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DOE/RL-89-03
Revision 2

Copy No. _____

616 Nonradioactive Dangerous Waste Storage Facility Dangerous Waste Permit Application

9413294.0506

ATTACHMENT 8 TO THE DANGEROUS WASTE PORTION OF THE RESOURCE CONSERVATION AND RECOVERY ACT PERMIT FOR THE TREATMENT, STORAGE AND DISPOSAL OF DANGEROUS WASTE
(Second Draft)

United States
Department of Energy
Richland, Washington

Approved for Public Release

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THE 616 NONRADIOACTIVE DANGEROUS WASTE STORAGE FACILITY DANGEROUS WASTE PERMIT APPLICATION

FOREWORD

The Hanford Site is owned by the U.S. Government and operated by the U.S. Department of Energy Field Office, Richland. The Hanford Site manages and produces dangerous waste and mixed waste (containing both radioactive and dangerous components). The dangerous waste is regulated in accordance with the *Resource Conservation and Recovery Act* (RCRA) *of 1976* and the *State of Washington Hazardous Waste Management Act of 1976* [as administered through the Washington State Department of Ecology (Ecology) *Dangerous Waste Regulations*, Washington Administrative Code (WAC) 173-303]. The radioactive component of mixed waste is interpreted by the U.S. Department of Energy to be regulated under the *Atomic Energy Act of 1954*; the nonradioactive dangerous component of mixed waste is interpreted to be regulated under the RCRA and WAC 173-303.

For purposes of the *Resource Conservation and Recovery Act* and the Washington State Department of Ecology *Dangerous Waste Regulations*, the Hanford Site is considered to be a single facility. The single dangerous waste permit identification number issued to the Hanford Site by the U.S. Environmental Protection Agency and the Washington State Department of Ecology is U.S. Environmental Protection Agency/State Identification Number WA7890008967. This identification number encompasses over 60 treatment, storage, and/or disposal units within the Hanford Site, hereinafter referred to as the Hanford Facility when cited in the context of the *Resource Conservation and Recovery Act* and the Washington State Department of Ecology *Dangerous Waste Regulations*. All waste management activities carried out under the assigned identification number are considered to be 'onsite.'

Westinghouse Hanford Company is a major contractor to the U.S. Department of Energy Field Office, Richland and serves as co-operator of the 616 Nonradioactive Dangerous Waste Storage Facility, the storage unit addressed in this permit application.

Westinghouse Hanford Company is identified in the permit application as a "co-operator" and signs in that capacity. Any identification of Westinghouse Hanford Company as an 'operator' elsewhere in this application (e.g., in the building emergency plan) is not meant to conflict with Westinghouse Hanford Company's designation as a co-operator but rather is based on Westinghouse Hanford Company's contractual status (i.e., as an operations and engineering contractor) for the U.S. Department of Energy.

The *616 Nonradioactive Dangerous Waste Storage Facility Dangerous Waste Permit Application* consists of both a Part A and a Part B permit application. An explanation of the Part A revisions associated with this storage unit, including the Part A included with this document, is provided at the beginning of the Part A Section.

The Part B consists of 15 chapters addressing the organization and content of the Part B Checklist prepared by the Washington State Department of Ecology (Ecology 1987). For ease of reference, the checklist section numbers, in brackets, follow chapter headings and subheadings.

The *616 Nonradioactive Dangerous Waste Storage Facility Dangerous Waste Permit Application* (Revision 0) was submitted to the Washington State Department of Ecology and the U.S. Environmental Protection Agency on July 31, 1989. Revision 1, addressing Washington State Department of Ecology review comments made on Revision 0 dated November 21, 1989, and March 23, 1990, was submitted on June 22, 1990. This submittal, Revision 2, addresses Washington State Department of Ecology review comments made on Revision 1, dated June 22, 1990, August 30, 1990, December 18, 1990, and July 8, 1991.

The information provided in Revisions 0, 1, and 2 supersedes information included in the *RCRA Part B Permit Application - Nonradioactive Dangerous Waste Landfill and Storage Facility* submitted to the Washington State Department of Ecology on November 8, 1985 (DOE-RL 1985).

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ACRONYMS

ASTM	American Society for Testing Materials
CFR	Code of Federal Regulations
DOE	U.S. Department of Energy
DOE-RL	U.S. Department of Energy Field Office, Richland
Ecology	Washington State Department of Ecology
EPA	U.S. Environmental Protection Agency
HVAC	heating, ventilation, and air conditioning
~~616 NRDWSF~~	~~616 Nonradioactive Dangerous Waste Storage Facility~~
PVC	polyvinyl chloride
RCRA	*Resource Conservation and Recovery Act of 1976*
TCLP	toxicity characteristics leaching procedure
TSD	treatment, storage, and/or disposal
WAC	Washington Administrative Code

ABBREVIATIONS

°C	degrees Celsius
dia.	diameter
°F	degrees Fahrenheit
ft	feet
gal	gallon
in.	inches
≤	less than or equal to
kPa	kilopascal
M	Molar
max.	maximum
min.	minimum

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PART A

The Part A, Form 1, included in this permit application was submitted to the Washington State Department of Ecology on May 19, 1988. The Part A, Form 1, consists of three pages.

The original Part A, Form 3 (Revision 0), was submitted with the original Part B in November of 1985 (DOE-RL 1985). Revision 0 included the additional dangerous waste units addressed in the original Part B (the Nonradioactive Dangerous Waste Landfill, the 2727-S Storage Facility, the proposed 616 Nonradioactive Dangerous Waste Storage Facility, and three demolition sites). Revision 1 of the Part A, Form 3, provided individual Part A, Form 3's, for each of the storage units addressed in the original Part B (DOE-RL 1985). Revision 2 of the Part A, Form 3, was prepared to include Westinghouse Hanford Company as co-operator of the 616 Nonradioactive Dangerous Waste Storage Facility with the U.S. Department of Energy Field Office, Richland. Revision 3 of the Part A, Form 3, was prepared to ensure agreement between waste types and annual waste quantities as identified in the Part A, Form 3 (Revision 2), and the Hanford Site Annual Dangerous Waste Report submitted in March 1990 to the Washington State Department of Ecology.

The Part A, Form 3 (Revision 4), included in this permit application, was prepared to ensure agreement between annual waste quantities as identified in the Part A, Form 3 (Revision 3), and the Hanford Site Annual Dangerous Waste Report submitted in March 1990 to the Washington State Department of Ecology. The 26 new waste codes identified for toxicity characteristics leaching procedure testing (55 FR 61) were added. The design storage capacity of the 616 Nonradioactive Dangerous Waste Storage Facility was changed from 26,500 gallons (100,313 liters) to 28,635 gallons (108,395 liters) to reflect a new storage configuration. The Part A included in this permit application consists of 21 pages of Form 3, 2 figures, and 1 photograph.

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FORM 1

State of Washington Department of Ecology

WASHINGTON STATE

DANGEROUS WASTE PERMIT GENERAL INFORMATION

(Read "Form 1 Instructions" before starting)

I. EPA/STATE I.D. NUMBER

WA7090008967

II. NAME OF FACILITY

U.S. DEPARTMENT OF ENERGY-HANFORD SITE

III. FACILITY CONTACT

A. NAME & TITLE (Last, First, & Title)	B. PHONE (area code & no.)
LAWRENCE, MICHAEL J., MANAGER	509 376 7395

IV. FACILITY MAILING ADDRESS

A. STREET OR P.O. BOX

P.O. BOX 550

B. CITY OR TOWN	C. STATE	D. ZIP CODE
RICHLAND	WA	99352

V. FACILITY LOCATION

A. STREET, ROUTE NO. OR OTHER SPECIFIC IDENTIFIER

HANFORD SITE

B. COUNTY NAME

BENTON

C. CITY OR TOWN	D. STATE	E. ZIP CODE	F. COUNTY CODE (if known)
RICHLAND	WA	99352	005

IV. SIC CODES (4-digit, in order of priority)

A. FIRST	B. SECOND
9711 (specify) NATIONAL SECURITY	8922 (specify) NUCLEAR NONCOMMERCIAL DEVELOPMENT AND EDUCATION
C. THIRD	**D. FOURTH**
9611 (specify) ADMINISTRATION AND GENERAL ECONOMICS PROGRAM	4911 (specify) STEAM-ELECTRIC GENERATION

VII. OPERATOR INFORMATION

A. NAME (DOE-RL)

DEPARTMENT OF ENERGY-RICHLAND OPERATIONS

WESTINGHOUSE HANFORD COMPANY (WHC)

B. Is the same listed in item VII-A also the owner? ☒ YES ☐ NO **

C. STATUS OF OPERATOR (Enter the appropriate letter into the answer box; if "Other", specify.)

F = FEDERAL
S = STATE
P = PRIVATE
M = PUBLIC (other than federal or state)
O = OTHER (specify)

F (specify)

D. PHONE (area code & no.) 509 376 7395

509 376 7803

E. STREET OR P.O. BOX

PO BOX 550/PO BOX 1970

F. CITY OR TOWN	G. STATE	H. ZIP CODE
RICHLAND	WA	99352

VIII. INDIAN LAND

Is the facility located on Indian lands? ☐ YES ☒ NO

**DOE-RL: OWNER/CO-OPERATOR; WHC: CO-OPERATOR FOR CERTAIN UNITS ON THE HANFORD SITE.

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IX. MAP

Attach to this application a topographic map of the area extending to at least one 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 hazardous waste treatment, storage, or disposal facilities, and each well where it injects fluids underground. Include all springs, rivers and other surface water bodies in the map area. See instructions for precise requirements.

X. NATURE OF BUSINESS (provide a brief description)

- o NATIONAL DEFENSE NUCLEAR MATERIAL PRODUCTION
- o ENERGY RESEARCH AND TECHNOLOGY DEVELOPMENT
- o DEFENSE NUCLEAR WASTE MANAGEMENT
- o BYPRODUCT STEAM, SOLD FOR ELECTRIC POWER GENERATION

AND SIC 15: BUILDING CONSTRUCTION - GENERAL CONTRACTORS AND OPERATIVE BUILDERS

XI. CERTIFICATION (see instructions)

I certify under penalty of law that I have personally examined and am familiar with the information submitted in this application and all attachments and that, based on my inquiry of those persons immediately responsible for obtaining the information contained in the application, I believe that the information is true, accurate and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment.

A. NAME & OFFICIAL TITLE (Type or print)	B. SIGNATURE	C. DATE SIGNED
SEE ATTACHMENT		

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WA7890008967

FORM 1

DANGEROUS WASTE PERMIT GENERAL INFORMATION

XI. CERTIFICATION

I certify under penalty of law that I have personally examined and am familiar with the information submitted in this application and all attachments, and that based on my inquiry of those individuals immediately responsible for obtaining the information, I believe that the submitted information is true, accurate, and complete. I am aware that there are significant penalties for submitting false information including the possibility of fine and imprisonment.

Michael J. Lawrence — 5-19-88
Date

Michael J. Lawrence
Manager, Richland Operations
United States Department of Energy

W. M. Jacobi — 5/13/88
Date

William M. Jacobi
President
Westinghouse Hanford Company
Co-operator

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Please print or type in the unshaded areas only

(Fill-in areas are spaced for elite type, i.e., 12 characters/inch)

FORM 3

DANGEROUS WASTE PERMIT APPLICATION

I. EPA/STATE I.D. NUMBER: W A 7 8 9 0 0 0 8 9 6 7

FOR OFFICIAL USE ONLY

APPLICATION APPROVED	DATE RECEIVED (mo. day. yr.)	COMMENTS

II. FIRST OR REVISED APPLICATION

Place an "X" in the appropriate box in A or B below (mark one box only) to indicate whether this is the first application you are submitting for your facility or a revised application. If this is your first application and you already know your facility's EPA/STATE I.D. Number, or if this is a revised application, enter your facility's EPA/STATE I.D. Number in Section I above.

A. FIRST APPLICATION (place an "X" below and provide the appropriate date)

☐ 1. EXISTING FACILITY (See instructions for definition of "existing" facility. Complete item below.)

FOR EXISTING FACILITIES, PROVIDE THE DATE (mo., day, & yr.) OPERATION BEGAN OR THE DATE CONSTRUCTION COMMENCED (use the boxes to the left)

MO.	DAY	YR.
09		86

☐ 2. NEW FACILITY (Complete item below.)

FOR NEW FACILITIES, PROVIDE THE DATE (mo., day, & yr.) OPERATION BEGAN OR IS EXPECTED TO BEGIN

MO.	DAY	YR.

B. REVISED APPLICATION (place an "X" below and complete Section I above)

☒ 1. FACILITY HAS AN INTERIM STATUS PERMIT

☐ 2. FACILITY HAS A FINAL PERMIT

III. PROCESSES — CODES AND DESIGN CAPACITIES

A. PROCESS CODE — Enter the code from the list of process codes below that best describes each process to be used at the facility. Ten lines are provided for entering codes. If more lines are needed, enter the code(s) in the space provided. If a process will be used that is not included in the list of codes below, then describe the process (including its design capacity) in the space provided on the (Section III-C).

B. PROCESS DESIGN CAPACITY — For each code entered in column A enter the capacity of the process.

1. AMOUNT — Enter the amount
2. UNIT OF MEASURE — For each amount entered in column B(1), enter the code from the list of unit measure codes below that describes the unit of measure used. Only the units of measure that are listed below should be used.

PROCESS	PROCESS CODE	APPROPRIATE UNITS OF MEASURE FOR PROCESS DESIGN CAPACITY
Storage:		
CONTAINER (barrel, drum, etc.)	S01	GALLONS OR LITERS
TANK	S02	GALLONS OR LITERS
WASTE PILE	S03	CUBIC YARDS OR CUBIC METERS
SURFACE IMPOUNDMENT	S04	GALLONS OR LITERS
Disposal:		
INJECTION WELL	D80	GALLONS OR LITERS
LANDFILL	D81	ACRE-FEET (the volume that would cover the area to a depth of one foot) OR HECTARE METER
LAND APPLICATION	D82	ACRES OR HECTARES
OCEAN DISPOSAL	D83	GALLONS PER DAY OR LITERS PER DAY
SURFACE IMPOUNDMENT	D84	GALLONS OR LITERS

PROCESS	PROCESS CODE	APPROPRIATE UNITS OF MEASURE FOR PROCESS DESIGN CAPACITY
Treatment:		
TANK	T01	GALLONS PER DAY OR LITERS PER DAY
SURFACE IMPOUNDMENT	T02	GALLONS PER DAY OR LITERS PER DAY
INCINERATOR	T03	TONS PER HOUR OR METRIC TONS PER HOUR; GALLONS PER HOUR OR LITERS PER HOUR
OTHER (Use for physical, chemical, thermal or biological treatment processes not occurring in tanks, surface impoundments or incinerators. Describe the processes in the space provided; Section III-C.)	T04	GALLONS PER DAY OR LITERS PER DAY

UNIT OF MEASURE	UNIT OF MEASURE CODE	UNIT OF MEASURE	UNIT OF MEASURE CODE	UNIT OF MEASURE	UNIT OF MEASURE CODE
GALLONS	G	LITERS PER DAY	V	ACRE FEET	A
LITERS	L	TONS PER HOUR	D	HECTARE METER	F
CUBIC YARDS	Y	METRIC TONS PER HOUR	W	ACRES	U
CUBIC METERS	C	GALLONS PER HOUR	E	HECTARES	O
GALLONS PER DAY	U	LITERS PER HOUR	H		

EXAMPLE FOR COMPLETING SECTION III (shown in line numbers X-1 and X-2 below): A facility has two storage tanks, one tank can hold 200 gallons and the other can hold 400 gallons. The facility also has an incinerator that can burn up to 20 gallons per hour.

NUMBER	A. PROCESS CODE (from list above)	B. PROCESS DESIGN CAPACITY 1. AMOUNT (specify)	B. PROCESS DESIGN CAPACITY 2. UNIT OF MEASURE (enter code)	FOR OFFICIAL USE ONLY
X-1	S 0 2	600	G	
X-2	T 0 3	20	E	
1	S 0 1	28,635	G	
2				
3				

NUMBER	A. PROCESS CODE (from list above)	B. PROCESS DESIGN CAPACITY 1. AMOUNT (specify)	B. PROCESS DESIGN CAPACITY 2. UNIT OF MEASURE (enter code)	FOR OFFICIAL USE ONLY
5				
6				
7				
8				
9				
10				

Continued from the front

III. PROCESSES (continued)

SPACE FOR ADDITIONAL PROCESS CODES OR FOR DESCRIBING OTHER PROCESS (code "T04") FOR EACH PROCESS ENTERED HERE INCLUDE DESIGN CAPACITY

501
The 616 Nonradioactive Dangerous Waste Storage Facility (616 NRDWSF) is located between the 200 East and 200 West Areas on the Hanford Site. The 616 NRDWSF provides container storage for nonradioactive dangerous waste generated in the research and development laboratories, process operations, construction, waste site cleanup/remediation, environmental monitoring, maintenance, and transportation functions throughout the Hanford Site. Waste is only stored at the 616 NRDWSF until arrangements can be made to ship the waste to a permitted offsite treatment, storage, and/or disposal facility. The 616 NRDWSF is capable of storing up to 28,635 gallons of nonradioactive dangerous waste in U.S. Department of Transportation-approved containers.

IV. DESCRIPTION OF DANGEROUS WASTES

A. DANGEROUS WASTE NUMBER — Enter the four digit number from Chapter 173-303 WAC for each listed dangerous waste you will handle. If you handle dangerous wastes which are not listed in Chapter 173-303 WAC, enter the four digit number(s) that describes the characteristics and/or the toxic contaminants of those dangerous wastes.

B. ESTIMATED ANNUAL QUANTITY — For each listed waste entered in column A estimate the quantity of that waste that will be handled on an annual basis. For each characteristic or toxic contaminant entered in column A estimate the total annual quantity of all the non—listed waste(s) that will be handled which possess that characteristic or contaminant.

C. UNIT OF MEASURE — For each quantity entered in column B enter the unit of measure code. Units of measure which must be used and the appropriate codes are:

ENGLISH UNIT OF MEASURE	CODE	METRIC UNIT OF MEASURE	CODE
POUNDS	P	KILOGRAMS	K
TONS	T	METRIC TONS	M

If facility records use any other unit of measure for quantity, the units of measure must be converted into one of the required units of measure taking into account the appropriate density or specific gravity of the waste.

D. PROCESSES

1. PROCESS CODES

For listed dangerous waste: For each listed dangerous waste entered in column A select the code(s) from the list of process codes contained in Section III to indicate how the waste will be stored, treated, and/or disposed of at the facility.

