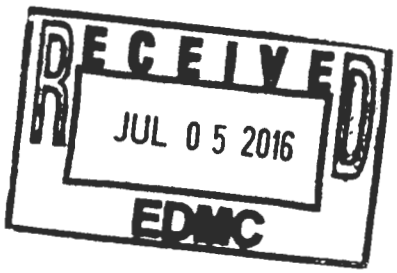
1239063
[0076239H]

Department of Energy
Richland Operations Office
P.O. Box 550
Richland, Washington 99352

16-ESQ-0093

JUN 30 2016



Ms. Alexandra Smith, Program Manager
Nuclear Waste Program
Washington State Department of Ecology
3100 Port of Benton Boulevard
Richland, Washington 99354

Dear Ms. Smith:

SUBMITTAL OF 324 BUILDING DANGEROUS WASTE MANAGEMENT UNITS CLOSURE PLAN, DOE/RL-96-73, REVISION 4

In accordance with the Tri-Party Agreement (TPA) Milestone M-089-06, the U.S. Department of Energy Richland Operations Office (RL) is submitting the revised document DOE/RL-96-73, Revision 4, "324 Building Dangerous Waste Management Units Closure Plan," as a Class 2 Permit Modification Request for the closure of the 324 Building Dangerous Waste Management Units. The TPA Milestone M-089-06 states the following:

> "Submit to Ecology in accordance with procedures in WAC 173-303-830(4)(b), a request for a Class 2 modification to Hanford Dangerous Waste Permit, to include in the Permit the "324 Building Radiochemical Engineering Cells, High-Level Vault, Low-Level Vault, and Associated Area Closure Plan" (Closure Plan), DOE/RL-96-73 revised as necessary to address releases to the soil and to ensure compliance with requirements of WAC-173-303-610. DOE's revised closure plan will include a schedule for completing closure activities."

The permit modification includes the following attachments:

- Attachment 1: Certification Statement
- Attachment 2: Part A Form
- Attachment 3: "324 Building Dangerous Waste Management Units Closure Plan," DOE/RL-96-73, Revision 4

A 60-day public comment period will be held on the Permit Modification Request, as required by Washington Administrative Code (WAC) WAC 173-303-830(4)(b)(ii)(A). The notice required by the Permittees in WAC 173-303-830(4)(b)(ii) will be included in the appropriate Hanford Facility Agreement and Consent Order Publication or List Server, as described in Hanford Facility Resource Conservation and Recovery Act Permit Condition I.C.3. A public meeting will be held on August 24, 2016, at 5:30 p.m., per WAC 173-303-830(3)(b)(iv).

If you have any questions, please contact me, or your staff may contact Jeffrey A. Frey, Assistant Manager for Safety and Environment, on (509) 376-7727.

Sincerely,

Stacy Charboneau
Manager

ESQ:DBC

Attachments

cc w/attachs:
Laura J. Cusack, CHPRC
Suzanne L. Dahl-Crumpler, Ecology
Moses N. Jaraysi, CHPRC
Stephanie Schleif, Ecology
Jennie R. Stults, CHPRC
Administrative Record
Ecology NWP Library
Environmental Portal
HF Operating Record (J. K. Perry, MSA, A3-01)

cc w/o attachs:
Gabriel Bohnee, NPT
Rex Buck, Wanapum
Russell Jim, YN
David Rowland, YN
Rod Skeen, CTUIR

ATTACHMENT 1

CERTIFICATION STATEMENT PAGE
FOR
HANFORD FACILITY DANGEROUS WASTE PART A PERMIT FORM
324 BUILDING DANGEROUS WASTE MANAGEMENT UNITS CLOSURE PLAN

Consisting of 2 pages
(including this cover page.)

The following certification statement is provided for the Hanford Facility Dangerous Waste Part A Permit Form and the 324 Building Dangerous Waste Management Units Closure Plan.

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.

Stacy L. Charboneau
Manager
U.S. Department of Energy
Richland Operations Office

6/30/16
Date

John A. Ciucci
President and Chief Executive Officer
CH2M HILL Plateau Remediation Company

6/9/16
Date

ATTACHMENT 2

HANFORD FACILITY DANGEROUS WASTE PART A FORM
324 BUILDING DANGEROUS WASTE MANAGEMENT UNITS CLOSURE PLAN

Consisting of 15 pages
(including this cover page.)

WASHINGTON STATE DEPARTMENT OF ECOLOGY

Dangerous Waste Permit Application Part A Form

Date Received	Reviewed by:	Date:
Month Day Year	Approved by:	Date:

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

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

III. Name of Facility

U.S. Department of Energy - Hanford Facility

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

A. Street

Refer to Permit Attachment 2 - Hanford Facility Legal Description

City or Town	State	ZIP Code
Near Richland	WA	

County Code (If known)	County Name
0 0 5	Benton

B. Land Type	C. Geographic Location: Latitude (degrees, mins, secs)	Longitude (degrees, mins, secs)	D. Facility Existence Date: Month Day Year
F	Refer to TOPO Map (Section XV).		1 1 / 1 9 / 1 9 8 0

V. Facility Mailing Address

Street or P.O. Box

P.O. Box 550

City or Town	State	ZIP Code
Richland	WA	99352

VI. Facility contact (Person to be contacted regarding waste activities at facility)		
Name (last)	(first)	
Charboneau	Stacy	
Job Title	Phone Number (area code and number)	
Manager	(509) 376-7395	
Contact Address		
Street or P.O. Box		
P.O. Box 550		
City or Town	State	ZIP Code
Richland	WA	99352

VII. Facility Operator Information	
A. Name	Phone Number
U.S. Department of Energy Owner/Operator	(509) 376-7395
CH2M HILL Plateau Remediation Company Co-operator for dangerous waste management units in the 324 Unit Group*	(509) 376-0556*
Street or P.O. Box	
P.O. Box 550 P.O. Box 1600*	

City or Town	State	ZIP Code
Richland	WA	99352

B. Operator Type	F
C. Does the name in VII.A reflect a proposed change in operator?	☐ Yes ☒ No
If yes, provide the scheduled date for the change:	Month / Day / Year
D. Is the name listed in VII.A. also the owner? If yes, skip to Section VIII.C.	☐ Yes ☒ No

VIII. Facility Owner Information	
A. Name	Phone Number (area code and number)
U.S. Department of Energy Owner/Operator	(509) 376-7395
Street or P.O. Box	
P.O. Box 550	

City or Town	State	ZIP Code
Richland	WA	99352

B. Operator Type	F
C. Does the name in VII.A reflect a proposed change in operator?	☐ Yes ☒ No
If yes, provide the scheduled date for the change:	Month / Day / Year

IX. NAICS Codes (5/6 digit codes)													
A. First							B. Second						
5	6	2	2	1	1	Waste Treatment & Disposal	9	2	4	1	1	0	Administration of Air & Water Resource & Solid Waste Management Programs

C. Third							D. Fourth						
5	4	1	7	1	2	Research & Development in the Physical, Engineering, & Life Sciences	5	6	2	9	1	0	Remediation Services

X. Other Environmental Permits (see instructions)

A. Permit Type	B. Permit Number	C. Description
E	AOP00-05-006	Air Operating Permit (AOP) [1] see comments section.
E	AIR-06-10-14	WAC 246-247, Radiation Protection – Air Emissions [1] see comments section.
E	ST0004511	Misc. Streams Permit. [1] see comments section.

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

Process Codes

X99 - The 324 Building has six dangerous waste management units (DWMUs) that are considered Miscellaneous Units due to their unique nature and high radiation content. The 324 Building DWMUs store mixed waste residues from past research operations in four hot cells and two tank systems with associated piping. Classification of these DWMUs as miscellaneous units is necessary because the unique radiological characteristics require specialized management systems and requirements other than those applicable to tank systems. Not all stored materials contain mixed waste. Research operations have been discontinued and the facility remains under surveillance and maintenance until final deactivation and decommissioning. This will occur prior to demolition and remediation under both a *Comprehensive Environmental Response, Compensation, and Liability Act of 1980* (CERCLA) removal action and CERCLA remedial action. These CERCLA response actions will achieve closure performance standards.

Facility Description

The 324 Building was constructed in 1966 and was used for scientific research on highly radioactive materials. Research on highly radioactive materials was conducted within shielded structures known as "hot cells." The 324 Building consists of four individual hot cells (A-Cell, B-Cell, C-Cell, and D-Cell) connected by a common air lock and known collectively as the Radiochemical Engineering Cells (REC). Each of the hot cells is considered an individual DWMU (the airlock is included in the B-Cell DWMU boundary). A-Cell was not used for dangerous waste activities; therefore, there are no specific closure activities required. However, piping between B-Cell and the High-Level Vault (HLV) tanks passes under A-Cell in a crawl space and piping will be removed. C-Cell was not used for treatment, storage, and disposal activities; therefore, there are no specific closure activities required. The facility also includes two belowgrade vaults (high-level waste and low-level waste) containing tanks that collected high activity liquid effluent from the REC complex during past operations. Each of the vaults is considered a DWMU that contains a tank system. Table 1 lists all of the 324 Building DWMUs. Figure 1 locates the REC complex, HLV, and Low-Level Vault (LLV) that comprise the 324 Building DWMUs. The tanks in both vaults were flushed following deactivation and Tank 103 (LLV) and Tank 105 (HLV) have been stabilized by filling them with grout, rendering both tanks permanently inoperable. The hot cells remain functional and will be used for the CERCLA remediation of high-activity soil contamination found to exist beneath B-Cell. The rest of the 324 Facility consists of laboratories, office space, and other plant operation support structures and functions.

The dangerous waste stored in the DWMUs could include arsenic (D004), barium (D005), cadmium (D006), chromium (D007), lead (D008), mercury (D009), selenium (D010), and silver (D011).

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 1. Amount	B. Process Design Capacity 2. Unit of Measure (enter code)	C. Process Total Number of Units	Line Number		A. Process Codes (enter code)			B Process Design Capacity 1. Amount	B Process Design Capacity 2. Unit of Measure (enter code)	C. Process Total Number of Units	D. Process Description
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	X	9	9	4,630[2]	Y	006		1	X	9	9	4,487[3]	Y	004	Storage.
	2								2	X	9	9	29,080	G	002	Tank Storage.
	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							

XIV. Description of Dangerous Wastes

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

Line Number	A. Dangerous Waste No. (enter code)	B. Estimated Annual Quantity of Waste	C. Unit of Measure (enter code)	D. Processes (1) Process Codes (enter)	D. Processes (2) Process Description (If a code is not entered in D (1))
X 1	D 0 0 2	400	P	S 0 1 T 0 1	
X 2	D 0 0 1	100	P	S 0 2 T 0 1	
X 3	D 0 0 2				Included with above
1	D 0 0 4	189,795[4]	P	X 9 9	Included with above and includes debris.
2	D 0 0 5				Included with above and includes debris.
3	D 0 0 6				Included with above and includes debris.
4	D 0 0 7				Included with above and includes debris.
5	D 0 0 8				Included with above and includes debris.
6	D 0 0 9				Included with above and includes debris.
7	D 0 1 0				Included with above and includes debris.
8	D 0 1 1				Included with above and includes debris.
9					
10					
11					
12					
13					
14					
15					
16					
17					
18					
19					
20					
21					
22					
23					

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))
24					
25					
26					
27					
28					
29					
31					
32					
33					
34					

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.

Topographic map is located in the Ecology library.

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.

Operator Name and Official Title (type or print)	**Signature**	**Date Signed**
Stacy L. Charboneau, Manager U.S. Department of Energy Richland Operations Office	Stacy Charboneau	6/30/16
Co-Operator* Name and Official Title (type or print) John Ciucci President and Chief Executive Officer CH2M HILL Plateau Remediation Company	**Signature**	**Date Signed** 6/9/16
Co-Operator* – Address and Telephone Number P.O. Box 1600 Richland, WA 99352 (509) 376-0556		
Facility-Property Owner Name and Official Title (type or print) Stacy L. Charboneau, Manager U.S. Department of Energy Richland Operations Office	**Signature** Stacy Charboneau	**Date Signed** 6/30/16

Table 1. 324 Dangerous Waste Management Units

DWMUs	Location	Operation Function
A-Cell	REC complex	Research & development with remote handled radioactive materials
B-Cell (including the pipe trench and the airlock)	REC complex	Research & development with remote handled radioactive materials
C-Cell	REC complex	Research & development with remote handled radioactive materials
D-Cell	REC complex	Research & development with remote handled radioactive materials
High-level Vault (including piping to and from REC)	Beneath cask handling area	Accumulation and transfer of high-activity process and waste liquids
Low-level Vault (including piping to and from REC)	Beneath Room 147 Hot Shop	Accumulation and transfer of low-activity process and waste liquids

