptance documentation
Halogenated/Volatile Organic Compounds	Photoionizer or Flame Ionizer, or Clor-D-Tect Kits(c)	Confirm that waste matches that described on waste acceptance documentation
<b>Pre-Shipment Review</b>		
Mercury (total)	Generator knowledge or SW-846 Method 7470/7471	Identify waste prohibited by LDR requirements related to downstream TSD unit acceptance criteria.
Toxicity characteristic organic compounds	Generator knowledge or SW-846 Methods 1311 and 8260 (volatile organic compounds) and 8270 (semivolatile organic compounds)	Identify waste not identified in Chapter 1.0, Part A
Polycyclic aromatic hydrocarbons	Generator knowledge or SW-846 Method 8270 or 8100	Identify waste not identified in Chapter 1.0, Part A, (for waste with >1% solids and for which WP03 could apply)

(a) Addition parameters can be used on current waste acceptance criteria of the downstream TSD unit. Operation limits transfer/shipments are based on current waste acceptance criteria.

(b) Procedures based on EPA SW-846, unless otherwise noted. When regulations require a specific method, the method shall be followed.

(c) These tests will not be performed on materials known to be organic peroxides, ether, and/or water reactive compounds.

1	<b>Chapter 4.0</b>	<b>Process Information</b>
<hr/>		
2	4.0	PROCESS INFORMATION ..... 4.1
3		
4	4.1	CONTAINERS ..... 4.1
5	4.1.1	Description of Containers ..... 4.1
6	4.1.2	Container Management Practices..... 4.1
7	4.1.3	Container Labeling ..... 4.3
8	4.1.4	Containment Requirements for Storing Containers ..... 4.3
9	4.1.5	Demonstration that Containment Is Not Required Because Containers Do Not Contain
10		Free Liquids, Wastes That Exhibit Ignitability or Reactivity, or Wastes Designated
11		F020-F023, F026, or F027 ..... 4.7
12	4.1.6	Prevention of Reaction of Ignitable, Reactive, and Incompatible Waste in Containers ..... 4.7
13		
14	4.2	TANK SYSTEMS ..... 4.7
15		
16	4.3	WASTE PILES ..... 4.8
17		
18	4.4	SURFACE IMPOUNDMENTS ..... 4.8
19		
20	4.5	INCINERATORS ..... 4.8
21		
22	4.6	LANDFILLS..... 4.8
23		
24	4.7	LAND TREATMENT ..... 4.8
25		
26	4.8	AIR EMISSIONS CONTROL..... 4.8
27	4.8.1	Process Vents ..... 4.8
28	4.8.2	Equipment Leaks ..... 4.8
29	4.8.3	Tanks and Containers..... 4.8
30	<b>Figures</b>	
<hr/>		
31	Figure 4.1.	Acids and Oxidizers Cell..... 4.10
32	Figure 4.2.	Poisons and Class 9 Cell..... 4.11
33	Figure 4.3.	Alkaline, Washington State Criteria Waste, Organic Peroxides, and Non-Regulated
34		Waste Cell ..... 4.12
35	Figure 4.4.	Flammable, Organic and Compressed Aerosols Cell ..... 4.13
36	Figure 4.5.	Bay Storage Area..... 4.14
37		
38	<b>Tables</b>	
<hr/>		
39	Table 4.1.	Storage Devices Used at the 331-C Storage Unit ..... 4.15
40	Table 4.2.	Building Occupancy limits. .... 4.16
41		

January 2007

WA7890008967, Operating Unit 15  
331-C Storage Unit

1  
2  
3  
4  
5

This page intentionally left blank.



January 2007

- 1 Drums are never carried on the forks or "speared" by slipping the forks under the chime. When waste  
2 handling operations are conducted, at least two persons are present in the unit.
- 3 Lab Packing. One of the major functions of the 331-C Storage Unit is the preparation of lab packs for  
4 offsite recycling, treatment and/or disposal of small quantity lab waste generated by DOE-RL/PNNL  
5 activities.
- 6 Lab packs are prepared in compliance with WAC 173-303-161, 49 CFR 173.12, other applicable  
7 regulations, and requirements of the planned receiving facility (recycler, treatment facility, or disposal  
8 facility). Requirements affecting preparation of lab packs might include types of absorbent materials to  
9 be used (e.g., no vermiculite).
- 10 Lab packs are prepared in the bay area or in the storage cell containing the hazard class(es) to be placed in  
11 the lab pack.
- 12 Partial and completed lab packs are closed, labeled, and the contents list documented. Lab packs are  
13 stored in the cell from which the containers inside were drawn, or in the bay area if appropriate.
- 14 Unit personnel wear appropriate protective clothing while handling containers being placed in lab packs.  
15 At a minimum this includes lab coats or long sleeved shirt, long pants, safety glasses or other protective  
16 eyewear, and chemical resistant gloves. More stringent requirements, including use of respiratory  
17 protection, may be imposed if appropriate.
- 18 Bulking. In order to promote greater recycling or treatment of waste and reduce land disposal, some  
19 liquid wastes are "bulked" into larger containers, typically 30- or 55-gallon closed head drums. Bulking  
20 is the commingling of small containers of compatible waste into one container. Appropriate respiratory  
21 protection will be used when the bulking of flammable liquids or toxics is performed. Bulking of  
22 nonvolatile, low hazard waste such as saline solutions or ethylene glycol may be done within the  
23 containment areas of the appropriate storage cell or bay area.
- 24 Compatibility of waste to be bulked is determined using the information from generating unit designation  
25 information, process knowledge, laboratory analyses, and/or by compatibility determinations.
- 26 Glass containers emptied (as defined by WAC 173-303-160(2)) as a result of bulking activities are  
27 usually crushed onsite by an electric glass crusher, which mounts on a 55-gallon drum or managed as  
28 solid waste in accordance with WAC 173-303-160(3). If an emptied glass container held acutely  
29 hazardous waste, as defined by WAC 173-303-040(2), the container is rinsed at least three times with an  
30 appropriate cleaner or solvent before being destroyed. The rinsates are managed as dangerous waste.
- 31 Once bulking is complete, the bulk container is closed, labeled, and the contents list documented.  
32 Containers of bulked waste are stored in the cell from which the containers inside were drawn, or in Cell  
33 7 if appropriate. If incompatible wastes are stored in Cell 7, they are kept in individual secondary  
34 containment systems if in bulk drum form.
- 35 Unit personnel wear appropriate protective clothing while bulking containerized liquid waste. At a  
36 minimum, this includes coveralls, or long sleeved shirt, long pants, disposable splash-resistant apron, eye  
37 protection, and chemical resistant gloves. More stringent requirements, including use of respiratory  
38 protection, may be imposed if appropriate.

January 2007

1 **4.1.3 Container Labeling**

2 As required by WAC 173-303-630, all containers of dangerous waste are marked and/or labeled to  
3 describe the contents of the container and the major hazards of the waste. Containers are also marked  
4 with a unique identifying number assigned by the unit's computerized waste tracking system.

5 **4.1.4 Containment Requirements for Storing Containers**

6 **4.1.4.1 Secondary Containment System Design**

7 Several design features have been engineered into the construction of the 331-C Storage Unit as added  
8 safeguards for containment of dangerous waste spills or leaks. The following subsections comment  
9 briefly on each of the design features.

10 **4.1.4.1.1 System Design**

11 The facility is covered by a roof that is maintained to prevent intrusion of rainwater into areas where  
12 hazardous waste is stored.

13 The base of the facility consists of a 6-inch reinforced, poured concrete slab. All exposed surfaces were  
14 finished with a smooth troweled surface and painted with a chemical resistant epoxy based coating. All  
15 edges and corners were sealed with a bead of sealant.

16 The concrete floors in each bay storage cell are sealed and bermed using angle iron and have containment  
17 trenches at the entrances to these cells. These trenches are isolated from each other to prevent interaction,  
18 reactions, or offsite migration of spilled materials. This provides protection even during simultaneous  
19 spills.

20 The condition of the floor coating is inspected weekly per Chapter 6.0, and repairs are made as needed.  
21 Immediate repairs are indicated whenever the coating is observed to have been chipped, bubbled up,  
22 scraped, or otherwise damaged in a manner that would significantly impact the capability of the coating to  
23 contain spilled materials. Minor nicks and small chips resulting from normal operations will be repaired  
24 on a periodic basis.

25 The floors in Cell 7 are sealed and bermed using angle iron and have containment trenches at every exit to  
26 the area to prevent offsite migration of spilled material. Drums stored in this area are also stored on  
27 pallets to prevent contact with spilled material in the event of a release.

28 **4.1.4.1.2 Structural Integrity of Base**

29 The concrete was mixed in accordance with ASTM C94/C94M, and is capable of bearing the loads  
30 associated with normal container storage and movement.

31 **4.1.4.1.3 Containment System Capacity**

32 Secondary containment is provided for all dangerous waste stored at the 331-C Storage Unit. Storage  
33 limits for all chemicals are listed in Table 4.1 (1988 Uniform Building Code). All floors in the bay area  
34 have sumps that have no drains and are covered with grating to prevent safety hazards. The capacity of  
35 the two sumps at the entrances to the building is 168 gallons per trench, and the sumps to the individual  
36 storage cells have a capacity of 98 gallons per sump. In addition, all floors in the bay area are coated  
37 with an epoxy based coating as described in Section 4.1.4.1.1. Inspection of the containment system to

January 2007

1 maintain integrity is described in Chapter 6.0. Individual secondary containment systems are configured  
2 as follows:

3 **a. Acids and Oxidizers Cell.** The acids and oxidizers cell (Cell 1) is located at the northwest corner of  
4 the 331-C Storage Unit bay area. The concrete floor in this storage cell is sealed and bermed using angle  
5 iron and has a containment trench at the entrance. This trench is isolated from the other trenches in order  
6 to prevent interaction, reactions, or offsite migration of spilled materials. This provides protection even  
7 during simultaneous spills. Six cabinets, open shelving, and a large-container storage area are provided  
8 within the cell to allow storage of various sizes of containers. The containment volume of the sump  
9 entering the cell is 98 gallons. A diagram of the cell is provided in Figure 4.1.

10 **b. Poisons and Class 9 Cell.** The poisons and Class 9 cell (Cell 2) is located just south of the acids and  
11 oxidizers cell along the west wall of the bay area. The concrete floor in this storage cell is sealed and  
12 bermed using angle iron and has a containment trench at the entrance. This trench is isolated from the  
13 other trenches in order to prevent interaction, reactions, or offsite migration of spilled materials. This  
14 provides protection even during simultaneous spills. The northeast corner of the cell is used for PCB  
15 storage for disposal complying with 40 CFR 761.65(b). The containment volume of the sump entering  
16 the cell is 98 gallons. A diagram of this cell is provided in Figure 4.2.

17 **c. Alkaline, Washington State Criteria Waste, Organic Peroxides, and Non-Regulated Waste Cell.**  
18 The alkaline, Washington State Criteria waste, and non-regulated waste cell (Cell 3) is located south of  
19 the poisons and Class 9 cell on the west wall of the bay area. The concrete floor in this storage cell is  
20 sealed and bermed using angle iron and has a containment trench at the entrance. This trench is isolated  
21 from the other trenches in order to prevent interaction, reactions, or offsite migration of spilled materials.  
22 This provides protection even during simultaneous spills. Four storage cabinets, three sets of open  
23 shelving, and one explosion proof refrigerator, are positioned in the cell to allow storage of various sizes  
24 of containers. The containment volume of the sump entering the cell is 98 gallons. A diagram of this cell  
25 is provided in Figure 4.3.

26 **d. Flammable, Organic and Compressed Aerosols Cell.** The flammable cell (Cell 4) is located south  
27 of the alkaline, Washington State Criteria waste, and non-regulated waste cell. The concrete floor in this  
28 storage cell is sealed and bermed using angle iron and has a containment trench at the entrance. This  
29 trench is isolated from the other trenches in order to prevent interaction, reactions, or offsite migration of  
30 spilled materials. This provides protection even during simultaneous spills. The containment volume of  
31 the sump entering the cell is 98 gallons. A diagram of this cell is provided in Figure 4.4.