For non—listed dangerous wastes: For each characteristic or toxic contaminant entered in Column A select the code(s) from the list of process codes contained in Section III to indicate all the processes that will be used to store, treat, and/or dispose of all the non—listed dangerous wastes that possess that characteristic or toxic contaminant.

Note: Four spaces are provided for entering process codes. If more are needed: (1) Enter the first three as described above; (2) Enter "000" in the extreme right box of Item IV-D(1), and (3) Enter in the space provided on page 4 the line number and the additional code(s).

2. PROCESS DESCRIPTION: If a code is not listed for a process that will be used, describe the process in the space provided on the form.

NOTE: DANGEROUS WASTES DESCRIBED BY MORE THAN ONE DANGEROUS WASTE NUMBER — Dangerous wastes that can be described by more than one Waste Number shall be described on the form as follows:

1. Select one of the Dangerous Waste Numbers and enter it in column A. On the same line complete columns B, C, and D by estimating the total annual quantity of the waste and describing all the processes to be used to treat, store, and/or dispose of the waste.
2. In column A of the next line enter the other Dangerous Waste Number that can be used to describe the waste. In column D(2) on that line enter "included with above" and make no other entries on that line.
3. Repeat step 2 for each other Dangerous Waste Number that can be used to describe the dangerous waste.

EXAMPLE FOR COMPLETING SECTION IV (shown in line numbers X-1, X-2, X-3 and X-4 below) — A facility will treat and dispose of an estimated 900 pounds per year of chrome shavings from leather tanning and finishing operations. In addition, the facility will treat and dispose of three non—listed wastes. Two wastes are corrosive only and there will be an estimated 200 pounds per year of each waste. The other waste is corrosive and ignitable and there will be an estimated 100 pounds per year of that waste. Treatment will be in an incinerator and disposal will be in a landfill.

LINE NO.	A. DANGEROUS WASTE NO. (enter, next)	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 — D(1))
X-1	K 0 5 1	900	P	T 0 3 D 8 0	
X-2	D 0 0 2	200	P	T 0 3 D 8 0	
X-3	D 0 0 1	100	P	T 0 3 D 8 0	
X-4	D 0 0 2			T 0 3 D 8 0	included with above

Continued from page 2

NOTE: Photocopy this page before completing if you have more than 26 wastes to list.

I.D. NUMBER (enter from page 1): WA7890008967

IV. DESCRIPTION OF DANGEROUS WASTES (continued)

LINE NO.	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))
1	D001	65,000	K	S01	Storage
2	D002	50,000			
3	D003	5,000			
4	D004	↓			
5	D005				
6	D006	20,000			
7	D007	35,000			
8	D008	30,000			
9	D009	17,000			
10	D010	5,000			
11	D011				
12	D012				
13	D013				
14	D014				
15	D015				
16	D016				
17	D017				
18	D018				
19	D019				
20	D020				
21	D021				
22	D022				
23	D023				
24	D024				
25	D025				
26	D026	↓	↓	↓	↓

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NOTE: Photocopy this page before completing if you have more than 26 wastes to list.

I.D. NUMBER (enter from page 1): WA7890008967

IV. DESCRIPTION OF DANGEROUS WASTES (continued)

LINE NO.	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))
1	D027	5,000	K	S01	Storage
2	D028				
3	D029				
4	D030				
5	D031				
6	D032				
7	D033				
8	D034				
9	D035				
10	D036				
11	D037				
12	D038				
13	D039				
14	D040				
15	D041				
16	D042				
17	D043	↓			
18	WC01	22,000			
19	WC02	30,000			
20	WP01	24,000			
21	WP02	5,000			
22	WP03	4,000			
23	WT01	80,000			
24	WT02	114,000	↓	↓	↓
25					
26					

(Continued from page 1)

NOTE: Photocopy this page before completing if you have more than 26 wastes to list.

I.D. NUMBER (enter from page 1)

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

IV. DESCRIPTION OF DANGEROUS WASTES (continued)

LINE NO.	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 process is not assigned a code in D.1)
1	F001	4,000	K	S01	Storage
2	F002	13,000			
3	F003	26,000			
4	F004	3,000			
5	F005	26,000			
6	F006	500			
7	F007				
8	F008				
9	F009				
10	F010				
11	F011				
12	F012				
13	F019				
14	F020				
15	F021				
16	F022				
17	F023				
18	F024				
19	F026				
20	F027	800			
21	F028	500			
22	W001	2,500			
23					
24					
25					
26					

CONTINUE ON REVERSE

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NOTE: Photocopy this page before completing if you have more than 26 wastes to list.

I.D. NUMBER (enter from page 1)

WA789000897

IV. DESCRIPTION OF DANGEROUS WASTES (continued)

LINE NO.	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))
1	P001	500	K	S01	Storage
2	P002				
3	P003				
4	P004				
5	P005				
6	P006				
7	P007				
8	P008				
9	P009				
10	P010				
11	P011				
12	P012				
13	P013				
14	P014				
15	P015				
16	P016				
17	P017				
18	P018				
19	P020				
20	P021				
21	P022				
22	P023				
23	P024				
24	P025				
25	P026				
26	P027				

Continued from page 2.

NOTE: Photocopy this page before completing if you have more than 26 wastes to list.

I.D. NUMBER (enter from page 1)
WA 7 8 9 0 0 0 8 9 6 7

IV. DESCRIPTION OF DANGEROUS WASTES (continued)

LINE NO.	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))
1	P028	500	K	S01	Storage
2	P029				
3	P030				
4	P031				
5	P033				
6	P034				
7	P035				
8	P036				
9	P037				
10	P038				
11	P039				
12	P040				
13	P041				
14	P042				
15	P043				
16	P044				
17	P045				
18	P046				
19	P047				
20	P048				
21	P049				
22	P050				
23	P051				
24	P052				
25	P054				
26	P056				

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I.D. NUMBER (enter from page 1)

WA789000897

IV. DESCRIPTION OF DANGEROUS WASTES (continued)

LINE NO.	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))
1	P057	500	K	S01	Storage
2	P058				
3	P059				
4	P060				
5	P062				
6	P063				
7	P064				
8	P065				
9	P066				
10	P067				
11	P068				
12	P069				
13	P070				
14	P071				
15	P072				
16	P073				
17	P074				
18	P075				
19	P076				
20	P077				
21	P078				
22	P079				
23	P081				
24	P082				
25	P084				
26	P085				

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NOTE: Photocopy this page before completing if you have more than 26 wastes to list.

I.D. NUMBER (enter from page 1)

WA789000896 7

IV. DESCRIPTION OF DANGEROUS WASTES (continued)

LINE NO.	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))
1	P087	500	K	S01	Storage
2	P088				
3	P089				
4	P092				
5	P093				
6	P094				
7	P095				
8	P096				
9	P097				
10	P098				
11	P099				
12	P101				
13	P102				
14	P103				
15	P104				
16	P105				
17	P106				
18	P107				
19	P108				
20	P109				
21	P110				
22	P111				
23	P112				
24	P113				
25	P114				

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NOTE: Photocopy this page before completing if you have more than 26 wastes to list.

I.D. NUMBER (enter from page 1)

WA 7 8 9 0 0 0 8 9 6 7

IV. DESCRIPTION OF DANGEROUS WASTES (continued)

LINE NO.	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))
1	P116	500	K	S01	Storage
2	P118				
3	P119				
4	P120				
5	P121				
6	P122				
7	P123				
8					
9					
10					
11					
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I.D. NUMBER (enter from page 1)

WA 7 8 9 0 0 0 8 9 6 7

IV. DESCRIPTION OF DANGEROUS WASTES (continued)

LINE NO.	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))
1	U001	500	K	S01	Storage
2	U002	1,000			
3	U003	↓			
4	U004	500			
5	U005				
6	U006				
7	U007				
8	U008				
9	U009				
10	U010				
11	U011				
12	U012				
13	U014				
14	U015				
15	U016				
16	U017				
17	U018				
18	U019				
19	U020				
20	U021				
21	U022				
22	U023				
23	U024				
24	U025				
25	U026				

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I.D. NUMBER (enter from page 1): WA7890008967

IV. DESCRIPTION OF DANGEROUS WASTES (continued)

LINE NO.	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))
1	U028	500	K	S01	Storage
2	U029				
3	U030				
4	U031				
5	U032	1,000			
6	U033	500			
7	U034				
8	U035				
9	U036				
10	U037				
11	U038				
12	U039				
13	U040				
14	U041				
15	U042				
16	U043				
17	U044	1,000			
18	U045	500			
19	U046				
20	U047				
21	U048				
22	U049				
23	U050				
24	U051	2,000			
25	U052	500			
26	U053				

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NOTE: Photocopy this page before completing if you have more than 26 wastes to list.

I.D. NUMBER (enter from page 1)

WA789000896 7

IV. DESCRIPTION OF DANGEROUS WASTES (continued)

LINE NO.	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))
1	U055	500	K	S01	Storage
2	U056				
3	U057				
4	U058				
5	U059				
6	U060				
7	U061				
8	U062				
9	U063				
10	U064				
11	U066				
12	U067				
13	U068				
14	U069				
15	U070				
16	U071				
17	U072				
18	U073				
19	U074				
20	U075				
21	U076				
22	U077				
23	U078				
24	U079				
25	U080				

Continued from page 2.

NOTE: Photocopy this page before completing if you have more than 26 wastes to list.

I.D. NUMBER (enter from page 1)

WA 7 8 9 0 0 0 8 9 6 7

IV. DESCRIPTION OF DANGEROUS WASTES (continued)

LINE NO.	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))
1	U082	500	K	S01	Storage
2	U083				
3	U084				
4	U085				
5	U086				
6	U087				
7	U088				
8	U089				
9	U090				
10	U091				
11	U092				
12	U093				
13	U094				
14	U095				
15	U096				
16	U097				
17	U098				
18	U099				
19	U110				
20	U102				
21	U103				
22	U105				
23	U106				
24	U107				
25	U108				
26	U110				

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NOTE: Photocopy this page before completing if you have more than 26 wastes to list.

I.D. NUMBER (enter from page 1)

WA789000897

IV. DESCRIPTION OF DANGEROUS WASTES (continued)

LINE NO.	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))
1	U111	500	K	S01	Storage
2	U112				
3	U113				
4	U115				
5	U116				
6	U117				
7	U118				
8	U119				
9	U120				
10	U121				
11	U122				
12	U123				
13	U124				
14	U125				
15	U126				
16	U127				
17	U128				
18	U129				
19	U130				
20	U131				
21	U132				
22	U133	2,000			
23	U134	1,000			
24	U135	500			
25	U136				

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NOTE: Photocopy this page before completing if you have more than 26 wastes to list.

I.D. NUMBER (enter from page 1)
WA 7 8 9 0 0 0 8 9 6 7

IV. DESCRIPTION OF DANGEROUS WASTES (continued)

LINE NO.	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))
1	U138	500	K	S01	Storage
2	U139				
3	U140				
4	U141				
5	U142				
6	U143				
7	U144				
8	U145	1,000			
9	U146	500			
10	U147				
11	U148				
12	U149				
13	U150				
14	U151	3,000			
15	U152	500			
16	U153				
17	U154	1,000			
18	U155	500			
19	U156				
20	U157				
21	U158				
22	U159				
23	U160				
24	U161				
25	U162				
26	U163				

Continued from page 2.

NOTE: Photocopy this page before completing if you have more than 26 wastes to list.

I.D. NUMBER (enter from page 1)

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

IV. DESCRIPTION OF DANGEROUS WASTES (continued)

LINE NO.	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))
1	U164	500	K	S01	Storage
2	U165				
3	U166				
4	U167				
5	U168				
6	U169				
7	U170				
8	U171				
9	U172				
10	U173				
11	U174				
12	U175				
13	U176				
14	U177				
15	U178				
16	U179				
17	U180				
18	U181				
19	U182				
20	U183				
21	U184				
22	U185				
23	U186				
24	U187				
25	U188				
26	U189				

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NOTE: Photocopy this page before completing if you have more than 26 wastes to list.

I.D. NUMBER (enter from page 1)

WA789000896 7

IV. DESCRIPTION OF DANGEROUS WASTES (continued)

LINE NO.	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))
1	U190	500	K	S01	Storage
2	U191				
3	U192				
4	U193				
5	U194				
6	U196				
7	U197				
8	U200				
9	U201				
10	U202				
11	U203				
12	U204				
13	U205				
14	U206				
15	U208				
16	U209				
17	U210				
18	U211				
19	U213				
20	U214				
21	U215				
22	U216				
23	U217				
24	U218				
25	U219				
26	U220				

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NOTE: Photocopy this page before completing if you have more than 26 wastes to list.

I.D. NUMBER (enter from page 1): WA7890008967

IV. DESCRIPTION OF DANGEROUS WASTES (continued)

LINE NO.	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))
1	U221	500	K	S01	Storage
2	U222	↓			
3	U223	1,500			
4	U225	↓			
5	U226	3,000			
6	U227	500			
7	U228	1,000			
8	U231	500			
9	U234	↓			
10	U235	1,000			
11	U236	↓			
12	U237	↓			
13	U238	500			
14	U239	1,000			
15	U240	5,000			
16	U242	500			
17	U243	↓			
18	U244	1,000			
19	U245	500			
20	U246	↓			
21	U247	↓			
22	U328	↓			
23	U353	↓			
24	U359	↓	↓	↓	↓
25					
26					

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IV. DESCRIPTION OF DANGEROUS WASTES (continued)

2. USE THIS SPACE TO LIST ADDITIONAL PROCESS CODES FROM SECTION D(1) ON PAGE 3.

The 616 NROWSF is used for the storage of nonradioactive dangerous waste generated on the Hanford Site. This waste consist of listed waste, waste from non-specific sources, characteristic waste, and state-only waste.

V. FACILITY DRAWING

All existing facilities must include in the space provided on page 5 a scale drawing of the facility (see instructions for more detail).

VI. PHOTOGRAPHS

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

VII. FACILITY GEOGRAPHIC LOCATION This information is provided on attached drawings and photos

LATITUDE (degrees, minutes, & seconds)	LONGITUDE (degrees, minutes, & seconds)

VIII. FACILITY OWNER

A. 1. If the facility owner is also the facility operator as listed in Section VII on Form 1, "General Information", place an "X" in the box to the left and skip to Section IX below.

B. 1. If the facility owner is not the facility operator as listed in Section VII on Form 1, complete the following items:

1. NAME OF FACILITY'S LEGAL OWNER	2. PHONE NO. (area code & no.)

3. STREET OR P.O. BOX	4. CITY OR TOWN	5. ST	6. ZIP CODE

IX. OWNER CERTIFICATION

I certify under penalty of law that I have personally examined and am familiar with the information submitted in this and all attached documents, and that based on my inquiry of those individuals immediately responsible for obtaining the information, I believe that the submitted information is true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment.

NAME (print or type)	SIGNATURE	DATE SIGNED
Michael J. Lawrence Manager, Richland Operations United States Department of Energy	Michael J. Lawrence	6/21/90

X. OPERATOR CERTIFICATION

I certify under penalty of law that I have personally examined and am familiar with the information submitted in this and all attached documents, and that based on my inquiry of those individuals immediately responsible for obtaining the information, I believe that the submitted information is true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment.

NAME (print or type)	SIGNATURE	DATE SIGNED
SEE ATTACHMENT		

CONTINUE ON PAGE 5

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X. OPERATOR CERTIFICATION

I certify under penalty of law that I have personally examined and am familiar with the information submitted in this and all attached documents, and that based on my inquiry of those individuals immediately responsible for obtaining the information, I believe that the submitted information is true, accurate, and complete. I am aware that there are significant penalties for submitting false information including the possibility of fine and imprisonment.

Roger C. Nichols — 6/13/90

Co-operator
Roger C. Nichols, President
Westinghouse Hanford Company

Date

Michael J. Lawrence — 6/21/90

Owner/Operator
Michael J. Lawrence, Manager
U.S. Department of Energy
Richland Operations Office

Date

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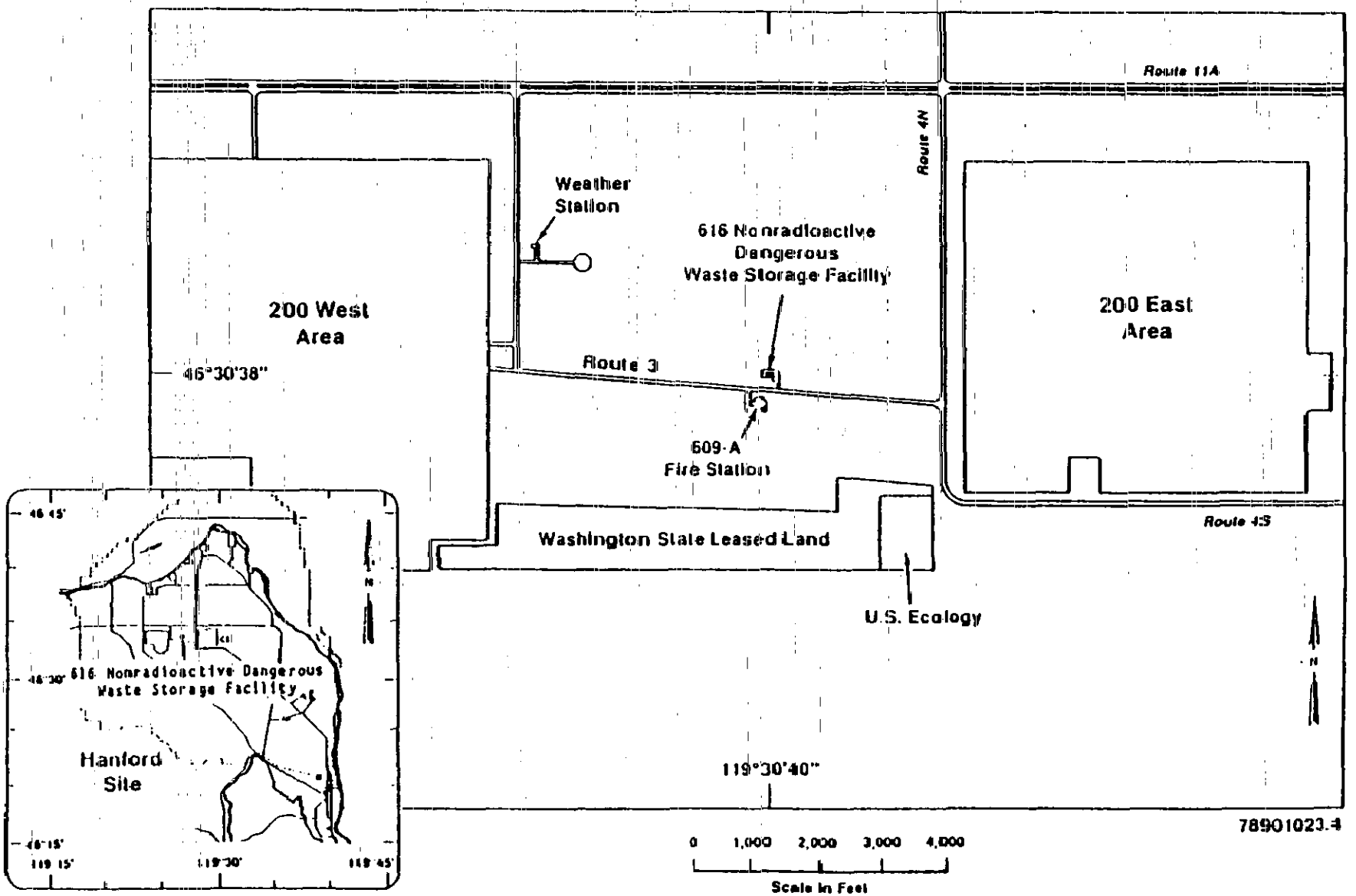
616 Nonradioactive Dangerous Waste Storage Facility Location