Figure 1. 324 Simplified Floor Plan and Closure Boundary

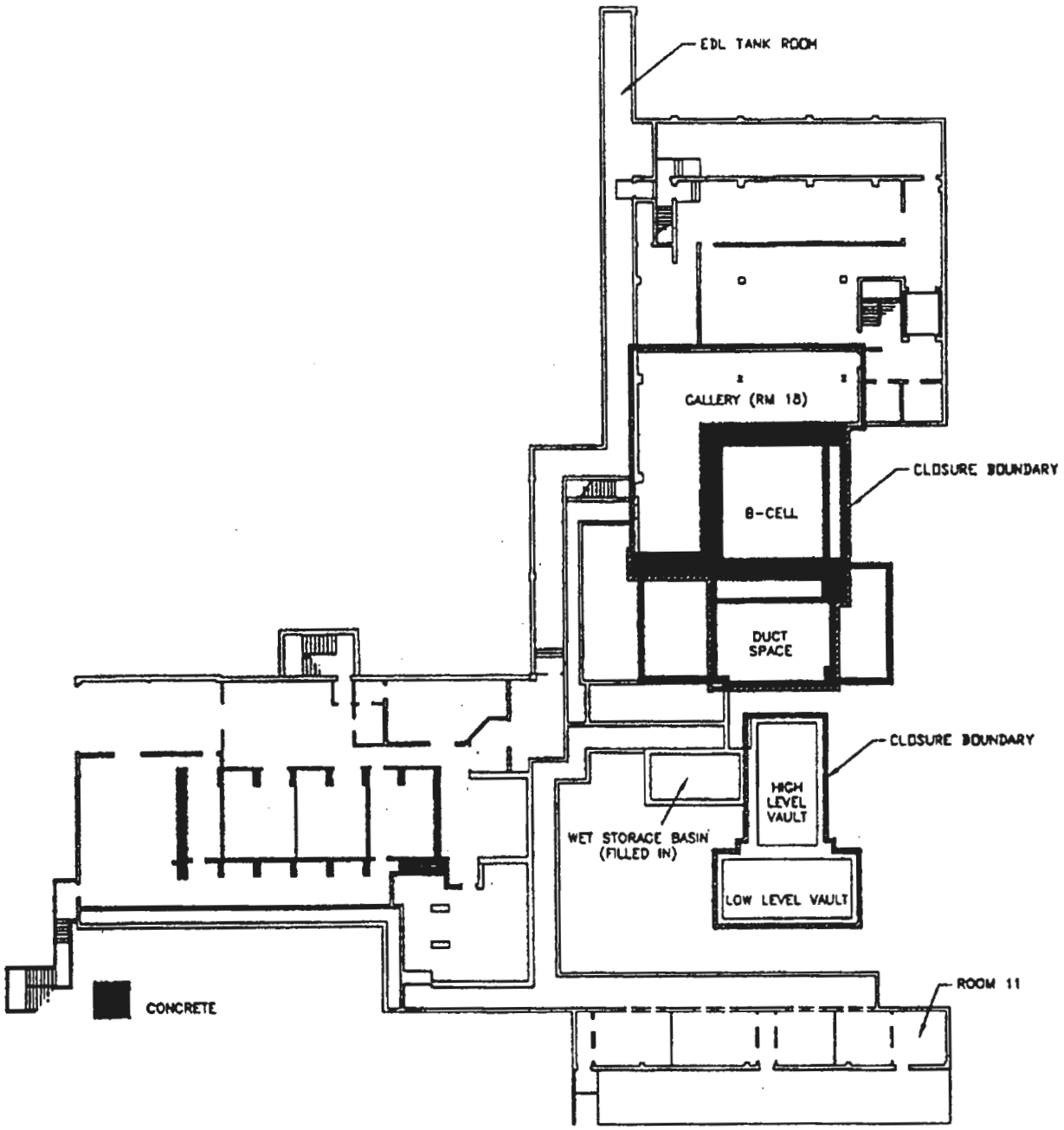


Figure 2. REC Complex Cutaway View

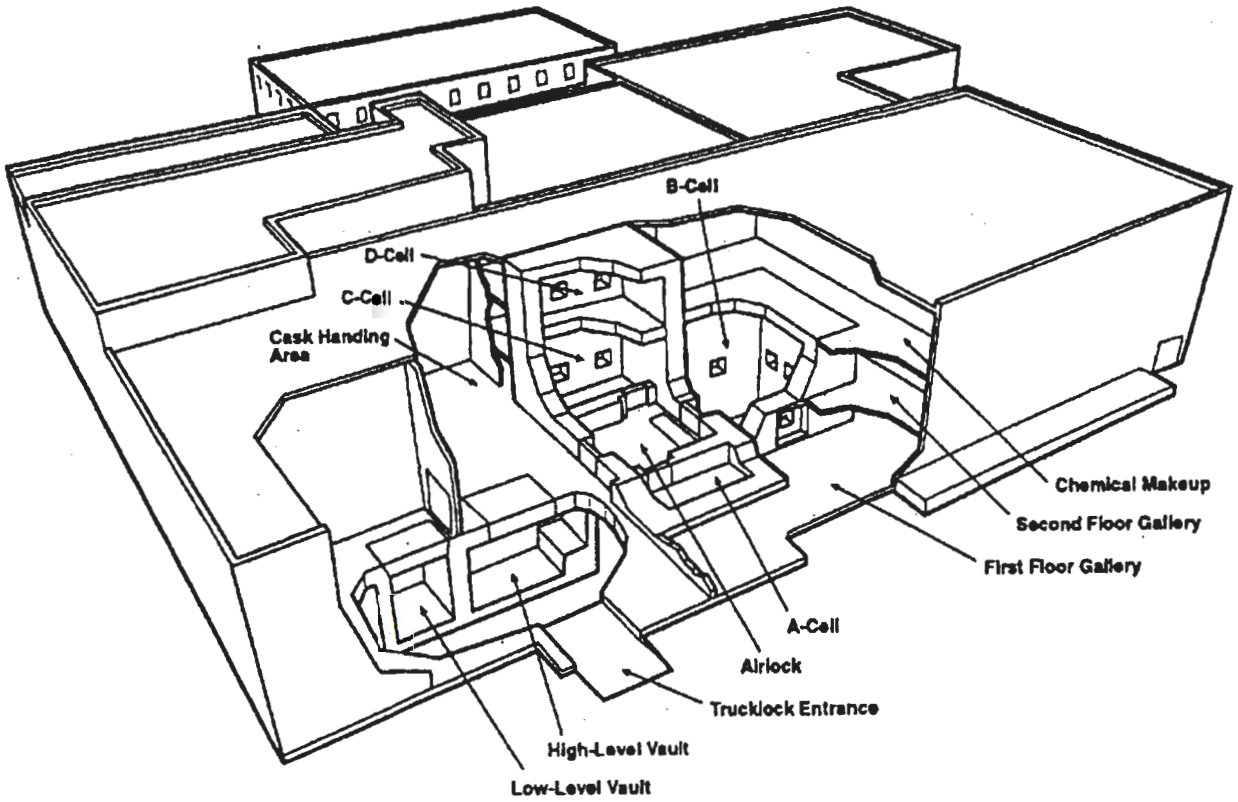


Figure 3. REC Complex Plan View

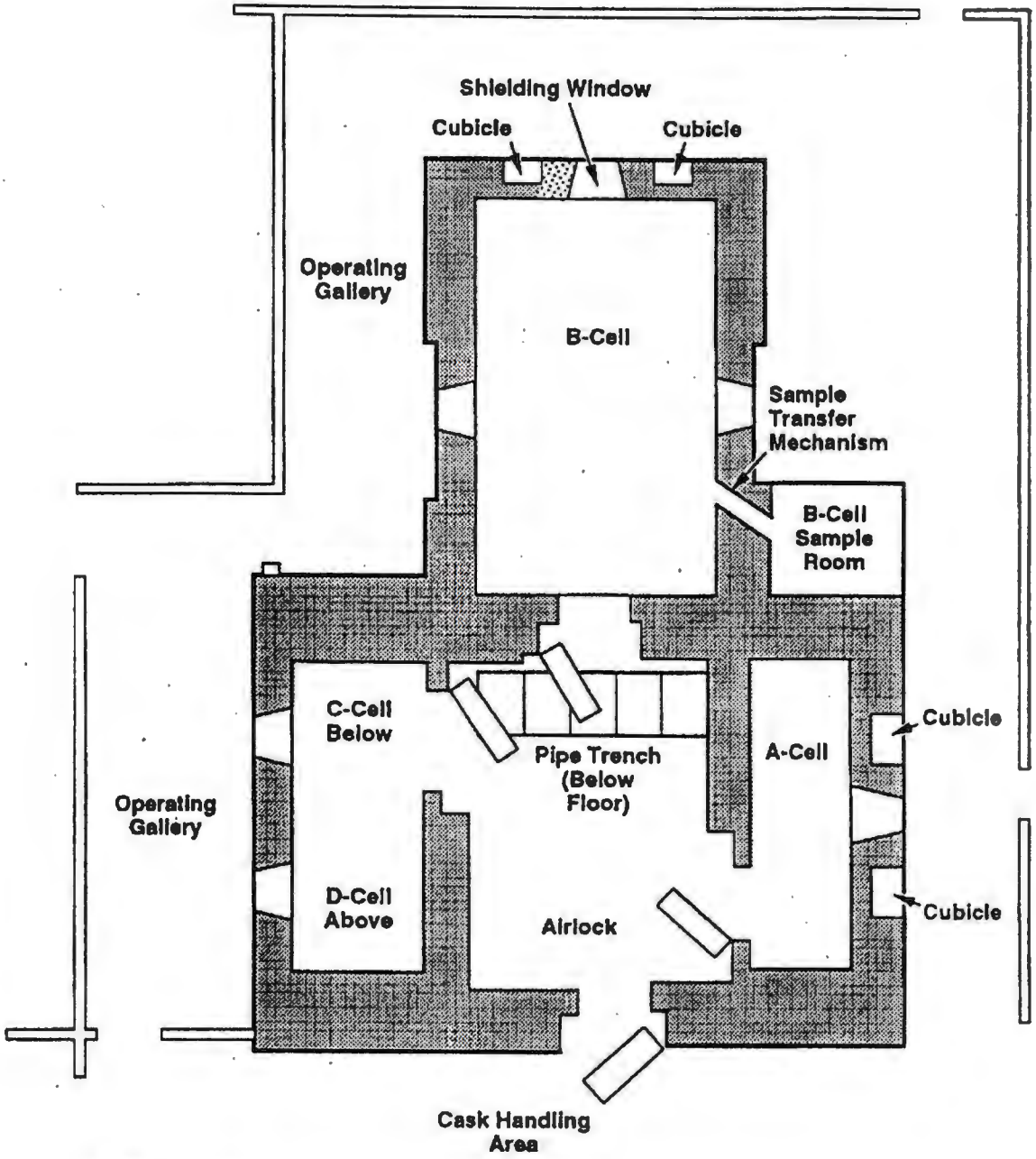


Figure 4. 324 Building Cross-Section Through the High-Level Vault, Low-Level Vault, Airlock, and B-Cell.

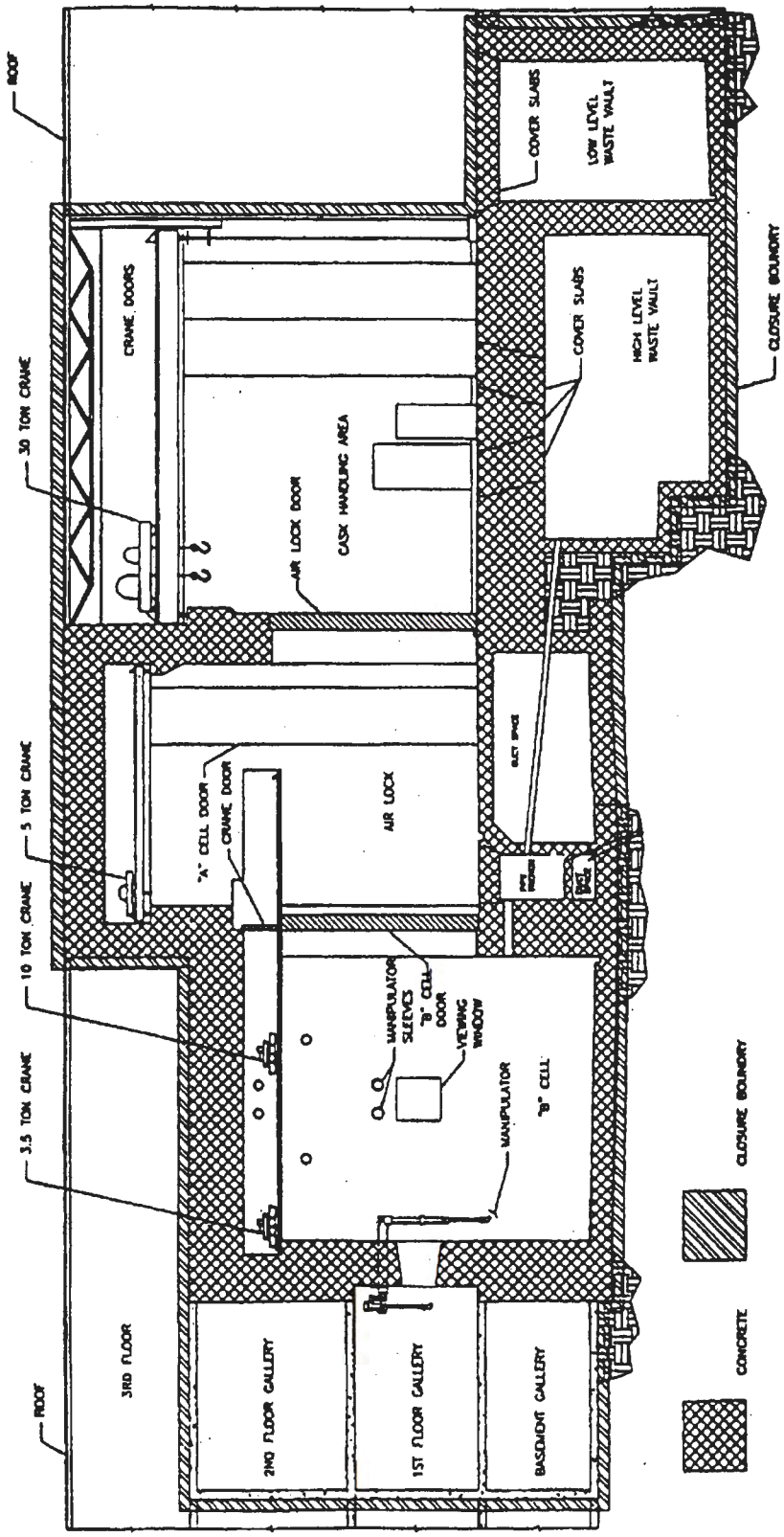
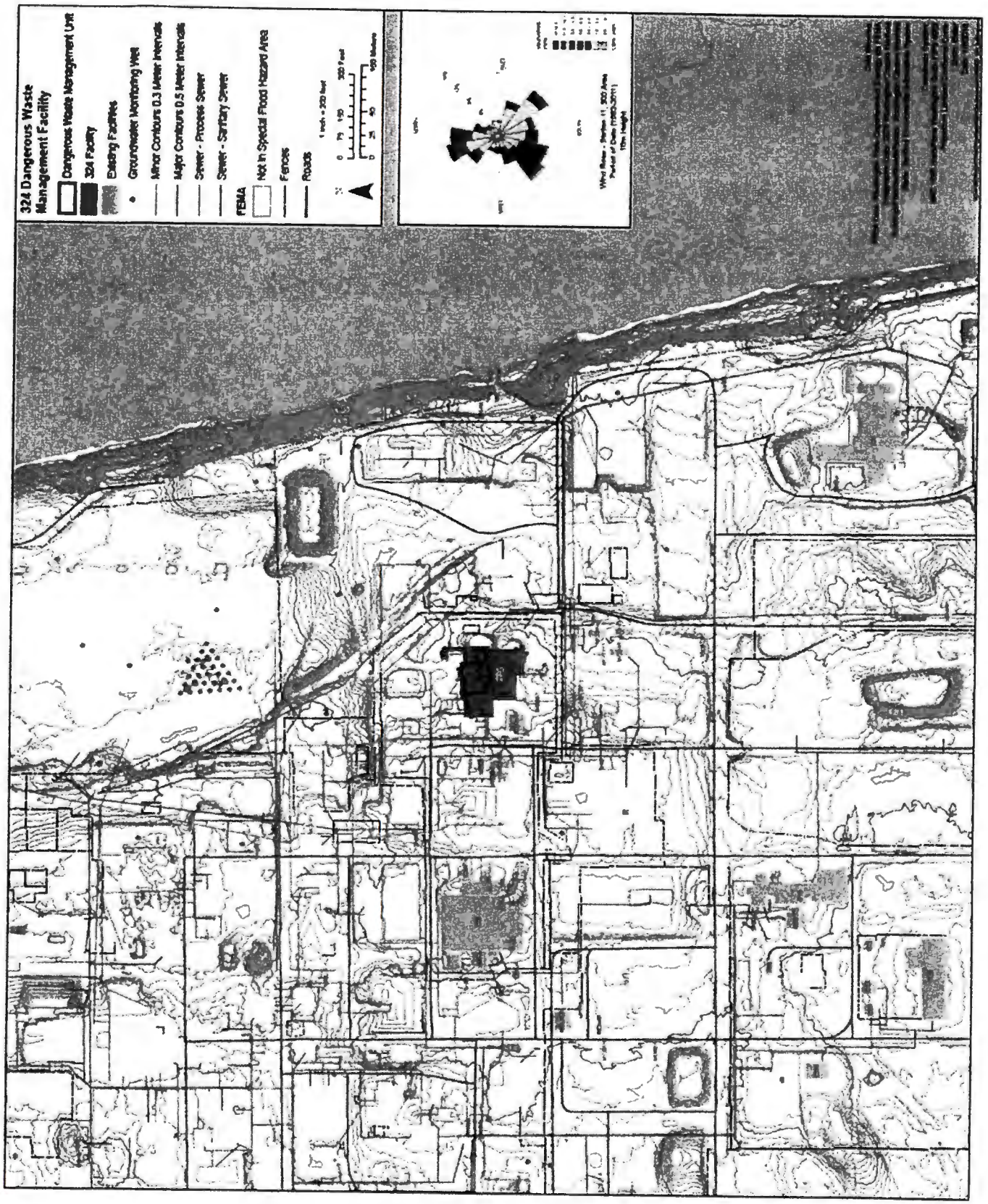


Figure 5. 324 Building Topographic Map



ATTACHMENT 3

DOE/RL-96-73, REVISION 4,
324 BUILDING DANGEROUS WASTE MANAGEMENT UNITS CLOSURE PLAN

Consisting of 56 pages
(including this cover page.)

The following certification statement is provided for the Hanford Facility Dangerous Waste Part A Permit Form and the 324 Building Dangerous Waste Management Units Closure Plan.

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.

Stacy L. Charboneau
Manager
U.S. Department of Energy
Richland Operations Office

6/30/16
Date

John A. Ciucci
President and Chief Executive Officer
CH2M HILL Plateau Remediation Company

6/9/16
Date

Date Received for Clearance Process (MM/DD/YYYY)
06/06/2016

INFORMATION CLEARANCE FORM

A. Information Category

- ☐ Abstract
- ☐ Journal Article
- ☐ Summary
- ☐ Internet
- ☐ Visual Aid
- ☐ Software
- ☐ Full Paper
- ☐ Report
- ☒ Other Closure Plan

B. Document Number DOE/RL-96-73 Revision 4

C. Title
324 Building Dangerous Waste Management Units Closure Plan

D. Proposed Internet Address

E. Required Information (MANDATORY)

1. Is document potentially Classified? ◉ No ○ Yes

Horn, Sarah R Via IDMS Data File att.
Manager Required (Print and Sign)

If Yes _____
ADC Required (Print and Sign) ○ No ○ Yes Classified

2. Official Use Only ◉ No ○ Yes Exemption No. ____
3. Export Controlled Information ◉ No ○ Yes OUO Exemption No. 3
4. UCNI ◉ No ○ Yes
5. Applied Technology ◉ No ○ Yes OUO Exemption No. 5
6. Other (Specify) _____

7. Does Information Contain the Following:

a. New or Novel (Patentable) Subject Matter? ◉ No ○ Yes
If "Yes", OUO Exemption No. 3
If "Yes", Disclosure No.: _____

b. Commercial Proprietary Information Received in Confidence, Such as Proprietary and/or Inventions?
◉ No ○ Yes If "Yes", OUO Exemption No. 4

c. Corporate Privileged Information? ◉ No ○ Yes
If "Yes", OUO Exemption No. 4

d. Government Privileged Information? ◉ No ○ Yes
If "Yes", Exemption No. 5

e. Copyrights? ◉ No ○ Yes If "Yes", Attach Permission.

f. Trademarks? ◉ No ○ Yes If "Yes", Identify in Document.

8. Is Information requiring submission to OSTI? ◉ No ○ Yes

9. Release Level? ◉ Public ○ Limited

F. Complete for a Journal Article

1. Title of Journal

G. Complete for a Presentation

1. Title for Conference or Meeting _____
2. Group Sponsoring _____
3. Date of Conference _____ 4. City/State _____
5. Will Information be Published in Proceedings? ◉ No ○ Yes 6. Will Material be Handed Out? ◉ No ○ Yes

H. Information Owner/Author/Requestor

Garcia, Erika A Approved - IDMS Data File att.
(Print and Sign)

Responsible Manager
Horn, Sarah R Approved - IDMS Data File att.
(Print and Sign)

Approval by Direct Report to President (Speech/Articles Only) _____
(Print and Sign)

I. Reviewers	Yes	Print	Signature	Public Y/N (If N, complete J)
General Counsel	☒	Swenson, Raymond T	Y - Public, IDMS Data File att.	Y / N
Office of External Affairs	☐			Y / N
DOE	☒	McKarns, Tony C	Y - Public, IDMS Data File att.	Y / N
Other	☐			Y / N
Other	☐			Y / N
Other	☐			Y / N

J. Comments
This document is to meet TPA Milestone requirements due to DOE June 10th. Please hold final release to IDMS pending J. Ciucci signature page insertion to final PDF.