32 Ignitable organic waste materials are stored in this cell that also exhibits the characteristics of corrosivity  
33 and toxicity as well as reactivity. Eight Factory Mutual-approved flammable liquid storage cabinets are  
34 utilized for storage of various classes of flammable liquids as defined by the Uniform Fire Code. The  
35 capacities of the various cabinets are shown in Table 4.1. The following cabinets also are used for storage  
36 in this cell: one for combustibles, one for aerosols, two for flammable solids, and one for overflow from  
37 one of the other cabinets.

38 Total ignitable Waste Storage capacity of the 331-C Storage Unit bay, including the organics cell,  
39 Ignitable drum storage area, and bay storage area is limited by the following UBC restrictions for Class B  
40 occupancy:

- 41 • Class 1A flammable liquids: 120 gallons
- 42 • Class 1B flammable liquids: 240 gallons
- 43 • Class 1C flammable liquids: 360 gallons
- 44 • Maximum Class 1A, 1B, and 1C at any one time: 480 gallons

January 2007

- 1 • Maximum Class 1A, 1B and 1C stored in Cell 8 self contained storage module for flammable liquids  
2 is 240 gallons
- 3 • Class 2 combustible liquids: 480 gallons
- 4 • Class 3A combustible liquids: 1320 gallons
- 5 • Combustible fibers, loose: 100 cubic feet
- 6 • Combustible fibers, baled: 1000 cubic feet
- 7 • Flammable gases in any one cylinder: 3000 cubic feet
- 8 • Liquefied flammable gases: 60 gallons

9 **e. Flammable Liquids Storage Module.** The flammable liquid storage module is a self-contained  
10 storage module (Cell 8) that allows additional storage space for flammable waste. The flammable liquid  
11 storage module is located along the south wall and is connected to the buildings fire suppression system.  
12 The flammable liquid storage module has a 2-hour fire rated containment system so that according to the  
13 Uniform Fire Code, an unlimited capacity is allowed. However, the flammable waste storage capacity of  
14 the flammable liquid storage module is limited by the 240-gallon capacity of the module's secondary  
15 containment system. No more than 240 gallons of any combination of flammable liquid classes will be  
16 stored in the module. This flammable waste storage capacity is in addition to the flammable storage  
17 limits for the bay area. A diagram showing the module location in the bay area is included in Figure 4.5.

18 **f. Ignitable Waste Drum Storage Area.** An additional section of the bay area (Cell 8) has been  
19 dedicated with two flammable drum storage cabinets used to store drum quantities of ignitable waste  
20 before offsite shipment. The bay area is bordered on all sides by angle iron (3½ in. x 6 in.) bolted to the  
21 floor and sealed to provide secondary containment. To further enhance containment and to allow greater  
22 storage capacity, the drums stored in this area are stored in flammable liquid drum storage cabinets.

23 Maximum storage in these two cabinets is approximately four 55-gallon drums and twelve five-gallon  
24 drums. A diagram showing the two flammable storage cabinets in the bay area is included in Figure 4.5.  
25 Additional ignitable waste storage is provided for in Cell 4, the organics cell, and in the flammable liquids  
26 storage module. All of this ignitable waste storage is provided for utilizing flammable liquid storage  
27 cabinets for added safety.

28 **g. Universal and Recycling Waste Storage Area.** A section of the bay (Cell 6) has been dedicated to  
29 storage of drum quantities of universal and recycling waste before shipment. The area is approximately  
30 20 ft. x 5 ft. in size dependent on the amounts in storage. All material in this area is stored in DOT  
31 approved containers and is stored on pallets to prevent contact with spilled waste in the event of an  
32 incident. A diagram of this area is included in Figure 4.5.

33 **h. Bay Storage Area.** The bay storage area is itself a secondary containment area for loading,  
34 unloading, and the storage of dangerous waste. All floors in the bay area are bordered on all sides by  
35 angle iron (3½ in. x 6 in.) bolted to the floor and sealed with an epoxy based coating to provide secondary  
36 containment. Sump locations are indicated in Figure 4.5.

37 Due to space limitations in the individual cells, and for ease of mechanical handling, the bay floor is  
38 typically used for storage of chemicals in drums.

39 The bay floor is also used to store lab packs and bulked waste containers before offsite shipment to  
40 permitted treatment, disposal, or recycling facilities. Generally, only corrosives, oxidizers, toxic organic  
41 solvent mixtures (typically halogenated solvents), antifreeze mixtures, contaminated water which is toxic  
42 dangerous waste, nonliquid waste, Class 9, or state-only dangerous waste materials are stored in the bay  
43 storage area.

January 2007

1 If incompatible wastes are stored in the bay area, they are kept in individual secondary containment  
2 systems (spill pallets, portable booms or other commercially available drum containment systems) if in  
3 bulk drum form. If the waste is in labpack form, it will meet WAC 173-303-161, *Overpacked containers*  
4 (*labpacks*), requirements before being stored in the bay area. The DOT approved outer container serves  
5 as the secondary containment system for segregation in case of simultaneous accidental spillage.

6 The bay storage is governed by the building occupancy limits of Table 4.2, which includes the inventory  
7 of the individual storage cells previously described. In order to provide additional separation from spilled  
8 liquids and for ease of handling, all drums stored on the bay floor are stored on pallets. A diagram of the  
9 bay area is provided in Figure 4.5.

10 **i. Explosives Storage Area.** Due to Uniform Building Code restrictions, waste classified as explosive  
11 by DOT regulations are stored in a 3 ft. x 3 ft. x 3 ft. explosives magazine, with an 8 cubic foot interior,  
12 outside Cell 4. The magazine is constructed of steel and certified to have been fabricated per Institute of  
13 Makers of Explosives (IME) SLP22, type 2-day box requirements. No more than 1 pound of explosives  
14 is stored in the magazine at one time. The location of the magazine is indicated in Figure 4.5.

#### 15 **4.1.4.1.4 Control of Run-On**

16 The 331-C Storage Unit was designed to eliminate the likelihood of on-site, or for that matter, off-site  
17 migration via run-on and run-off. The building and the covered area adjacent to the building have been  
18 constructed upon a foundation and the surrounding soil sloped away so that precipitation cannot cause  
19 either run-on or run-off problems.

#### 20 **4.1.4.2 Removal of Liquids from Containment System**

21 Upon discovery of liquid accumulation in the containment resulting from a spill or other release, the  
22 Building Emergency Director (BED) must be contacted in accordance with the 331-C Storage Unit  
23 Building Emergency Procedure (BEP) Chapter 7.0. The BED may determine that the contingency plan  
24 should be implemented. If the incident is minor, and the BED approves, removal of the liquids will  
25 commence immediately following a safety evaluation. Appropriate protective clothing and respiratory  
26 protection will be worn during removal activities; a PNNL industrial hygienist may be contacted to  
27 determine appropriate personnel protection requirements and any other safety requirements that may be  
28 required, such as chemical testing or air monitoring. In addition, ventilation of the spill-impacted area  
29 may be performed if determined to be safe and if appropriate monitoring of the air discharge(s) is  
30 performed.

31 Spills are normally contained either within the storage cabinet, within the cell, or within a secondary  
32 containment trench or berm as described in Section 4.1.4.1.1. In any case, spilled material will be  
33 recovered to the extent possible by pumping recovered liquids with a pump made of non-reactive  
34 materials (either steel or PVC) to intact containers selected in accordance with the container criteria in  
35 WAC 173-303-190. Non-recoverable liquids will be absorbed with an appropriate absorbent (after  
36 appropriate chemical reaction to neutralize reactivity in the case of reactive waste, or neutralization in the  
37 case of corrosive materials); refer to Table 6.2 for a list of available materials for this purpose. The  
38 absorbent material will then be recovered and placed in a container selected in accordance with  
39 Section 4.1.1.1, using non-sparking shovels in the case of ignitable waste. The floor, cabinets and any  
40 other impacted containers may be cleaned with dry rags, soap and water, or a compatible solvent if  
41 necessary to remove external contamination. Contaminated rags and other cleanup material will be  
42 disposed of in an appropriate manner.

January 2007

1 **4.1.5 Demonstration that Containment Is Not Required Because Containers Do Not Contain Free**  
2 **Liquids, Wastes That Exhibit Ignitability or Reactivity, or Wastes Designated F020-F023,**  
3 **F026, or F027**

4 This section is not applicable to the 331-C Storage Unit because the storage area is used to store  
5 containers both with and without free liquids. The 331-C Storage Unit does not meet the conditions for  
6 reduced requirements for storing only containers without free liquid; therefore, the facility is subject to  
7 the full requirements for containment.

8 **4.1.6 Prevention of Reaction of Ignitable, Reactive, and Incompatible Waste in Containers**

9 The following sections provide information on the management of ignitable, reactive, and incompatible  
10 waste in containers. Additional information on this subject can be found in Chapter 6.0, Section 6.5.

11 **4.1.6.1 Management of Certain Reactive Wastes in Containers**

12 Wastes described in WAC 173-303-070(7)(vi), (vii), and/or (viii) (explosive type wastes) will be stored in  
13 the explosives magazine described in Section 4.1.4.1.3 above. This magazine meets the Uniform Fire  
14 Code requirements for storage of such materials.

15 **4.1.6.2 Management of Ignitable or Reactive Waste in Containers**

16 Ignitable and reactive wastes are stored in compliance with Uniform Fire Code Division II regulations for  
17 Container and Portable Tank Storage Inside Buildings (International Conference of Building  
18 Officials 1988). Containers of ignitable and reactive waste are stored in individual flammable storage  
19 cabinets within the storage cells.

20 **4.1.6.3 Design of Areas to Manage Incompatible Wastes**

21 Chapter 6.0, Section 6.5.2 describes guidelines used at the 331-C Storage Unit to determine the  
22 compatibility of dangerous waste so that incompatible wastes are not stored together. Chemical waste  
23 stored in the 331-C Storage Unit are separated by compatibility, chemical makeup, and hazard class and  
24 stored in areas having appropriate secondary containment, as described in Section 4.1.1.6.

25 As shown in Figures 4.1 through 4.5, each storage area has individual storage configurations; secondary  
26 containment structures are provided to verify that incompatible materials will not commingle if spilled.  
27 Further segregation is provided by chemical storage cabinets located throughout the facility in various  
28 areas as shown in Figures 4.1 through 4.5. Cabinet types are noted in those figures and capacities are  
29 described in Table 4.1. Incompatible wastes are never placed in the same container, or in unwashed  
30 containers that previously held incompatible waste.

31 Compliance with WAC 173-303-395(1)(b) is assured utilizing the reactivity groupings given in *A Method*  
32 *for Determining the Compatibility of Hazardous Waste* (EPA 1980). Using this system and following the  
33 guidelines for handling ignitable or reactive waste and mixing of incompatible waste, as described in  
34 Section 6.5.2, fulfills the requirements of WAC 173-303-395(1)(c).

35 **4.2 TANK SYSTEMS**

36 This section is not applicable to the 331-C Storage Unit because waste is not managed in tanks.

January 2007

1 **4.3 WASTE PILES**

2 This section is not applicable to the 331-C Storage Unit because waste is not managed in waste piles.

3 **4.4 SURFACE IMPOUNDMENTS**

4 This section is not applicable to the 331-C Storage Unit because waste is not placed in surface  
5 impoundments.

6 **4.5 INCINERATORS**

7 This section is not applicable to the 331-C Storage Unit because waste is not incinerated.

8 **4.6 LANDFILLS**

9 This section is not applicable to the 331-C Storage Unit because waste is not placed in landfills.

10 **4.7 LAND TREATMENT**

11 This section is not applicable to the 331-C Storage Unit because waste is not treated in land treatment  
12 units.

13 **4.8 AIR EMISSIONS CONTROL**

14 **4.8.1 Process Vents**

15 This section is not applicable to the 331-C Storage Unit, as no equipment subject to WAC 173-303-690  
16 (Subpart AA requirements) is located or utilized at the unit.