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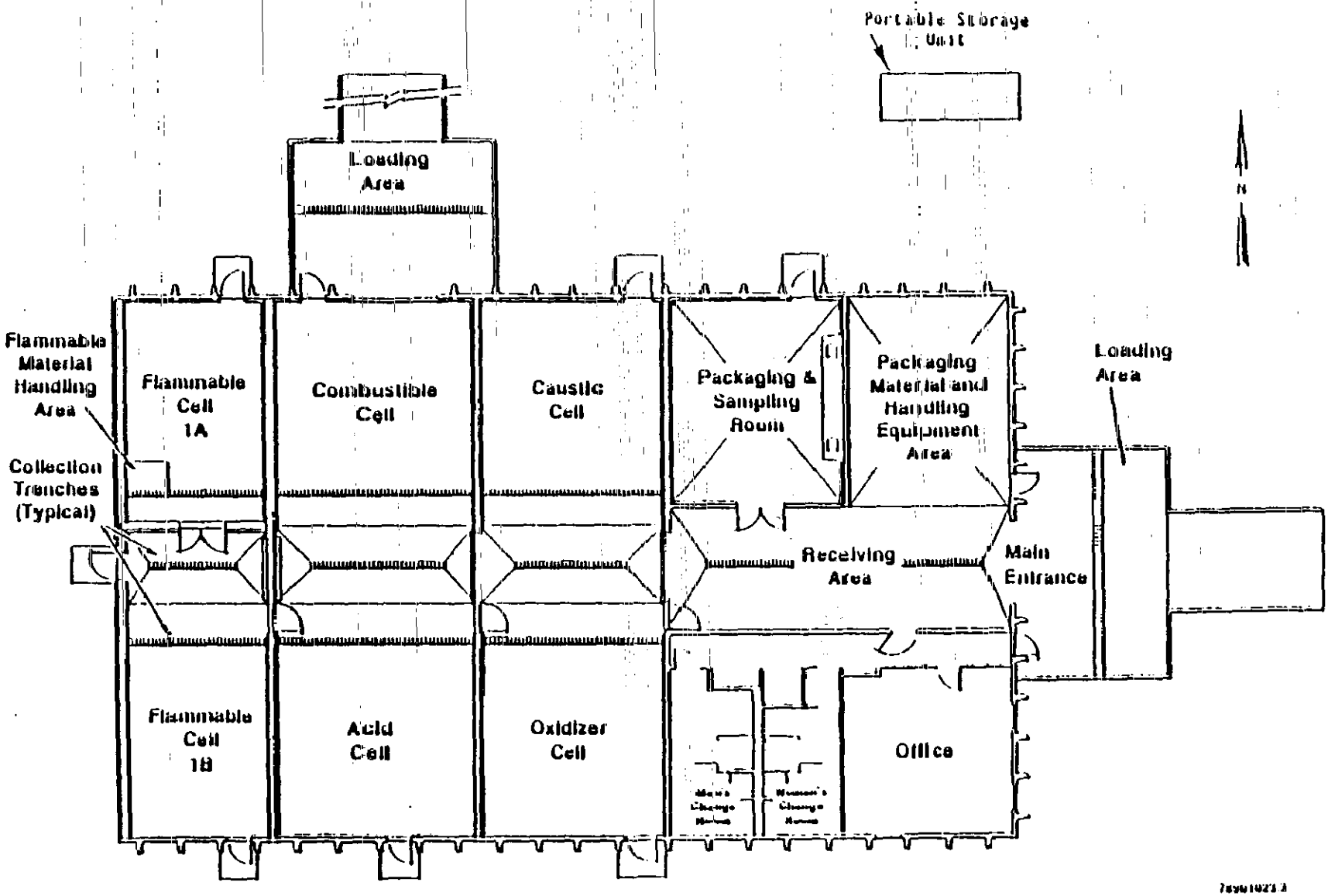
616 Nonradioactive Dangerous Waste Storage Facility Floor Plan



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616 NONRADIOACTIVE DANGEROUS WASTE STORAGE FACILITY

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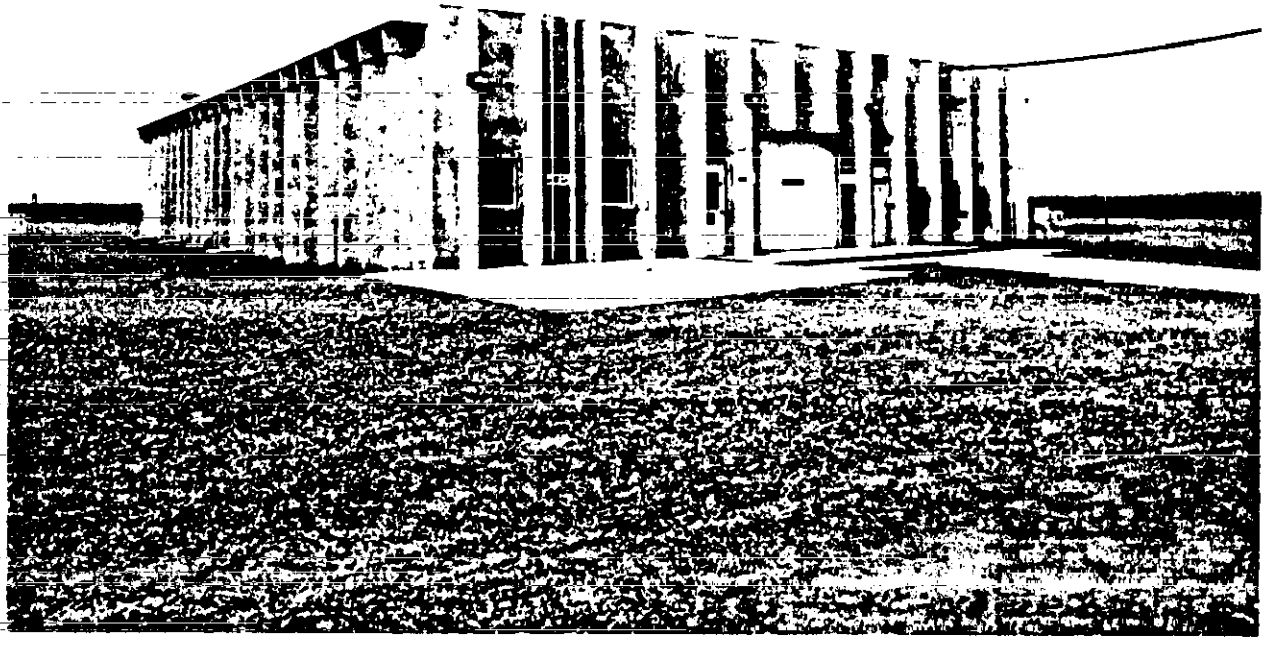

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PART B

This Part B permit application for the 616 Nonradioactive Dangerous Waste Storage Facility consists of 15 chapters and 10 appendices.

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CONTENTS

1.0 INTRODUCTION 1-1

1.1 THE 616 NONRADIOACTIVE DANGEROUS WASTE STORAGE FACILITY PERMITTING 1-1

1.2 THE 616 NONRADIOACTIVE DANGEROUS WASTE STORAGE FACILITY PART B PERMIT APPLICATION CONTENTS 1-1
1.2.1 Facility Description and General Provisions 1-2
1.2.2 Waste Characteristics 1-2
1.2.3 Process Information 1-2
1.2.4 Groundwater Monitoring 1-2
1.2.5 Procedures to Prevent Hazards 1-2
1.2.6 Contingency Plan 1-3
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1.2.9 Waste Minimization Plan 1-3
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1.2.11 Reporting and Recordkeeping 1-3
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1.2.13 Certification 1-4
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1.4 DEFINITIONS 1-4

1.5 PERMIT MODIFICATIONS 1-6

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1.0 INTRODUCTION

This chapter describes the permitting approach for the 616 Nonradioactive Dangerous Waste Storage Facility (616 NRDWSF) and provides an overview of the 616 NRDWSF Part B permit application.

1.1 THE 616 NONRADIOACTIVE DANGEROUS WASTE STORAGE FACILITY PERMITTING

The 616 NRDWSF began operation in September 1986. This treatment, storage, and/or disposal (TSD) unit, classified as container storage, will be permitted under Washington State Department of Ecology (Ecology) *Dangerous Waste Regulations*, Washington Administrative Code (WAC) 173-303-806.

The 616 NRDWSF provides a centralized storage unit to receive, store, and prepare offsite shipments of nonradioactive dangerous waste generated on the Hanford Site. Before receipt of dangerous waste at the 616 NRDWSF, the waste is characterized, designated according to Ecology regulations for dangerous waste, and packaged according to the U.S. Department of Transportation regulations for hazardous materials. The waste is shipped to the 616 NRDWSF by truck. Once a waste shipment is accepted from the transporter, the 616 NRDWSF personnel place the waste in the appropriate storage cell as determined by the hazard class and chemical compatibility of the waste. Approximately 18 times a year, depending on the rate of waste accumulation, containers are manifested according to U.S. Department of Transportation regulations for hazardous materials, inspected for offsite shipment, and transported to a permitted TSD facility.

1.2 THE 616 NONRADIOACTIVE DANGEROUS WASTE STORAGE FACILITY PART B PERMIT APPLICATION CONTENTS

The 616 NRDWSF Part B permit application consists of 15 chapters:

- Introduction (Chapter 1.0)
- Facility Description and General Provisions (Chapter 2.0)
- Waste Characteristics (Chapter 3.0)
- Process Information (Chapter 4.0)
- Groundwater Monitoring (Chapter 5.0)
- Procedures to Prevent Hazards (Chapter 6.0)
- Contingency Plan (Chapter 7.0)
- Personnel Training (Chapter 8.0)
- Exposure Information Report (Chapter 9.0)

- Waste Minimization Plan (Chapter 10.0)
- Closure and Postclosure Requirements (Chapter 11.0)
- Reporting and Recordkeeping (Chapter 12.0)
- Other Relevant Laws (Chapter 13.0)
- Certification (Chapter 14.0)
- References (Chapter 15.0).

A brief description of each chapter is provided in the following sections.

1.2.1 Facility Description and General Provisions (Chapter 2.0)

This chapter provides a general description of the 616 NRDWSF. A brief description and history of the Hanford Site also are provided.

1.2.2 Waste Characteristics (Chapter 3.0)

This chapter discusses the physical, chemical, and biological characteristics of the waste types transported to the 616 NRDWSF from various Hanford Site generating units. A waste analysis plan that provides the methodology for determining waste types is included.

1.2.3 Process Information (Chapter 4.0)

This chapter covers the detailed operation of the 616 NRDWSF. Additional information is given concerning container descriptions and primary and secondary containment systems.

1.2.4 Groundwater Monitoring (Chapter 5.0)

This chapter explains that the 616 NRDWSF is not operated as a dangerous waste surface impoundment, waste pile, land treatment unit, or landfill. Therefore, groundwater monitoring is not required.

1.2.5 Procedures to Prevent Hazards (Chapter 6.0)

This chapter discusses hazard prevention and emergency preparedness equipment, structures, and procedures.

1.2.6 Contingency Plan (Chapter 7.0)

This chapter provides information on contingency planning to ensure that the 616 NRDWSF has measures in place to lessen the potential impact on the public health and the environment in the event of an emergency.

1.2.7 Personnel Training (Chapter 8.0)

This chapter outlines the training program for 616 NRDWSF employees whose primary duties are identified as being associated with dangerous waste management.

1.2.8 Exposure Information Report (Chapter 9.0)

This chapter explains that the 616 NRDWSF does not store, treat, or dispose of dangerous waste in a surface impoundment or a landfill. Therefore, exposure information is not required.

1.2.9 Waste Minimization Plan (Chapter 10.0)

This chapter discusses the program to minimize the volume or quantity and toxicity of waste generated at the 616 NRDWSF. The regulatory basis for, and objectives of, the waste minimization program are discussed. Waste generation and specific procedures for minimizing waste are described.

1.2.10 Closure and Postclosure Requirements (Chapter 11.0)

This chapter describes how the 616 NRDWSF will be decontaminated and closed. A closure schedule is provided. The 616 NRDWSF is to be clean closed; therefore, no postclosure plan is included.

1.2.11 Reporting and Recordkeeping (Chapter 12.0)

This chapter summarizes commitments for reporting and recordkeeping made in other chapters of this Part B permit application.

1.2.12 Other Relevant Laws (Chapter 13.0)

This chapter discusses federal and state laws that govern the operation of the 616 NRDWSF, other than the *Resource Conservation and Recovery Act (RCRA) of 1976*, as amended, and the *State of Washington Hazardous Waste Management Act of 1976*, as amended.

1.2.13 Certification (Chapter 14.0)

This chapter contains the required certification signed by officials of the U.S. Department of Energy (DOE) Field Office, Richland (RL) and Westinghouse Hanford Company indicating that the information provided is true, accurate, and complete.

1.2.14 References (Chapter 15.0)

References used throughout this Part B permit application are listed in this chapter. All references listed here, which generally are not available from other sources, will be made available for review, upon request, to any regulatory agency or public commentor. References can be obtained by contacting the following:

Administrative Records Specialist
Public Access Room H4-22
Westinghouse Hanford Company
P. O. Box 1970
Richland, Washington 99352

1.3 ACRONYMS AND ABBREVIATIONS

Acronyms and abbreviations used throughout this Part B permit application are located at the beginning of the document between the Foreword and the Part A permit application.

1.4 DEFINITIONS

Definitions specific to this permit application are provided in this section. These definitions supplement those provided in WAC 173-303-040.

Contractor--Firm under contract to the U.S. Department of Energy to provide Hanford Site services. Currently, there are the following four onsite, prime contractors:

An Operations and Engineering Contractor

A Research and Development Contractor

An Engineer and Constructor Contractor

A Medical and Health Services Contractor.

Throughout the remainder of this permit application, the term contractor, except where specified, is used to refer to the operations and engineering contractor.

Dangerous or hazardous waste--In addition to the definition in WAC 173-303-040, means the nonradioactive dangerous component of waste commonly called mixed waste (i.e., waste that is both dangerous and radioactive). Dangerous waste commonly is used to refer to hazardous, dangerous, or extremely hazardous waste within this permit application.

Facility--Dependent on context, the term 'facility', as used in this permit application, could refer to:

- The Hanford Facility (refer to definition)
- A facility as defined in WAC 173-303-040
- Building nomenclature commonly used at the Hanford Facility. In this context, the term 'facility' remains as part of the title for various TSD units (e.g., 616 Nonradioactive Dangerous Waste Storage Facility, Grout Treatment Facility).

Generating Unit--Term inferred to have the same meaning as 'generator' as defined in WAC 173-303-040. For purposes of RCRA and the *Dangerous Waste Regulations*, the Hanford Facility is considered to be a single generator consisting of a number of generating units.

Hanford Facility--A single RCRA facility identified by the EPA/State Identification Number WA7890008967 that consists of over 60 TSD units conducting dangerous waste management activities. These TSD units are included in the *Hanford Facility Dangerous Waste Part A Permit Application* (DOE-RL 1988b). Also, the contiguous portion of the Hanford Site that contains these TSD units and, for the purposes of the RCRA, is owned and operated by the U.S. Department of Energy (excluding lands north and east of the Columbia River, river islands, state owned or leased lands, lands owned by the Bonneville Power Administration, lands leased to the Washington Public Power Supply System, and the Ashe Substation). The Hanford Facility is a single site for purposes of provisions regulating 'offsite' or 'onsite' waste handling.

Hanford Site--The approximately 560 square miles (1,450 square kilometers) in southeastern Washington State owned by the United States Government and commonly known as the Hanford Reservation.

Offsite Shipments--Shipments not considered to be onsite.

Onsite Shipments--Shipments (1) from waste generating units to TSD units operated by the DOE-RL or (2) between TSD units operated by the DOE-RL.

Treatment, Storage, and/or Disposal Unit--A unit used for treatment, storage, and/or disposal of dangerous waste that is required to be permitted and/or closed pursuant to RCRA requirements as determined in the *Hanford Federal Facility Agreement and Consent Order* (Tri-Party Agreement) (Ecology et al. 1990). Also refers to a grouping of TSD units for the purpose of preparing and submitting a permit application and/or closure plan pursuant to the requirements under RCRA, as determined in the Tri-Party Agreement Action Plan.

Tri-Party Agreement--The term Tri-Party Agreement means the *Hanford Federal Facility Agreement and Consent Order*, dated May 1989, as amended August 1990, and as it may be amended from time to time, including the Action Plan incorporated in the Tri-Party Agreement.

Waste Management Unit--Term inferred to have the same meaning as 'dangerous waste management unit' as defined in WAC 173-303-040. Also inferred to have the same meaning as TSD unit.

1.5 PERMIT MODIFICATIONS

All modifications to the 616 NRDWSF Dangerous Waste Permit will be made in accordance with the requirements identified in WAC 173-303-830, with the following exception. The notifications required by WAC 173-303-830(4)(a)(i)(A) and (B) for Class 1 changes will be submitted on an annual basis to the required regulatory agencies, appropriate units of state and local government, and individuals on the facility mailing list maintained by Ecology. These notifications will be submitted by March 1 of each year.

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2.0 FACILITY DESCRIPTION AND GENERAL PROVISIONS [B]

This chapter briefly describes the Hanford Site and provides a general overview of the 616 NRDWSF, including the following:

- General description
- Topography
- Location information
- Traffic information
- Performance standards
- Buffer monitoring zones
- Spills and discharges
- Manifest system.

2.1 GENERAL DESCRIPTION [B-1]

This section discusses the general Hanford Facility operating areas and provides an introduction to the 616 NRDWSF. A brief description of the Hanford Facility waste management practices and a description of the 616 NRDWSF are contained in this section. A more detailed discussion of the waste types and known characteristics of the waste that the 616 NRDWSF stores, and the identification of the methods of storage are provided in Chapters 3.0 and 4.0, respectively.