Information Clearance Approval

APPROVED
By Janis Aarvig at 8:25 am, Jun 07, 2016

Approved for Public Release;
Further Dissemination Unlimited

If Additional Comments, Please Attach Separate Sheet

A-6001-401 (REV 5)

- <workflow name="**(JDA) RUSH - DOE/RL-96-73 Rev4_Deliv324BldgDWMU Close**" id="**208946149**">
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    <comments>**ATTN - Due Tuesday, 6/7/2016 - COB Please approve the Deliverable, 324 Building Dangerous WMU Closure Plan, submitted by Sarah Horn, for public release. Thank you, Janis Aardal Information Clearance**</comments>
  </task>
  <task name="**Add XML**" id="**1**" date-done="**20160606T1129**" />
  <task name="**RUSH - Manager Approval**" id="**26**" date-due="**20160607T1129**" date-done="**20160606T1146**" performer="**Sarah R Horn**" performer-id="**155197854**" username="**h3704425**" disposition="**Approve**" authentication="**true**" />
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  <task name="**Milestone 2**" id="**62**" date-done="**20160606T1637**" />
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DOE/RL-96-73
Revision 4

324 Building Dangerous Waste Management Units Closure Plan

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

U.S. DEPARTMENT OF ENERGY Richland Operations Office

P.O. Box 550
Richland, Washington 99352

DOE/RL-96-73
Revision 4

324 Building Dangerous Waste Management Units Closure Plan

E. A. Garcia
CH2M HILL Plateau Remediation Company

Date Published
June 2016

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

U.S. DEPARTMENT OF ENERGY Richland Operations Office
P.O. Box 550
Richland, Washington 99352

APPROVED
By Janis Aardal at 6:26 am, Jun 07, 2016

Release Approval Date

Printed in the United States of America

WASHINGTON STATE DEPARTMENT OF ECOLOGY

Dangerous Waste Permit Application Part A Form

Date Received Month / Day / Year	Reviewed by:	Date:
	Approved by:	Date:

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

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

III. Name of Facility

U.S. Department of Energy – Hanford Facility

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

A. Street

Refer to Permit Attachment 2 – Hanford Facility Legal Description

City or Town	State	ZIP Code
Near Richland	WA	

County Code (If known)	County Name
005	Benton

B. Land Type	C. Geographic Location Latitude (degrees, mins, secs)	Longitude (degrees, mins, secs)	D. Facility Existence Date Month / Day / Year
F	Refer to TOPO Map (Section XV).		11 / 19 / 1980

V. Facility Mailing Address

Street or P.O. Box

P.O. Box 550

City or Town	State	ZIP Code
Richland	WA	99352

VI. Facility contact (Person to be contacted regarding waste activities at facility)	
Name (last)	**(first)**
Charboneau	Stacy
Job Title	**Phone Number (area code and number)**
Manager	(509) 376-7395
Contact Address	
Street or P.O. Box	
P.O. Box 550	
City or Town	**State** / **ZIP Code**
Richland	WA / 99352

VII. Facility Operator Information	
A. Name	**Phone Number**
U.S. Department of Energy Owner/Operator CH2M HILL Plateau Remediation Company Co-operator for dangerous waste management units in the 324 Unit Group*	(509) 376-7395 (509) 376-0556*
Street or P.O. Box	
P.O. Box 550 P.O. Box 1600*	
City or Town	**State** / **ZIP Code**
Richland	WA / 99352
B. Operator Type F	
C. Does the name in VII.A reflect a proposed change in operator? ☐ Yes ☒ No **If yes, provide the scheduled date for the change:** Month / Day / Year	
D. Is the name listed in VII.A. also the owner? If yes, skip to Section VIII.C. ☐ Yes ☒ No	

VIII. Facility Owner Information	
A. Name	**Phone Number (area code and number)**
U.S. Department of Energy Owner/Operator	(509) 376-7395
Street or P.O. Box	
P.O. Box 550	
City or Town	**State** / **ZIP Code**
Richland	WA / 99352
B. Operator Type F	
C. Does the name in VII.A reflect a proposed change in operator? ☐ Yes ☒ No **If yes, provide the scheduled date for the change:** Month / Day / Year	

IX. NAICS Codes (5/6 digit codes)

A. First							B. Second						
5	6	2	2	1	1	Waste Treatment & Disposal	9	2	4	1	1	0	Administration of Air & Water Resource & Solid Waste Management Programs

C. Third							D. Fourth						
5	4	1	7	1	2	Research & Development in the Physical, Engineering, & Life Sciences	5	6	2	9	1	0	Remediation Services

X. Other Environmental Permits (see Instructions)

A. Permit Type	B. Permit Number	C. Description
E	AOP 00-05-00	Air Operating Permit (AOP) [1] see comments section.
E	AIR-06-10 14	WAC 246-247, Radiation Protection – Air Emissions [1] see comments section.
E	ST 00 04 51 1 1	Misc. Streams Permit. [1] see comments section.

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

Process Codes

X99 - The 324 Building has six dangerous waste management units (DWMUs) that are considered Miscellaneous Units due to their unique nature and high radiation content. The 324 Building DWMUs store mixed waste residues from past research operations in four hot cells and two tank systems with associated piping. Classification of these DWMUs as miscellaneous units is necessary because the unique radiological characteristics require specialized management systems and requirements other than those applicable to tank systems. Not all stored materials contain mixed waste. Research operations have been discontinued and the facility remains under surveillance and maintenance until final deactivation and decommissioning. This will occur prior to demolition and remediation under both a *Comprehensive Environmental Response, Compensation, and Liability Act of 1980* (CERCLA) removal action and CERCLA remedial action. These CERCLA response actions will achieve closure performance standards.

Facility Description

The 324 Building was constructed in 1966 and was used for scientific research on highly radioactive materials. Research on highly radioactive materials was conducted within shielded structures known as "hot cells." The 324 Building consists of four individual hot cells (A-Cell, B-Cell, C-Cell, and D-Cell) connected by a common air lock and known collectively as the Radiochemical Engineering Cells (REC). Each of the hot cells is considered an individual DWMU (the airlock is included in the B-Cell DWMU boundary). A-Cell was not used for dangerous waste activities; therefore, there are no specific closure activities required. However, piping between B-Cell and the High-Level Vault (HLV) tanks passes under A-Cell in a crawl space and piping will be removed. C-Cell was not used for treatment, storage, and disposal activities; therefore, there are no specific closure activities required. The facility also includes two belowgrade vaults (high-level waste and low-level waste) containing tanks that collected high activity liquid effluent from the REC complex during past operations. Each of the vaults is considered a DWMU that contains a tank system. Table 1 lists all of the 324 Building DWMUs. Figure 1 locates the REC complex, HLV, and Low-Level Vault (LLV) that comprise the 324 Building DWMUs. The tanks in both vaults were flushed following deactivation and Tank 103 (LLV) and Tank 105 (HLV) have been stabilized by filling them with grout, rendering both tanks permanently inoperable. The hot cells remain functional and will be used for the CERCLA remediation of high-activity soil contamination found to exist beneath B-Cell. The rest of the 324 Facility consists of laboratories, office space, and other plant operation support structures and functions.

The dangerous waste stored in the DWMUs could include arsenic (D004), barium (D005), cadmium (D006), chromium (D007), lead (D008), mercury (D009), selenium (D010), and silver (D011).

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 1. Amount	B. Process Design Capacity 2. Unit of Measure (enter code)	C. Process Total Number of Units	Line Number		A. Process Codes (enter code)			B Process Design Capacity 1. Amount	B Process Design Capacity 2. Unit of Measure (enter code)	C. Process Total Number of Units	D. Process Description
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	X	9	9	4,630[2]	Y	006		1	X	9	9	4,487[3]	Y	004	Storage.
	2								2	X	9	9	29,080	G	002	Tank Storage.
	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							

XIV. Description of Dangerous Wastes

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

Line Number			A. Dangerous Waste No. (enter code)				B. Estimated Annual Quantity of Waste	C. Unit of Measure (enter code)	D. Processes (1) Process Codes (enter)									(2) Process Description [If a code is not entered in D (1)]
X	1		D	0	0	2	400	P	S	0	1	T	0	1				
X	2		D	0	0	1	100	P	S	0	2	T	0	1				
X	3		D	0	0	2												Included with above
		1	D	0	0	4	189,795[4]	P	X	9	9							Included with above and includes debris.
		2	D	0	0	5												Included with above and includes debris.
		3	D	0	0	6												Included with above and includes debris.
		4	D	0	0	7												Included with above and includes debris.
		5	D	0	0	8												Included with above and includes debris.
		6	D	0	0	9												Included with above and includes debris.
		7	D	0	1	0												Included with above and includes debris.
		8	D	0	1	1												Included with above and includes debris.
		9																
	1	0																
	1	1																
	1	2																
	1	3																
	1	4																
	1	5																
	1	6																
	1	7																
	1	8																
	1	9																
	2	0																
	2	1																
	2	2																
	2	3																

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)]
24					
25					
26					
27					
28					
29					
31					
32					
33					
34					

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.

Topographic map is located in the Ecology library.

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.

Operator Name and Official Title (type or print)	**Signature**	**Date Signed**
Stacy L. Charboneau, Manager U.S. Department of Energy Richland Operations Office	Stacy Charboneau	6/30/16
Co-Operator* Name and Official Title (type or print) John Ciucci President and Chief Executive Officer CH2M HILL Plateau Remediation Company	**Signature**	**Date Signed** 6/9/16
Co-Operator* – Address and Telephone Number P.O. Box 1600 Richland, WA 99352 (509) 376-0556		
Facility-Property Owner Name and Official Title (type or print) Stacy L. Charboneau, Manager U.S. Department of Energy Richland Operations Office	**Signature** Stacy Charboneau	**Date Signed** 6/30/16

Table 1. 324 Dangerous Waste Management Units

DWMUs	Location	Operation Function
A-Cell	REC complex	Research & development with remote handled radioactive materials
B-Cell (including the pipe trench and the airlock)	REC complex	Research & development with remote handled radioactive materials
C-Cell	REC complex	Research & development with remote handled radioactive materials
D-Cell	REC complex	Research & development with remote handled radioactive materials
High-level Vault (including piping to and from REC)	Beneath cask handling area	Accumulation and transfer of high-activity process and waste liquids
Low-level Vault (including piping to and from REC)	Beneath Room 147 Hot Shop	Accumulation and transfer of low-activity process and waste liquids