17 **4.8.2 Equipment Leaks**

18 This section is not applicable to the 331-C Storage Unit, as no equipment subject to WAC 173-303-691  
19 (Subpart BB requirements) is located or utilized at the unit. Note that pumps or other equipment may  
20 contact hazardous waste with an organic concentration of at least ten percent by weight for less than 300  
21 hours per calendar year. If so, the equipment will be identified as required by WAC 173-303-691(1)(f).

22 **4.8.3 Tanks and Containers**

23 **4.8.3.1 Applicability of Subpart CC Standards**

24 The requirements of WAC 173-303-692 (Subpart CC standards) apply to dangerous waste stored at the  
25 331-C Storage Unit unless one or more of the exceptions given at WAC 173-303-692(1)(b) apply.

26 **4.8.3.2 Tank Systems and Container Areas – Demonstrating Compliance**

27 Compliance with the Subpart CC standards is maintained at the 331-C Storage Unit by utilizing DOT-  
28 specification containers for storage, when the container has a design capacity greater than 0.1 m<sup>3</sup>  
29 (26.4 gallons). Containers greater than 0.46 m<sup>3</sup> (121 gallons) are not typically utilized at 331-C, and if  
30 they are, they would be used only for materials with low vapor pressures. Hence Level 1 container  
31 standards are the only standards that must be met.

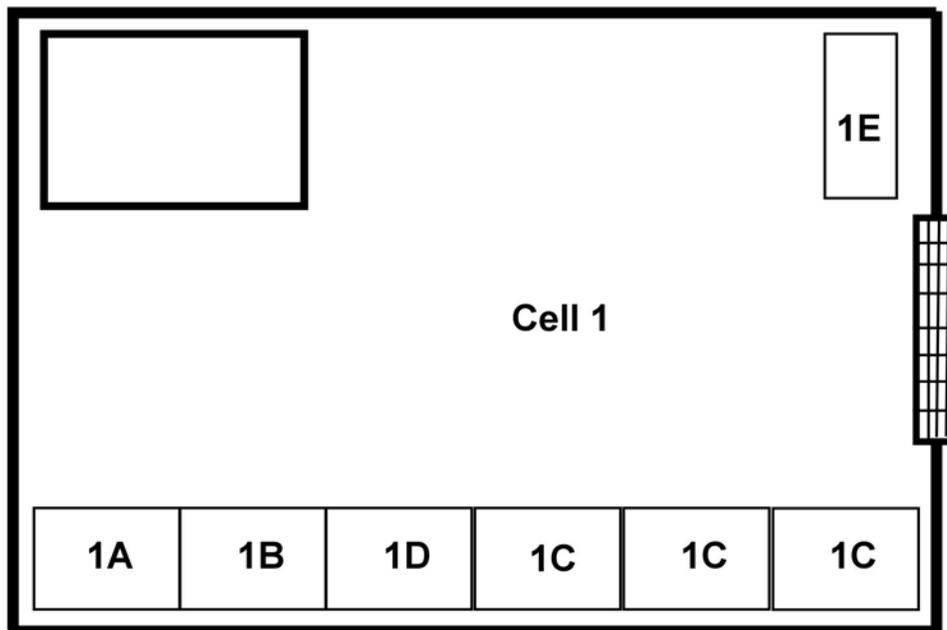
32 To meet the Level 1 standards, the following standards are observed:

January 2007

- 1 • Opening hazardous waste containers only occurs when adding or removing waste, or for necessary  
2 inspection or sampling, after which the container is promptly re-closed.
- 3 • Inspection of the closure of hazardous waste containers is checked prior to loading for shipment to  
4 331-C as part of the waste acceptance process (Section 3.2.2).
- 5 • Any waste container greater than 0.1 m<sup>3</sup> capacity stored longer than one year is re-inspected at least  
6 once every 12 months to check the container for deterioration or damage. Any deterioration or  
7 damage is documented and promptly repaired in accordance with 40 CFR 264.1086(c)(4)(iii).
- 8 Determination that containers with capacity greater than 0.46 m<sup>3</sup> (121 gallons) are not in "light material  
9 service" is provided through the acceptance criteria in the 331-C waste analysis plan (Section 3.2).

1  
2

Figure 4.1. Acids and Oxidizers Cell

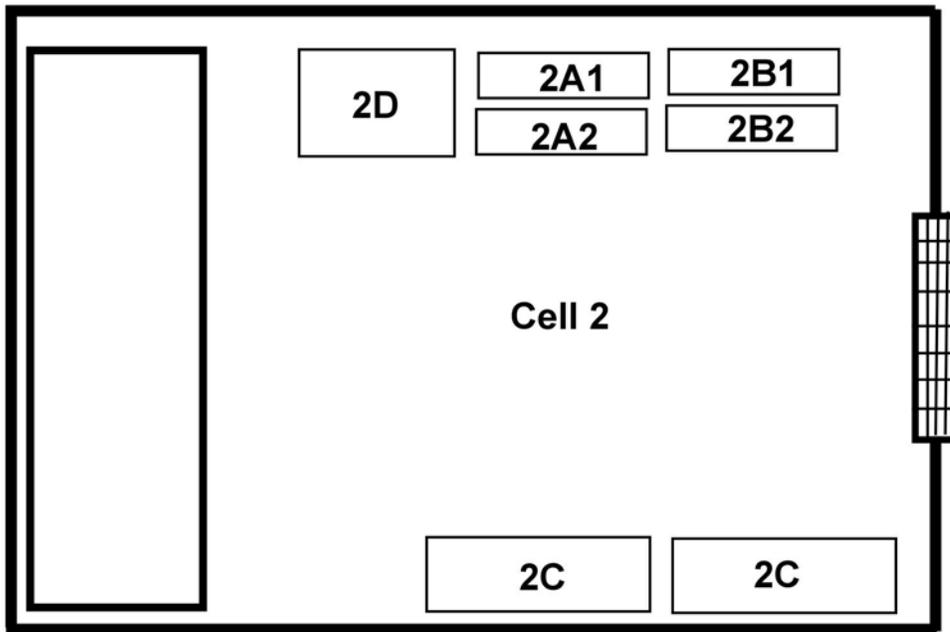


3  
4  
5

**Legend**

- 7 1A Liquid Oxidizers (Medium Cabinet)
- 8 1B Solid Oxidizers (Small Cabinet)
- 9 1C Inorganic Acids (Medium Cabinet)
- 10 1D Organic Acids (corrosive) (Small Cabinet)
- 11 1E Mercury/Corrosive Solids (Small Shelf)
- 12  Epoxy coated angle iron
- 13  Collection Sump
- 14  Drum and Carboy Storage Area

Figure 4.2. Poisons and Class 9 Cell

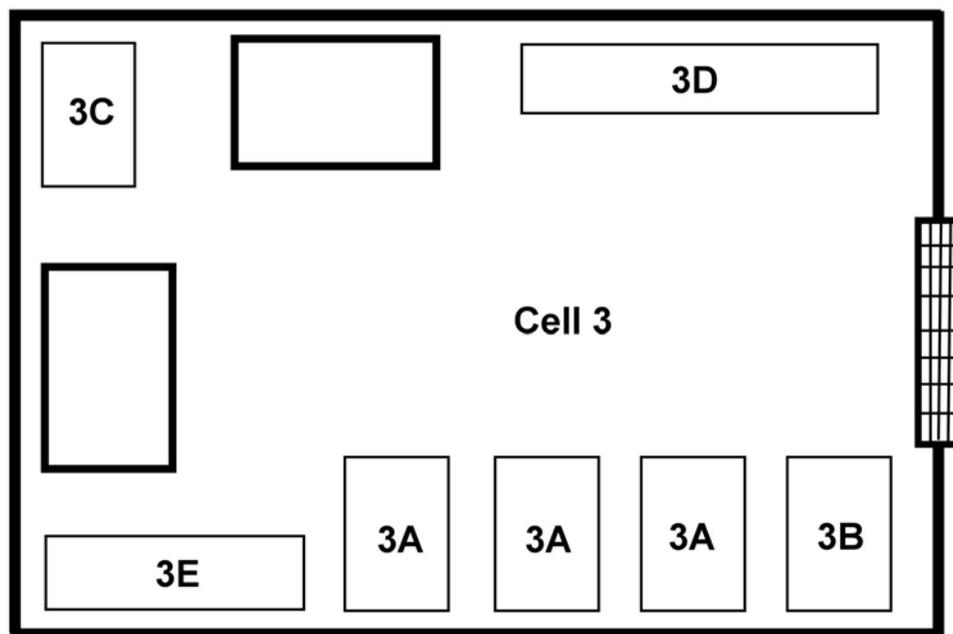


**Legend**

- 2A1 Poisons, Acidic (P.G.II and P.G.III) (Small Cabinet)
- 2A2 Poisons, Neutral/Basic (P.G.II and P.G.III) (Small Cabinet)
- 2B1 Poisons, Neutral/Basic (P.G.I) (Small Cabinet)
- 2B2 Poisons, Acidic (P.G.I) (Small Cabinet)
- 2C Class 9 (nonreactive) (Large and Small Shelf)
- 2D Class 9 (reactives) (Large Cabinet)
- Epoxy coated angle iron
- ▤ Collection Sump
- Drum and Carboy Storage Area

1 **Figure 4.3. Alkaline, Washington State Criteria Waste, Organic Peroxides, and Non-Regulated**  
2 **Waste Cell**

3



4

5

6 **Legend**

7 3A Alkaline (liquids and solids) (Medium Cabinet)

8 3B Alkaline/Oxidizers (Medium Cabinet)

9 3C Organic Peroxides and temperature sensitive (refrigerator)

10 3D Washington State Criteria Waste ( Large Shelve)

11 3E Non-Regulated Liquids/Solids (Small Shelf)