2.1.1 Hanford Site

The Hanford Site covers approximately 560 square miles (1,450.4 square kilometers) of semiarid land that is owned by the U.S. Government and managed by the DOE-RL. The Hanford Site is located northwest of the city of Richland, Washington (Figure 2-1). The city of Richland adjoins the southeasternmost portion of the Hanford Site boundary and is the nearest population center. In early 1943, the U.S. Army Corps of Engineers selected the Hanford Site as the location for reactor, chemical separation, and related activities for the production and purification of plutonium.

Activities on the Hanford Site are centralized in numerically designated areas (Drawing H-6-958 in Appendix 2A). The reactors are located along the Columbia River in the 100 Areas. The reactor fuel reprocessing units are in the 200 Areas, which are on a plateau approximately 7 miles (11 kilometers) from the Columbia River. The 300 Area, located adjacent to and north of Richland, contains the reactor fuel manufacturing plants and the research and development laboratories. The 400 Area, 5 miles (8 kilometers) northwest of

the 300 Area, contains the Fast Flux Test Facility used for testing liquid metal reactor systems. The 600 Area covers all locations not specifically given an area designation. Adjacent to and north of Richland, the 1100 Area contains offices associated with administration, maintenance, transportation, and materials procurement and distribution. The 3000 Area, between the 1100 Area and 300 Area, contains engineering offices and administrative offices. Administrative offices also are located in the 700 Area, which is in downtown Richland.

Drawing H-6-958 in Appendix 2A provides a general overview of the Hanford Site and contiguous area. The drawing illustrates the following:

- Legal boundary
- Contours [at 20-foot (6.1-meter) intervals] sufficient to show surface water flow
- Fire control services
- Access roads, internal roads, railroads, perimeter gates, and barricades
- Longitudes and latitudes.

2.1.2 The Hanford Facility

The Hanford Facility for the purposes of RCRA is defined as the contiguous portion of the Hanford Site that includes the TSD units identified in the *Hanford Facility Dangerous Waste Part A Permit Application* (DOE-RL 1988b) (Chapter 1.0, Section 1.4). The Hanford Facility is assigned the single EPA/State Identification Number WA7890008967. All waste management activities carried out under the assigned identification number are considered to be onsite. The 616 NRDWSF is a single storage unit and is considered part of the Hanford Facility.

2.1.3 The 616 Nonradioactive Dangerous Waste Storage Facility Description

The 616 NRDWSF is a permanent structure constructed of precast concrete double-tee wall and roof panels. The construction specifications and design drawings for this storage unit are included in Appendices 4A and 4B. The 616 NRDWSF is located approximately 200 feet (61 meters) north of Route 3, across from the 609-A Fire Station, between the 200 East and 200 West Areas (Figure 2-2). The storage unit boundary is considered to be 300 feet (91.4 meters) from the exterior walls, except to the south, where

Route 3 serves as the boundary (Drawing H-13-000014 in Appendix 2A). The storage building consists of the following areas (Figure 2-3):

- Office and change rooms
- Storage cells:
  - Caustic
  - Oxidizer
  - Combustible
  - Acid
  - Flammable 1-A
  - Flammable 1-B.
- Packaging and sampling room
- Packaging material and handling equipment area
- Receiving area
- Loading and unloading areas.

Each area is addressed in the following sections.

2.1.3.1 Office and Change Rooms. The office and change rooms (Figure 2-3) serve as the operations center for the 616 NRDWSF. The 616 NRDWSF Solid Waste Facility Operations Supervisor (616 NRDWSF Supervisor) occupies the office. The office and change rooms are serviced by an independent heat pump designed to provide positive air pressure over the chemical storage cells (Figure 2-4). This system reduces the potential of exposing personnel in the office and change rooms to airborne chemical contaminants from the stored waste. Design drawings of the 616 NRDWSF heating, ventilation, and air conditioning systems are provided in Appendix 4B.

2.1.3.2 Storage Cells. Six storage cells (Figure 2-3) are provided for the interim storage of dangerous waste at the 616 NRDWSF. Waste is stored in cells which, in the event of a release or offnormal event, are designed and constructed to minimize damage to personnel, the environment, and the storage unit.

The storage cells have sealed concrete slabs sloped to a collection trench for the accumulation of released liquids (Chapter 4.0, Section 4.1.1.4). Each collection trench is covered by a removable carbon steel grate (shown in Chapter 4.0, Figure 4-1). Containment systems for free liquid or waste designated as F020-F027 are required to have sufficient capacity to contain 10 percent of the volume of the stored waste volume or the volume of the largest container, whichever is greater (WAC 173-303-630).

Containment systems at the 616 NRDWSF include cell trenches and floor areas up to the top of containment curbs. The collection trenches in the 616 NRDWSF are capable of holding between 92 and 252 gallons (348 and 954 liters) of liquid for each cell as the width of each cell varies.

The individual cell containment systems are capable of holding between 637 and 915 gallons (2,411 and 3,464 liters) (Chapter 4.0, Section 4.1.1.6).

A curb surrounds each cell with a sloped ramp on one end for access. The curb height varies between 2 and 4 inches as the slope of the floor varies. The curb provides additional containment in the event of a major spill that would exceed the capacity of the trench. Collected or contained liquids can be removed by using hand pumps, absorbents, or vacuum trucks. Actions to be taken in response to a spill or discharge are detailed in the Building Emergency Plan - 616 Building provided in Appendix 7A.

The floors of the storage cells are sealed as detailed in Chapter 4.0, Section 4.1.1.4. The walls of the storage cells are painted to a height of 8 feet (2.4 meters). The storage areas are separated from the rest of the facility by a 2-hour fire-rated concrete masonry unit firewall. Access is provided by a 1 1/2-hour fire-rated personnel door and a 1 1/2-hour fire-rated rollup door. All of the rollup doors in the firewalls are equipped for automatic closure in the event of a fire. The fire protection system for the storage cells is a wet-pipe sprinkler system designed to meet Extra Hazard, Group II requirements, as specified in the National Fire Protection Association's *National Fire Codes* (NFPA 1989). All of the storage cells have emergency exit doors with fire alarm pull boxes and surface-mounted industrial fluorescent light fixtures with a lighting level of 20 foot candles.

The heating, ventilation, and air conditioning system in the storage cells exhausts air at a minimum rate of 4 air changes an hour. To minimize the accumulation of vapors, exhaust duct openings are located near the floor and 8 feet (2.4 meters) above the floor. This system meets the requirements of the *Uniform Building Code* (ICBO 1982) for hazardous occupancies. The heating, ventilation, and air conditioning unit for the storage areas is located approximately 40 feet (12.2 meters) from the heat pump used for the office and change rooms. The exhaust opening faces away from the heat pump to preclude the intake of exhaust vapors into the office and change rooms (Figure 2-4). Design drawings of the 616 NRDWSF heating, ventilation, and air conditioning systems are provided in Appendix 4B.

Activities that take place in the dangerous waste storage cells during normal operation are defined as follows.

- The containerized waste designated for storage in a particular cell is received and shipped in packagings of various sizes that are moved by hand, handtruck, or forklift.

- Waste containers are inspected as specified in Chapter 6.0.

Waste placement and segregation within the storage cells are performed according to a waste storage compatibility chart (Figure 2-5). As part of the designation process (Chapter 3.0, Section 3.2), the contractor's Solid Waste Engineering organization reviews the compatibility chart and assigns a primary storage location. Solid Waste Engineering also documents any unusual chemical characteristics and/or incompatibilities on the hazardous waste disposal

analysis record (Chapter 3.0, Section 3.2). If the 'primary' storage location is full, the Solid Waste Unit Operations Supervisor can choose a secondary storage location from the compatibility chart.

Deviations from the compatibility chart can be performed only after Solid Waste Engineering has completed a review of the inventory to determine waste compatibility. The Solid Waste Engineering compatibility assessment must be documented, signed for Solid Waste Engineering peer review, and signed to indicate the Solid Waste Unit Operations Supervisor concurrence. The assessment either can be documented in the logbook or filed at the 616 NRDWSF and referenced in the logbook. Waste that cannot be managed safely at the 616 NRDWSF because of chemical compatibility characteristics is not accepted.

2.1.3.2.1 Caustic and Oxidizer Storage Cells. The caustic and oxidizer cells (Figure 2-3) are separated from the other cells by a 2-hour fire-rated concrete masonry unit firewall with 1 1/2-hour fire-rated personnel doors and rollup doors.

2.1.3.2.2 Combustible and Acid Storage Cells. The combustible and acid cells are located in the middle of the storage area (Figure 2-3). The combustible and acid cells provide the same features as those provided in the caustic and oxidizer storage cells. In addition, a safety shower and an eye wash station are located in the combustible cell.

2.1.3.2.3 Flammable Liquid Storage Cells. Because of its hazardous and sometimes explosive characteristic, Class 1-A and Class 1-B flammable liquid waste must be stored in specific cells (Figure 2-3). The 1-A cell can store 1-B liquid waste, but the 1-B cell cannot store the 1-A liquid waste. The 1-A and 1-B cells are separated from the other storage cells by a 4-hour fire-rated concrete masonry unit firewall, two back-to-back 1 1/2-hour fire-rated rollup doors, and a 3-hour fire-rated personnel door.

Water reactive waste packaged in U.S. Department of Transportation-specified containers is stored inside portable weatherproof flammable liquid storage cabinets located in the 1-A and 1-B cells.

Unlike the other storage cells, the 1-A flammable storage cell is enclosed totally and provides a number of additional features because of the unique nature of the stored waste. These features include the following:

- Double blast-resistant entry doors
- A controlled-relief exterior wall system on one side for explosion venting
- Explosion-relief vents on the roof
- Lighting and electrical fixtures as specified in National Fire Protection Association codes (NFPA 1989) for Class I-Division I hazardous atmospheres

- An area for transferring flammable liquid waste equipped with explosion-proof electrical pumps with receptacles and grounding cables.

If contents from leaking containers of 1-A and 1-B flammable liquid waste must be transferred, the 1-A flammable storage cell meets the explosion venting requirements of the National Fire Protection Association, Table 5-7.3 (NFPA 1989).

2.1.3.3 Packaging and Sampling Room. The packaging and sampling room (Figure 2-3) is constructed of 2-hour fire-rated concrete masonry unit interior walls and a precast double-tee exterior wall. Entry is provided by two 1 1/2-hour fire-rated doors. The floor is sealed concrete and the ceiling of precast-concrete double-tee construction is full building height. The floor is sloped to a 202-gallon (764.7-liters) sump for the collection of released liquid. Collected liquid can be removed with absorbents or hand pumps. A 2- to 4-inch (5.1- to 10.1-centimeter) curb surrounds the room at the base of each wall for additional containment. Actions to be taken in response to a spill or discharge are detailed in the Building Emergency Plan - 616 Building provided in Appendix 7A.

A countertop is provided in the packaging and sampling room with the following items:

- Two drainless stainless-steel basins
- Hot and cold running water (both basins)
- Independent hot water heater.

The basins, provided for dangerous waste use, allow waste to be retrieved for appropriate packaging and disposal. A safety shower and an eyewash station also are provided.

Although the primary purpose of the packaging and sampling room is for waste repackaging and sampling, the room can be used as an overflow storage area for compatible waste (excluding flammable 1-A and 1-B liquid waste), empty waste containers, and nonradioactive waste samples. The packaging and sampling room also is used to store waste sampling equipment, laboratory equipment, monitoring equipment, and various other equipment required for Hanford Facility waste management activities.

2.1.3.4 Packaging Material and Handling Equipment Area. The packaging material and handling equipment area, in the northeast end of the storage building (Figure 2-3), is used to store waste packaging materials and waste handling equipment. Its proximity to areas where dangerous waste is handled requires the following additional features:

- Sealed concrete floor that slopes to a 202-gallon (764.4-liters) sump for the collection of liquid from spills or leaks that might inadvertently enter the area (actions to be taken in response to a

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spill or discharge are detailed in the Building Emergency Plan - 616 Building provided in Appendix 7A)

- Same fire protection system as previously described for the storage cells

- Emergency exit door.

Equipment and material stored in the packaging material and handling equipment area are as follows:

- Tools, drum dollies, forklift, and other waste handling equipment

- Absorbents and other miscellaneous spill control equipment.

Additional containers and absorbents are stored in the portable storage unit located approximately 50 feet (15.2 meters) north of the 616 NRDWSF (Figure 2-3). A detailed list of equipment is included in the Building Emergency Plan - 616 Building provided in Appendix 7A.

2.1.3.5 Receiving Area. The receiving area, in the east end of the 616 NRDWSF (Figure 2-3), is a corridor used when transferring waste from the east loading area to the storage cells. Waste containers that are leaking or of questionable integrity sometimes are overpacked in this area. Compatible waste with incomplete paperwork also can be staged in this area while discrepancies are resolved. Because of the types of activities that are performed in the receiving area, the area has the following additional features:

- Sealed concrete floor that slopes to a 252-gallon (953.9-liter) trench for the collection of liquid from spills or leaks that might inadvertently enter the area (actions to be taken in response to a spill or discharge are detailed in the Building Emergency Plan - 616 Building provided in Appendix 7A)

- Same fire protection system as previously described for the storage cells

- One and a half-hour fire-rated rollup doors at each end of the corridor.

2.1.3.6 Loading and Unloading Areas. The 616 NRDWSF has two loading and unloading areas (Figure 2-3). The primary loading and unloading area is a 20- by 30-foot (6.1- by 9.1-meter) sealed concrete slab with a 13- by 20-foot (4.0- by 6.1-meter) approach ramp. The primary loading and unloading area, located at the east end of the 616 NRDWSF, is provided for incoming and outgoing dangerous waste transfers. The slab is sloped to a trench for liquid collection. The trench has a drain (with a locking removable plug) that connects to a french drain (Figure 2-6) for the release of accumulated water (e.g., rainwater, snowmelt) (Section 2.5.1). Design drawings of the french drain are provided in Appendix 4B. The slab and ramp are surrounded by a curb

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with the exception of the ramp entry, which is at the high point of the slope. The curb provides containment and channels liquid to the collection trench in this area.

The secondary loading and unloading area [a 25-foot 6-inch by 20-foot (7.8- by 6.1-meter) slab with a 13- by 20-foot (4.0- by 6.1-meter) approach ramp] is located outside the combustible cell on the north side of the 616 NRDWSF. The secondary loading and unloading area is of identical construction to the primary loading and unloading area. This secondary loading and unloading area is a redundant system and is not used under normal operating conditions.

The containment trenches are kept free of excess water when the 616 NRDWSF is in operation. In the event that a dangerous waste spill occurs on either of the loading areas, the released material will be recaptured to the greatest extent possible using pumps, absorbents, or alternate methods. Any additional liquids used to decontaminate the spill area will be containerized and managed as specified in Chapter 3.0. Wipe samples will be performed to determine cleanup adequacy (Chapter 4.0, Section 4.1.1.8). Water (e.g., rainwater, snowmelt) accumulated in the trench before completion of the laboratory analysis or wipe samples also will be containerized. Accumulated water will be sampled and characterized if the initial wipe samples determine that the cleanup was inadequate. Actions to be taken in response to a spill or discharge are detailed in the Building Emergency Plan - 616 Building provided in Appendix 7A. Water accumulated in the 'clean' or 'spill free' loading and unloading area trenches will be drained to the french drain system (Section 2.5.1).

2.2 TOPOGRAPHIC MAP [B-2]

A topographic map, showing a distance of at least 1,000 feet (305 meters) around the 616 NRDWSF, is located in Appendix 2A (Drawing H-13-000014). This map is at a scale of 1 unit equals 2,000 units. The contour interval clearly shows the pattern of surface water flow in the vicinity of the 616 NRDWSF. The map contains the following information:

- Map scale
- Date
- Prevailing wind speed and direction
- A north arrow
- Surrounding land use
- Legal boundaries of the 616 NRDWSF
- Access road location

- Access control
- Location of the 616 NRDWSF.

A legal description of the 616 NRDWSF site is provided in Appendix 2A.

2.3 LOCATION INFORMATION [B-3]

This section describes the location of the 616 NRDWSF in relation to seismic, floodplain, and shoreline considerations.

2.3.1 Seismic Consideration [B-3a]

The 616 NRDWSF was designed for seismic consideration in accordance with the *Hanford Plant Standards*, Standard Design Criteria - 4.1 (DOE-RL 1988a). This Plant Standard provides seismic load criteria specific for the Hanford Site. Therefore, no further demonstration of compliance with the seismic standard is required.

2.3.2 Floodplain Standard [B-3b]

Three sources of potential flooding of the storage unit were considered: (1) the Columbia River, (2) the Yakima River, and (3) storm-induced run-off in ephemeral streams draining the Hanford Site. No perennial streams occur in the central part of the Hanford Site.

The Federal Emergency Management Agency has not prepared floodplain maps for the Columbia River through the Hanford Site. The flow of the Columbia River is largely controlled by several upstream dams that are designed to reduce major flood flows. Based on a U.S. Army Corps of Engineers study of the flooding potential of the Columbia River that considered historic data and water storage capacity of the dams on the Columbia River (COE 1969), the U.S. Department of Energy (ERDA 1976) has estimated the probable maximum flood (Figure 2-7). The estimated probable maximum flood would have a larger floodplain than either the 100- or 500-year floods. The 616 NRDWSF is well above the elevation of the Columbia River probable maximum flood and therefore is not within the 100- or 500-year floodplain.

The 100-year floodplain for the Yakima River, as determined by the Federal Emergency Management Agency (FEMA 1980), is shown in Figure 2-8. The 616 NRDWSF is not within the floodplain.

The only other potential source of flooding of the 616 NRDWSF is run-off from a large precipitation event in the Cold Creek watershed. This event could result in flooding of the ephemeral Cold Creek. Skaggs and Walters (1981) have given an estimate of the probable maximum flood using conservative values of precipitation, infiltration, surface roughness, and

topographic features. The resulting flood area (Figure 2-9) would not affect the 616 NRDWSF. The 100-year flood would be less than the probable maximum flood.

2.3.2.1 Demonstration of Compliance [B-3b(1)]. The 616 NRDWSF is not located within a 100-year floodplain. Therefore, no demonstration of compliance is required.

2.3.2.1.1 Flood Proofing and Flood Protection Measures [B-3b(1)(a)]. The 616 NRDWSF is not located within a 100-year floodplain. Therefore, no demonstration of compliance is required.

2.3.2.1.2 Flood Plan [B-3b(1)(b)]. The 616 NRDWSF is not located within a 100-year floodplain. Therefore, no demonstration of compliance is required.