Figure 1. 324 Simplified Floor Plan and Closure Boundary

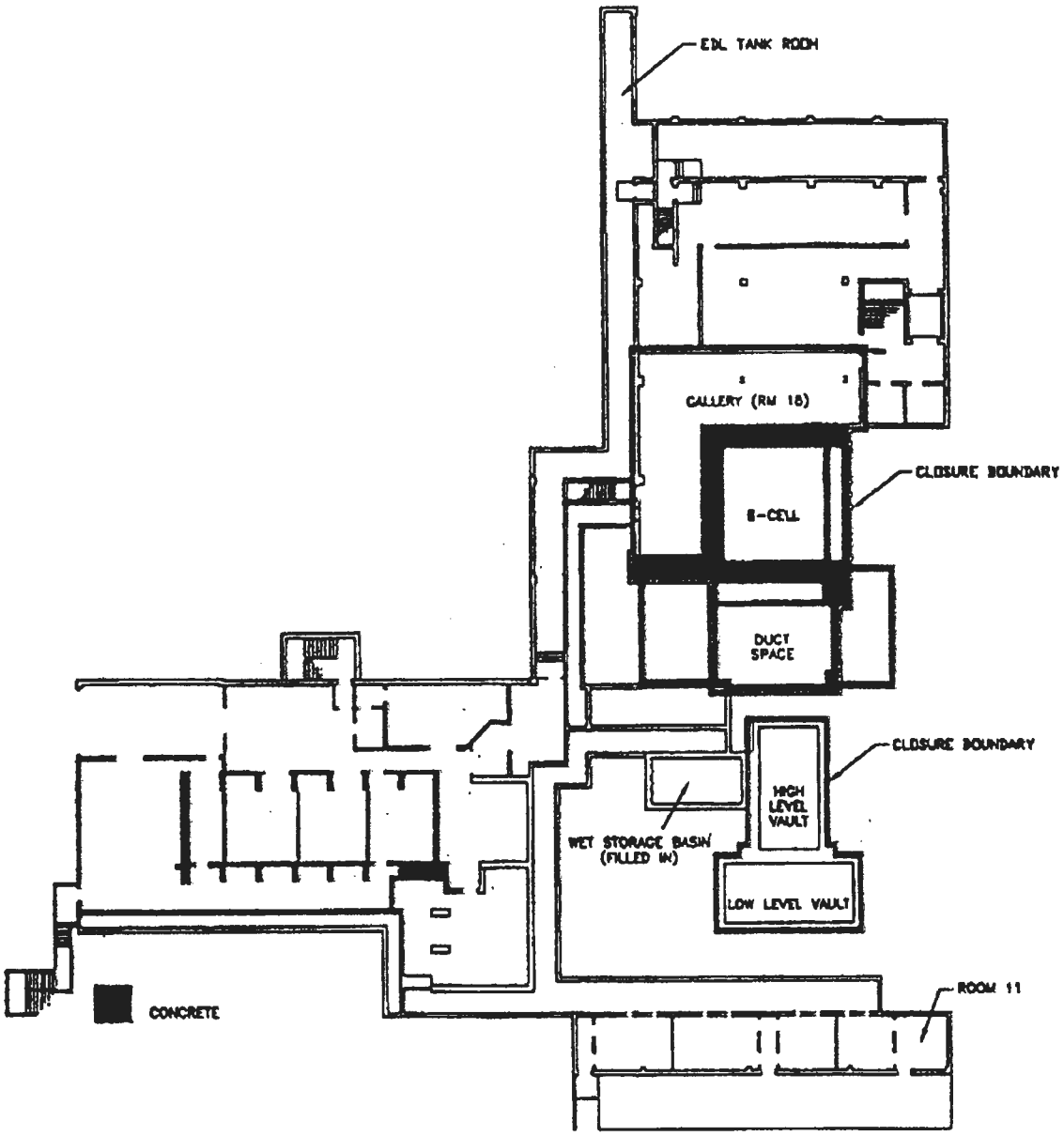


Figure 2. REC Complex Cutaway View

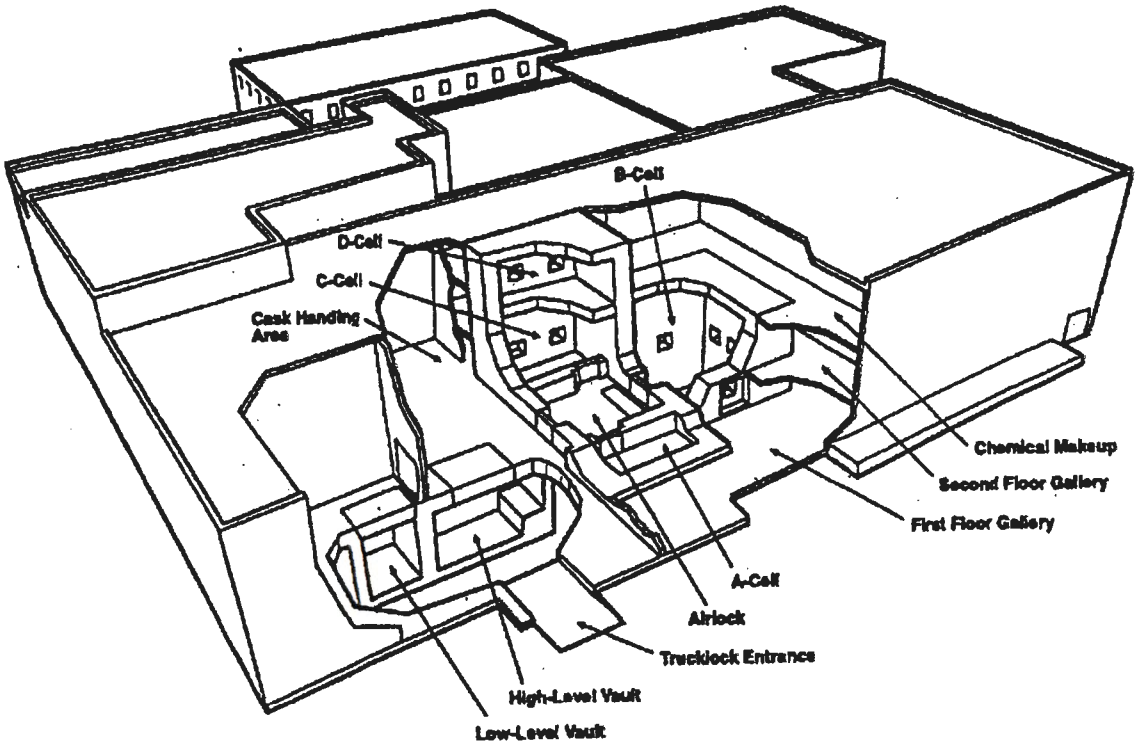
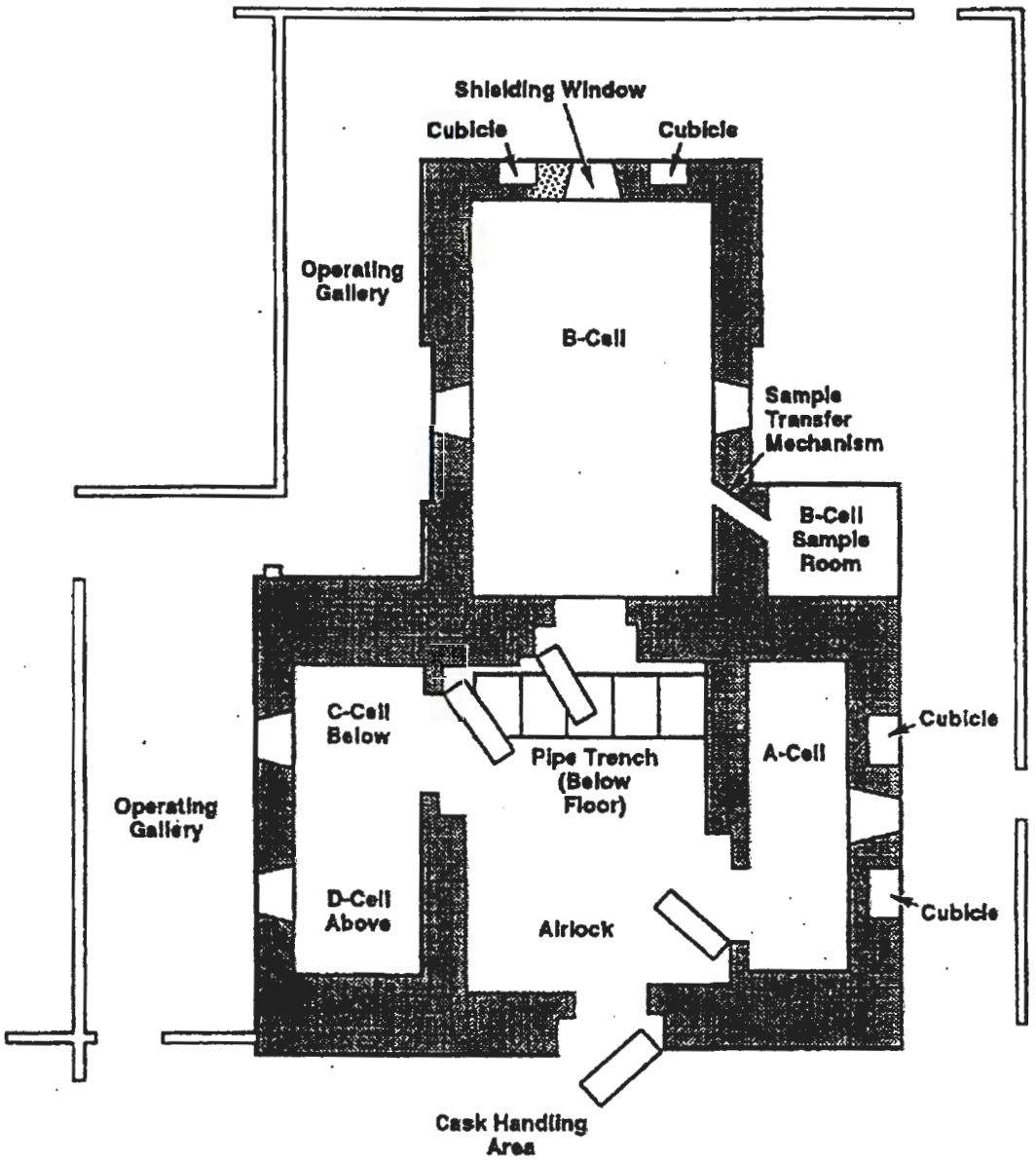


Figure 3. REC Complex Plan View



Note: Hot cell and airlock doors are interlocked.
Airlock cannot be accessed when any hot cell door is open.

Figure 4. 324 Building Cross-Section Through the High-Level Vault, Low-Level Vault, Airlock, and B-Cell.

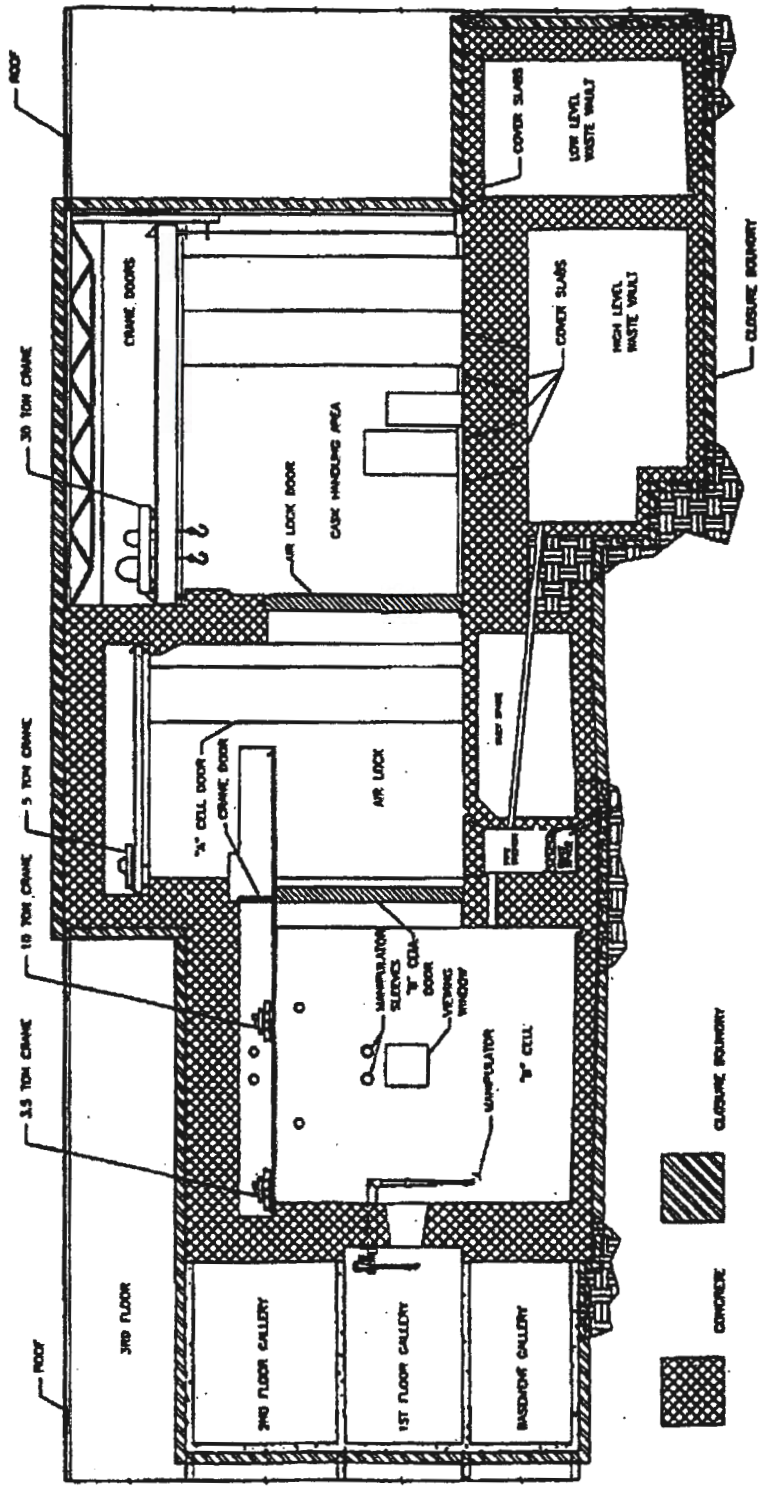
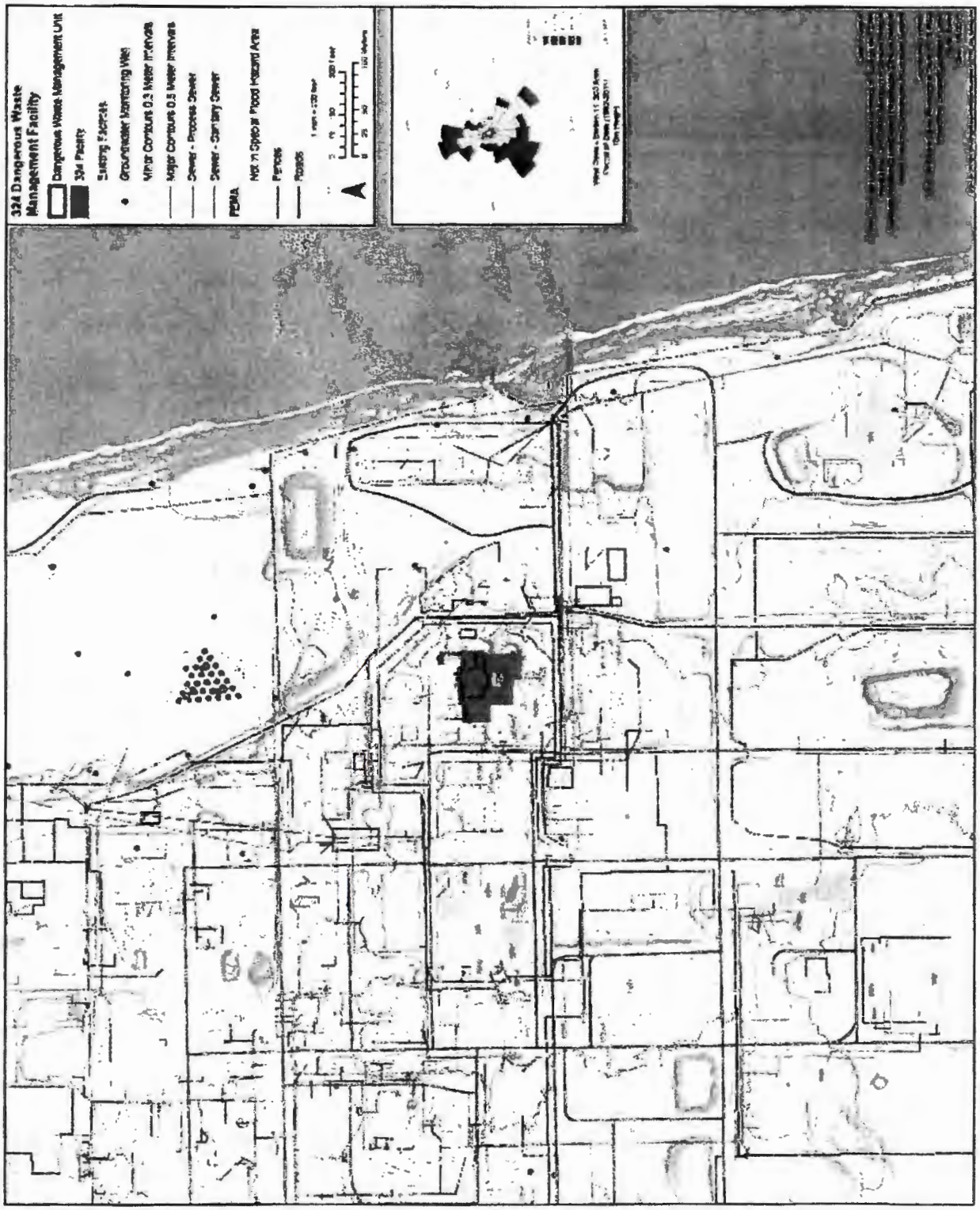


Figure 5. 324 Building Topographic Map



Addendum H

Closure Plan

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Contents

Figures

Tables

Terms

CERCLA	*Comprehensive Environmental Response, Compensation, and Liability Act of 1980*
CHPRC	CH2M HILL Plateau Remediation Company
D4	Deactivation, Decommission, Decontamination, and Demolition
DOE	U.S. Department of Energy
DOE-RL	U.S. Department of Energy-Richland Operations Office
DWMU	Dangerous Waste Management Unit
ECO	Environmental Compliance Officer
EDL	Engineering Development Laboratory
EE/CA	Engineering Evaluation/Cost Analysis
EPA	U.S. Environmental Protection Agency
ERDF	Environmental Restoration Disposal Facility
GHFT	General Hanford Facility Training
HLV	High-Level Vault
IQRPE	independent, qualified, registered professional engineer
LDR	Land Disposal Restrictions
LLV	Low-Level Vault
NCO	Nuclear Chemical Operator
OT	Operations Training
PNNL	Pacific Northwest National Laboratory
QA	quality assurance
RCRA	*Resource Conservation and Recovery Act of 1976*
RDR/RAWP	remedial design report/remedial action work plan
REC	Radiochemical Engineering Cells
S&M	surveillance and maintenance
SMF	Shielded Materials Facility
TPA	Tri-Party Agreement
TSD	treatment, storage, and disposal

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H1 Introduction

This addendum describes the planned activities and performance standards that meet the requirements found in WAC 173-303-610(2), "Closure and Post-Closure," for closing the 324 Building Dangerous Waste Management Units (DWMUs).

H1.1 Facility Contact Information

The Hanford Facility, located in southeastern Washington State, is owned by the U.S. Government and is managed and operated by the U.S. Department of Energy (DOE). Dangerous waste and mixed waste (containing both dangerous and radioactive components) are generated and managed at the Hanford Facility. The 324 Building, which is part of the Hanford Facility, is owned by the U.S. Government and is operated by DOE and its contractor, CH2M HILL Plateau Remediation Company (CHPRC). The contact information is as follows:

324 Building DWMUs Operator and Property Owner

U.S. Department of Energy, Richland Operations Office
P.O. Box 550
Richland, WA 99352
(509) 372-2400

324 Building DWMUs Co-Operator

CH2M HILL Plateau Remediation Company
P.O. Box 1600
Richland, WA 99352
(509) 376-0556

H1.2 Facility Description

The 324 Building was constructed from 1964 to 1966 in the 300 Area of the Hanford Facility. It was designed to provide office and laboratory space for scientific and engineering staff who conducted multi-disciplinary research in areas of waste characterization and immobilization, waste remediation and cleanup development, biomass research, spent fuel characterization, tritium development, and cesium chloride encapsulation. Because the 324 Building housed research and development activities, the work being conducted changed over operational years as programs were concluded and other programs started.

The 324 Building is a concrete and steel structure with a partial basement and first, second, and partial third floors surrounding the engineering hot cell complex. Accessible floor areas total 9,450 m^2 (101,718 ft^2). The foundation structure is poured-in-place steel reinforced concrete. The roof of the facility is a parapetted, slightly sloped steel deck covered with a concrete, gravel finished, built-up roof.

The 324 Building and its components are depicted in Figures H-1 through H-14. The 324 Building is divided into four integrated but separate primary work areas: Engineering Development Laboratory (EDL) -101 and EDL-102; Radiochemical Engineering Cells (REC); EDL-146; and Shielded Materials Facility (SMF). The total floor area is about 6,164 m^2 (66,349 ft^2). Maximum overall building dimensions are 62.5 x 71.6 x 13.7 m (205 x 235 x 45 ft).

The EDL-101 and EDL-102 rooms were historically used to perform bench-to-prototype scale engineering studies of waste immobilization processes with nonradioactive materials, depleted uranium, and thorium. EDL-101 also was used to develop sodium and lithium cleaning processes in support of

development of the Fast Flux Test Facility. EDL-101 consists of a single room (originally designed as a cold (i.e., nonradioactive) crafts shop to support activities in EDL-102).

The EDL-146 contained unshielded or mildly shielded gloveboxes for studies with extremely toxic materials, tracer level fission products, and/or plutonium. Located within EDL-146 is the sampling room (Room 145), which contained sampling equipment for the High-Level Vault (HLV) and Low-Level Vault (LLV) tanks.

The REC provided for studies of chemical or mechanical processes used to further DOE's mission with radiation levels of up to one million R/hr. The REC consists of four operating hot cells (A-Cell, B-Cell, C-Cell, and D-Cell) surrounding a common airlock cell. The airlock functions primarily as a transition zone and ventilation barrier for movement of shielded material between external areas and the four processing cells. All of the cells and the airlock are equipped with overhead crane service, lead-glass windows that are oil filled to facilitate viewing, and master-slave manipulators to aid remote operation and maintenance of in-cell equipment.

The SMF includes the fabrication cell (South Cell), the airlock cell, and the feed preparation cell (East Cell). Complete containment of radioactive materials, alpha, beta, and gamma, were provided for remote research and fabrication studies on metallic and ceramic fuel materials with radiation levels on the order of one million R/hr.

The cask handling area was the central hub for control of radioactive material movements within the radiological areas of the 324 Building. This area is centrally located adjacent to the REC, the SMF, EDL-146, and the former master-slave manipulator repair shop in Room 147 (Figure H-3). Material transfers between EDL, REC, and SMF were routed through the cask handling area. Facilities existed for load-in and load-out of large quantities of radioactive materials to any cell or to the shielded vault area through equipment in the truck lock and cask handling areas.

Two shielded vaults (the HLV and LLV), containing stainless steel tanks ranging from 1,700 L (394 gal) to 19,000 L (5,019 gal), provided for segregation and holding of radioactive liquid feed-stocks for, or waste from, chemical processing and/or cleaning operations in the hot cells.

The remainder of the 324 Building consisted of offices, lunchroom, change rooms, and ancillary laboratory spaces. These areas were used to provide administrative support, development laboratories, maintenance shops, and common facility service and support areas. *Comprehensive Environmental Response, Compensation, and Liability Act of 1980* (CERCLA) removal actions conducted from 2009 through 2011 resulted in the demolition of the 324 Building Office Annex, the cold materials testing High-Bay, the 324C Lithium Enclosure, and the Mechanics Shop. These ancillary structures were demolished as part of CERCLA deactivation, decommissioning, and demolition of the 324 Building per the Removal Action Work Plan for 300 Area Facilities (DOE/RL-2004-77, *Removal Action Work Plan for 300 Area Facilities*). The main portion of the 324 Building remains and is undergoing surveillance and maintenance (S&M) until CERCLA demolition resumes. S&M activities include operation of the ventilation system and other associated safety systems important to maintaining the 324 Building in a stable configuration.