12  Epoxy coated angle iron

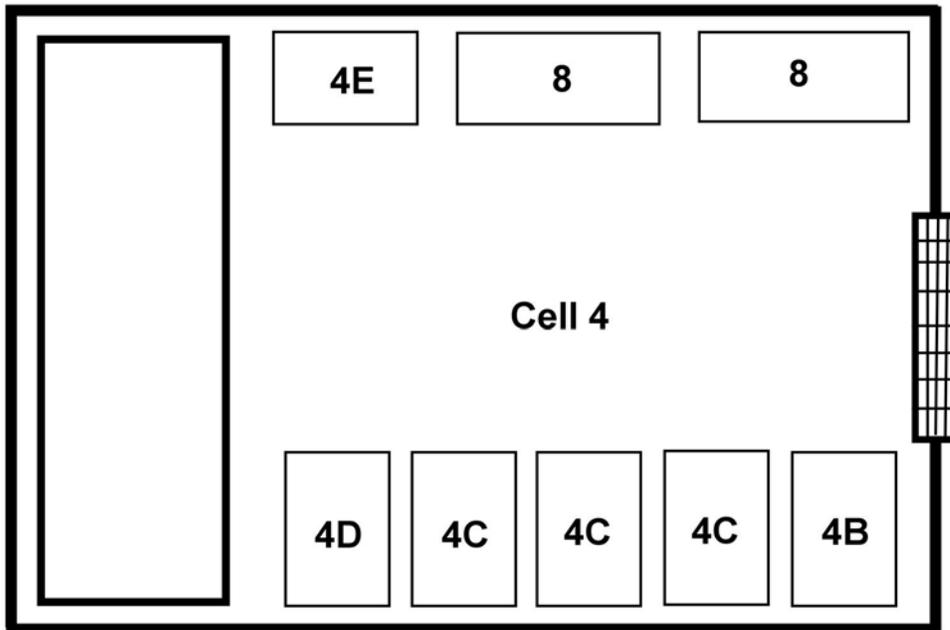
13  Collection Sump

14  Drum and Carboy Storage Area

15

1  
2

**Figure 4.4. Flammable, Organic and Compressed Aerosols Cell**



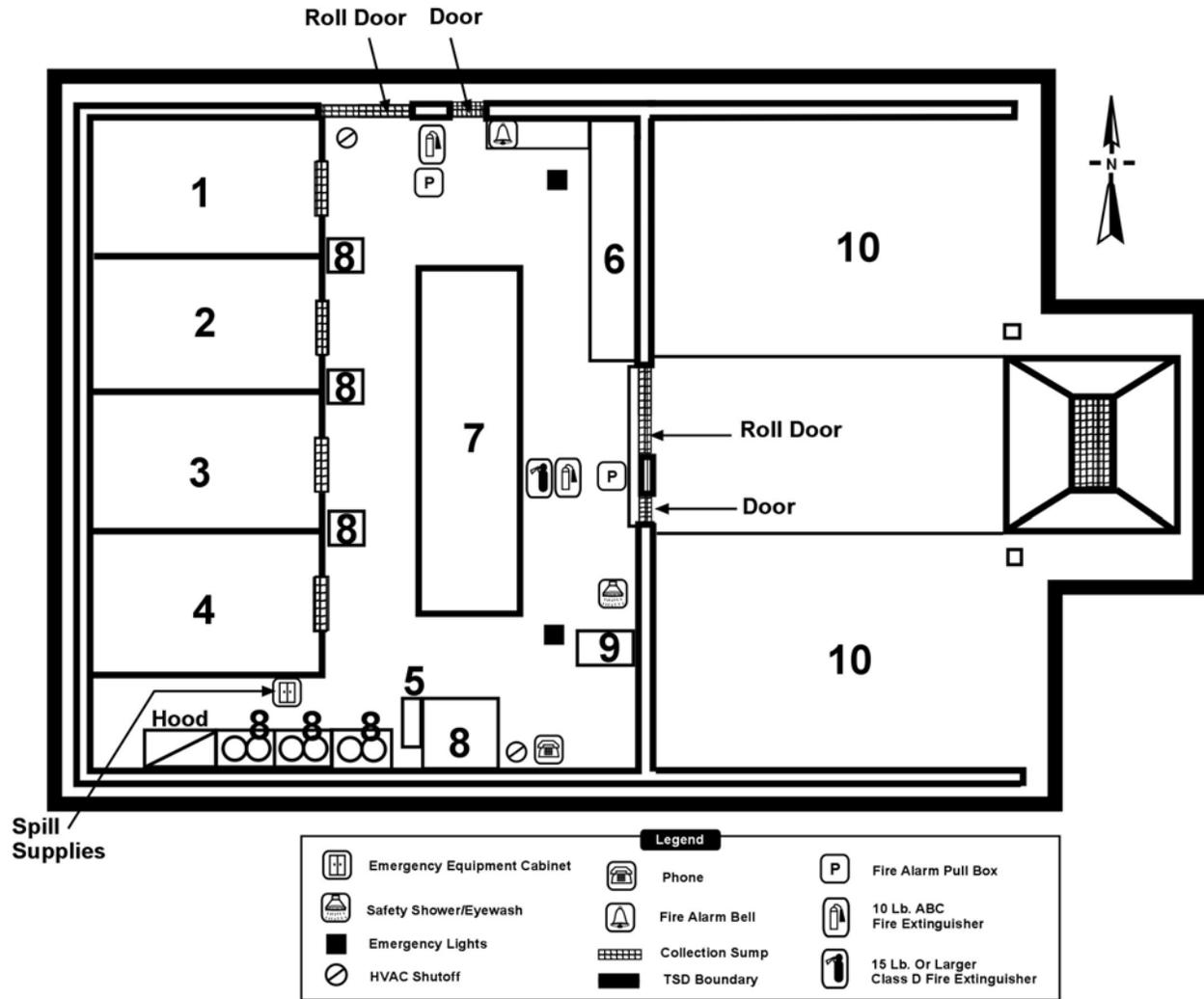
3  
4

**Legend**

- 6 4B Aerosols (Large Cabinet)
- 7 4C Flammable Liquids (Large Cabinet)
- 8 4D Flammable Solids (Dangerous When Wet) (Large Cabinet)
- 9 4E Flammable Solids (with water Spontaneously Combustible) (Large Cabinet)
- 10 4F Floating Cabinet (Large Cabinet)
- 11 8 Flammable Liquids (Large Cabinets)
- 12  Epoxy coated angle iron
- 13  Collection Sump
- 14  Drum and Carboy Storage Area

1  
2

Figure 4.5. Bay Storage Area



3  
4  
5  
6

Legend

1. Acids, Oxidizers
2. Poisons, Class 9
3. Alkaline, WSDW, Organic Peroxides
4. Organics Flammable and Compressed Aerosols
5. Compressed gases
6. Universal/Recycling Storage Area
7. Class 9, WSDW, Non-flammable and compatible waste
8. Flammable Storage
9. Explosive Magazine
10. Outdoor Storage

1

**Table 4.1. Storage Devices Used at the 331-C Storage Unit**

Storage Device	Typical Use	Approximate External Dimensions (in.)	Approximate Capacity (gal/ft3.)
Small Cabinet	Storage of containers (5 gallons or less capacity)	43w x 18d x 65h	50 max
Medium Cabinet	Storage of containers (18.93 liter [5 gallons] or less capacity)	31w x 31d x 65h	60 max
Large Cabinet	Storage of containers (5 gallons or less capacity)	34w x 34d x 65h	80 max
Small Drum Cabinet	Storage of drums (5 to 55 gallons capacity)	34w x 34d x 65h	65 max
Large Drum Cabinet	Storage of drums (5 to 55 gallons capacity)	59w x 34d x 65h	130 max
Small Shelving	Storage of containers (5 gallons or less capacity)	47w x 18d x 62h	65 max
Large Shelving	Storage of containers (5 gallons or less capacity)	72w x 18d x 62h	100 max
Flammable Storage Module	18.93 liter [5 gallons] to 208.18 liter [55 gallons] capacity	78w x 73d x 100h	240 max
Refrigerator/Freezer	Storage of containers of organic peroxides and other temperature sensitive waste	34w x 29d x 67h	25 Cu.Ft.
Explosives Magazine	Storage of containers containing DOT classified explosives	36w x 36d x 36h	8 Cu.Ft.

1

**Table 4.2. Building Occupancy limits.**

TABLE NO.9-A—EXEMPT AMOUNTS OF HAZARDOUS MATERIALS, LIQUIDS  
AND CHEMICALS REPRESENTING A PSYICAL HAZARD  
BASIC QUANTITIES PER CONTROL AREA<sup>1</sup>

When two units are given values within parentheses are in cubic feet (Cu.Ft.) or pounds (Lbs.)

CONDITION		STORAGE <sup>2</sup>			USE <sup>2</sup> —CLOSED SYSTEMS			USE <sup>2</sup> —OPEN SYSTEMS		
MATERIAL	CLASS	Solid Lbs. (Cu.Ft.)	Liquid Gallons (Lbs.)	Gas (Cu.Ft.)	Solid Lbs. (Cu.Ft.)	Liquid Gallons (Lbs.)	Gas (Cu.Ft.)	Solid Lbs. (Cu.Ft.)	Liquid Gallons (Lbs.)	Gas (Cu.Ft.)
1.1 Combustible liquid <sup>3</sup>	II	—	120 <sup>4 5</sup>	—	—	120 <sup>4</sup>	—	—	30 <sup>4</sup>	—
	III-A	—	330 <sup>4 5</sup>	—	—	330 <sup>4</sup>	—	—	80 <sup>4</sup>	—
	III-B	—	13,200 <sup>5 6</sup>	—	—	13,200 <sup>6</sup>	—	—	3,300 <sup>6</sup>	—
1.2 Combustible dust lbs./1000 Cu.Ft.		1 <sup>7</sup>	—	—	1 <sup>7</sup>	—	—	1 <sup>7</sup>	—	—
1.3 Combustible fiber (loose)		(100)	—	—	(100)	—	—	(20)	—	—
	(baled)	(1,000)	—	—	(1,000)	—	—	(200)	—	—
1.4 Cryogenic, flammable or oxidizing		—	45	—	—	45	—	—	10	—
2.1 Explosives		1 <sup>5 8 9</sup>	(1) <sup>5 8 9</sup>	—	¼ <sup>8</sup>	(¼) <sup>8</sup>	—	¼ <sup>8</sup>	(¼) <sup>8</sup>	—
3.1 Flammable solid		125 <sup>4 5</sup>	—	—	25 <sup>4</sup>	—	—	25 <sup>4</sup>	—	—
3.2 Flammable gas (gaseous)		—	—	750 <sup>4 5</sup>	—	—	750 <sup>4 5</sup>	—	—	—
	(liquefied)	—	15 <sup>4 5</sup>	—	—	15 <sup>4 5</sup>	—	—	—	—
3.1 Flammable liquid <sup>3</sup>		—	30 <sup>4 5</sup>	—	—	30 <sup>4</sup>	—	—	10 <sup>4</sup>	—
		—	60 <sup>4 5</sup>	—	—	60 <sup>4</sup>	—	—	15 <sup>4</sup>	—
		—	90 <sup>4 5</sup>	—	—	90 <sup>4</sup>	—	—	20 <sup>4</sup>	—
Combination I-A, I-B, I-C		—	120 <sup>4 5 10</sup>	—	—	120 <sup>4 10</sup>	—	—	30 <sup>4 10</sup>	—
4.1 Organic peroxide, unclassified detonable		1 <sup>5 8</sup>	(1) <sup>5 8</sup>	—	¼ <sup>8</sup>	(¼) <sup>8</sup>	—	¼ <sup>8</sup>	(¼) <sup>8</sup>	—
4.2 Organic peroxide	I	5 <sup>4 5</sup>	(5) <sup>4 5</sup>	—	(1) <sup>4</sup>	(1) <sup>4</sup>	—	1 <sup>4</sup>	1 <sup>4</sup>	—
	II	50 <sup>4 5</sup>	(50) <sup>4 5</sup>	—	50 <sup>4</sup>	(50) <sup>4</sup>	—	10 <sup>4</sup>	(10) <sup>4</sup>	—
	III	125 <sup>4 5</sup>	(125) <sup>4 5</sup>	—	125 <sup>4</sup>	(125) <sup>4</sup>	—	25 <sup>4</sup>	(25) <sup>4</sup>	—
	IV	500	(500)	—	500 <sup>4</sup>	(500)	—	100	(100)	—
	V	N.L.	N.L.	—	N.L.	N.L.	—	N.L.	N.L.	—
4.3 Oxidizer	4	1 <sup>5 8</sup>	(1) <sup>5 8</sup>	—	¼ <sup>8</sup>	(¼) <sup>8</sup>	—	¼ <sup>8</sup>	(¼) <sup>8</sup>	—
	3	10 <sup>4 5</sup>	(10) <sup>4 5</sup>	—	2 <sup>4</sup>	(2) <sup>4</sup>	—	2 <sup>4</sup>	(2) <sup>4</sup>	—
	2	250 <sup>4 5</sup>	(250) <sup>4 5</sup>	—	250 <sup>4</sup>	(250) <sup>4</sup>	—	50 <sup>4</sup>	(50) <sup>4</sup>	—
	1	1,000 <sup>4 5</sup>	(1,000) <sup>4 5</sup>	—	1,000 <sup>4</sup>	(1,000) <sup>4</sup>	—	200 <sup>4</sup>	(200) <sup>4</sup>	—
4.1 Oxidizer—Gas (gaseous)		—	—	1,500 <sup>4 5</sup>	—	—	1,500 <sup>4 5</sup>	—	—	—
	(liquefied)	—	15 <sup>4 5</sup>	—	—	15 <sup>4 5</sup>	—	—	—	—
5.1 Pyrophoric		4 <sup>5 8</sup>	(4) <sup>5 8</sup>	50 <sup>5 8</sup>	1 <sup>8</sup>	(1) <sup>8</sup>	10 <sup>5 8</sup>	0	0	0
6.1 Unstable (reactive)	4	1 <sup>5 8</sup>	(1) <sup>5 8</sup>	10 <sup>5 8</sup>	¼ <sup>8</sup>	(¼) <sup>8</sup>	2 <sup>5 8</sup>	¼ <sup>8</sup>	(¼) <sup>8</sup>	0
	3	5 <sup>4 5</sup>	(5) <sup>4 5</sup>	50 <sup>4 5</sup>	1 <sup>4</sup>	(1) <sup>4</sup>	10 <sup>4 5</sup>	1 <sup>4</sup>	(1) <sup>4</sup>	0
	2	50 <sup>4 5</sup>	(50) <sup>4 5</sup>	250 <sup>4 5</sup>	50 <sup>4</sup>	(50) <sup>4</sup>	250 <sup>4 5</sup>	10 <sup>4</sup>	(10) <sup>4</sup>	0
	1	125 <sup>4 5</sup>	(125) <sup>4 5</sup>	750 <sup>4 5</sup>	125 <sup>4</sup>	(125) <sup>4</sup>	750 <sup>4 5</sup>	25 <sup>4</sup>	(25) <sup>4</sup>	0
7.1 Water (reactive)	3	5 <sup>4 5</sup>	(5) <sup>4 5</sup>	—	5 <sup>4</sup>	(5) <sup>4</sup>	—	1 <sup>4</sup>	(1) <sup>4</sup>	—
	2	50 <sup>4 5</sup>	(50) <sup>4 5</sup>	—	50 <sup>4</sup>	(50) <sup>4</sup>	—	10 <sup>4</sup>	(10) <sup>4</sup>	—
	1	125 <sup>5 6</sup>	(125) <sup>5 6</sup>	—	125 <sup>6</sup>	(125) <sup>5 6</sup>	—	25 <sup>6</sup>	(25) <sup>6</sup>	—

January 2007

N.L. = Not Limited

<sup>1</sup> Control area is a space bounded by not less than a one-hour fire-resistive occupancy separation within which the exempted amounts of hazardous materials may be stored dispensed, handled or used. The number of control areas within a building used for retail and wholesale stores shall not exceed two. The number of control areas in buildings with other uses shall not exceed four.