2.3.2.2 Plan for Future Compliance with Floodplain Standard [B-3b(2)]. The 616 NRDWSF is not located within a 100-year floodplain. Therefore, no demonstration of compliance is required.

2.3.3 Shoreline Standard [B-3c]

The 616 NRDWSF is not located within regulated 'shorelines of the state' or 'wetlands' as defined in the *Shoreline Management Act of 1971*. The 616 NRDWSF is located on the Hanford Site, which is owned by the U.S. Government and operated by the DOE-RL. The Hanford Site is not classified as natural, conservancy, rural, or residential.

2.3.4 Sole Source Aquifer Criteria [B-3d]

The 616 NRDWSF is not located over a 'sole source aquifer' as defined in Section 1424(e) of the *Safe Drinking Water Act of 1974*.

2.4 TRAFFIC INFORMATION [B-4]

The regional highway network traversing the Hanford Site (Washington State Highways 24 and 240 and Route 10, and that portion of Route 4S south of the Wye Barricade) and the restricted access roadways are shown in Figure 2-1.

Roadways on the Hanford Site north of the Wye Barricade and within the 300 and 400 Areas are restricted to authorized personnel. The 616 NRDWSF is located approximately 4 miles (6.4 kilometers) from the nearest roadway (Washington State Highway 240) that has unrestricted public access. Estimated traffic volumes, in vehicles per day, are shown on Figure 2-10. The majority of traffic is passenger vehicles used for commuting and conducting company business. Approximately 10 percent of the traffic volume is trucks, and these trucks are mainly delivery, construction, and maintenance vehicles.

2.4.1 Hanford Site Roadways

Figure 2-10 shows the major roads throughout the Hanford Site. These roads are classified as either primary or secondary routes. The primary routes include Routes 4N, 4S, 10, 2N, 3, 6, and 11A, as well as various avenues within each area. The primary routes are constructed of bituminous asphalt [usually 2 inches (5.1 centimeters) thick, but the thickness of the asphalt layer will vary with each road] with an underlying aggregate base in accordance with U.S. Department of Transportation requirements. The secondary routes are constructed of layers of an oil and rock mixture with an underlying aggregate base. The aggregate base consists of various types and sizes of rock found onsite. Currently, no load-bearing capacities of these roads are available; however, loads as large as 140 pounds (63.5 kilograms) per square inch have been transported without observable damage to road surfaces. All roads meet the requirements for the American Association of State Highway and Transportation Officials HS-20-44 load rating (AASHTO 1983). An HS-20-44 loading represents a two-axle tractor [front axle loading of 8,000 pounds (3,628.7 kilograms) and rear axle loading of 32,000 pounds 14,515 kilograms)] plus a single-axle trailer with a 32,000-pound (14,515-kilograms) axle loading.

2.4.2 The 616 Nonradioactive Dangerous Waste Storage Facility Roadways

The 616 NRDWSF is located approximately 200 feet (61 meters) north of Route 3 (Figure 2-2). The access road from Route 3 to the 616 NRDWSF has a graded gravel surface with an underlying aggregate base. This surface may be paved to control dust. Drawing H-13-000014 in Appendix 2A shows the 616 NRDWSF access road configuration.

2.4.3 Traffic Control Signs, Signals, and Procedures

Standard traffic control signs are used throughout the Hanford Site (e.g., hexagonal stop signs, triangular yield signs). The only traffic light in the vicinity of the 616 NRDWSF is a flashing amber warning light in front of the 609-A Fire Station on Route 3 (Figure 2-2). The light is switched to red whenever an emergency requires a rapid response from the Hanford Fire Department.

Speed limits are posted throughout the Hanford Site, and the maximum posted speed is 55 miles (88.5 kilometers) per hour on major thoroughfares. Inside the 200 East and 200 West Areas, posted speeds are reduced to a maximum of 35 miles (56.3 kilometers) per hour, and held to speeds as low as 15 miles (24.1 kilometers) per hour.

2.5 PERFORMANCE STANDARDS [B-5]

The 616 NRDWSF is designed to minimize the exposure of personnel to dangerous waste and hazardous substances and to prevent dangerous waste and hazardous substances from reaching the environment.

In addition, measures are taken to ensure that the 616 NRDWSF is maintained and operated in a manner that prevents:

- Degradation of groundwater quality
- Degradation of air quality by open burning or other activities
- Degradation of surface water quality
- Destruction or impairment of flora or fauna outside of the 616 NRDWSF
- Excessive noise
- Negative aesthetic impacts
- Unstable hillsides or soils
- Use of processes that do not treat, detoxify, recycle, reclaim, and recover waste material to the extent economically feasible
- Endangerment to the health of employees or the public near the 616 NRDWSF.

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

2.5.1 Measures to Prevent Degradation of Groundwater Quality

Degradation of groundwater quality is prevented by storing waste containers inside an enclosed concrete building on self-contained, sealed concrete pads. In addition, the 616 NRDWSF accepts only those waste packages meeting appropriate U.S. Department of Transportation requirements. Containers are opened only in areas with spill containment. The 616 NRDWSF design and administrative controls significantly reduce the possibility of loss of waste to the ground and/or contamination of the groundwater. [In the vicinity of the 616 NRDWSF, the water table ranges from about 180 to 280 feet (54.9 to 85.3 meters) below the surface.]

Each loading pad trench drain plug is kept closed and secured when not in use. The 616 NRDWSF Supervisor controls the trench key. When water (e.g., rainwater, snowmelt) from a known source has accumulated in either of the loading pad trenches, it is released to the ground via the french drain (Figure 2-6). Before the liquid is released, the following is performed.

1. Liquid is visually inspected for signs of contamination.
2. Daily inspection reports and the 616 NRDWSF logbook are reviewed to identify any spills on the pad.
3. Cleanup reports are reviewed to verify that the pad is clean (Section 2.7.2.1).

4. The 616 NRDWSF Supervisor contacts Solid Waste Engineering and reviews steps 1 through 3 above. Solid Waste Engineering gives concurrence.

5. The 616 NRDWSF Supervisor signs the logbook indicating that the above steps have been completed and that the pad is clean (Section 2.7.2.1). The Solid Waste Engineering contact is noted in the logbook.

6. The 616 NRDWSF Supervisor unlocks the drain plug.

7. After the trench has completely drained, the 616 NRDWSF Supervisor locks the drain plug closed.

8. The 616 NRDWSF Supervisor signs the logbook indicating that the trench was drained and the drain plug was closed and secured.

Water that has accumulated in the loading pad trenches that cannot be verified to be free of contamination is containerized and stored in an area of the 616 NRDWSF that is equipped with secondary containment (Chapter 4.0, Section 4.1.1.8). The containerized water is handled in accordance with the provisions of the waste analysis plan described in Chapter 3.0, Section 3.2.

2.5.2 Measures to Prevent Degradation of Air Quality by Open Burning or Other Activities

No open burning occurs at the 616 NRDWSF to degrade air quality. Vegetation around the 616 NRDWSF has been removed within 25 feet (7.6 meters) of the storage building and the soil has been compacted, thereby reducing the risk of a fire or wind erosion near the 616 NRDWSF. Combustible waste and flammable waste are packaged in a manner that reduces the potential for fire.

2.5.3 Measures to Prevent Degradation of Surface Water Quality

The potential for degradation of surface water is extremely low because there is no natural surface water near the 616 NRDWSF. The Columbia River is approximately 10 miles (16.1 kilometers) from the 616 NRDWSF and Cold Creek (ephemeral) is approximately 4 miles (6.4 kilometers) from the 616 NRDWSF. Rainwater soaks into the sandy soil rather than flowing on the soil surface. Small pools can be observed after rapid snowmelt, but these usually dissipate within 72 hours. In addition, waste packages are handled on loading pads with sealed concrete containment systems.

2.5.4 Measures to Prevent Destruction or Impairment of Flora or Fauna Outside of the Storage Unit

The 616 NRDWSF activities associated with dangerous waste storage do not appear to have altered the flora and fauna outside the storage building for the 5 years the 616 NRDWSF has been in operation. Because the 616 NRDWSF only

stores waste packages and these packages are not opened during normal operations (abnormal operations include a leaking waste package requiring transfer to a new package), there is no impact on the flora or fauna outside the 616 NRDWSF.

2.5.5 Measures to Prevent Excessive Noise

During normal operations, excessive noise is not generated. The 616 NRDWSF also is located away from residential and industrial areas. Any noise generated is heard only by the 616 NRDWSF personnel and the Hanford Fire Department personnel in the 609-A Fire Station (Figure 2-2).

2.5.6 Measures to Prevent Negative Aesthetic Impacts

The 616 NRDWSF does not injure or destroy the surrounding flora and fauna. The 616 NRDWSF stores waste in U.S. Department of Transportation-approved containers within the confines of the storage building. The storage building is fairly new (constructed in 1986) with an exterior that complements the surrounding terrain. For these reasons, the 616 NRDWSF presents no negative aesthetic impacts.

2.5.7 Measures to Prevent Unstable Hillsides or Soils

There are no naturally unstable hillsides or soils near the 616 NRDWSF. The soil beneath and around the storage unit was compacted with a mechanical tamper before construction activities commenced. After each pass, a sample was taken and analyzed for depth of lift, percent moisture, pounds per cubic foot - dry, maximum density, and percent compaction. When the percent compaction reached or exceeded 95 percent, the soil compaction was accepted. Details of the soil compaction process are included in the construction specification provided in Appendix 4A.

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

The 616 NRDWSF is a storage building only. Under normal operating conditions, no waste is treated, detoxified, recycled, reclaimed, or recovered in any manner at the 616 NRDWSF. Therefore, this requirement is not applicable to the 616 NRDWSF.

2.5.9 Measures to Prevent Endangerment to the Health of Employees or the Public Near the Storage Unit

The 616 NRDWSF is isolated from the general public [approximately 25 miles (40.2 kilometers) from the nearest population center, Richland, Washington]. Employee and public protection is enhanced further by

administrative controls over the designation, packaging, loading, transporting, and storing of dangerous waste. Each generating unit must receive written approval for the type, quantity, and packaging of the waste before being handled at the 616 NRDWSF.

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

A contingency plan, consisting of a building emergency plan and emergency response procedures, is in place. This plan is implemented for spill prevention and containment, and provides countermeasures to reduce safety and health hazards to employees, the environment, and the public. The contingency plan is described in Chapter 7.0.

2.6 BUFFER MONITORING ZONES [B-6]

Requirements for buffer monitoring zones have been deleted from WAC-173-303-440. Therefore, no discussion of the checklist items under buffer monitoring zones [B6] will be included in this permit application.

2.7 SPILLS AND DISCHARGES INTO THE ENVIRONMENT [B-7]

The procedures that are followed to ensure immediate response to a nonpermitted spill or discharge of dangerous waste from the 616 NRDWSF to the environment are detailed in the Building Emergency Plan - 616 Building provided in Appendix 7A.

2.7.1 Notification [B-7a]

The following are details of notification of the DOE-RL, Ecology, and the National Response Center.

- The building emergency director or line management documents all emergencies on an occurrence report (Figure 2-11), which must be completed within 24 hours. The occurrence report is used to provide management with facts about an unplanned event and to disseminate information to those responsible for preventing recurrence of similar events. The DOE-RL is notified by either line management or the assigned overview organization, depending on the consequences of the event. Copies of the occurrence reports are retained at the 616 NRDWSF.

- All detectable spills to the environment and/or the atmosphere will be reported immediately to the Occurrence Notification Center. The Occurrence Notification Center notifies Ecology of the release of dangerous waste.

- Upon detection, immediate notification will be made to Ecology at (509) 546-2977 of all spills as required under applicable regulations.

- In addition, if a spill exceeds the reportable quantities established under *Comprehensive Environmental Response, Compensation, and Liability Act* (CERCLA) *of 1980*, according to 40 CFR 302, the Occurrence Notification Center will notify the National Response Center 800-424-8802.

- The report to Ecology and the National Response Center will contain the following information:

  - Name and telephone number of reporter
  - Name and location of waste unit or zone
  - Time and type of incident
  - Name and quantity of material(s) involved to the extent known
  - Extent of injuries if any
  - Possible hazards to human health and the environment outside the Hanford Facility boundary.

- All detectable releases of dangerous waste, including those that do not exceed a CERCLA limit, are reported to the Hanford Fire Department and the contractor's environmental protection organization. The contractor's environmental protection organization compiles a report for submittal to the DOE-RL. The reports are kept on file at the 616 NRDWSF and are available for review by the appropriate regulatory agencies. The DOE-RL submits the report to the following address:

  Washington State Department of Ecology
  7601 West Clearwater, Suite 102
  Kennewick, WA 99336
  Phone: 509-546-2990.

- All detectable spills or releases that occur during transportation by an independent transporter (i.e., transporter with their own EPA/State identification number) will be reported by the transporter to the Occurrence Notification Center, the DOE-RL, and Ecology. In addition, a written report will be submitted to the following address:

  Director, Office of Hazardous Material Regulations
  Materials Transport Bureau
  Department of Transportation
  Washington, D.C. 20990.

2.7.2 Mitigation and Control [B-7b]

Actions taken to protect human health and the environment in the event of a nonpermitted spill or discharge are detailed in the Building Emergency Plan - 616 Building provided in Appendix 7A. A discussion of the most likely types of spills or discharges to occur at the 616 NRDWSF is included in the Building Emergency Plan - 616 Building.

2.7.2.1 Cleanup of Released Wastes or Substances [B-7b(1)]. Actions to be taken to clean up all released hazardous/dangerous waste or hazardous substances and the criteria used to determine the extent of removal are addressed in contingency plan documents noted in Chapter 7.0.

2.7.2.2 Management of Contaminated Soil, Waters, or Other Materials [B-7b(2)]. Actions to be taken to demonstrate that all soil, waters, or other materials contaminated by a spill or discharge will be treated, stored, or disposed of in accordance with WAC 173-303 are addressed in contingency plan documents noted in Chapter 7.0.

2.7.2.3 Restoration of Impacted Area [B-7b(3)]. Because of the remote location of the 616 NRDWSF [near the center of the DOE-RL managed Hanford Facility (Figure 2-1)], spills or discharges occurring on property that is not owned by the U.S. Government are unlikely. Therefore, a description of the actions to be taken to restore the impacted area and to replenish resources is not required.

2.8 MANIFEST SYSTEM [B-8]

The Hanford Facility uses an EPA Uniform Hazardous Waste Manifest for all offsite shipments of dangerous waste. Onsite waste tracking forms are voluntarily used for transporting waste on the Hanford Facility.

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

2.8.1 Procedures for Receiving Shipments [B-8a]

Before shipment of nonradioactive dangerous waste to the 616 NRDWSF, the following occurs (Chapter 3.0, Section 3.2).

- The generating unit secures the waste in a controlled, less-than-90-day-storage area.
- If the contents of the container cannot be verified, the waste coordinator for the generating unit (Chapter 3.0, Section 3.2) identifies the waste from associated manufacturer's data, waste records, or sample analysis.
- The waste coordinator for the generating unit submits a waste storage/disposal request (Chapter 3.0, Section 3.2) to Solid Waste Engineering.
- A trained designator in Solid Waste Engineering identifies the proper waste designation.
- The completed waste designation is reviewed and signed by a peer designator and a Solid Waste Engineering manager.

- Solid Waste Engineering sends a hazardous waste disposal analysis record (Chapter 3.0, Section 3.2) to the generating unit's waste coordinator, the 616 NRDWSF, the Transportation Logistics group, and the Solid Waste Disposal group.

- The generating unit's waste coordinator ensures that the dangerous waste is packaged, marked, and labeled in accordance with the hazardous waste disposal analysis record.

- The generating unit's waste coordinator prepares an onsite waste tracking form. The onsite waste tracking form identifies the applicable contractor as the transporter and the 616 NRDWSF as the receiving storage unit.

- Transportation Logistics personnel inspect the containers for compliance with U.S. Department of Transportation regulations and the hazardous waste disposal analysis record.

- Solid Waste Disposal personnel transport the dangerous waste from the generating unit to the 616 NRDWSF.

Before a shipment is accepted at the 616 NRDWSF, each container is reviewed against the onsite waste tracking form and the hazardous waste disposal analysis record. During the review, the following items are checked:

- Proper shipping name

- Proper hazard class

- Proper marking and labeling

- Valid radiation release sticker in place [except for exempted facilities (Appendix 3A)]

- Proper packaging (e.g., correct specification container)

- Container condition.

If the container passes these checks, the container is placed in the appropriate storage cell (Chapter 4.0, Section 4.1.1.2 and Chapter 6.0, Section 6.4.1). The acceptance procedure also ensures the following occurs.

- Significant discrepancies are noted on all copies of the waste tracking form.

- The transporter is given one signed copy of the waste tracking form.

- A copy of the waste tracking form is sent to the generating unit within 30 days of receipt.

- A copy of the waste tracking form is retained for at least 5 years by the 616 NRDWSF and Solid Waste Engineering.

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All dangerous waste stored at the 616 NRDWSF is shipped offsite for treatment, storage, and/or disposal. Before shipment offsite, all waste is manifested to comply with U.S. Department of Transportation, EPA, WAC, and other applicable regulations.

2.8.2 Response to Significant Discrepancies [B-8b]

The primary concern during acceptance of containers for storage is improper packaging or waste tracking form discrepancies. Depending on the nature of the condition, such discrepancies can be resolved through the use of one or more of the following alternatives.

- Incorrect or incomplete entries on waste tracking forms can be corrected or completed with concurrence of the generating unit's waste coordinator and the Solid Waste Engineering staff. Corrections are made by drawing a single line through the incorrect entry. Corrected entries are initialed and dated by the individual making the correction.

- The waste packages can be held and the generating unit's waste coordinator requested to provide written instructions for use in correcting conditions before the waste is accepted.

- The generating unit's waste coordinator can be requested to correct the condition before the waste is accepted.

Waste tracking form discrepancies are considered resolved when all parties are satisfied with the designation and packaging. To prevent any problems that could occur during transportation back to generating units, all waste tracking form discrepancies are resolved at the 616 NRDWSF.

2.8.3 Provisions for Nonacceptance of Shipment [B-8c]

Provisions for nonacceptance of shipments are discussed in the following sections. Waste from offsite sources is not accepted at the 616 NRDWSF.

2.8.3.1 Nonacceptance of Undamaged Shipment [B-8c(1)]. Shipments of materials that the 616 NRDWSF is not designed to store [explosives, class IV oxidizers greater than 10 pounds (4.5 kilograms), and waste without proper radiation releases] are rejected. All other types of discrepancies are resolved at the 616 NRDWSF before further transportation.