H1.3 Regulatory History and Background

In April 1993, the Washington State Department of Ecology (Ecology) and the U.S. Environmental Protection Agency (EPA) were notified that the Department of Energy-Richland Office (DOE-RL) had determined that the REC B-Cell and the HLV within the 324 Building were being used to manage or store mixed waste. This unit was not being managed under the *Resource Conservation and Recovery Act of 1976* (RCRA); therefore, these activities did not comply with RCRA regulations, resulting in an Ecology enforcement action.

Negotiations for resolution of the DOE-RL RCRA noncompliance were conducted among Ecology, EPA, and DOE-RL using the Tri-Party Agreement dispute resolution process. On February 7, 1995, the

Tri-Party Agreement Dispute Resolution Committee agreed to the following: Ecology would issue a Voluntary Compliance letter to document the areas of noncompliance associated with the 324 Building REC and HLV, and DOE-RL, Ecology, and Pacific Northwest National Laboratory (PNNL) (co-operator of the 324 Building at that time) would negotiate Tri-Party Agreement milestones to close the noncompliant treatment, storage, and disposal (TSD) unit. The parties agreed that these Tri-Party Agreement milestones would satisfy regulatory enforcement for the areas of noncompliance. Because of radiation, storage, and shipment concerns, it was not possible to immediately remove mixed waste material from the units. Radiation levels within these units are estimated to range between 1 R/hr to > one million R/hr. Ecology and DOE-RL agreed that PNNL would continue managing the waste in the REC and HLV in a manner appropriate for the radiological risks posed by the waste.

Based on the noncompliant activities and the special radiological considerations, the Tri-Party Agreement Milestones signed July 28, 1995, were established to address these issues and complete closure of the nonpermitted mixed waste units in the 324 Building REC and HLV, which was subsequently expanded to include the LLV:

- Milestone M-89-01 identified the HLV tanks that contained liquid mixed waste as Tanks 104, 105, 107, and directed DOE-RL to remove the mixed waste, flush, and drain these tanks. This milestone was completed in October 1996.
- Milestone M-89-02 required removal of B-Cell mixed waste and excess equipment. This milestone was completed in March 2001.
- Milestone M-89-03 required compliance with interim status facility standards for the non-permitted 324 Building areas. Because of the high radiation fields associated with mixed waste stored in the REC and HLV, alternative compliance measures for some interim status requirements were used. This milestone was completed in March 1995.
- Milestone M-89-04 required DOE-RL to identify mixed waste management alternatives. This milestone was completed in June 1995.
- Milestone M-20-55 required the submittal of a closure plan for the previously identified unpermitted TSD unit in the 324 Building. This milestone was satisfied with the initial submittal of this closure plan to Ecology in December 1995. The closure plan was subsequently modified and resubmitted in May 1997. Revision 1 of the closure plan was submitted in March 1998 to resolve comments and issues with the initial and subsequent closure plan, to reflect the change in building mission and management, and to provide better integration of closure activities with building stabilization and decontamination activities and with the CERCLA remedial actions for the 300 Area operable units.

The scope of Milestone M-89-00 is to complete closure of non-permitted mixed waste units in the 324 Building as described in this closure plan.

Tri-Party Agreement Change Number M-094-01-01 was approved in April 2002 and established the M-094 Series Milestones and provided the overall framework for disposition of 300 Area facilities. Milestones M-094-02 and M-094-03 were established by Change Number M-094-01-01, described as follows.

Tri-Party Agreement Milestone M-094-02 was defined in Change Number M-094-01-01 as: "Submit an amendment to the existing *324 Building REC/HLV Closure Plan*, DOE/RL-96-73, Rev. 1, for Ecology review and approval. The amendment shall change the existing closure path from clean closure to a path where the high-risk materials and wastes are removed from the facility followed by complete disposition." The amendment to the closure plan was submitted to Ecology in July 2002 and was approved by Ecology in December 2002. Revision 2 to the closure plan incorporated the amended change in closure path and closure standard to "removal" instead of clean closure. The change in closure path was

approved in Revision 3 (published in August 2005). The closure performance standard was changed to complete removal of each component requiring closure. Modification of the performance standard of individual components was changed from clean closure in accordance with the Debris Rule "clean debris surface" to "removal."

In the early 2000s, the 324 Building was added to the M-094 milestone series that required disposition (deactivation, decommissioning, decontamination, and demolition [D4]) of 300 Area surplus facilities through the CERCLA removal action process. This included development of an engineering evaluation/cost analysis (EE/CA) and action memoranda. In 2006, Action Memorandum #2 for 300 Area Facilities was issued after public comment on the EE/CA by DOE-RL and EPA that required D4 of the 324 Building under CERCLA authority. These CERCLA decisions are implemented through the Removal Action Work Plan (DOE/RL-2004-77).

Complete facility disposition (removal) under CERCLA will be performed in parallel with the removal and closure of the mixed waste units in the 324 Building. Closure of the Milestone M-89-00 mixed waste units in the 324 Building, as described in this closure plan, will be performed in parallel with the complete disposition of the 324 Building. Closure activities will be conducted and certified in accordance with the approved closure plan and National Priorities List Agreement/Change Control Form NPL-141, signed by DOE-RL and Ecology on November 7, 2007.

Removal and disposal of these closure area components will be performed under CERCLA authority. All wastes generated from completing the removal and remedial actions will be managed in accordance with the *Removal Action Work Plan for 300 Area Facilities* (DOE/RL-2004-77), and the *Record of Decision for 300-FF-2 and 300-FF-5 and Record of Decision Amendment for 300-FF-1* (dated November 2013, as authorized by DOE-RL, EPA, and Ecology). Implementation of the Record of Decision is per DOE/RL-2001-47, *Remedial Design Report/Remedial Action Work Plan for 300-FF-2 Soils.*

H1.4 Current Facility Status

During cleanout of B-Cell in March of 2010, a hole was discovered in the stainless steel sump liner. Direct radiological measurements observed approximately 8,900 R/hr at this failed sump location. A review of construction as-built drawings identified an expansion joint in the underlying concrete slab in that vicinity. This prompted concerns that radiological contamination may have been released to the environment from the failed sump liner. In 2011, the 324 mechanic's shop on the north side of the building was demolished and probes were inserted under the building. Radiological instruments inserted into the probes recorded radiological doses in excess of 14,000 R/hr in the soil beneath B-Cell, confirming that a release had occurred from B-Cell. In 2012, a soil sample of the contaminated soil was retrieved and analyzed at the 325 Radiochemical Process Laboratory. The analytical data and subsequent waste designation performed in accordance with WAC 173-303-070, "Designation of Dangerous Waste," confirmed the soil contamination was high-activity, low-level radioactive waste. The contaminated soils beneath the building do not designate as a dangerous waste.

As a consequence to the release discovery, the contaminated soils were entered into the Waste Information Data System as the 300-296 waste site. The *Final Record of Decision for 300-FF-2 and 300-FF-5 and Record of Decision Amendment for 300-FF-1* established 300-296 as a principle threat waste site that requires remediation.

H1.5 324 Building Dangerous Waste Management Units

The 324 Building DWMUs consists of three basic functional areas that were integrated during past research process operations—the REC (includes A-Cell, B-Cell, C-Cell, D-Cell, the airlock, and the pipe trench connecting the REC with the HLV and LLV), the HLV, and the LLV. These functional areas comprise the six 324 Building DWMUs: A-Cell, B-Cell (includes the pipe trench and the airlock), C-Cell, D-Cell, HLV (includes piping to and from the REC), and LLV (includes piping to and from the REC).

A-Cell was not used for dangerous waste activities; therefore, there are no specific closure activities required. However, piping between B-Cell and the HLV tanks passes under A-Cell in a crawl space and piping will be removed. C-Cell was not used for TSD activities; therefore, there are no specific closure activities required.

The following sections provide additional detail and status of the 324 Building DWMUs. The 324 Building has already undergone substantial deactivation and decommissioning under the CERCLA removal action program. Numerous facility systems and components, including portions of the DWMUs, have undergone shutdown, cleanout, and stabilization in preparation for demolition. The following sections provide additional detail for each of the DWMU functional areas.

H1.6 Unit Descriptions

Radiochemical Engineering Cells

The REC (Figures H-1, H-3, and H-4) consists of four hot cells (A-Cell, B-Cell, C-Cell, and D-Cell), a central airlock, and a pipe trench. The four hot cells are individual DWMUs and are joined by an airlock to form a T-shaped structure. D-Cell is located above the C-Cell on the south side. C-Cell/D-Cell, the airlock, and the A-Cell form the top of the T-shape. B-Cell connects to the airlock to form the bottom of the T-shape. The walls are constructed of 1.2 m (3.9 ft) thick, high-density concrete or 1.4 m (4.6 ft) thick, normal-density concrete. This concrete is used as containment and radiation shielding.

The hot cells in the REC complex provided for process engineering and testing of highly radioactive materials. Operations in the REC were performed remotely. Each cell is equipped with remote/ mechanical manipulators; remote operated cranes; remote viewing equipment; and 1.2 m (3.9 ft) thick leaded glass viewing windows, some of which are operational (i.e., filled with mineral oil), which acts as an optical clarifier. The airlock functions primarily as a transition zone and ventilation barrier for the transfer of highly radioactive material in shielded over-packs between the unshielded cask handling area and the four shielded hot cells. At present, the REC hot cells and airlock remain operational, but have undergone initial deactivation.

The larger A-Cell and B-Cell functioned as general purpose processing cells and were operated using remote equipment from the operating galleries. A semi-remote maintenance technique grouped process equipment into racks that 'plugged' into the cell walls, and allowed access to service connections on the 'cold' side for contact maintenance. Certain in-cell items were remotely operated and maintained using direct viewing through lead-glass, oil filled windows, supplemented by closed-circuit television and manipulators. Process connections were also made on the 'cold' side in a shielded pipe trench by semi-remote means.

A-Cell is a 10 m (32.8 ft) high cell that was used most recently for storage and characterization of vitrified waste in canisters and to store debris items relocated from B-Cell during terminal cleanout activities.

B-Cell is a 10 m (32.8 ft) high cell that was used primarily to demonstrate several engineering scale prototypes of waste immobilization processes. During a further cleanout of B-Cell in 2010, a breach in the containment liner was observed. B-Cell deactivated equipment and some debris were moved to adjacent hot cells and the floor was stabilized with the addition of 0.3 m (1 ft) of grout (Figures H-13 and H-14 provide before and after photos). Some equipment used during cleanout of B-Cell remains grouted to the floor.

The C-Cell and D-Cell are shorter process cells that were capable of handling equipment up to 3.35 m (11 ft) high, and operated by direct viewing and remote/mechanical manipulators with assistance from remotely operated overhead cranes. Typical processes studied in these cells were dissolution and separation of fuel element compounds by high-temperature gases or liquid salt melts, de-jacketing of fuel

elements, remote equipment development, and determination of physical properties of highly radioactive materials or equipment.

The REC airlock is used primarily as a transition area for transfer of material and equipment into and out of the adjoining cells. The airlock is located at the junction of the arms of the REC 'T' (Figure H-3) and is 6.7 m (22 ft) long, 6.6 m (21.7 ft) wide, and 10 m (32.8 ft) high. The floor and the walls up to 8.2 m (27 ft) high are lined with stainless steel plate welded at the seams. The airlock adjoins A-Cell (north), B-Cell (west), C-Cell/D-Cell (south), and the cask handling area (east). Access to these areas is via large steel doors equipped with interlocks to prevent unintended opening. The airlock is equipped with cranes that facilitate remote installation, maintenance, and operation of equipment. Shielding walls are constructed of 1.4 m (4.6 ft) thick, normal density concrete.

Access to the REC airlock is through two swinging doors, hung one above the other, sharing a single opening to the cask handling area (Figure H-12). The doors are constructed of stepped steel that is at least 0.3 m (1 ft) thick; the lower door has a 30 cm (11.8 in.) square lead-glass shielding window. Penetrations into the airlock include a cask access port, ventilation duct, manipulator sleeves, and electrical cables. These services are not completely sealed but rely on the negative pressure in the airlock to limit escape of contamination. Under normal operating conditions, the pressure differential between the interior and exterior of the airlock creates a constant sweep of air from the cask handling area through the penetrations into the airlock, thereby maintaining contamination control.

The pipe trench is located under the floor of the REC airlock just in front of the B-Cell door. The pipe trench is 1.3 m (4.3 ft) wide and 6.4 m (21 ft) long; it varies in depth from approximately 1.8 m (6 ft) on the north end to 1.6 m (5.2 ft) on the south end. Process and waste handling piping runs between the pipe trench and the HLV tanks, LLV tanks, and B-Cell.

The pipe trench was designed to collect water used for decontamination in the REC airlock. The pipe trench was equipped with a steam jet that enabled solutions collected in the trench to be transferred to LLV Tank 102, but the jet ceased functioning in 1985. After that time, collected water was managed by monitoring the pipe trench level, and by curtailing use of water in the airlock if levels reached an administrative control level.

The pipe trench can be accessed by removing five 60 cm (23.6 in.) thick cover blocks using B-Cell's 9.1 metric ton (10.3 U.S. ton) bridge crane. The pipe trench was used to make process connections for the radioactive liquids being handled by the cells and the vaults. Examples of the connections include transfer lines to and from the vaults, lines to the load-out station, and lines to B-Cell. Also, various utility connections (chemical addition lines, air lines, and steam lines) can be made in the pipe trench.

The pipe trench is lined with 0.32 m (1 ft) stainless steel plate. The pipe trench contains approximately 7.6 m (24.9 ft) of 12 mm (0.5 in.) pipe, approximately 210 m (689 ft) of 2.5 cm (1 in.) pipe, approximately 46 m (151 ft) of 5.08 cm (2 in.) pipe, and approximately 29 m (95 ft) of 7.6 cm (3 in.) pipe.

In the mid-1970s, an encased inter-building transfer line (transfer piping with pipe containments) was installed in the pipe trench to transfer wastes to the 325 Building and to return the processed solution to the 324 Building. This transfer line will be remediated per the *Final Record of Decision for 300-FF-2 and 300-FF-5 and Record of Decision Amendment for 300-FF-1* as waste site 300-265. This line is no longer operational.

The piping system is mostly nonoperational in the 324 Facility; the piping has not been isolated due to radiological concerns. However, the radiological liquid waste system still discharges wastes to Tank 102 in the LLV, where the liquids are evaporated and the vapor discharged through the 324 HEPA filters to the 324B Building stack.

High-Level Vault and Low-Level Vault

Two shielded underground vaults (HLV and LLV) are in the 324 Building (Figure H-1 and H-2). These vaults were equipped with tanks for temporary storage of liquids. Each vault contains four stainless steel

tanks. These tanks were used as temporary holding tanks for feed solutions, feedstock tanks for process solutions, or collection tanks for effluents from project activities.

The HLV is a rectangular concrete vault set under the floor of the cask handling area (Figure H-8). The HLV is 6.4 m (21 ft) long, 4.0 m (13.1 ft) wide, 4.4 m (14.4 ft) deep, and is oriented in an east/west direction. The west end of the vault (the end closest to the REC cells) has a ledge approximately 1.4 m (4.6 ft) high that enlarges the upper level of the HLV to 8.2 m (26.9 ft) long.

The HLV contains four stainless steel tanks (Tanks 104, 105, 106, and 107). Tank 104 and Tank 105 are on the lower level, with Tank 104 being the easternmost tank. Tanks 106 and 107 sit on the ledge, with Tank 107 being the northernmost tank. The smallest tank has a capacity of approximately 1,700 L (394 gal) and the largest tank has a capacity of approximately 19,000 L (5,019 gal).

Each tank is a cylinder with a flat top and sloped bottom (except for Tank 107, which has a concave bottom) and a stainless-steel cooling jacket, although the cooling system has been deactivated. Figure H-9 shows typical construction of the tanks. The vault provided secondary containment for the tank systems. The concrete vault is lined with seal welded 0.32 cm (0.1 in.) stainless steel plate.

The HLV has been filled with grout and stabilized to approximately 2.9 L (9.5 ft) deep, which still allows for the operation of the ventilation system. Only Tank 105 has been internally filled with grout, rendering the tank no longer operational and permanently disabled (see Figures H-9 and H-10 for before and after photos). The remaining tanks are empty and inactive.

The LLV is a rectangular concrete vault set under the floor of Room 147. Room 147 was used for repair of radioactively contaminated equipment. The vault is 8.7 m (28.5 ft) long, 4.0 m (13.1 ft) wide, and 5.6 m (18.4 ft) deep, and is oriented in a north/south direction.

The vault is covered by cover blocks (0.6 m [2 ft] thick concrete) that reveal approximately 40 percent of the vault when removed from above. Beneath the cover blocks are removable steel plate ventilation barriers. The LLV is connected via a short tunnel to the HLV near the top of the vaults in the southern interconnecting wall. The vaults share the same air space, which was vented to the low pressure side of the A-frame air filter bank from the HLV.

The LLV contains four stainless steel tanks (Tanks 101, 102, 103, and 108) shown in Figure H-11. All tanks have cooling jackets, which enabled circumferential heating and cooling of the tanks. The vault provided secondary containment for the tank systems. The concrete vault is lined with seal welded 0.32 cm (0.1 in.) stainless steel plate.