<sup>2</sup> The aggregate quantity in use and storage shall not exceed the quantity listed for storage.

<sup>3</sup> The quantities of alcoholic beverages in retail sales uses are unlimited provided the liquids are packaged in individual containers not exceeding four liters.

The quantities of medicines, foodstuffs and cosmetics containing not more than 50 percent of volume of water-miscible liquids and with the remainder of the solutions not being flammable in retail sales or storage occupancies are unlimited when packaged in individual containers not exceeding four liters.

<sup>4</sup> Quantities may be increased 100 percent in sprinklered buildings. When Footnote 5 also applies, the increase for both footnotes may be applied.

<sup>5</sup> Quantities may be increased 100 percent when stored in approved storage cabinets or safety cans as specified in the fire code. When Footnote 4 also applies, the increase for both may be applied.

<sup>6</sup> The quantities permitted in a sprinklered building are not limited.

<sup>7</sup> A dust explosion potential is considered to exist if 1 pound or more of combustible dust per 1,000 cubic feet of volume is normally in suspension or on horizontal surfaces inside buildings or equipment and which could be put into suspension by an accident, sudden force or small explosion.

<sup>8</sup> Permitted in sprinklered buildings only. None is allowed in unsprinklered buildings.

<sup>9</sup> One pound of black sporting powder and 20 pounds of smokeless powder are permitted in sprinklered or unsprinklered buildings.

<sup>10</sup> Containing not more than the exempt amounts of Class I-A, Class I-B, and Class I-C flammable liquids.

TABLE NO.9-B—EXEMPT AMOUNTS OF HAZARDOUS MATERIALS, LIQUIDS  
AND CHEMICALS REPRESENTING A HEALTH HAZARD  
MAXIMUM QUALITIES PER CONTROL AREA <sup>1 2</sup>

When two units are given, values within parentheses are in pounds (Lbs)

MATERIAL	STORAGE <sup>3</sup>			USE <sup>3</sup> —CLOSED SYSTEMS			USE <sup>3</sup> —OPEN SYSTEMS		
	Solid Lbs. (Cu.Ft.) <sup>5 6</sup>	Liquid Gallons <sup>5 6</sup> (Lbs.)	Gas (Cu.Ft.) <sup>5</sup>	Solid (Lbs.) <sup>5</sup>	Liquid Gallons <sup>5</sup> (Lbs.)	Gas (Cu.Ft.)	Solid (Lbs.) <sup>5</sup>	Liquid Gallons <sup>5</sup> (Lbs.)	Gas (Cu.Ft.) ( )
1. Corrosives	5,000	500	650 <sup>6</sup>	5,000	500	650 <sup>5</sup>	1,000	100	—
2. Highly Toxics <sup>1</sup>	1	(1)	20 <sup>7</sup>	1	(1)	20 <sup>7</sup>	(¼ )	(¼ )	—
3. Irritants	5,000	500	650 <sup>6</sup>	5,000	500	650 <sup>5</sup>	1,000	100	
4. Sensitizers	5,000	500	650 <sup>6</sup>	5,000	500	650 <sup>5</sup>	1,000	100	
5. Other Health Hazards	5,000	500	650 <sup>6</sup>	5,000	500	650 <sup>5</sup>	1,000	100	

<sup>1</sup> Control area is a space bounded by not less than a one-hour fire-resistive occupancy separation within which the exempted amounts of hazardous materials may be stored dispensed, handled or used. The number of control areas within a building used for retail and wholesale stores shall not exceed two. The number of control areas in buildings with other uses shall not exceed four.

<sup>2</sup> The quantities of medicines, foodstuffs and cosmetics containing not more than 50 percent of volume of water-miscible liquids and with the remainder of the solutions not being flammable in retail sales or storage occupancies are unlimited when packaged in individual containers not exceeding four liters.

<sup>3</sup> The aggregate quantity in use and storage shall not exceed the quantity listed for storage.

<sup>4</sup> For carcinogenic and radioactive materials, see the Fire Code.

<sup>5</sup> Quantities may be increased 100 percent in sprinklered buildings. When Footnote 6 also applies, the increase for both footnotes may be applied.

<sup>6</sup> Quantities may be increased 100 percent when stored in approved storage cabinets or safety cans as specified in the fire code. When Footnote 5 also applies, the increase for both may be applied.

<sup>7</sup> Permitted only when stored in approved exhaust gas cabinets, exhausted enclosures or fume hoods.

<sup>8</sup> For special provisions, see the Fire Code.

January 2007

WA7890008967, Operating Unit 15  
331-C Storage Unit

1  
2  
3  
4  
5

This page intentionally left blank.

---

1	<b>Chapter 6.0</b>	<b>Procedures to Prevent Hazards</b>
2	6.0	PROCEDURES TO PREVENT HAZARDS..... 6.1
3	6.1	SECURITY ..... 6.1
4	6.1.1	Security Procedures and Equipment ..... 6.1
5	6.1.2	Waiver..... 6.2
6	6.2	INSPECTION PLAN..... 6.2
7	6.2.1	General Inspection Requirements ..... 6.2
8	6.2.2	Inspection Log ..... 6.4
9	6.2.3	Schedule for Remedial Action for Problems Revealed..... 6.4
10	6.2.4	Specific Process Inspection Requirements ..... 6.4
11	6.3	PREPAREDNESS AND PREVENTION REQUIREMENTS ..... 6.5
12	6.3.1	Equipment Requirements..... 6.5
13	6.3.2	Aisle Space Requirements ..... 6.7
14	6.4	PREVENTIVE PROCEDURES, STRUCTURES, AND EQUIPMENT ..... 6.7
15	6.4.1	Unloading Operations ..... 6.7
16	6.4.2	Run-Off ..... 6.7
17	6.4.3	Water Supplies ..... 6.7
18	6.4.4	Equipment Failure and Power Outages..... 6.8
19	6.4.5	Personnel Protection Equipment..... 6.8
20	6.5	PREVENTION OF REACTION OF IGNITABLE, REACTIVE, AND/OR INCOMPATIBLE
21		WASTE..... 6.9
22	6.5.1	Precautions to Prevent Ignition or Reaction of Ignitable or Reactive Waste..... 6.9
23	6.5.2	General Precautions for Handling Ignitable or Reactive Waste and Mixing of Incompatible Waste6.9
24	<b>Figures</b>	
25	Figure 6.1.	Example of Weekly Inspection Checklist Form ..... 6.11
26	<b>Tables</b>	
27	Table 6.1.	Emergency Signals and Responses ..... 6.6
28	Table 6.2.	Material and Equipment for Spill Containment and Cleanup ..... 6.8
29		

1  
2  
3  
4  
5

This page intentionally left blank.

1  
2  
3  
4  
5  
6  
7  
8  
9  
10  
11  
12  
13  
14  
15  
16  
17  
18  
19  
20  
21  
22  
23  
24  
25  
26  
27  
28  
29  
30  
31  
32  
33  
34  
35  
36  
37  
38

## **6.0 PROCEDURES TO PREVENT HAZARDS**

The 331-C Storage Unit is operated to minimize exposure of the general public and operating personnel to dangerous and mixed waste.

### **6.1 SECURITY**

Security for 331-C Storage Unit is provided by a combination of the overall security system for the 300 Area and a specific security system for the waste storage unit. The former controls access to the 300 Area proper while the latter controls access to 331-C Storage Unit.

The 331-C Storage Unit is located in the southern portion of the 300 Area. As part of the Hanford Site, the 300 Area is subject to a restricted access and personnel security system for the protection of Government property, classified information, and special nuclear materials. The 300 Area is a controlled access area with access limited to persons authorized to enter and having appropriate security clearances or escorts.

The security program for the 331-C Storage Unit, in addition to 300 Area access, is designed to limit building access to those personnel within the 300 Area authorized to enter the unit. Access to the 331-C Storage Unit can be gained through two walk-in doors and two large roll up doors that facilitate loading and unloading activities. All doors to the 331-C Storage Unit are kept locked at all times except when in use. All requests for keys are reviewed and approved by the unit operating supervisor and the building manager.

Keys to the unit are issued only to unit personnel, security personnel, and emergency response personnel. The unit-operating supervisor approves any additions to this list and the building. Specific aspects of the security programs for both the 300 Area and the 331-C Storage Unit are described in more detail below.

#### **6.1.1 Security Procedures and Equipment**

The following sections describe the 24-hour surveillance system, barrier, and warning signs used to provide security and control access to the 331-C Storage Unit.

##### **6.1.1.1 Barrier and Means to Control Entry**

Entrances to the 331-C building are kept locked except when the building is in use to prevent unauthorized access. Normal working hours for the unit are 8:00 A.M. to 4:30 P.M., Monday through Friday, except holidays. The Hanford Patrol conducts routine patrols and random inspections of the 300 Area buildings, including the 331-C Storage Unit, on a 24-hour basis to verify no unauthorized access to the area. An 8-ft chain link fence topped with three strands of barbed wire surrounds the entire 300 Area. All waste management activities, however, are conducted within the unit and the east fenced yard. Therefore, the unit itself provides a barrier surrounding the active waste management operations.

Entry to the unit is controlled using locked entrances. The 331-C Storage Unit is kept locked at all times except when in use. Physical control of keys and records of key distributions are maintained by PNNL Security. Distribution of keys to the 331-C Storage Unit is subject to approval by the building manager and the unit-operating supervisor. Personnel in possession of keys have been instructed to admit only persons having official business. The 331-C Storage Unit staff must escort all untrained visitors (personnel without 24/40-hour hazardous waste operations training) in the waste storage areas.

1 **6.1.1.2 Warning Signs**

2 The 331-C Storage Unit is posted with *DANGER - UNAUTHORIZED PERSONNEL KEEP OUT* and  
3 *331-C CHEMICAL WASTE STORAGE BUILDING* signs near each entrance on all sides of the unit. The  
4 signs are clearly visible from the required distance of 25 feet.

5 **6.1.2 Waiver**

6 Waivers of the security procedures and equipment requirements for the 331-C Storage Unit are not  
7 required and will not be requested.

8 **6.2 INSPECTION PLAN**

9 The purpose and intent of implementing inspection procedures at the 331-C Storage Unit are to prevent  
10 malfunctions, deterioration, operator errors, and/or discharges that may cause or lead to the release of  
11 regulated waste to the environment or threats to human health. A system of daily, weekly, quarterly, and  
12 annual inspections involving various PNNL departments and levels of management are implemented at  
13 the 331-C Storage Unit.