2.8.3.2 Activation of Contingency Plan for Damaged Shipment [B-8c(2)]. If a shipment arrives in a condition as to present a hazard to public health or the environment in the process of further transportation, the contingency plan is implemented. The contingency plan is described in the Building Emergency Plan - 616 Building provided in Appendix 7A.

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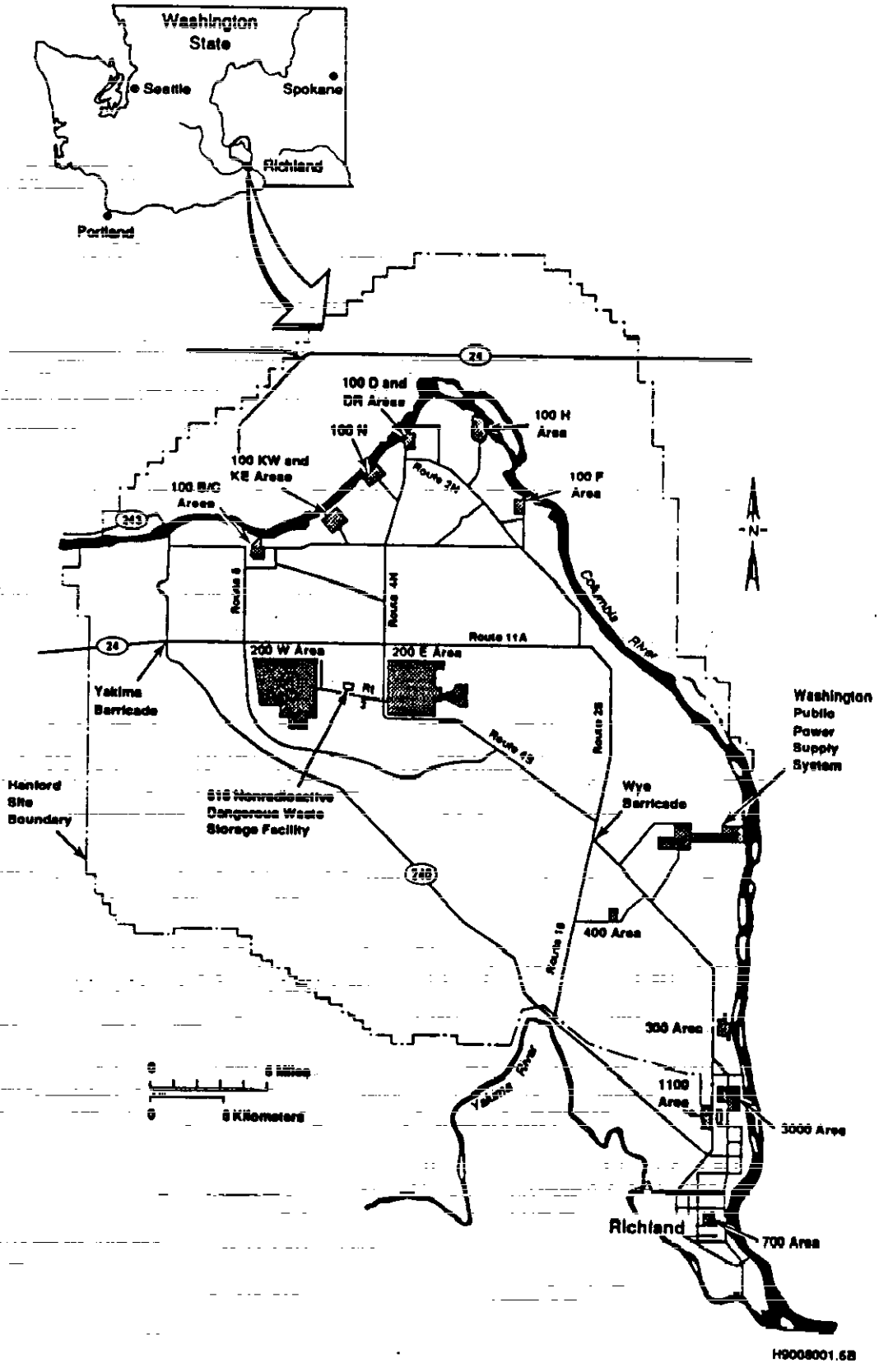

Figure 2-1. Hanford Site Map.

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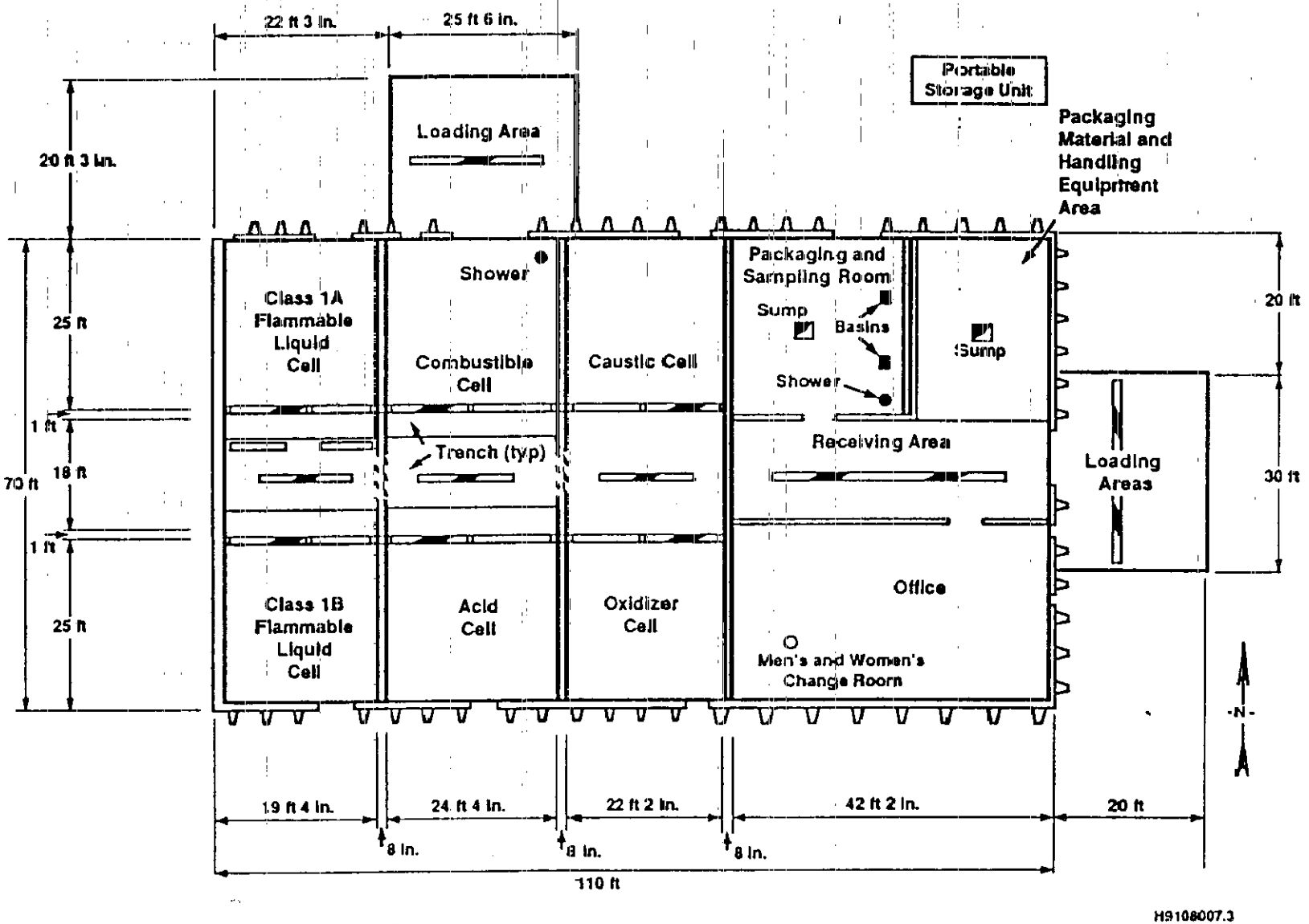

Figure 2-3. The 616 Nonradioactive Dangerous Waste Storage Facility Floor Plan.

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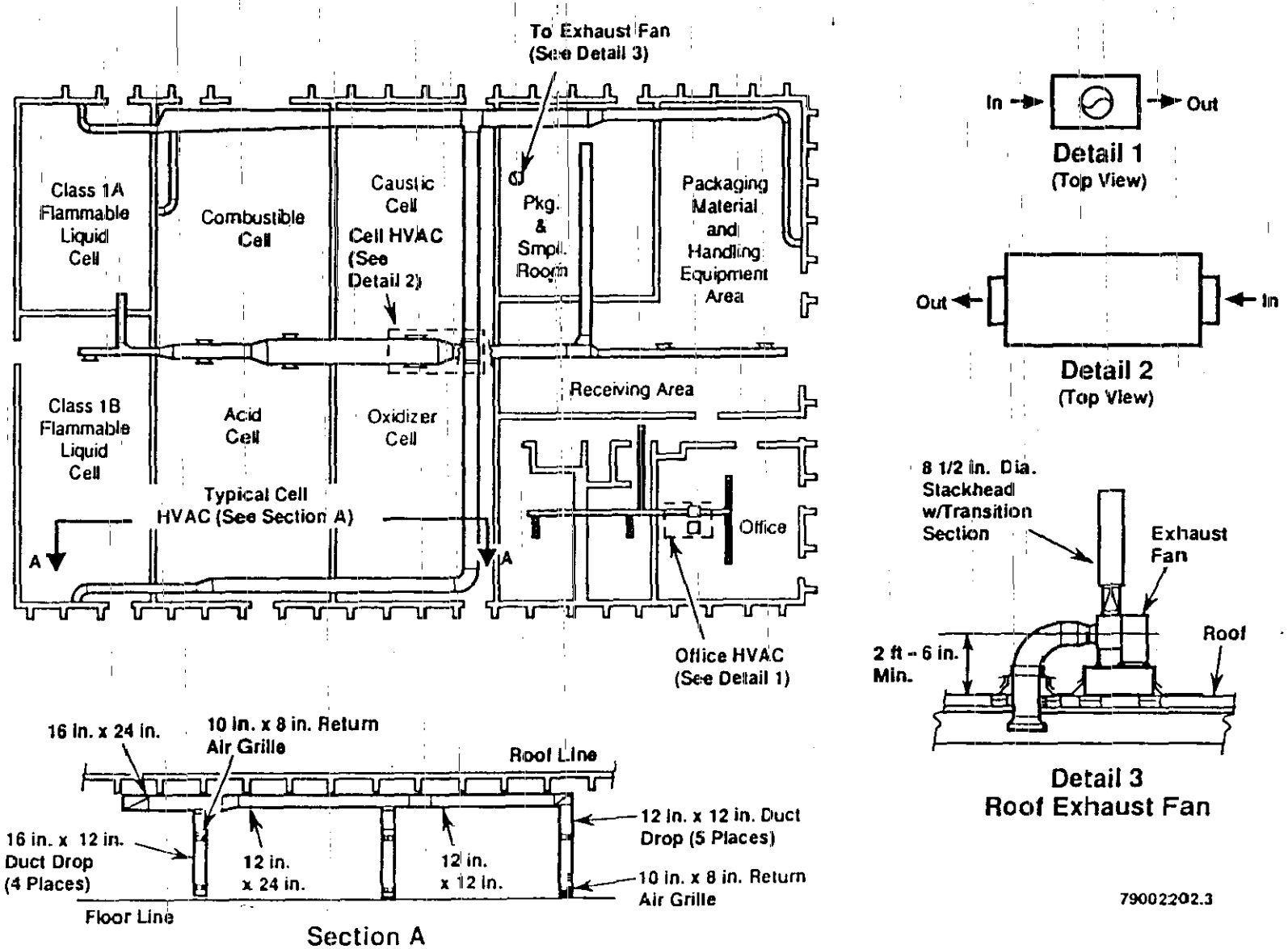
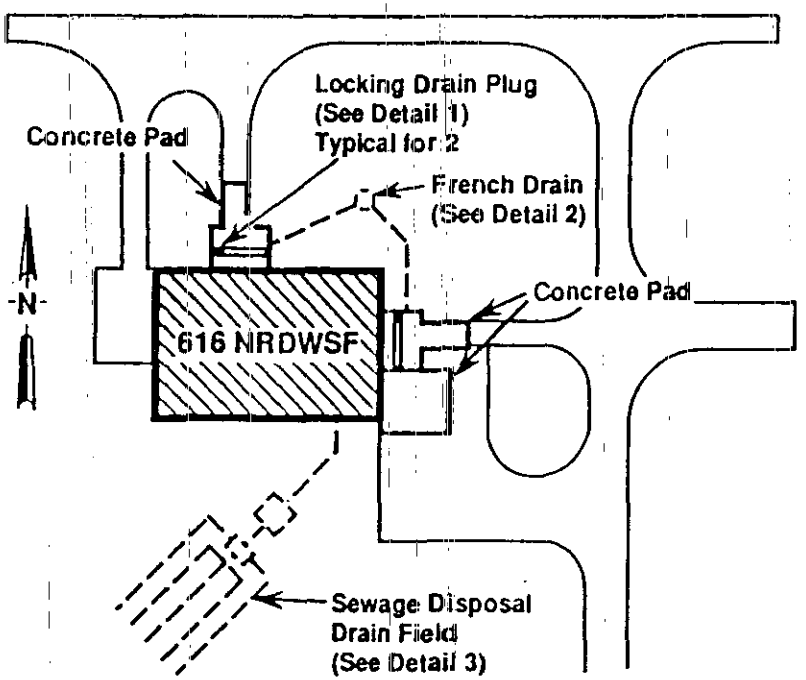


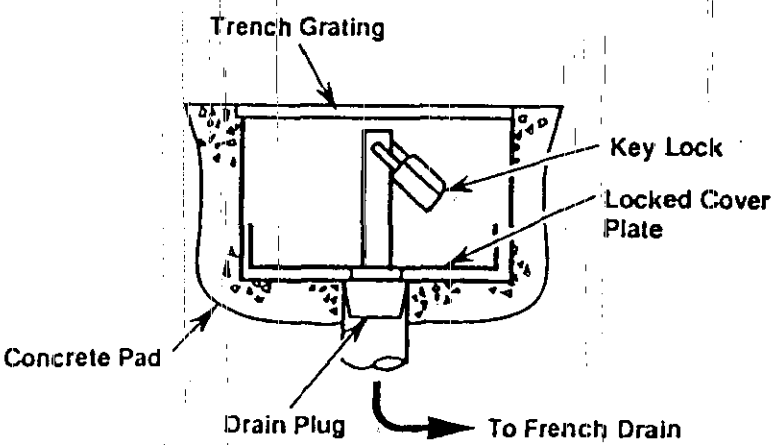
Figure 2-4. The 616 Nonradioactive Dangerous Waste Storage Facility Heating, Ventilation, and Air Conditioning Schematic.

Storage area	Primary storage	Secondary storage	Prohibited storage
Flammable 1A	Flammable gas Flammable liquid-1A Flammable solid	Nonflammable gas Flammable gas Combustible liquid Irritating material ORM-A,B,C,D,E Non-RCRA waste liquids Non-RCRA waste solids Flammable liquid-1B	Poison A Corrosive material (acid) Corrosive Material (caustic) Flammable solid-DWW
Flammable 1B	Nonflammable gas Flammable liquid-1B Flammable solid	Combustible liquid Irritating material ORM-A,B,C,D,E Non-RCRA waste liquids Non-RCRA waste solids	Poison A 1A flammable liquid Corrosive material (acid) Corrosive material (caustic) Flammable solid-DWW
Flammable 1A cabinet	Flammable solid-DWW	Flammable liquid-1A&1B Flammable solid	Poison A Corrosive material (acid) Corrosive material (caustic) Non-RCRA waste liquids
Flammable 1B cabinet	Flammable solid-DWW	Flammable liquid-1B Flammable solid	Poison A Corrosive material (acid) Corrosive material (caustic) Non-RCRA Waste liquids
Acid	Poison B Corrosive material (acid) Irritating material ORM-A,B,C,D,E Non-RCRA waste solids	Nonflammable gas Combustible liquid Non-RCRA waste liquids	Poison A Flammable solid-DWW Flammable gas Flammable liquid Flammable solid Oxidizer Organic peroxide Corrosive material (caustic)
Caustic	Corrosive material (caustic) Irritating material ORM-A,B,C,D,E Non-RCRA waste solids	Nonflammable gas Combustible liquid Poison B Non-RCRA waste liquids	Poison A Flammable Solid-DWW Flammable gas Flammable liquid Flammable solid Oxidizer Organic peroxide Corrosive material (acid)
Combustible	Poison A Combustible liquid Poison B Irritating material ORM-A,B,C,D,E Non-RCRA waste liquids Non-RCRA waste solids	Nonflammable gas Flammable solid	Flammable solid-DWW Flammable gas Flammable liquid Corrosive material (acid) Corrosive material (caustic)
Oxidizer	Oxidizer Organic peroxide Irritating material ORM-A,B,C,D,E Non-RCRA waste liquids Non-RCRA waste solids	Nonflammable gas Combustible liquid Poison B	Poison A Flammable solid-DWW Flammable gas Flammable liquid Corrosive material (acid) Corrosive material (caustic)
Packaging and sampling room		Combustible liquid Irritating material ORM-A,B,C,D,E Non-RCRA waste liquids Non-RCRA waste solids	Flammable gas Flammable liquid Flammable solid-DWW corrosive material (acid) corrosive material (caustic)

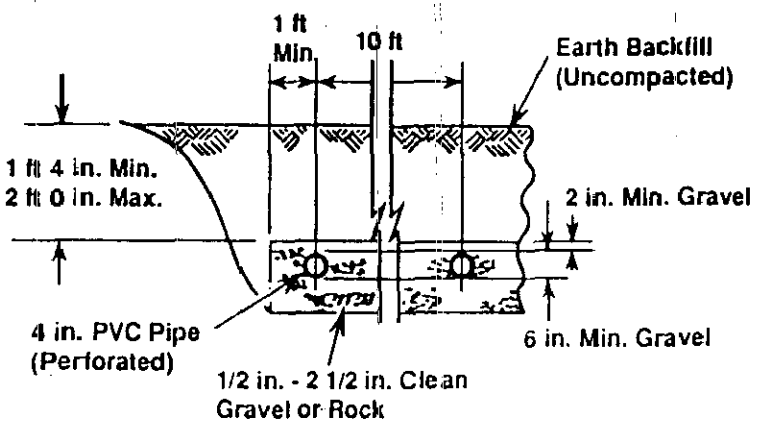
*DWW = Dangerous when wet

Figure 2-5. Waste Storage Compatibility by Hazard Class.