The LLV has been filled with grout and stabilized to approximately 2.9 m (9.5 ft) deep, which still allows for the operation of the ventilation system. Only Tank 103 has been internally filled with grout, rendering the tank no longer operational and permanently disabled. Tanks 101 and 108 remain empty and inactive. Tank 102 is currently used as a backup tank for any overflow from the sump located in Room 4. The sump is used to collect any water from the building. Both the sump and tank have operational level-fill indicators and high-level alarms.

H1.7 Mixed Waste Inventory

Mixed waste stored in the 324 Building DWMUs are conservatively designated as the following dangerous waste components: arsenic (D004), barium (D005), cadmium (D006), chromium (D007), lead (D008), mercury (D009), selenium (D010), and silver (D011). These heavy metals are associated with residual contaminants or in debris form (e.g., lead brick).

The 'estimated annual quantity of waste' listed in Addendum A, Part A, is an estimated mass based on residual contaminants remaining in contaminated structure surfaces to 2.5 cm (1 in.) in depth, residual within process piping, and on cell floors and walls. The amount includes specific known mass for discrete waste items located in the REC complex as well. Reference Addendum A, Part A, for additional information.

H1.8 Closure Performance Standards

The 324 Building DWMUs closure boundary remains the same as that described and approved in the *324 Building Radiochemical Engineering Cells, High-Level Vault, Low-Level Vault, and Associated Areas Closure Plan*, DOE/RL-96-73, Revision 3. Closure performance standards and closure will be achieved through the physical removal of the REC, HLV, LLV, and associated piping. Removal is to include 0.5 m (1.6 ft) of soil beneath the DWMUs. This meets the closure performance standards requirements in WAC 173-303-610(2), which requires closure of the facility in a manner that accomplishes the following objectives:

- Minimizes the need for further maintenance
- Controls, minimizes, or eliminates to the extent necessary to protect human health and the environment, post-closure escape of dangerous waste, dangerous constituents, leachate, contaminated runoff, or dangerous waste decomposition products to the ground, surface water, groundwater, or the atmosphere
- Returns the land to the appearance and use of surrounding land areas, to the degree possible, given the nature of the previous dangerous waste activity

Soil contamination will be addressed during CERCLA remediation of the 300-296 waste site in accordance with *Final Record of Decision for 300-FF-2 and 300-FF-5 and Record of Decision Amendment for 300-FF-1*.

H1.9 Closure Activities

Closure performance standards and closure will be achieved as part of a four-phase process implementing both RCRA closure activities and CERCLA removal and remedial actions. The four phases are described as follows with RCRA closure of the DMWUs being achieved during Phase 3.

Phase 1 consists of completing through-cell retrieval of the high-activity radioactive soils underlying B-Cell. Because of the remote handled nature of the soil contamination, retrieval will consist of installing remotely operated equipment and tools into B-Cell and using the cell as shielding. Equipment will be used to remove the B-Cell liner and floor slab and package the debris for relocation into the adjacent hot cells (A, C, and D) or for removal from the building for shipment and disposal at ERDF in compliance with the ERDF waste acceptance criteria (ERDF WAC). Following removal of the floor, the same equipment will be used to excavate and package the contaminated soils to a depth of approximately 3 to 4 m (13.1 ft) beneath the B-Cell floor. Packaged soil will either be relocated into the adjacent hot cells or removed from the building for shipment and disposal at ERDF. The target depth of excavation is intended to reduce dose rates to those acceptable in order to complete remediation of remaining contaminated soils using conventional excavation means. Because space to accept waste in the adjacent hot cells is limited and less than the projected volume of material to be excavated beneath B-Cell, dose rate considerations will be used to determine which materials are placed in the adjacent hot cells and which are removed from the building. Higher dose rate material will be given preference for relocation into the adjacent hot cells over lower dose rate materials.

Following completion of through-cell retrieval, the excavation beneath B-Cell will be backfilled with stabilizing agents such as grout or controlled density fill (i.e., self-leveling grout). As part of the later removal action, void spaces remaining in the hot cells will be filled with grout to stabilize the cell contents and provide stability for hot cell removal. Facility systems will remain operational during this phase of the project.

Phase 2 consists of deactivation of the 324 Building and associated operating systems (e.g., shutdown of the ventilation and fire suppression systems). Following deactivation utility isolations, hazardous material removal will be performed as part of preparations for demolition. Demolition during Phase 2 will consist

of removing the outer building structure and ancillary facilities from around the REC and vaults to a slab-on-grade configuration. Removal of the 324 Building stack may be sequenced with or after Phase 3. Phase 2 is intended to remove physical interferences necessary for initiation of Phase 3.

Phase 3 consists of removal of the REC and HLV and LLV structures. Portions of the facility will undergo monolithic removal, which will entail cutting the hot cells/vaults into large waste forms for removal as single-piece objects. The cuts through the hot cells will limit disturbance of highly contaminated areas to include waste generated from through-cell retrieval of 300-296 soils. All packages will meet the ERDF WAC. Closure performance standards and closure that includes removal of the REC, HLV, LLV, associated piping, and 0.5 m (1.6 ft) of soil will be achieved at the completion of Phase 3. At the completion of Phase 3, only non-DWMU portions of the 324 Building foundation and residual soil contamination may remain. Removal of the 324 Building as part of Phase 4 may be sequenced with or after Phase 3.

Phase 4 consists of completing demolition of the remaining 324 Building foundation per the Removal Action Work Plan (DOE/RL-2004-77) and excavation of residual contaminated soils associated with the 300-296 waste site. Completion of remediation of the 300-296 waste site will achieve 300-FF-2 operable unit CERCLA remedial action goals and remedial action objectives that include closure verification sampling in accordance with the remedial design report/remedial action work plan (RDR/RAWP) (DOE/RL-2001-47) and 300-FF-2 operable unit Sampling and Analysis Plan (DOE/RL-2001-48). Following demonstration that cleanup levels have been achieved, the remaining excavation from demolition and remediation will be backfilled to grade and revegetated.

H1.9.1 Training Requirements

The Permittees have instituted training or qualification programs to meet training requirements imposed by regulations, DOE orders, and national standards. For example, the environmental, safety, and health training program provides workers with the knowledge and skills necessary to execute assigned duties in accordance with the regulations. WA7890008967, *Hanford Facility Resource Conservation and Recovery Act Permit* (hereinafter called the Hanford Facility RCRA Permit), Attachment 5, "Hanford Facility Personnel Training Program," describes specific requirements for the Hanford Facility personnel. The Permittees will comply with the training matrix shown in Table H-1, which provides training requirements for Hanford Facility personnel associated with the 324 Building.

Project-specific training addressed explicitly to the project and the day's activity will include the following:

- Training will provide the knowledge and skills needed for personnel to perform work in accordance with quality assurance (QA) requirements.
- Personnel are required to be qualified in the type of work being performed in the field.

Table H-1. Training Matrix for 324 Building DWMUs

Training Category Course Description[a]	Frequency of Training	Training Type[b]	Job Title/Position				
			Non-Personnel or Visitor	Operation Supervisor	Waste Service Provider	NCO	ECO
Facility Health and Safety	Annual	GHFT, CPT	X[c]	X	X[c]	X	X

a. See the 324 Facility DWTP for a complete description of coursework in each training category.
b. Training types defined in the WA7890008967, *Hanford Facility Resource Conservation and Recovery Act Permit,* Attachment 5, "Hanford Facility Personnel Training Program."
c. This training is required only if workers are unescorted in the facility.

CPT = Contingency Plan Training
DWTP = Dangerous Waste Training Plan
ECO = Environmental Compliance Officer
GHFT = General Hanford Facility Training
NCO = Nuclear Chemical Operator
OT = Operations Training

H1.9.2 Removal of Wastes and Waste Residues

The DWMUs in the 324 Building are assumed to contain mixed low-level waste. Dangerous waste or waste residues are attached to surplus equipment and to walls and liners in the hot cells. The DWMUs will be maintained in accordance with the Removal Action Work Plan (DOE/RL-2004-77) in a manner that demonstrates that all steps have been taken and will continue to be taken to prevent threats to human health and the environment from the unclosed DWMUs. Due to the complexity and significant radiological contamination associated with the 324 Building DWMUs, entry to the hot cells and vaults. S&M activities may be performed in concert with deactivation and decommissioning of the 324 Building.

The objectives of the S&M are to ensure adequate containment of any contaminants left in place (both dangerous wastes and radiological), to provide physical safety and security controls, and maintain the building in a manner that will present no significant risk to human health or the environment until final disposition is complete. This approach is consistent with the requirements in the Removal Action Work Plan (DOE/RL-2004-77). S&M activities include the following activities of Section 2.0 of the Removal Action Work Plan (DOE/RL-2004-77):

- **Facility Maintenance** - Preventive maintenance activities for any remaining active systems will be performed.
- **Facility Surveillance** - Routine walkdowns will be performed to look at general condition and the status of any remaining active systems (e.g., lighting, emergency power).
- **Safeguards and Security** - The 324 Building will have limited access as described in the Removal Action Work Plan (DOE/RL-2004-77).

H1.9.3 Inspection of Units before Decontamination

To prevent threats to human health and the environment during the closure period, the 324 Building DWMUs will be inspected in accordance with WAC 173-303-320(2), "General Inspection." Inspections of the 324 Building DWMUs will be performed annually, until the closure certification is approved by Ecology, and will verify the following:

- Posted warning signs at each entrance to the 324 Building are present, legible, and visible at 7.6 m (25 ft).
- No evidence of unusual conditions exists at the closing DWMUs.

H1.9.4 Decontamination

All decontamination activities will be conducted during waste removal activities in accordance with the *Remedial Design Report/Remedial Action Work Plan for 300-FF-2 Soils (DOE/RL-2014-13-ADD 1).*

H1.9.5 Identifying and Managing Contaminated Environmental Media

Closure of the six 324 Building DWMUs will be the removal of the REC, HLV, and LLV structures and associated piping potentially contaminated with mixed waste. Soil remediation will be addressed through the 300 CERCLA soil remediation activities.

All the disposed mixed waste must meet the Land Disposal Restrictions (LDR) treatment standards according to WAC 173-303-140, "Land Disposal Restrictions," incorporating 40 CFR 268, "Land Disposal Restrictions." Surplus equipment waste may be treated as debris using Alternative Treatment Standards specified in 40 CFR 268.45 Table 1, "Alternative Treatment Standards for Hazardous Debris" (incorporated by WAC 173-303-140(2)(a)). This applies to all equipment disposed and grouted in the B-Cell and D-Cell as well as the vault tanks and pipes. Liners and walls in the hot cells that are assumed to have mixed waste on the surfaces (such as the B-Cell walls) will be treated through the application of a surface coating. This is an Alternative Treatment Standard as specified in 40 CFR 268.45 Table 1 (incorporated by WAC 173-303-140(2)(a)). All waste management activities will be completed per the Removal Action Work Plan (DOE/RL-2004-77).

H1.9.6 Role of the Independent Qualified Registered Professional Engineer

An independent, qualified, registered professional engineer (IQRPE) will be retained to provide certification of the closure, as required by WAC 173-303-610(6). The IQRPE will be responsible for observing field activities and reviewing documents associated with closure of the 324 Building DWMUs. At a minimum, the following field activities would be completed:

- Review of documentation of the grouted DMWUs
- Visual verification of the DWMUs removal
- Observe and/or review waste disposal documentation
- Verification that closure activities were performed in accordance with this closure plan.

The IQRPE will record his or her observations and reviews in a written report that will be retained in the operating record. The resulting report will be used to develop the closure certification, which will then be provided to Ecology.

H1.9.7 Certification of Closure

As noted in the proceeding section, RCRA closure will be achieved at the end of Phase 3. In accordance with WAC 173-303-610(6), within 60 days of completing closure activities for the 324 Building DWMUs, certification that closure activities have been completed in accordance with the approved closure plan will be submitted to Ecology by registered mail or other means that establish proof of receipt (including applicable electronic means). The certification will be signed by the owner or operator and signed and stamped by an IQRPE. Supporting information may be submitted upon request by Ecology.

H1.9.8 Conditions That Will Be Achieved When Closure Is Complete

Upon confirmation of RCRA closure of the 324 Building DWMUs, the remaining remediation work will be completed under the *Final Record of Decision for 300-FF-2 and 300-FF-5 and Record of Decision Amendment for 300-FF-1* Section 12.5.

H1.10 Closure Schedule and Duration

As shown in the following text and in Table H-2, the total duration of the four phases of the 324 Building closure project will encompass seven years once planning activities are completed. Durations for each phase as follows:

Phase 1 – through-cell retrieval = ~22 months

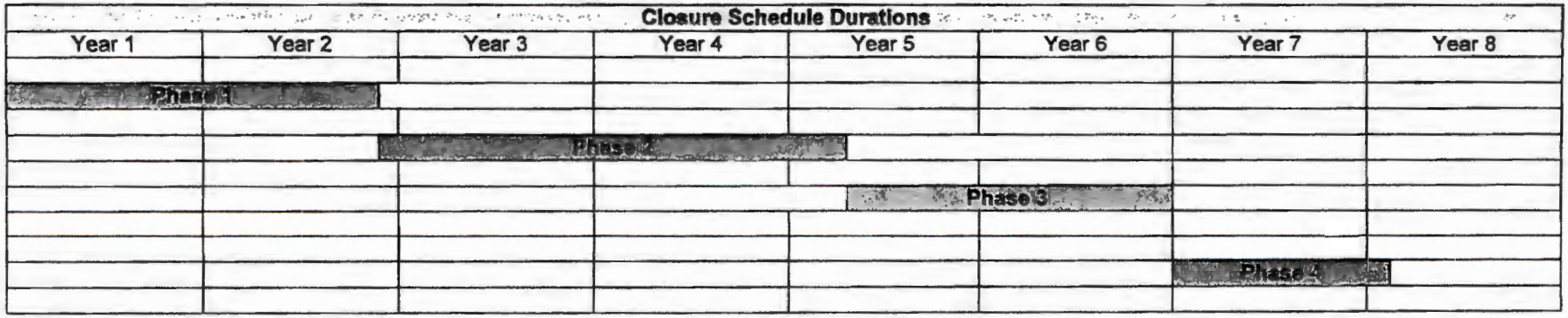
- Removal of grout and debris from B-Cell = ~1.75 months
- Readiness = ~1.5 months
- B-Cell floor removal = ~1.5 months
- B-Cell primary zone soil removal = ~12 months
- B-Cell secondary zone soil removal = ~5 months
- Backfill waste site = ~0.25 months

Phase 2 – deactivation and demolition = ~30 months
Phase 3 – cell and vault removal = ~19 months
Phase 4 – final remediation and backfill of 300-296 = ~15 months

H1.11 Closure Costs

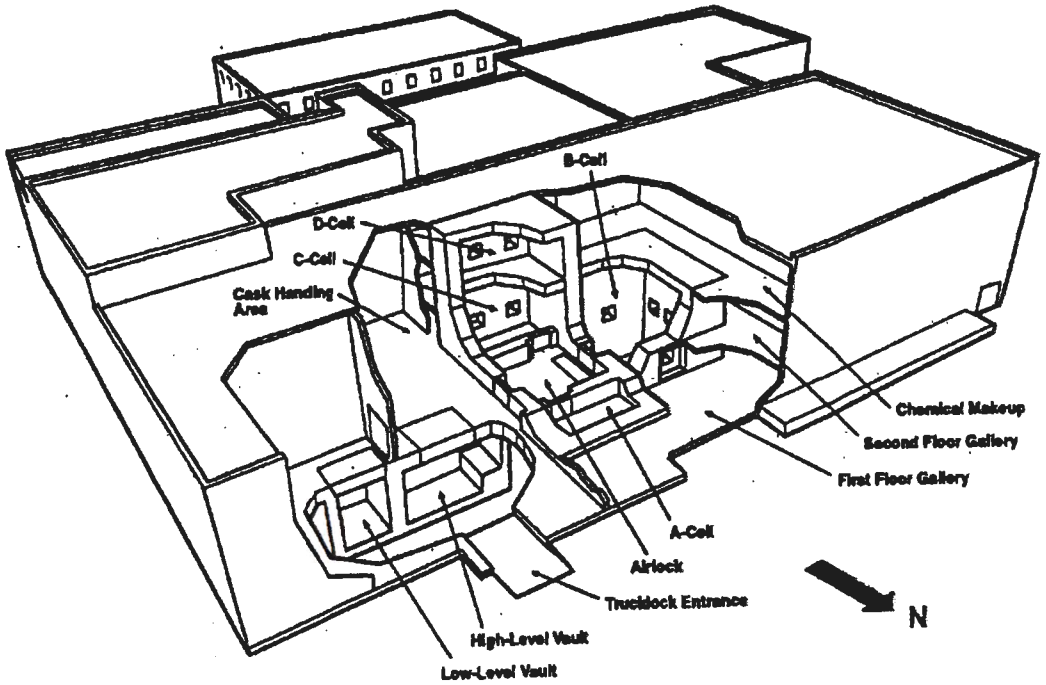
A detailed written estimate outlining updated projections of anticipated closure costs for the Hanford Facility TSD units is not required per Permit Condition II.H.

Table H-2. Closure Activity Schedule



Note: Closure of the DMWUs will be achieved at the end of Phase 3.