14 **6.2.1 General Inspection Requirements**

15 The content and frequency of inspections performed at the 331-C Storage Unit are described in this  
16 section. Also described is maintenance of inspection records.

17 **6.2.1.1 Types of Problems**

18 Daily, weekly, quarterly, and annual inspections are performed at the 331-C Storage Unit. The types of  
19 problems addressed by each of these inspections are described below.

20 **Daily Inspections.** The 331-C Storage Unit is inspected daily whenever waste packaging, transfer,  
21 shipping, or movement operations are being carried out. Daily inspections monitor container condition  
22 and integrity, the building waste containment system, and other building areas where wastes are handled.  
23 Specific inspection points include:

- 24 • Inspection of stored containers for leaks or damage
- 25 • Mislabeled or opened containers
- 26 • Improper storage (e.g., incompatible waste storage)
- 27 • Disorderliness or uncleanliness of a storage unit
- 28 • Check for accumulation of waste in containment systems.

29 Results of these daily inspections are recorded in the daily operating logbook that is part of the permanent  
30 331-C Storage Unit Operating Record.

31 **Weekly Inspections.** Waste management organization personnel conduct weekly inspections of both  
32 safety and operating equipment in the 331-C Storage Unit. Safety and emergency equipment are  
33 inspected for functionality and adequacy of supply. Staff conduct the weekly inspection each week using  
34 the inspection Logbook and the most current version of the Weekly Inspection Checklist Form that is on  
35 file at 331-C Storage Unit. An example of a Weekly Inspection Checklist is shown in Figure 6.1. The  
36 Inspection Checklist and Inspection Logbook become a permanent part of the 331-C Storage Unit  
37 Operating Record.

38 Specific problems to be looked for with each of the items inspected are identified on the Inspection  
39 Checklist Form. The use of this form enhances inspection effectiveness by providing a consistent and

1 detailed listing of areas of potential problems and those safeguards in place to prevent them. There is  
2 space provided on the form for the inventory summary, comments, and required remedial actions (if any),  
3 as well as the date such actions are accomplished. The inspector is required to sign and date the  
4 inspection checklist after performing the inspection. A copy of the completed inspection form with any  
5 assigned action items is distributed to the responsible operating personnel. All corrective actions required  
6 must be completed within 1 week of the inspection that found them deficient, unless there is documented  
7 reason for further delay. When corrective action has been completed, the responsible personnel date and  
8 initial the form.

9 ***Quarterly and Annual Inspections.*** Safety inspections are performed to verify that the fire protection  
10 system, eye wash/shower unit, and walk-in hood ventilation systems are in working order. PNNL  
11 facilities support staff perform additional documented inspections of the emergency eye wash/shower unit  
12 and the hood airflow. The emergency eyewash/safety shower and airflow of the hood are inspected  
13 quarterly. The emergency eyewash/safety shower is checked for proper operation, and the hood  
14 ventilation face velocity must meet minimum requirements. Records of these safety equipment  
15 inspections and their results, as well as documentation of any required corrective actions, are maintained  
16 by the preventive maintenance staff in PNNL's Facilities Management Department and Technical  
17 Services Department.

18 On an annual basis, the Fire Department performs a full inspection of the sprinkler system and pull boxes.  
19 A complete flow test is performed from the furthest valve to verify flow through the entire system. Fire  
20 extinguishers are also checked for proper pressure and function. The Hanford Fire Department keeps  
21 records of these fire inspections. Documentation of any required corrective actions is kept in the  
22 331-C Storage Unit Operating Record.

23

#### 24 **6.2.1.2 Frequency of Inspections**

25 Inspections are conducted on a daily, weekly, quarterly, and annual basis, as described in Section 6.2.1.1.

26 The frequency of inspections is based on specific regulatory requirements and on the rate of possible  
27 deterioration of equipment and probability of environmental or human health incidents.

28 Areas where dangerous wastes are actively handled, including the bay area, storage cells, and flammable  
29 liquid module, are considered to be areas subject to spills. These areas are given daily inspections when  
30 in use, as required by WAC 173-303-320(2)(c).

31 The containment system (i.e., floors and sumps) is inspected daily when in use for accumulation of spilled  
32 material. The containment system itself is inspected weekly for structural integrity (i.e., no cracks, gaps,  
33 leaks, etc. that could result in environmental release of waste in the event of a spill). This frequency is  
34 based on the need to perform timely corrective actions in the event that problems are noted.

35 Aisle space between containers is inspected weekly. This frequency is based on the consideration of the  
36 rate of container transfers and movement within the 331-C Storage Unit. Weekly inspections will allow  
37 container spacing problems to be identified and corrected before they become major problems.

38 Emergency and safety equipment and personal protective equipment are inspected weekly. This  
39 frequency is based on consideration of the expected rate of use of this equipment. Use of emergency  
40 equipment should not occur more than once during any one-week period. Weekly inspections will verify  
41 that this equipment is always functional and available in adequate supply.

1 **Chapter 7.0** **Building Emergency Procedure**

2 7.0 Building Emergency Procedure 331-C Storage Unit..... 7.1  
3 7.1 General Information..... 7.1  
4 7.1.1 Facility Name..... 7.2  
5 7.1.2 Facility Location ..... 7.2  
6 7.1.3 Owner/Operator ..... 7.2  
7 7.1.4 Facility Description..... 7.2  
8 7.1.5 Hanford Site Emergency Sirens/Alarms ..... 7.2  
9 7.1.6 Building Specific Emergency Alarms ..... 7.3  
10 7.1.7 Coordination Agreements ..... 7.3  
11 7.1.8 Communication Equipment ..... 7.3  
12 7.2 Purpose of the Building Emergency Procedure ..... 7.3  
13 7.2.1 Distribution ..... 7.3  
14 7.2.2 Acronyms..... 7.3  
15 7.3 Building Emergency Response Organization ..... 7.5  
16 7.3.1 BEDs and Alternates..... 7.5  
17 7.3.2 Other Members of the Building Emergency Response Organization (BERO)..... 7.7  
18 7.4 Implementation of the BEP..... 7.8  
19 7.5 Facility Hazards ..... 7.10  
20 7.5.1 Hazardous Materials ..... 7.10  
21 7.5.2 Physical (Industrial) Hazards ..... 7.10  
22 7.5.3 Dangerous or Mixed Waste ..... 7.10  
23 7.5.4 Radioactive Materials ..... 7.10  
24 7.5.5 Criticality ..... 7.10  
25 7.5.6 Biological Agents ..... 7.10  
26 7.6 Potential Emergency Conditions and Appropriate Response ..... 7.10  
27 7.6.1 Facility Operations Emergencies ..... 7.10  
28 7.6.2 Identification of Hazardous Materials in and Around Facility ..... 7.16  
29 7.6.3 Natural Phenomena..... 7.16  
30 7.6.4 Security Contingencies ..... 7.17  
31 7.7 Facility Take Cover – Shutdown of HVAC..... 7.18  
32 7.7.1 Local Shutdown Using Power Operator, BED, or Alternate BED ..... 7.18  
33 7.8 Utility Disconnects Locations..... 7.18  
34 7.8.1 Compressed Air ..... 7.18  
35 7.8.2 Sanitary and Process Water ..... 7.18  
36 7.8.3 Main Electrical Power..... 7.18  
37 7.8.4 HVAC Systems..... 7.19  
38 7.9 Termination, Incident Recovery, and Restart ..... 7.19  
39 7.9.1 Termination..... 7.19  
40 7.9.2 Prevention of Recurrence or Spread of Fires, Explosions, or Releases ..... 7.19  
41 7.9.3 Recovery ..... 7.19

**OFFICIAL USE ONLY**  
May be exempt from public release under the Freedom of Information Act  
(5 U.S.C. 552)Exemption number(s) and category: Exemption 2  
Circumvention of Statute  
Department of Energy review required before public release

1	7.9.4	Required Reports .....	7.20
2	7.10	Emergency Equipment.....	7.21
3	7.10.1	Portable Emergency Equipment .....	7.21
4	7.10.2	Communications Equipment/Warning Systems .....	7.21
5	7.10.3	Personal Protective Equipment (PPE).....	7.22
6	7.10.4	Spill Control and Containment Supplies.....	7.22
7	7.11	Evacuation of Persons with a Disability or Visitors .....	7.22
8	7.12	Exhibits .....	7.22
9	7.12.1	Exhibit: 331-C Storage Unit Emergency Equipment Locations .....	7.24
10	7.12.2	Exhibit: 331-C Storage Unit Building Evacuation Exits .....	7.25
11	7.12.3	Exhibit: 331-C Storage Unit Staging Area .....	7.26
12	7.12.4	Exhibit: BED for Low-Hazardous Facilities – Checklisted Duties .....	7.27
13	7.12.5	Exhibit: Staging Area Supervisor Checklist .....	7.29
14	7.12.6	Exhibit: Facility Operations Specialist - Checklist Duties.....	7.31
15	7.12.7	Exhibit: Emergency Checklist for Emergency Management Support Group .....	7.32
16	7.12.8	Exhibit: Emergency Closeout - Checklisted Duties.....	7.35
17	7.12.9	Exhibit: Emergency Telephone Numbers .....	7.36
18			

**OFFICIAL USE ONLY**

May be exempt from public release under the Freedom of Information Act  
(5 U.S.C. 552) Exemption number(s) and category: Exemption 2

Circumvention of Statute

Department of Energy review required before public release

**CONTACT:**

Greta Davis, State of Washington Department of Ecology  
3100 Port of Benton, Richland, 99352  
509-372-7894

1 **Chapter 8.0** **Personnel Training**

---

2 8.0 PERSONNEL TRAINING..... 8.1  
3  
4 8.1 OUTLINE OF INTRODUCTORY AND CONTINUING TRAINING PROGRAMS ..... 8.1  
5 8.1.1 Introductory Training ..... 8.1  
6 8.1.2 Continuing Training ..... 8.2  
7  
8 8.2 DESCRIPTION OF TRAINING DESIGN ..... 8.2  
9  
10 8.3 DESCRIPTION OF TRAINING PLAN ..... 8.3  
11

12 **Tables**

---

13 Table 8.1. 331-C Storage Unit Training Matrix..... 8.4  
14

January 2007

WA7890008967, Operating Unit 15  
331-C Storage Facility

1  
2  
3  
4  
5

This page intentionally left blank.

## 1 8.0 PERSONNEL TRAINING

2 This chapter discusses personnel training requirements based on WAC 173-303 and the Hanford Facility  
3 RCRA Permit, WA7890008967 (Permit). 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 operators to prepare persons to operate or  
6 maintain the TSD facility in a safe manner as required to demonstrate compliance with  
7 WAC 173-303-330" and (2) "a brief description of how training will be designed to meet actual job tasks  
8 in accordance with the requirements in WAC 173-303-330(1)(d)." Permit Condition II.C (Personnel  
9 Training) contains training requirements applicable to Hanford Facility personnel and non-Facility  
10 personnel.

11 Compliance with these requirements at the 331-C Storage Unit is demonstrated by information contained  
12 in DOE/RL-91-28, Chapter 8.0 and this chapter.

### 13 8.1 OUTLINE OF INTRODUCTORY AND CONTINUING TRAINING PROGRAMS

14 The introductory and continuing training programs are designed to prepare personnel to manage and  
15 maintain the TSD unit in a safe, effective, and environmentally sound manner. In addition to preparing  
16 personnel to manage and maintain TSD units under normal conditions, the training programs verify that  
17 personnel are prepared to respond in a prompt and effective manner should abnormal or emergency  
18 conditions occur. Emergency response training is consistent with the description of actions contained in  
19 Chapter 7.0, Building Emergency Procedure. The introductory and continuing training programs contain  
20 the following objectives:

- 21 • Teach Hanford Facility personnel to perform their duties in a way that ensures the Hanford Facility's  
22 compliance with WAC 173-303
- 23 • Teach Hanford Facility personnel dangerous waste management procedures (including  
24 implementation of the contingency plan) relevant to the job titles/positions in which they are  
25 employed, and
- 26 • Verify that Hanford Facility personnel can respond effectively to emergencies.