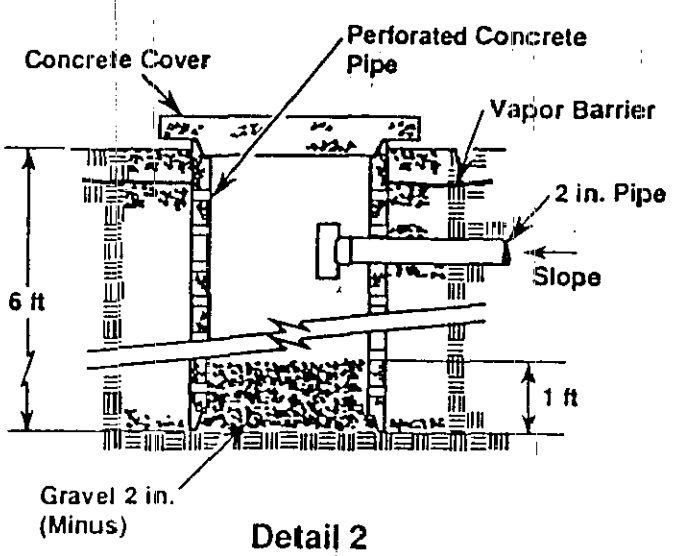




Detail 1
Locking Drain Plug



Detail 3
Sewage Disposal Drain Field



Detail 2
French Drain

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Figure 2-6. Diagram of French Drain.

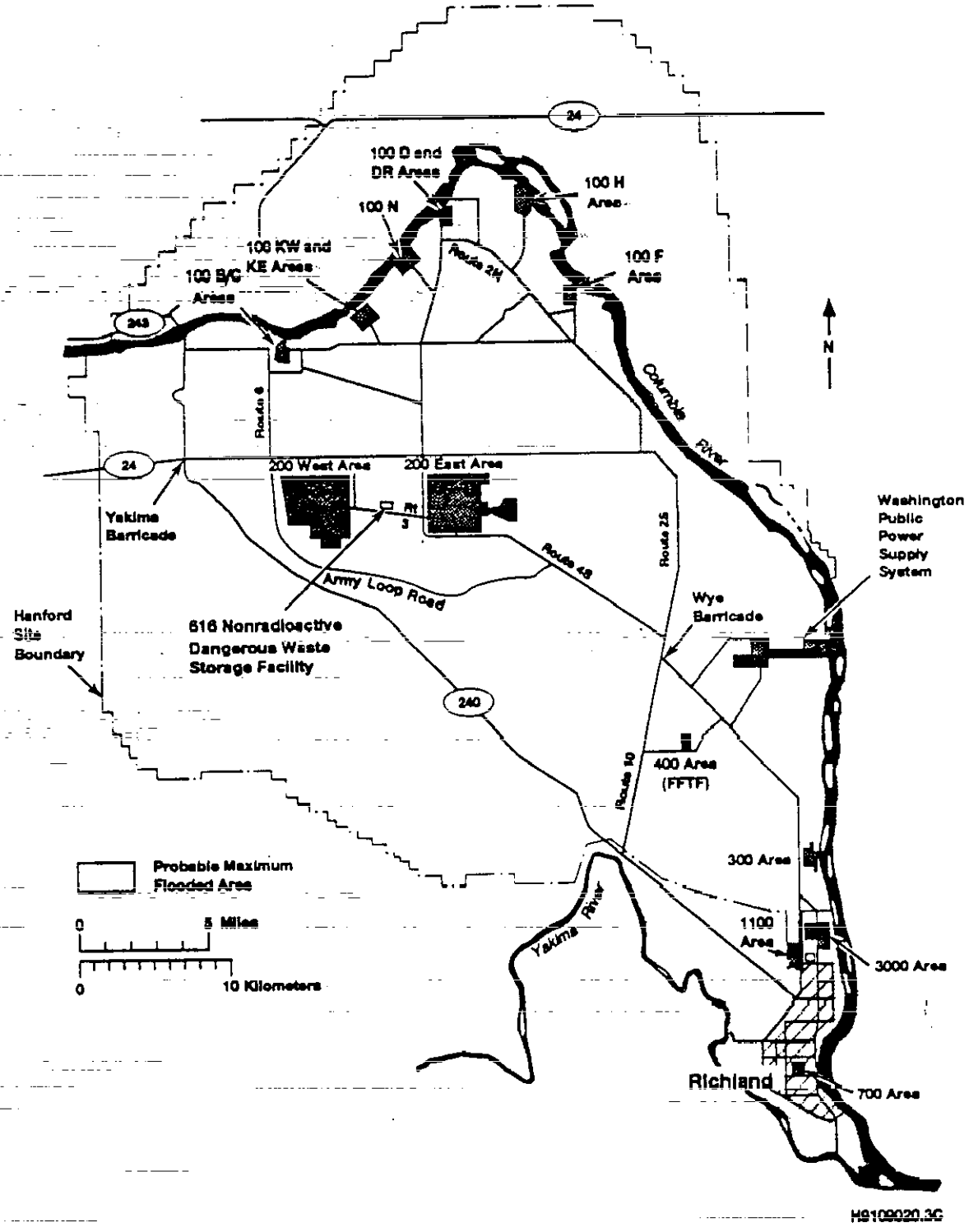

Figure 2-7. Columbia River Floodplain (probable maximum flood).

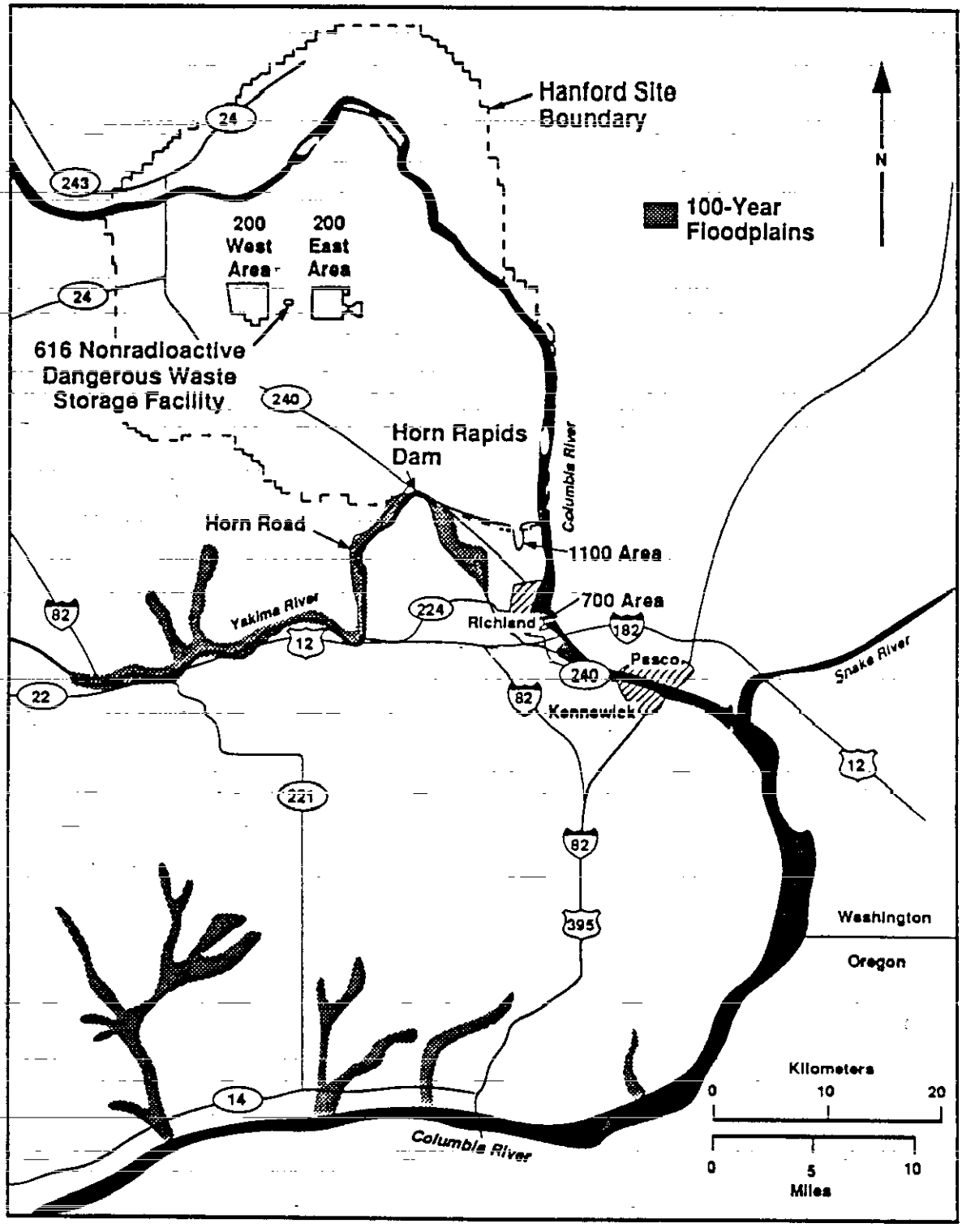

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Figure 2-8. Yakima River Floodplain.

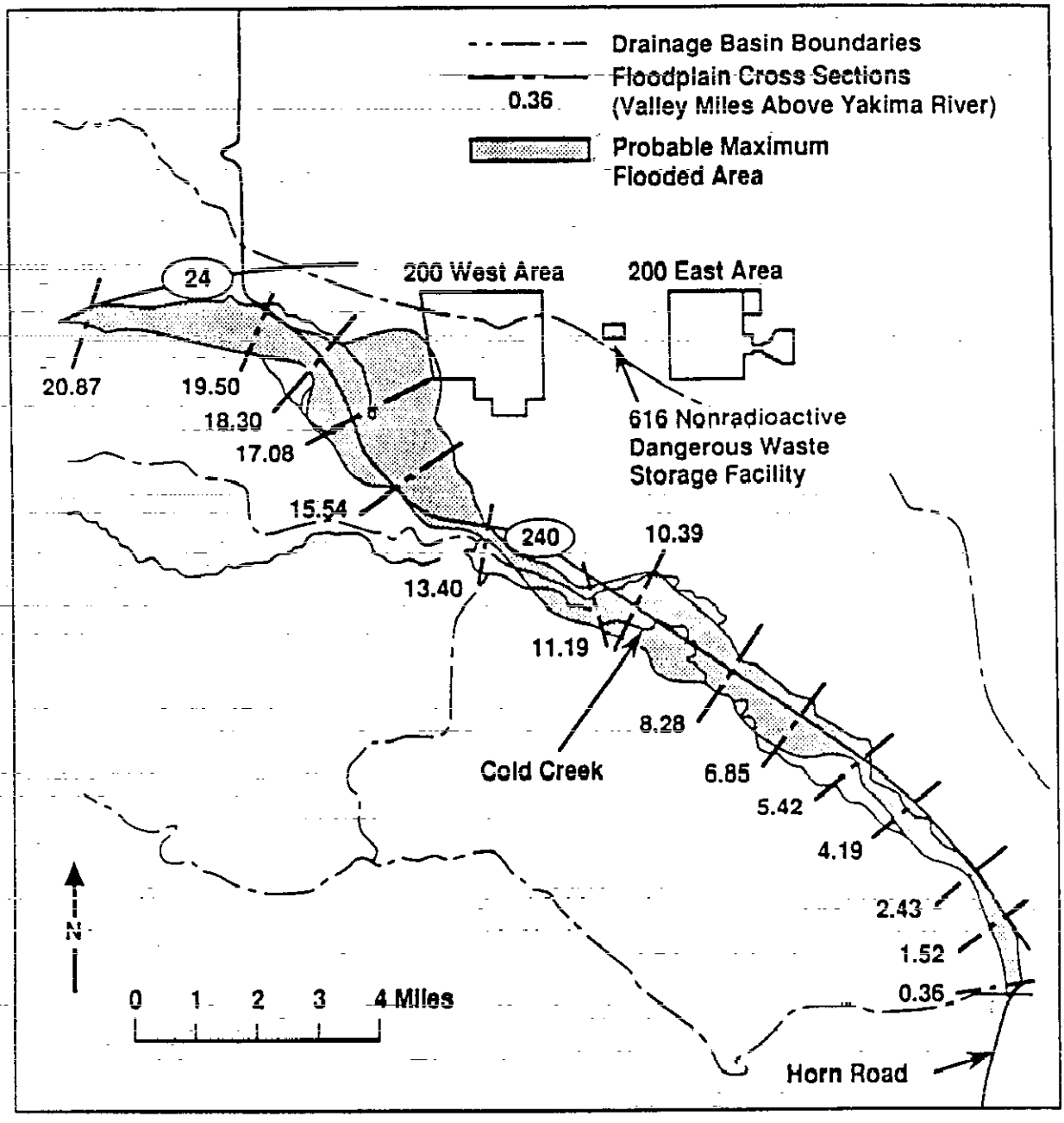

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Figure 2-9. Cold Creek Watershed Floodplain (probable maximum flood).

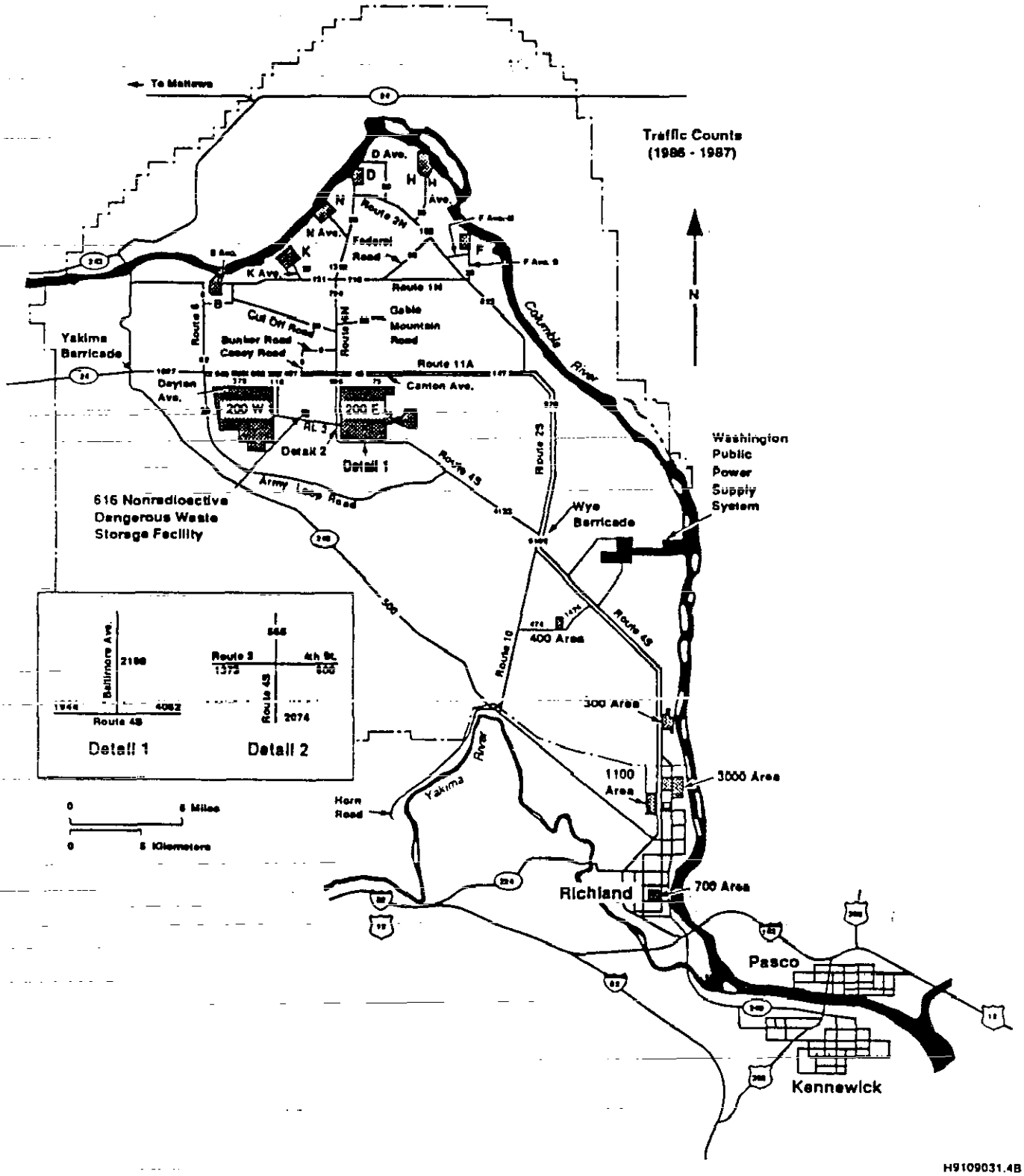

Figure 2-10. Estimated Traffic Volumes (vehicles per day).

(Name of Facility)

Balance of Plant
(Facility Function Involved)

(Name of Laboratory Site or Organization)

(Facility Manager/Designee) (Org. Code)

(Job Title) (Phone No.)

(Originator) (Title)

(Organization) (Phone No.)

3. OCCURRENCE CATEGORY: []

4. CONTRACTOR DIVISION OR PROJECT: []

5. DOE PROGRAM OFFICE: []

6. SYSTEM, BLDG., OR EQUIPMENT: 7. UNCI:8. PLANT AREA

9. DATE AND TIME DISCOVERED:
10. DATE AND TIME CATEGORIZED:

	DATE	TIME	PERSON NOTIFIED	ORG.
11. DOE-HQ NOTIFICATIONS:				
12. OTHER NOTIFICATIONS:				

13. SUBJECT OR TITLE OF OCCURRENCE:

14. NATURE OF OCCURRENCE: []

15. DESCRIPTION OF OCCURRENCE:

16. OPERATING CONDITIONS OF FACILITY AT TIME OF OCCURRENCE:

Figure 2-11. Typical Occurrence Report. (sheet 1 of 4)

17. ACTIVITY CATEGORY: []

18. IMMEDIATE ACTIONS TAKEN AND RESULTS:

END OF NOTIFICATION REPORT

19. DIRECT CAUSE: []
20. CONTRIBUTING CAUSE(S): []
21. ROOT CAUSE: []

22. DESCRIPTION OF CAUSE:

23. EVALUATION: (By Facility Manager/Designee)

24. IS FURTHER EVALUATION REQUIRED? [] Yes [] No
IF YES, BEFORE FURTHER OPERATION? [] Yes [] No
BY WHOM:
BY WHEN:

25. CORRECTIVE ACTIONS:

TARGET COMPLETION DATE: COMPLETION DATE:

26. IMPACT ON ENVIRONMENT, SAFETY AND HEALTH:

27. PROGRAMMATIC IMPACT:

28. IMPACT UPON CODES AND STANDARDS:

29. FINAL EVALUATIONS AND LESSONS LEARNED:

30. SIMILAR OCCURRENCE REPORT NUMBERS:

Figure 2-11. Typical Occurrence Report. (sheet 2 of 4)

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31. DOE FACILITY REPRESENTATIVE INPUT:

32. DOE FACILITY REPRESENTATIVE NAME AND POSITION:

APPROVED BY: _____
Balance of Plant Facility Manager Signature Approval required for all 10-Day and 10-Day Update Reports.