1



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3 **Figure H-1. Cut-Away of the 324 Building showing the High-Level Vault, Low-Level Vault, and the**
4 **Radiochemical Engineering Cells**

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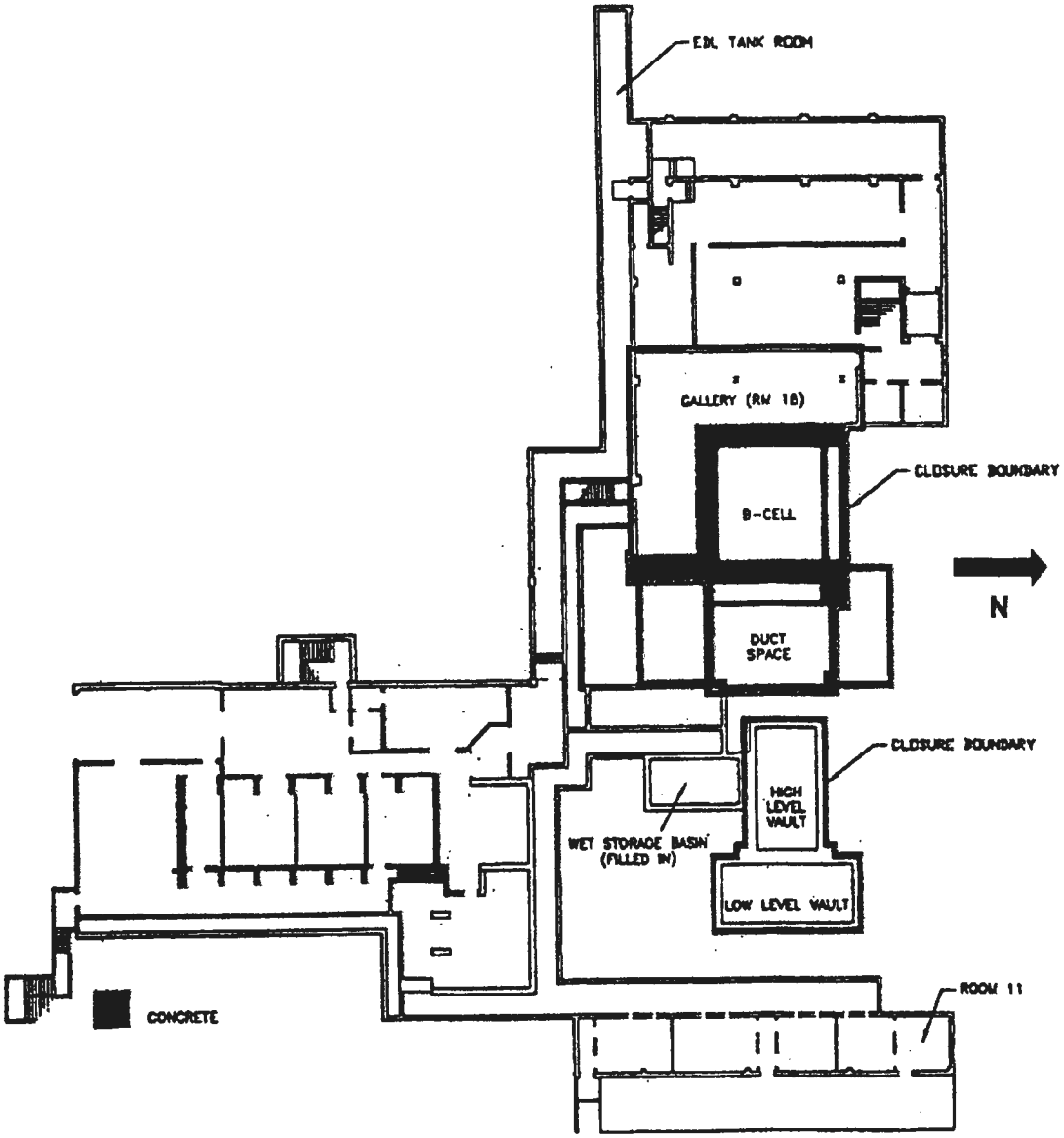

Figure H-2. 324 Building Basement Plan

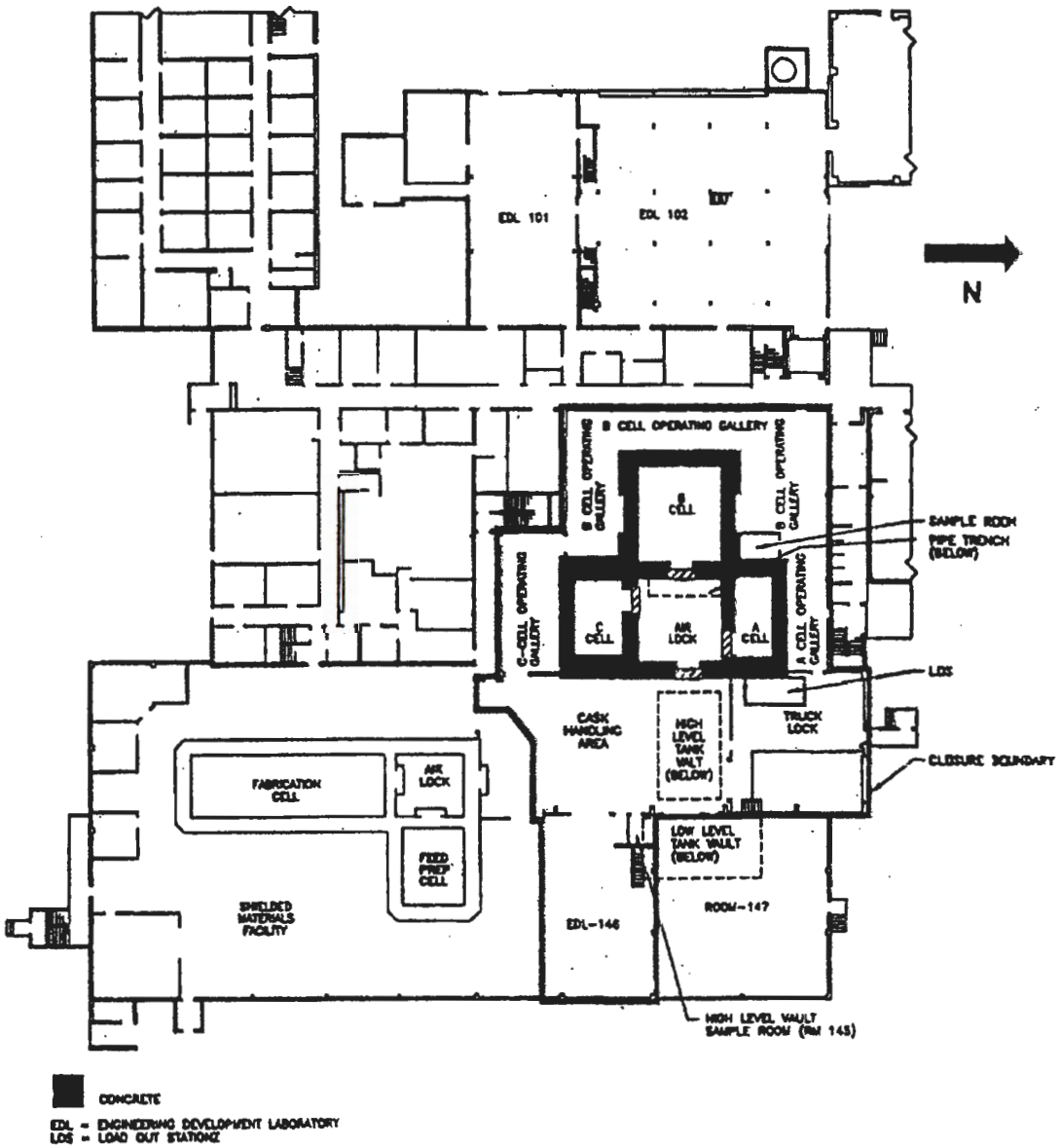

Figure H-3. 324 Building First Floor Plan

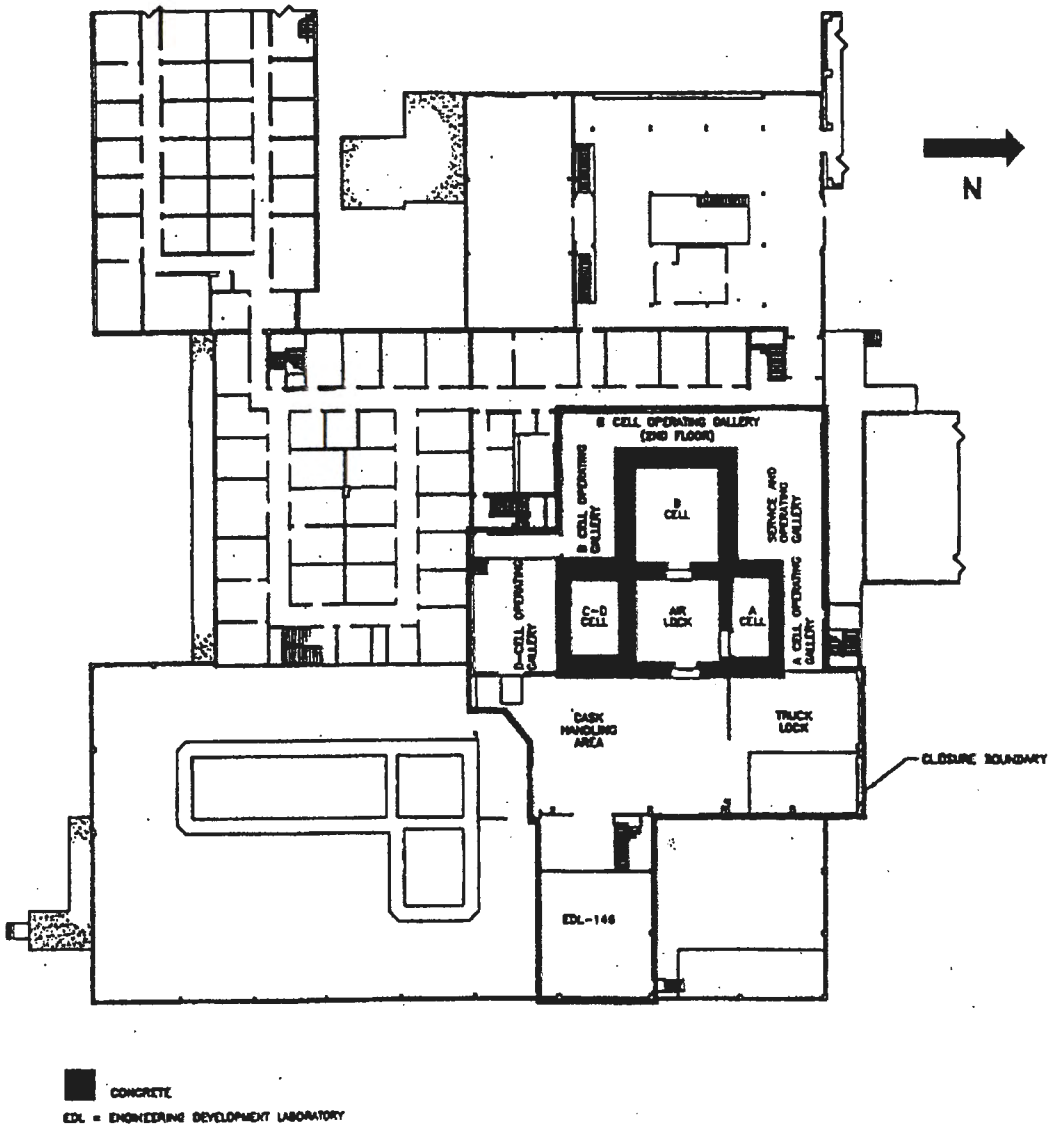

Figure H-4. 324 Building Second Floor Plan

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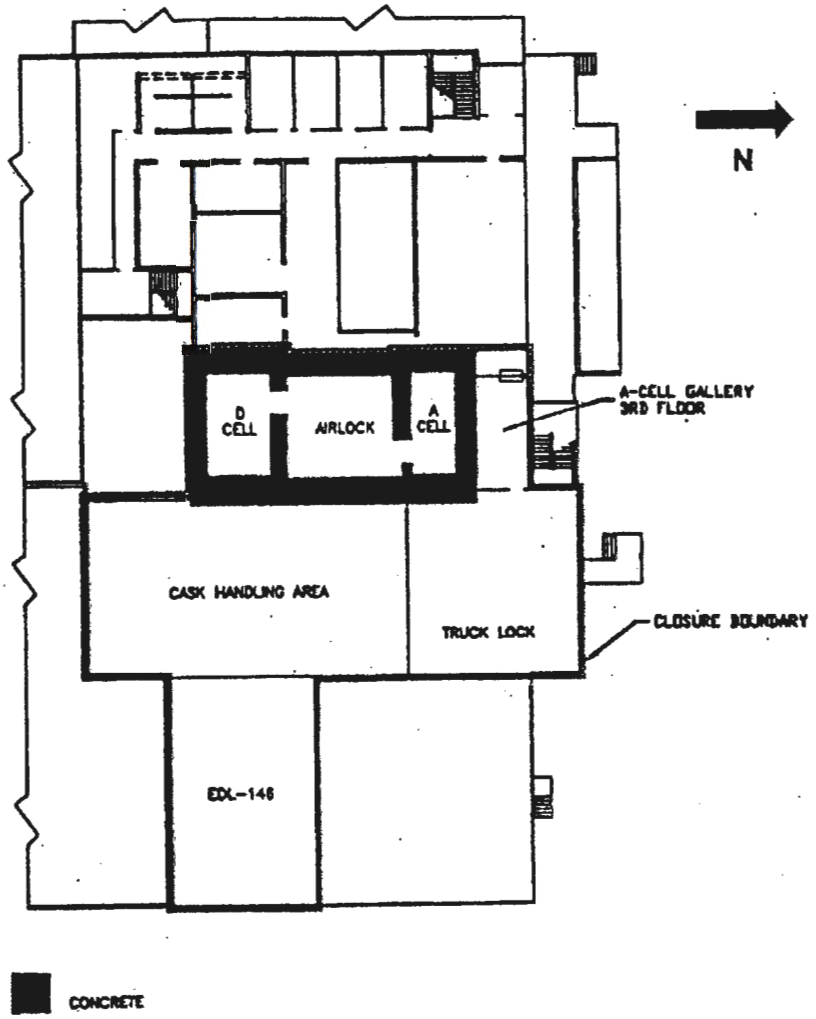

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3 **Figure H-5. 324 Building Third Floor Plan**

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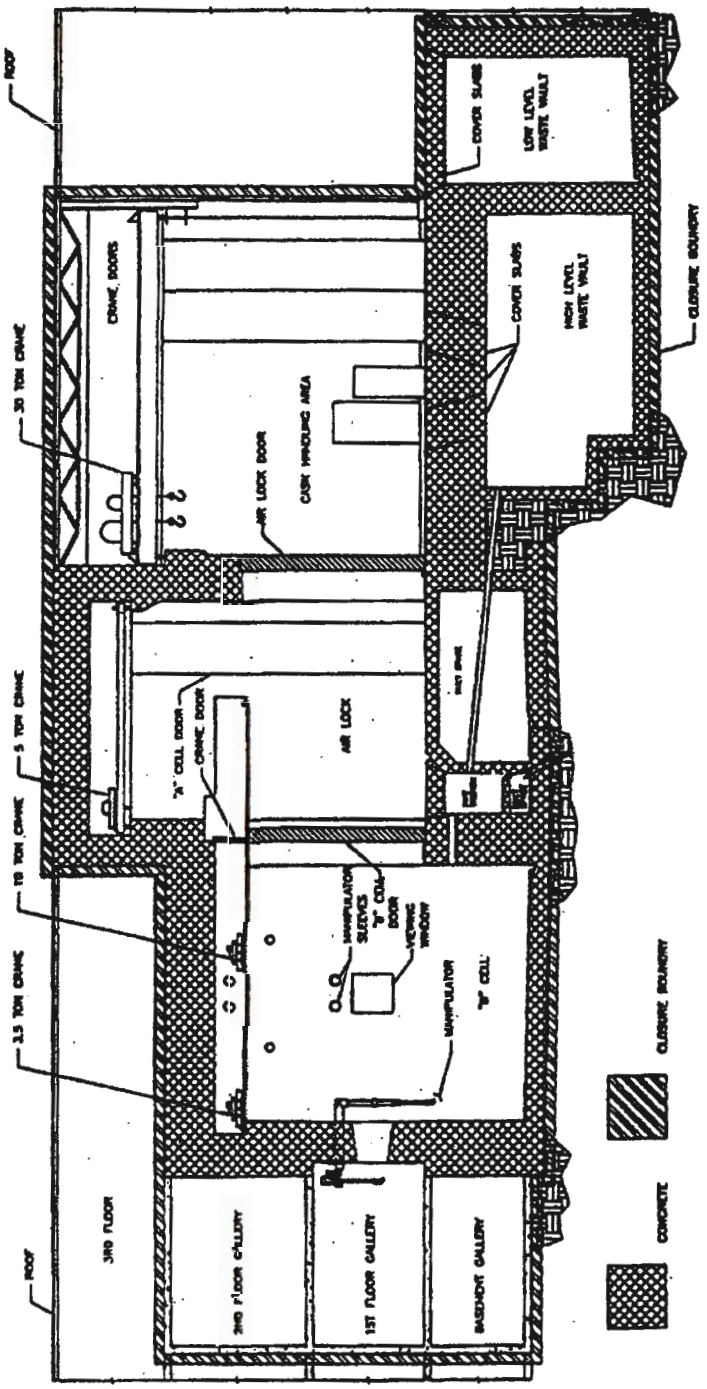