#### 27 8.1.1 Introductory Training

28 Introductory training includes general Hanford Facility training and TSD unit-specific training. General  
29 Hanford Facility training is described in DOE/RL-91-28, Chapter 8.0, and is provided in accordance with  
30 the Permit Condition II.C.2. TSD unit-specific training is provided to Hanford Facility personnel  
31 allowing those personnel to work unescorted, and in some cases is required for escorted access. Hanford  
32 Facility personnel cannot perform a task for which they are not properly trained, except to gain required  
33 experience while under the direct supervision of a supervisor or coworker who is properly trained.  
34 Hanford Facility personnel must be trained within 6 months after their employment at or assignment to  
35 the Hanford Facility, or to a new job title/position at the Hanford Facility, whichever is later.

36 General Hanford Facility training: Refer to description in DOE/RL-91-28, Chapter 8.0.

37 Contingency Plan training: Hanford Facility personnel receive training on applicable portions of the  
38 *Hanford Emergency Management Plan* (DOE/RL-94-02) in general Hanford Facility training. In  
39 addition, Hanford Facility personnel receive training on the content of the description of actions contained  
40 in contingency plan documentation in Chapter 7.0 to be able to effectively respond to emergencies.

January 2007

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

7 Operations training: Dangerous waste management operations training (e.g., waste designation training,  
8 shippers training) will be determined on a unit-by-unit basis and shall consider the type of waste  
9 management unit (e.g., container management unit) and the type of activities performed at the waste  
10 management unit (e.g., sampling). For example, training provided for management of dangerous waste in  
11 containers will be different than the training provided for management of dangerous waste in a tank  
12 system. Common training required for compliance within similar waste management units can be  
13 provided in general training and supplemented at the TSD unit. Training provided for TSD unit-specific  
14 operations will be identified in the training plan documentation based on (1) whether a general training  
15 course exists, (2) the training needs to verify waste management unit compliance with WAC 173-303, and  
16 (3) training commitments agreed to with Ecology.

### 17 **8.1.2 Continuing Training**

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

20 General Hanford Facility training: Annual refresher training is provided for general Hanford Facility  
21 training. Refer to description in DOE/RL-91-28, Chapter 8.0.

22 Contingency plan training: Annual refresher training is provided for contingency plan training. Refer to  
23 description above in Section 8.1.1.

24 Emergency coordinator training: Annual refresher training is provided for emergency coordinator  
25 training. Refer to description above in Section 8.1.1.

26 Operations training: Refresher training occurs on many frequencies (i.e., annual, every other year, and  
27 every 3 years) for operations training. When justified, some training will not contain a refresher course  
28 and will be identified as a one-time only training course. The TSD unit-specific training plan  
29 documentation will specify the frequency for each training course. Refer to description above in Section  
30 8.1.1.

## 31 **8.2 DESCRIPTION OF TRAINING DESIGN**

32 Proper design of a training program verifies that personnel who perform duties on the Hanford Facility  
33 related to WAC 173-303-330(1)(d) are trained to perform their duties in compliance with WAC 173-303.  
34 Actual job tasks, referred to as duties, are used to determine training requirements. The first step taken to  
35 verify that Hanford Facility personnel have received the proper training is to determine and document the  
36 waste management duties by job title/position. The second step compares waste management duties to  
37 the general waste management unit training curriculum. If the general waste management unit training  
38 curriculum does not address the waste management duties, the training curriculum is supplemented and/or  
39 on-the-job training is provided. The third step summarizes the content of a training course necessary to  
40 verify that the training provided to each job title/position addresses associated waste management duties.  
41 The last step is to assign training curriculum to Hanford Facility personnel based on the previous  
42 evaluation. The training plan documentation contains this process.

January 2007

1 Waste management duties include those specified in Section 8.1 as well as those contained in  
2 WAC 173-303-330(1)(d). Training elements of WAC 173-303-330(1)(d) applicable to the 331-C Storage  
3 Unit operations include the following:

- 4 • Procedures for using, inspecting, repairing, and replacing emergency and monitoring equipment
- 5 • Communications or alarm systems
- 6 • Response to fires or explosions
- 7 • Shutdown of operations.

8 Hanford Facility personnel who perform these duties receive training pertaining to their duties. The  
9 training plan documentation described in Section 8.3 contains specific information regarding the types of  
10 training Hanford Facility personnel receive based on the outline in Section 8.1.

### 11 **8.3 DESCRIPTION OF TRAINING PLAN**

12 In accordance with Permit Condition II.C.3, the unit-specific portion of the *Hanford Facility Dangerous*  
13 *Waste Permit Application* must contain a description of the training plan. Training plan documentation is  
14 maintained outside of the *Hanford Facility Dangerous Waste Part B Permit Application* and the Permit.  
15 Therefore, changes made to the training plan documentation are not subject to the Permit modification  
16 process. However, the training plan documentation is prepared to comply with WAC 173-303-330(2).

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

20 A description of how training plan documentation meets the three items in WAC 173-303-330(2) is as  
21 follows:

- 22 1. -330(2)(a): "The job title, job description, and name of the employee filling each job. The job  
23 description must include requisite skills, education, other qualifications, and duties for each position."

24 Description: The specific Hanford Facility personnel job title/position is correlated to the waste  
25 management duties. Waste management duties relating to WAC 173-303 are correlated to training  
26 courses to verify that training is properly assigned.

27 Only names of Hanford Facility personnel who carry out job duties relating to TSD unit waste  
28 management operations at the 331-C Storage Unit are maintained. Names are maintained within the  
29 training plan documentation. A list of Hanford Facility personnel assigned to the 331-C Storage Unit  
30 is available upon request.

31 Information on requisite skills, education, and other qualifications for job title/positions are addressed  
32 by providing a reference where this information is maintained (e.g., human resources). Specific  
33 information concerning job title, requisite skills, education, and other qualifications for personnel can  
34 be provided upon request.

- 35 2. -330(2)(b): "A written description of the type and amount of both introductory and continuing  
36 training required for each position."

37 Description: In addition to the outline provided in Section 8.1, training courses developed to comply  
38 with the introductory and continuing training programs are identified and described in the training  
39 plan documentation. The type and amount of training is specified in the training plan documentation  
40 as shown in Table 8.1.

January 2007

- 1 3. -330(2)(c): "Records documenting that personnel have received and completed the training required  
2 by this section. The Department may require, on a case-by-case basis, that training records include  
3 employee initials or signature to verify that training was received."

4 Description: Training records are maintained consistent with DOE/RL-91-28, Chapter 8.0.

5 **Table 8.1. 331-C Storage Unit Training Matrix**

	Training Category <sup>(a)</sup>				
Attachment 33, General Information Portion, Chapter 8.0 Training (DOE/RL-91-28) Category	General Hanford Facility Training	Contingency Plan Training	Emergency Coordinator Training	Operations Training	
331-C Storage Unit	Orientation Program	Building Emergency Plan	Building Emergency Director Training	Advanced Waste Management Training	Container Management
<b>Staff Position</b>					
Technical Group Lead	X	X	X <sup>1</sup>	X	X
Hazardous Waste Operations Staff	X	X	X <sup>(b)</sup>	X	X

- 6 <sup>1</sup> Required for any staff that has been assigned the duties of Building Emergency Director or alternate.  
7 (a) Refer to the Environmental Management Services Department Training Plan for a complete description of  
8 coursework in each training category.  
9 (b) Required for any staff that has been assigned the duties of Building Emergency Director or alternate.

1 **Chapter 11.0** **Closure and Financial Assurance**

---

2 11.0 CLOSURE AND FINANCIAL ASSURANCE ..... 11.1  
3  
4 11.1 CLOSURE PLAN/FINANCIAL ASSURANCE FOR CLOSURE..... 11.1  
5 11.1.1 Closure Performance Standard ..... 11.1  
6 11.1.2 Closure Activities ..... 11.1  
7 11.1.3 Maximum Waste Inventory ..... 11.5  
8 11.1.4 Closure of Waste Piles, Surface Impoundments, Incinerators, Land Treatment Facilities, and  
9 Miscellaneous Units..... 11.5  
10 11.1.5 Closure of Landfill Units ..... 11.5  
11 11.1.6 Schedule for Closure..... 11.5  
12 11.1.7 Extension for Closure Time ..... 11.5  
13 11.1.8 Closure Cost Estimate..... 11.5  
14 11.1.9 Financial Assurance Mechanism for Closure ..... 11.6  
15  
16 11.2 NOTICE IN DEED ..... 11.6  
17  
18 11.3 POSTCLOSURE PLAN ..... 11.6  
19  
20 11.4 LIABILITY REQUIREMENTS ..... 11.6

21 **Tables**

---

22 Table 11.1. Summary of Closure Activities..... 11.6  
23 Table 11.2. Detailed Schedule of Closure..... 11.6

January 2007

WA7890008967, Operating Unit 15  
331-C Storage Unit

1  
2  
3  
4  
5

This page intentionally left blank.



January 2007

- 1 • Decontaminate storage building components and storage building and loading area floors, trenches,  
2 and sumps
- 3 • Visually inspect the decontaminated surfaces for achievement of the clean closure standard
- 4 • Sample any contaminated soil and compare results to clean closure standards for soil (not currently  
5 expected to be necessary)
- 6 • Certify that closure activities were completed in accordance with the approved closure plan.

#### 7 **11.1.2.1 Maximum Extent of Operations**

8 The 331-C Storage Unit is used to store a variety of different research-related waste and is expected to be  
9 fully operational until closure (i.e. no partial closures of storage areas are expected). The maximum  
10 inventory of waste in storage at any time will be constrained by three factors:

- 11 • The total amount of dangerous waste in storage at 331-C Storage Unit at any time will not exceed the  
12 design capacity of 20,000 gallons (it is typically 2,000 to 5,000 gallons during normal operations)
- 13 • The total amount of any particular dangerous waste in storage during any given year will not exceed  
14 the amounts given in the Part A Form for 331-C Storage Unit (Chapter 1.0)
- 15 • The total amount of dangerous waste by hazard class in storage at any one time will not exceed  
16 Uniform Building Code Class B Hazardous Material Quantity Restrictions (Table 4.1).

17 Evidence of spills or leaks will be obtained through (a) review of spill reports and operating log books;  
18 (b) visual inspection of unit structures accessible to the environment (e.g., floors) and through inspection  
19 of all visible barriers designed to prevent migration to the environment, and (c) sampling, as necessary to  
20 characterize waste/debris that is found while performing visual inspection. If this inspection program  
21 indicates that contamination is present, the potential for migration of contamination to the environment  
22 will be evaluated. If potential migration appears likely, samples will be taken. In addition, if the  
23 inspections identify any potential contaminant migration routes (e.g., cracks in sumps), samples will be  
24 collected to determine whether migration has occurred. Waste site specific information discovered during  
25 facility closure will be updated in WIDS.

#### 26 **11.1.2.2 Removing Dangerous Wastes**

27 Closure activities will be initiated by removal of the dangerous waste inventory present at 331-C Storage  
28 Unit at the time of closure. Inventory removal procedures will be identical to the waste handling,  
29 packaging, and manifesting activities associated with normal operation of the unit. All dangerous waste  
30 present will be placed into proper containers according to waste handling procedures described in Chapter  
31 4 of this document. To the extent possible, chemicals will be labpacked or bulked into larger containers.  
32 If wastes are bulked, containers will be emptied in compliance with WAC 173-303-160 so that they are  
33 not dangerous waste. Labpack containers will be packaged in compliance with the requirements of WAC  
34 173-303-161. All containers of dangerous waste will be manifested, and custody transferred to a  
35 dangerous waste transporter having a proper dangerous waste identification number. Waste will be  
36 transported to a permitted dangerous waste facility for treatment or disposal.

#### 37 **11.1.2.3 Decontaminating Structures, Equipment and Soil**

38 The following sections describe decontamination and inspection activities for structures and  
39 miscellaneous building components that will remain after closure.