Figure H-6. 324 Building Cross-Section through the High-Level Vault, Low-Level Vault, Airlock, and B-Cell Section View (Looking North)

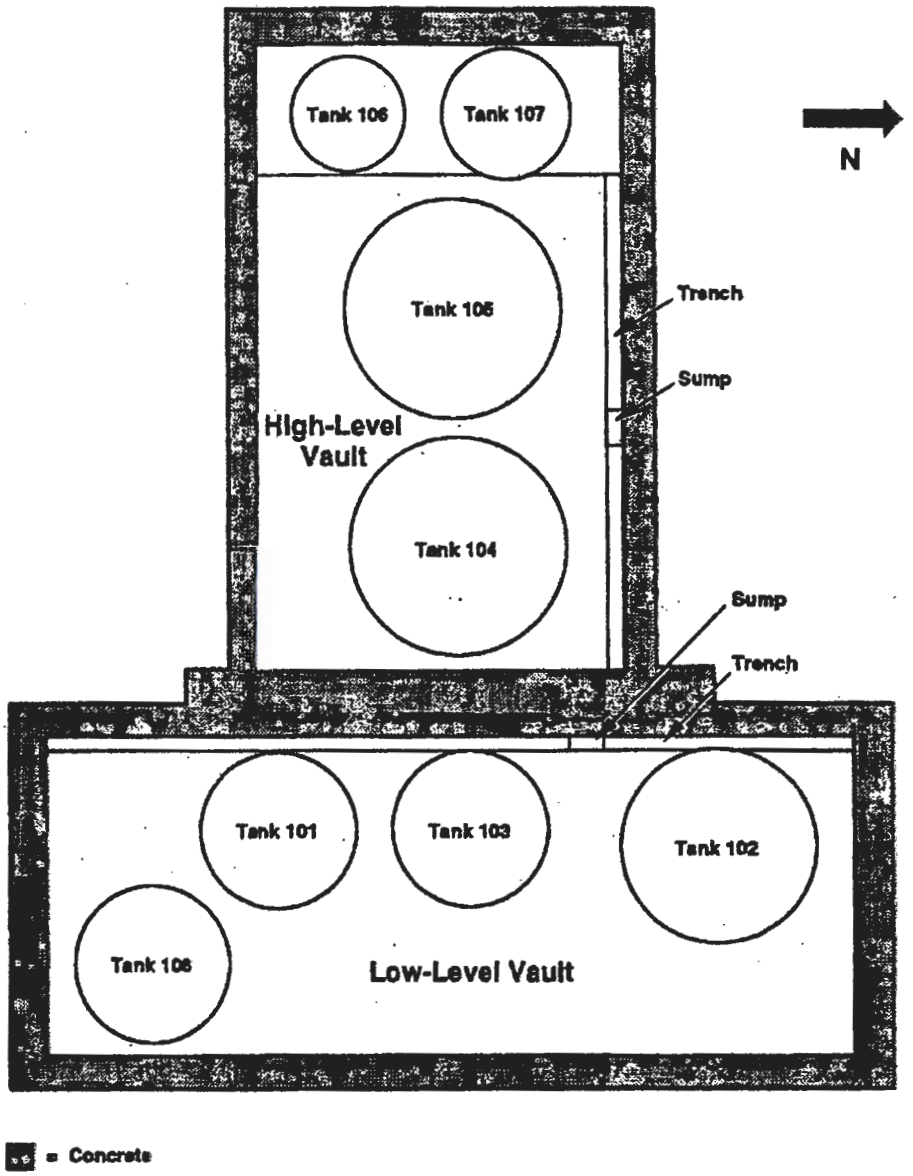

Figure H-7. 324 Building High-Level Vault, Low-Level Vault, and Vault Tanks Plan View

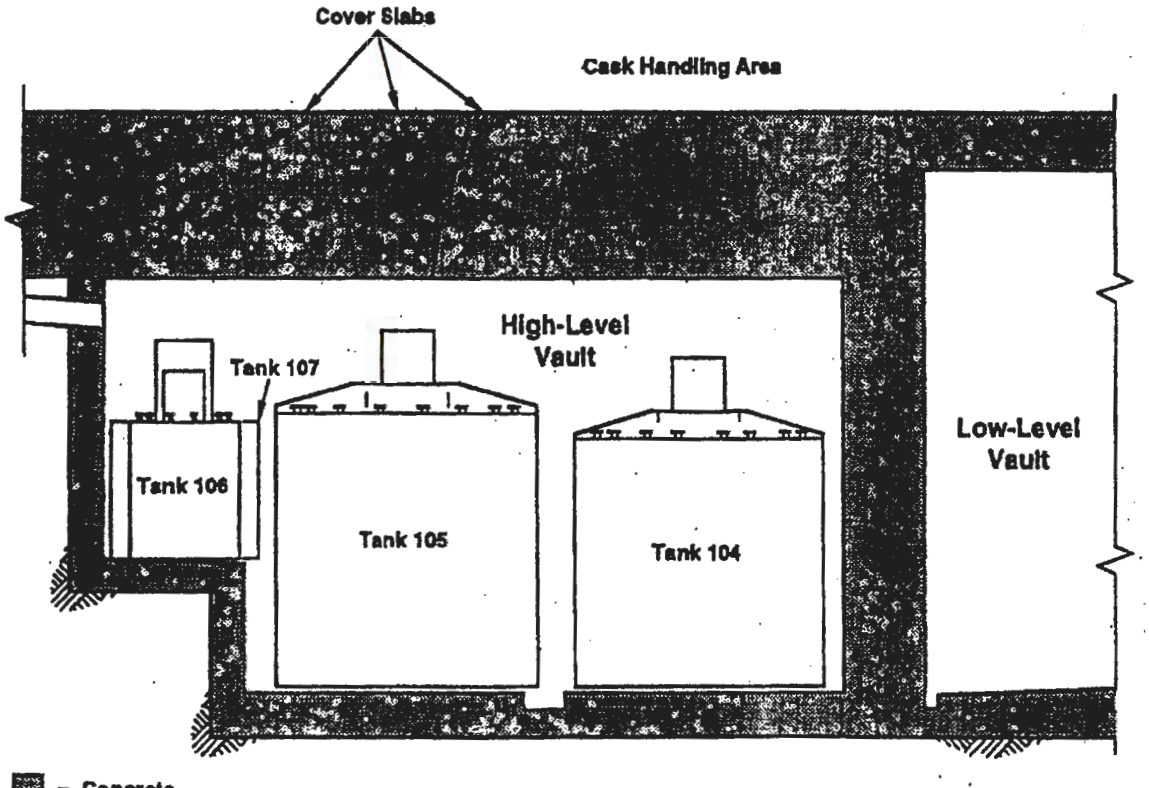

Figure H-8. 324 Building High-Level Vault Cross-Section (Looking North)

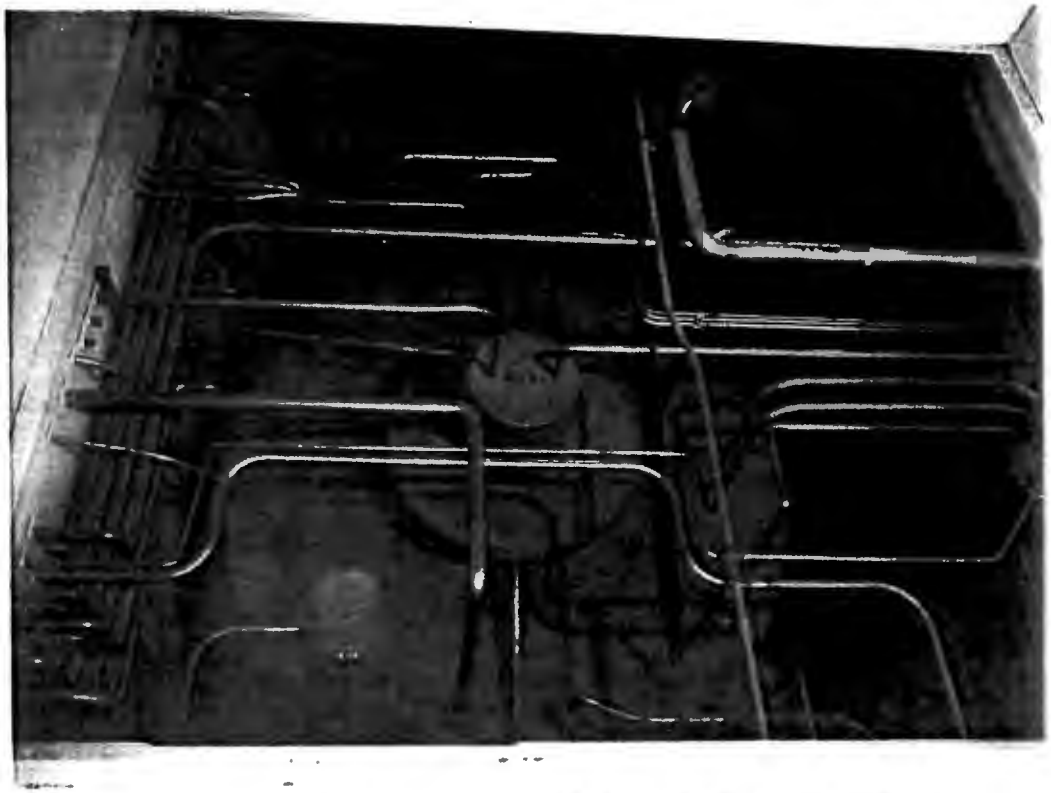

Figure H-9. 324 Building High-Level Vault Construction Photograph

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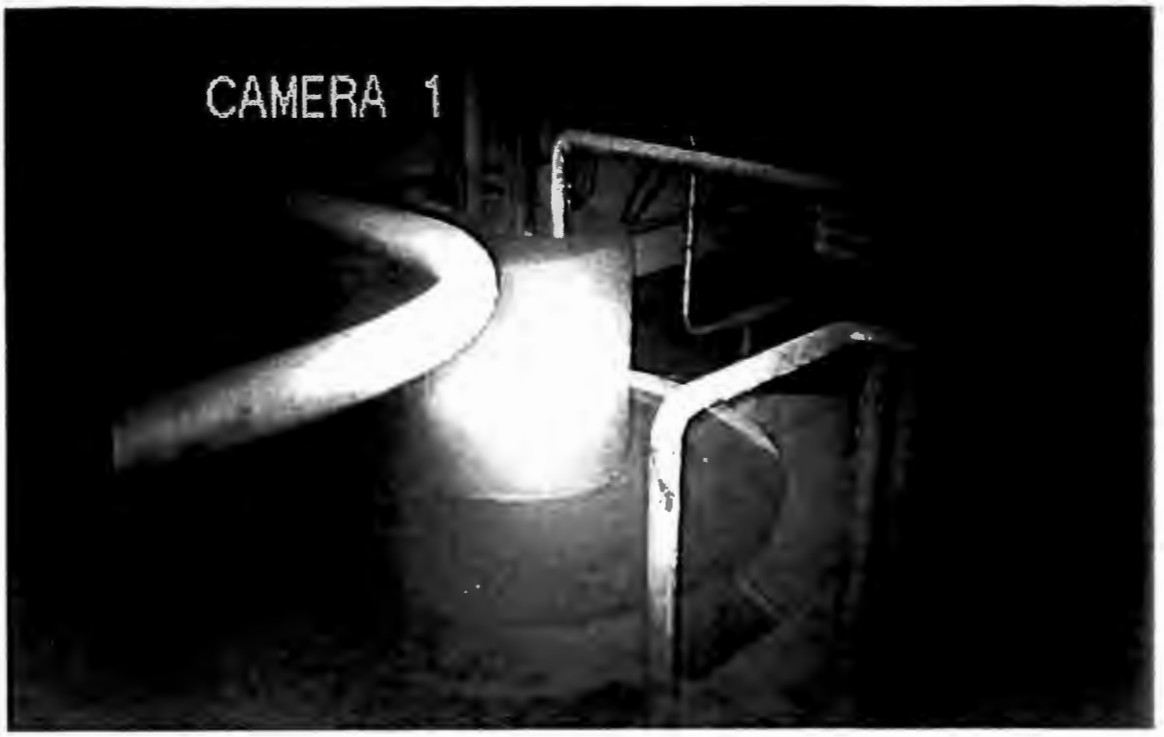

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3 **Figure H-10. Tank 105 Post Grout Photograph**

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5

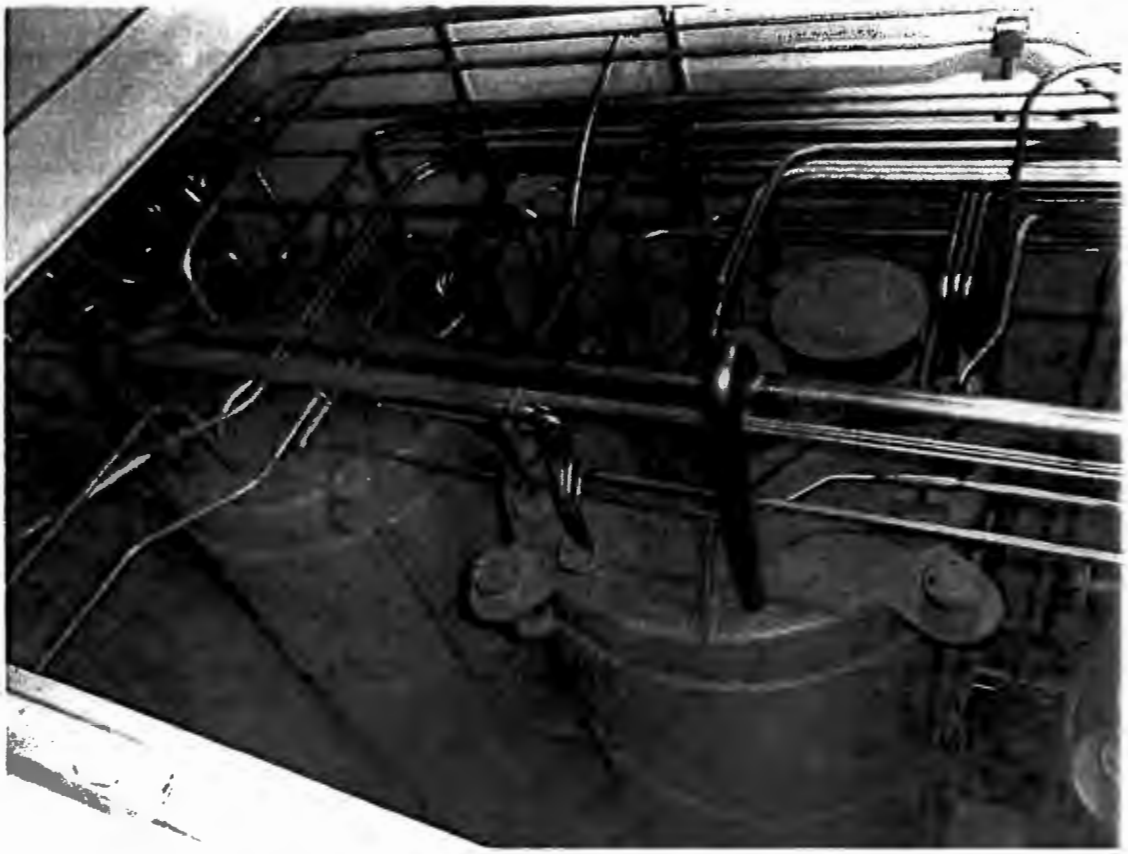

Figure H-11. 324 Building Low-Level Vault Construction Photograph

1

2
3 **Figure H-12. 324 Building Airlock Shield Door Opening Photograph**

4

1

2

3 **Figure H-13. 324 Building B-Cell Floor Prior to Placing Grout Photograph (Note the failed sump in the upper**
4 **right hand corner)**

5

Figure H-14. 324 Building B-Cell Floor After Placing Grout Photograph

H2 References

324 Building Radiochemical Engineering Cells, High-Level Vault, Low-Level Vault, and Associated Areas Closure Plan, DOE/RL-96-73, Revision 3

324 Building Radiochemical Engineering Cells, High-Level Vault, Low-Level Vault, and Associated Areas Closure Plan, DOE/RL-96-73, Revision 1

40 CFR 268, "Land Disposal Restrictions."

40 CFR 268.45 Table 1, "Alternative Treatment Standards for Hazardous Debris"

Comprehensive Environmental Response, Compensation, and Liability Act of 1980 (CERCLA

Final Record of Decision for 300-FF-2 and 300-FF-5 and Record of Decision Amendment for 300-FF-1

National Priorities List Agreement/Change Control Form NPL-141

DOE/RL-2001-47, *Record of Decision for 300-FF-2 and 300-FF-5 and Record of Decision Amendment for 300-FF-1 Remedial Design Report/Remedial Action Work Plan for 300-FF-2 Soils*

DOE/RL-2014-13-ADD 1, Remedial Design Report/Remedial Action Work Plan for 300-FF-2 Soils

DOE/RL-2004-77, *Removal Action Work Plan for 300 Area Facilities*

Resource Conservation and Recovery Act of 1976

Tri-Party Agreement

WA7890008967, *Hanford Facility Resource Conservation and Recovery Act Permit*

WAC 173-303-070, "Designation of Dangerous Waste

WAC 173-303-140, "Land Disposal Restrictions

WAC 173-303-320(2), "General Inspection."

WAC 173-303-610(6),

WAC 173-303-610(2), "Closure and Post-Closure