##### 40 **11.1.2.3.1 Waste Handling Equipment**

41 No equipment will remain after closure that would require decontamination to meet clean closure levels.  
42 All portable waste handling equipment used for handling containers (e.g., barrel tongs, forklift truck,  
43 shelving, cabinets) will be decontaminated in the same manner as described in Section 11.1.2.3.3 below,  
44 removed and redeployed to other Hanford or PNNL operations.

January 2007

1 **11.1.2.3.2 Examination of Structure Surfaces**

2 After waste inventory removal, but prior to beginning decontamination procedures, the unit surfaces will  
3 be inspected to identify any cracks or other openings through which dangerous waste or decontamination  
4 fluids might migrate. The inspections will determine which of the materials that will remain after closure  
5 already meet the clean closure standard of a “clean debris surface” and which materials require  
6 decontamination to meet the standard. A *“clean debris surface means the surface, that when viewed  
7 without magnification, shall be free of all visible contaminated soil and hazardous waste, except that  
8 residual staining from soil and waste consisting of light shadows, slight streaks, or minor discoloration,  
9 and soils and waste in cracks, crevices and pits shall be limited to no more than 5% of each square inch  
10 of surface area.” (40 CFR 268.45)*

11 Any cracks or openings in unit surfaces will be documented in the 331-C operating record and  
12 investigated to determine if releases of dangerous waste or dangerous waste constituents have occurred.  
13 If the potential exists for releases to have occurred, sampling will be required, in which case this closure  
14 plan will be amended to provide for the sampling and analysis process (Section 11.1.2.4). If no potential  
15 for releases is found, the cracks or openings will be repaired to prevent release of decontamination fluids  
16 and decontamination will proceed as described below.

17 **11.1.2.3.3 Decontamination of Structures**

18 Storage cell floors, sumps, trenches, and outdoor loading areas requiring decontamination will be cleaned  
19 using one or more of the removal technologies described in 40 CFR 268.45, as necessary to meet the  
20 “clean debris surface” criteria. Cleaning will be conducted so as to minimize the quantity of rinsates  
21 generated. Rinsates (if any) will be collected in trenches or sumps, pumped from the sumps into  
22 appropriate containers, and the pump triple rinsed. Rinsate collection locations will be cleaned and  
23 inspected last. Decontamination will be documented on a decontamination and inspection checklist (see  
24 next paragraph). All decontamination waste will be designated in accordance with WAC 173-303 and , if  
25 hazardous, managed in compliance with WAC 173-303-610(5). Decontamination waste requiring  
26 management as dangerous waste will be managed in a 90-day accumulation area established for the  
27 purpose and/or transported to a permitted TSD unit for storage pending disposal.

28 Inspection of materials for a “clean debris surface” will be documented on a checklist that will identify  
29 the area inspected, whether decontamination/treatment methods were implemented and the standard used  
30 to perform the inspection. If contamination above the clean surface debris criteria is found, the affected  
31 areas will be cleaned. Any contaminated material generated by this activity will be managed as described  
32 above.

33 Following completion of decontamination, another visual inspection will be performed to verify that  
34 decontamination is complete. The cleaned surfaces will be visually inspected for achievement of the  
35 clean closure standard described in Section 11.1.1.2 of no obvious stains or residues indicating potential  
36 dangerous waste contamination. The visual inspection will be documented on the checklist used to  
37 document the decontamination. When the visual standard is met, the structure will be considered clean.  
38 Copies of the completed visual inspection checklist(s) will be placed in the 331-C Storage Unit Operating  
39 Record.

40 **11.1.2.3.4 Decontamination and Inspection of Miscellaneous Building Components**

41 Grating over trenches of the indoor areas and the outdoor loading pads will be cleaned by high-  
42 pressure/low-volume steam or water spray, or will be cleaned by hand using rags, brushes, water, and an  
43 appropriate cleaner, if necessary. Rinsate and decontamination materials will be collected, designated, and  
44 managed accordingly. Decontamination will be documented on a decontamination and inspection  
45 checklist. The grating will be inspected for achievement of the clean closure standard and the inspection  
46 documented on the checklist used to document the decontamination.

January 2007

1 **11.1.2.4 Sampling and Analysis to Identify Extent of Decontamination/Removal and to Verify**  
2 **Achievement of Closure Standard**

3 No sampling and analysis of environmental samples (soil or other materials) is expected to be required  
4 due to the preventive measures in place during the operating life of the 331-C Storage Unit. If  
5 environmental media are contaminated during operation of the 331-C Storage Unit, this plan will be  
6 revised to identify methods for sampling and analysis of such media. Decontamination of hazardous  
7 debris will be conducted in accordance with the procedures given in Section 11.1.2.3. The results of this  
8 examination will be documented on a decontamination and inspection checklist. Any necessary sampling  
9 and analysis will be conducted in accordance with a sampling and analysis plan to be developed  
10 according to Ecology's Clean Closure Guidance (Publication 94-111, current version).

11 **11.1.2.5 Other Activities**

12 Within 60 days of completion of the final closure activities described in this plan, a certification of  
13 closure will be submitted to Ecology. This certification will indicate that the 331-C Storage Unit has been  
14 closed as described in this plan and that the closure performance standard given in Section 11.1 has been  
15 met. The certification will be submitted by registered mail and will be signed by the Permittees and an  
16 independent Professional Engineer registered in the State of Washington as described below.

17 The Permittees will certify with the following document or a document similar to it:

18 *I, (name), an authorized representative of the U.S. Department of Energy-Richland Operations*  
19 *Office located at the Federal Building, 825 Jadwin Avenue, Richland, Washington, hereby state*  
20 *and certify that the 331-C Storage Unit at the 300 Area, to the best of my knowledge and belief,*  
21 *has been closed in accordance with the attached approved closure plan, and that the closure*  
22 *was completed on (date).*

23 (Signature and date)

24 The Permittees will engage an independent Professional Engineer registered in the State of Washington to  
25 inspect closure activities, to verify that closure activities are being conducted according to this plan, and  
26 to certify that closure has been performed in accordance with this plan.

27 The engineer will inspect the 331-C Storage Unit at least weekly while closure activities are being  
28 performed. During these inspections the engineer will observe closure activities to determine whether  
29 they are being performed according to this plan. Inspections will include, but not be limited to:

- 30 • Inspection of dangerous waste containment structures and systems to determine whether releases of  
31 waste to the environment have occurred
- 32 • Verification that the dangerous waste inventory has been removed within 90 days of receipt of the last  
33 waste shipment
- 34 • Inspection of manifests and Operating Record to verify that these waste were disposed of in  
35 compliance with WAC 173-303
- 36 • Inspection of decontamination operations to verify that they are being performed using the procedures  
37 described in this plan
- 38 • Inspections of the Operating Record to verify that samples of liquid decontamination waste were  
39 collected and analyzed using the procedures described in this plan
- 40 • Inspection of the Operating Record to verify that decontamination waste were properly managed in  
41 accordance with the requirements of WAC 173-303-610(5).

42 Inspections by the engineer will be documented in a bound notebook. Notations will include the date and  
43 time of the inspection, the areas inspected, the activities inspected, applicable closure plan requirements  
44 inspected, status of observed activities with respect to plan requirements, corrective actions required

January 2007

1 status of past corrective actions, and name and signature of inspector. This inspection notebook will be  
2 made available to Ecology upon request.

3 Upon completion of closure according to the plan, the Permittees will require the engineer to sign the  
4 following document or a document similar to it:

5 *I, (name), a registered Professional Engineer, hereby certify, to the best of my knowledge and*  
6 *belief, that I have made visual inspection(s) of the 331-C Storage Unit at the 300 Area and that*  
7 *closure of the aforementioned unit has been performed in accordance with the attached*  
8 *approved closure plan.*

9 (Signature, date, state Professional Engineer license number, business address, and phone number.)

10 No other activities are expected to be necessary for clean closure.

### 11 **11.1.3 Maximum Waste Inventory**

12 The maximum waste inventory for the 331-C Storage Unit will not exceed 20,000 gallons, as described in  
13 Chapter 1.0. The inventory will consist of the waste types described in Chapter 1.0.

### 14 **11.1.4 Closure of Waste Piles, Surface Impoundments, Incinerators, Land Treatment Facilities,** 15 **and Miscellaneous Units**

16 This section is not applicable to the 331-C Storage Unit because wastes are not managed in these types of  
17 units.

### 18 **11.1.5 Closure of Landfill Units**

19 This section is not applicable to the 331-C Storage Unit because it does not contain any landfill units and  
20 will not be closed as a dangerous waste landfill unit.

### 21 **11.1.6 Schedule for Closure**

22 When closure begins, the inventory of dangerous waste will be removed within 90 days from receipt of  
23 the final volume of waste. All closure activities will be completed within 180 days of receipt of the final  
24 volume of waste. Ecology will be notified by DOE-RL at least 45 days before the final closure activities  
25 are begun. Closure activities are summarized in Table 11.1. A detailed schedule of closure activities is  
26 provided in Table 11.2.

### 27 **11.1.7 Extension for Closure Time**

28 The inventory of dangerous waste will be removed from the 331-C Storage Unit within 90 days of receipt  
29 of the last volume of waste. The closure activities described in this plan will be completed within  
30 180 days of receipt of the final volume of waste. No extension to the time frame for initiation and  
31 completion of closure is currently expected to be necessary. Extensions to the time frames for closure  
32 would only be necessary if unexpected conditions were encountered during closure of the unit. If it  
33 becomes apparent that all waste cannot be removed within 90 days, Ecology will be so notified at least  
34 30 days prior to expiration of the 90-day period. This notification will demonstrate why more than  
35 90 days is required for removal of the waste and will demonstrate that steps have been taken to prevent  
36 threats to human health and the environment and that the unit is in compliance with applicable permit  
37 standards. If it becomes apparent that closure cannot be completed within 180 days after approval of this  
38 plan, Ecology will be so notified at least 30 days prior to expiration of the 180-day period. This  
39 notification will demonstrate why more than 180 days is required for closure and will demonstrate that  
40 steps have been taken to prevent threats to human health and the environment and that the unit is in  
41 compliance with applicable permit standards.

### 42 **11.1.8 Closure Cost Estimate**

43 The Hanford Facility is not required to comply with the financial assurance requirements in  
44 WAC 173-303-620 based upon Permit Condition II.H.

January 2007

1 **11.1.9 Financial Assurance Mechanism for Closure**

2 The Hanford Facility is not required to comply with the financial assurance requirements in  
3 WAC 173-303-620 based upon Permit Condition II.H.

4 **11.2 NOTICE IN DEED**

5 This section is not applicable because the 331-C Storage Unit is not expected to be closed as a dangerous  
6 waste disposal unit.

7 **11.3 POSTCLOSURE PLAN**

8 This section and subsequent subsections are not applicable because the 331-C Storage Unit is expected to  
9 be clean closed, not as a land-based unit.

10 **11.4 LIABILITY REQUIREMENTS**

11 The Hanford Facility is not required to comply with the financial assurance requirements in  
12 WAC 173-303-620 based upon Permit Condition II.H.3.

13 **Table 11.1. Summary of Closure Activities**

Closure Activity Description	Expected Duration
Receipt of final volume of dangerous waste	N/A
Notify EPA and Ecology that closure will begin	30 days
Remove waste inventory – package all dangerous waste, manifest, and transfer to permitted facility for further storage, treatment and/or disposal	45 days
Decontaminate structural surfaces and equipment.	55 days
Analyze decontamination waste to determine proper methods of treatment/disposal	25 days
Dispose of decontamination waste based on results of waste analysis	20 days

14 **Table 11.2. Detailed Schedule of Closure**

Action	Schedule
<b>Pre-Closure Activities</b>	
Date of receipt of last volume of waste	Day 0
Notify EPA and Ecology	Day 30
<b>Closure Activities</b>	
Removal of Waste Inventory	Day 75
Removal of equipment and components	Day 95
Decontamination of Unit	Day 130
<b>Management of Decontamination Waste</b>	
Waste Analysis	Day 155
Waste Disposal	Day 175
<b>Other Activities</b>	
Certification of Closure to Ecology	Day 215

15