END OF PART I

Figure 2-11. Typical Occurrence Report. (sheet 3 of 4)

PART II

OCCURRENCE REPORT NUMBER:

33. QUEST SUBJECT CODE:

34. QUEST CONTRIBUTING FACTOR CODE:

35. QUEST ROOT CAUSE CODE:

36. PRIORITY/SEVERITY CATEGORY:

37. FACILITY MANAGERS ORGANIZATION CODE:

38. SIGNATURES:

Approved by: _____ Date: _____
Facility Manager

Reviewed by: _____ Date: _____
Impacted Oversight Organization

Reviewed by: _____ Date: _____
Impacted Oversight Organization

Reviewed by: _____ Date: _____
Impacted Oversight Organization

Reviewed by: _____ Date: _____
ADC/UCNI

PART I

OCCURRENCE REPORT

Facility/Personnel Information

1. OCCURRENCE REPORT NUMBER:

2. REPORT TYPE AND DATE: DATE TIME

[] Notification Report
[] 10-Day Report
[] Latest 10 Day Update
[] Final

Figure 2-11. Typical Occurrence Report. (sheet 4 of 4)

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4.0 PROCESS INFORMATION [D]

This chapter discusses the processes used to store containers at the 616 NRDWSF.

4.1 CONTAINERS [D-1]

The following sections describe the type of containers stored at the 616 NRDWSF. The construction specification for this storage unit is provided in Appendix 4A.

4.1.1 Containers with Free Liquids [D-1a]

Containers with free liquid are discussed in the following sections.

4.1.1.1 Description of Containers [D-1a(1)]. The 616 NRDWSF only accepts waste properly packaged in U.S. Department of Transportation-approved containers. These containers are chosen in accordance with pertinent regulations and are approved for that waste. Table 4-1 lists the most common types of containers [and applicable U.S. Department of Transportation specifications (49 CFR 178)] stored at the 616 NRDWSF.

All containers stored at the 616 NRDWSF are in an acceptable condition for each waste type (Chapter 2.0, Section 2.8.1). Because no containers are reconditioned on the Hanford Facility, there are no reconditioned containers at the 616 NRDWSF.

All waste containers received at the 616 NRDWSF are marked and labeled in accordance with the requirements specified under U.S. Department of Transportation regulations (49 CFR 172). Solid Waste Engineering specifies marking and labeling requirements on the hazardous waste disposal analysis record (Chapter 3.0, Section 3.2). In addition to the U.S. Department of Transportation marking and labeling requirements, all waste containers are marked as follows:

- 'PERSISTENT' - If a WP01, WP02, or WP03 waste code is applicable
- 'TOXIC' - If a WT01 or WT02 waste code is applicable
- 'CARCINOGENIC' - If a WC01 or WC02 waste code is applicable.

4.1.1.2 Container Management Practices [D-1a(2)]. The 616 NRDWSF is designed with two different types of cells: regular storage and flammable liquid storage (Chapter 2.0, Figure 2-3). The details for each cell are provided in Table 4-2.

Before being accepted at the 616 NRDWSF for storage, each container is inspected (Chapter 2.0, Section 2.8.1) for the following:

- Container condition
- Container seal
- Proper marking and labeling
- Valid radiological release.

On being accepted for storage at the 616 NRDWSF, containers are unloaded in accordance with the requirements of Chapter 6.0, Section 6.4.1, and moved to the proper storage cell as described on the hazardous waste disposal analysis record (Chapter 3.0, Section 3.2). The containers are moved on drum dollies or by a pallet jack or by a forklift if pallatized (the forklift is prohibited from operating in the Class 1-A flammable liquid cell). The containers are placed in the assigned storage cell, with the containers being placed in one of the storage locations painted on the cell floor (Chapter 6.0, Figure 6-3 provides storage locations). The location of the container is logged on a locator chart and input into the 616 NRDWSF waste tracking system. This system identifies the location of each container stored in the 616 NRDWSF. Waste packages can be stacked in any storage cell. Table 4-3 identifies the stacking restrictions for each cell.

The containers can be stacked either by hand or machine (e.g., forklift). Containers stacked by hand are placed next to the containers on which the containers are to be stacked. The container is lifted and placed onto the base container, taking care not to damage either container. The 616 NRDWSF Supervisor is responsible for ensuring that all lifts are done in accordance with applicable safety requirements. No personnel are allowed to lift a waste container in a manner that jeopardizes them or other personnel. As a guideline, hand stacking weight limits do not exceed 65 pounds (29.5 kilograms) per male employee and 45 pounds (20.4 kilograms) per female employee.

The lifting of containers having a gross weight that exceeds the weight limit identified for an individual can be stacked by two employees or by mechanical means. Containers having a gross weight exceeding 130 pounds (59.1 kilograms) must be stacked by mechanical means. Mechanically stacked containers must be placed on a pallet or similar dunnage to properly distribute the load to base containers. Containers stacked using pallets always will have four base containers of the same height under them.

Containers are closed during normal operations and are not handled or stored in a manner that might damage the packaging. The containers are inspected daily (when the storage unit is occupied) for degradation and leakage. Activities restricted to the office area do not require a daily inspection of the storage area, provided the ventilation system is fully operational. Solid Waste Engineering performs a weekly audit inspection of the 616 NRDWSF and its waste inventory, regardless of occupation (Chapter 6.0, Section 6.2.1.2).

In preparation for shipment of waste from the 616 NRDWSF to an offsite TSD facility, Solid Waste Engineering identifies containers for shipment from the 616 NRDWSF inventory tracking system. A completed offsite manifest and a list of waste proposed for shipment are transmitted to Transportation Logistics personnel and a contracted offsite TSD facility for review. Review comments are dispositioned to the satisfaction of all parties. The 616 NRDWSF personnel mark the containers with the offsite manifest number (provided by Solid Waste Engineering). Solid Waste Engineering prepares a letter that accompanies the waste shipment addressing the land disposal restriction; documentation requirements are identified in Chapter 12.0, Section 12.4.2.2.7.

Before shipment, each container is inspected and reviewed by two Transportation Logistics representatives for proper designation, packaging, marking, and labeling. Two representatives from Solid Waste Disposal perform an independent review of the shipping documentation (i.e., offsite manifest, product information sheets). Both a Solid Waste Engineering representative and the 616 NRDWSF Supervisor review each package before the package is loaded on the truck for offsite shipment.

4.1.1.3 Secondary Containment System Design and Operation [D-1a(3)]. The design of the secondary containment system is shown in Figure 4-1 and in Appendix 4B. Secondary containment consists of three main components. First, each cell consists of a sealed concrete pad, which is sloped to containment trenches. Second, there are three containment trenches between adjacent cells, one for each cell and one in the walkway between the cells. Third, each cell is surrounded by a curb for additional containment. This curb varies from 2 to 4 inches (5.1 to 10.2 centimeters) in height as the level of the cell floor varies.

4.1.1.4 Requirement for Base or Liner to Contain Liquids [D-1a(3)(a)]. The floor and trenches in the storage and container handling areas are constructed of reinforced concrete. Concrete was selected as a construction material because concrete is essentially inert and inhibits downward permeation of liquid caustic, oxidizing, combustible, and flammable materials. Additionally, the concrete floor surface has been sealed with Aquapon*, a polyamide epoxy resin that, when cured, has properties similar to glass. Aquapon base finish coatings were selected because of the capability of the coatings to resist abrasion, extreme environmental conditions, and a wide variety of chemical exposures (Appendix 4D). The application of additional and/or alternate sealants was determined to be unnecessary because of the limited potential for adverse chemical exposure to the 616 NRDWSF storage areas.

The design of the floor in the storage and container handling areas consists of concrete slabs (seamless) sloped to dedicated collection trenches (Figure 4-1 and Appendix 4B). All interior trenches are self-contained (without drains). Each storage cell is surrounded by a curb varying in height from 2 to 4 inches (5.1 to 10.2 centimeters), which would provide additional containment in the event of a large spill.

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*Aquapon is a trademark of PPG Industries, Inc.

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If a crack that compromises the integrity of the concrete containment system of a storage cell is found, the crack is prepared, grouted, and sealed in accordance with the Project B-526 Construction Specification (Appendix 4A) and the repair material manufacturer's instructions. Significant cracks in the floor surface of the containment cells are repaired within 14 days of detection. Significant cracks in the storage cell containment trenches are repaired within 5 working days of detection. If crack repairs cannot be completed within the specified time periods, liquid waste storage in the affected areas is suspended until repairs are completed.

After repair completion, the 616 NRDWSF Supervisor and a Solid Waste Engineering representative inspect the repair to ensure acceptability. The supervisor and the Solid Waste Engineering representative sign the 616 NRDWSF logbook indicating acceptance of the repair. The logbook is maintained for the life of the 616 NRDWSF.

4.1.1.5 Containment System Drainage [D-1a(3)(b)]. Each storage cell consists of a concrete slab sloped to a self-contained containment trench (Section 4.1.1.4).

4.1.1.6 Containment System Capacity [D-1a(3)(c)]. Each storage cell is designed to contain over 10 percent of the total volume of containers that can be stored there. Each cell is designed with a sloping floor that drains to a containment trench (Figure 4-1 and Appendix 4B). Table 4-4 lists the total containment volume and maximum container storage volume per cell. Calculations performed to verify containment capacity are detailed in Appendix 4C.

4.1.1.7 Control of Run-On/Run-Off [D-1a(3)(d)]. The only major run-on or run-off foreseen would be a flood, fire sprinkler activation, or a break in the water main. No floods are predicted to impact the 616 NRDWSF (Chapter 2.0, Section 2.3.2).

In the event of a run-on or run-off from any source (e.g., fire sprinkler activation, pipe break, etc.), containment systems in the 616 NRDWSF are capable of holding between 645 gallons (2,445 liters) and 926 gallons (3,510 liters) of liquid for each cell as cell width varies. Collected or contained liquid can be removed by hand pumps for large quantities and by absorbents for smaller quantities. All waste stored in the 616 NRDWSF is in sealed containers, which limits the detrimental impact of a run-on or run-off situation.

In the event that contaminated water is released from the 616 NRDWSF because of flooding of the containment system, fire sprinkler activation, or a pipe break (Section 4.1.1.8), the incident will be treated as a spill.

Actions to be taken in response to a spill or discharge are detailed in the Building Emergency Plan - 616 Building provided in Appendix 7A.

4.1.1.8 Removal of Liquids from Containment System [D-1a(3)(e)]. In the event of a spill or release at the 616 NRDWSF that results in collection of liquid waste material in the containment system, the following will be performed.

- Containers in the cell(s) affected by the spill will be inspected for signs of leakage. Leaking containers will be repackaged and identified in the 616 NRDWSF operating and spill logbooks.

- Inspection reports and the 616 NRDWSF operating and spill logbooks will be reviewed to identify any waste releases in the waste storage areas for which remedial actions have not been completed.

- The waste will be removed from the containment system. The equipment used for removal of large quantities of liquid normally would be a hand-held pump or vacuum system. Absorbents will be used for removal of small amounts of liquid. The waste material will be placed in the appropriate U.S. Department of Transportation-specified container.

- The containerized waste will be handled as follows.

  - If the waste has been altered during stabilization and cleanup actions (absorbed, mixed, diluted, etc.), the containerized waste will be placed in storage and managed in accordance with the provisions of the waste analysis plan (Chapter 3.0, Section 3.2).

  - A waste storage/disposal request (Chapter 3.0, Section 3.2) will be submitted to the Solid Waste Engineering staff for waste designation. In response, the Solid Waste Engineering staff will issue a Waste Disposal Analysis Record describing the regulatory status and proper packaging, labeling, and marking requirements for the waste (Chapter 3.0, Section 3.2).

  - The 616 NRDWSF inventory will be altered to reflect the changes in waste description, volume, and storage locations.

  - If the waste was not altered during stabilization and cleanup activities, the containerized waste will be placed in the appropriate storage area and the 616 NRDWSF inventory altered to reflect any changes.

- Wipe samples will be taken of the spill area in accordance with an approved procedure (EPA 1987) using Whatman* No. 42 filter paper or an equivalent. The filter paper used to collect the sample will be moistened with an appropriate collection medium based on the characteristics of the spilled material. Wherever possible, organic free water will be used as the collection medium to minimize the generation of additional dangerous waste. In the event that water would not be an appropriate collection medium to dissolve the

*Whatman is a trademark of Whatman Incorporated.

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contamination of concern, the solvent used by the laboratory for analysis will be used. The filter paper will be sent to a laboratory where the filter paper will be prepared and analyzed in accordance with the test methods identified in Chapter 3.0, Section 3.2.2, for constituents known to have been involved in the spill to verify cleanup adequacy.

An alternative sampling mechanism will be used for detection of waste matrices for which wipe sampling protocols are ineffective. Volatile organics will be detected using organic vapor air samplers. To detect the presence of corrosive liquids, pH paper and pH monitors will be used. The type of sampling technique used to determine the cleanliness of the containment system will be documented in the spill logbook.

- When sampling techniques have verified cleanup, the 616 NRDWSF Supervisor will sign the spill logbook indicating that the waste was removed from the containment system and cleanup activities were completed. A Solid Waste Engineering representative will sign the spill logbook indicating approval of actions taken.

Specific actions to be taken in response to a spill or discharge are detailed in the Building Emergency Plan - 616 Building provided in Appendix 7A.

In the event of a fire sprinkler activation or a pipe break within the 616 NRDWSF that results in collection of water in the containment system, the following will be performed.

- Water in the containment system visually will be inspected for signs of contamination.

- Containers in the cell(s) affected by a sprinkler activation or a pipe break will be inspected for signs of leakage.

- Inspection reports and the 616 NRDWSF operating and spill logbooks will be reviewed to identify any waste releases in the waste storage areas for which remedial actions were not completed.

- The 616 NRDWSF Supervisor will sign the 616 NRDWSF logbook indicating that the above steps were completed and that the storage building is clean. Solid Waste Engineering will review the supervisors actions and give concurrence.

- The water will be removed from the containment system. Water that cannot be verified to be free of contamination will be containerized and stored in an area equipped with secondary containment. The containerized water will be handled in accordance with the provisions of the waste analysis plan (Chapter 3.0, Section 3.2).

- The 616 NRDWSF Supervisor will sign the logbook indicating that the water was removed from the containment system.

Actions to be taken in response to a spill or discharge are detailed in the Building Emergency Plan - 616 Building provided in Appendix 7A.

4.1.2 Containers Without Free Liquids That Do Not Exhibit Ignitability or Reactivity [D-1b]

Containers without free liquids are discussed in the following sections.

4.1.2.1 Test for Free Liquids [D-1b(1)]. The 616 NRDWSF stores containers with free liquid and without free liquid. Therefore, a test for free liquid is not required.

4.1.2.2 Description of Containers [D-1b(2)]. Refer to Section 4.1.1.1, Description of Containers.

4.1.2.3 Container Management Practices [D-1b(3)]. Refer to Section 4.1.1.2, Container Management Practices.

4.1.2.4 Container Storage Area Drainage [D-1b(4)]. Each storage cell consists of a concrete slab sloped to a self-contained containment trench (Section 4.1.1.4 and Chapter 2.0, Section 2.1.2).

4.1.3 Protection of Extremely Hazardous Waste in Containers [D-1c]

All containers are in storage cells at the 616 NRDWSF. These cells are completely enclosed to the weather (Section 4.1.1.7).

4.1.4 Prevention of Reaction of Ignitable, Reactive, and Incompatible Wastes in Containers [D-1d]

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

4.1.4.1 Management of Reactive Waste in Containers [D-1d(1)]. The 616 NRDWSF does not store waste exhibiting the characteristic (reactivity) specified in WAC 173-303-090(7)(a)(vi), (vii), or (viii).

4.1.4.2 Management of Ignitable and Reactive Waste in Containers [D-1d(2)]. The nearest structure or TSD unit boundaries are in excess of 200 feet (61 meters) from any of the ignitable waste sites as shown on Drawing H-13-000014 in Appendix 2A. Two hundred feet (61 meters) is in excess of the limits imposed by the National Fire Protection Association (NFPA 1989).

4.1.4.3 Management of Incompatible Wastes in Containers [D-1d(3)]. The generating unit's waste coordinator and the Solid Waste Engineering staff are responsible for determining the regulatory status of each waste and determining the incompatible compounds of the waste. Status information is

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forwarded on a hazardous waste disposal analysis record (Chapter 3.0, Section 3.2) to the generating unit, who packages the waste as instructed. Afterwards, Solid Waste Disposal Unit personnel inspect the container for proper packaging, labeling, marking, and onsite waste tracking forms before transport to the 616 NRDWSF. The container is inspected again at the 616 NRDWSF to determine that the waste is properly packaged, marked, labeled, and manifested (Chapter 3.0, Section 3.2).

Each storage cell in the 616 NRDWSF contains one compatibility group and is segregated either by three self-contained trenches or concrete walls.

4.2 TANK SYSTEM [D-2]

Operation of the 616 NRDWSF does not involve the storage of dangerous waste in tank systems. Therefore, the requirements of WAC 173-303-640 are not applicable to the 616 NRDWSF.

4.3 WASTE PILES [D-3]

Operation of the 616 NRDWSF does not involve the placement of dangerous waste in piles. Therefore, the requirements of WAC 173-303-660 are not applicable to the 616 NRDWSF.

4.4 SURFACE IMPOUNDMENTS [D-4]

Operation of the 616 NRDWSF does not involve the placement of dangerous waste in surface impoundments. Therefore, the requirements of WAC 173-303-650 are not applicable to the 616 NRDWSF.

4.5 INCINERATORS [D-5]

Operation of the 616 NRDWSF does not involve the incineration of dangerous waste. Therefore, the requirements of WAC 173-303-670 are not applicable to the 616 NRDWSF.

4.6 LANDFILLS [D-6]

Operation of the 616 NRDWSF does not involve the placement of dangerous waste in landfills. Therefore, the requirements of WAC 173-303-665 are not applicable to the 616 NRDWSF.

4.7 LAND TREATMENT [D-7]

Operation of the 616 NRDWSF does not involve the land treatment of dangerous waste. Therefore, the requirements of WAC 173-303-655 are not applicable to the 616 NRDWSF.

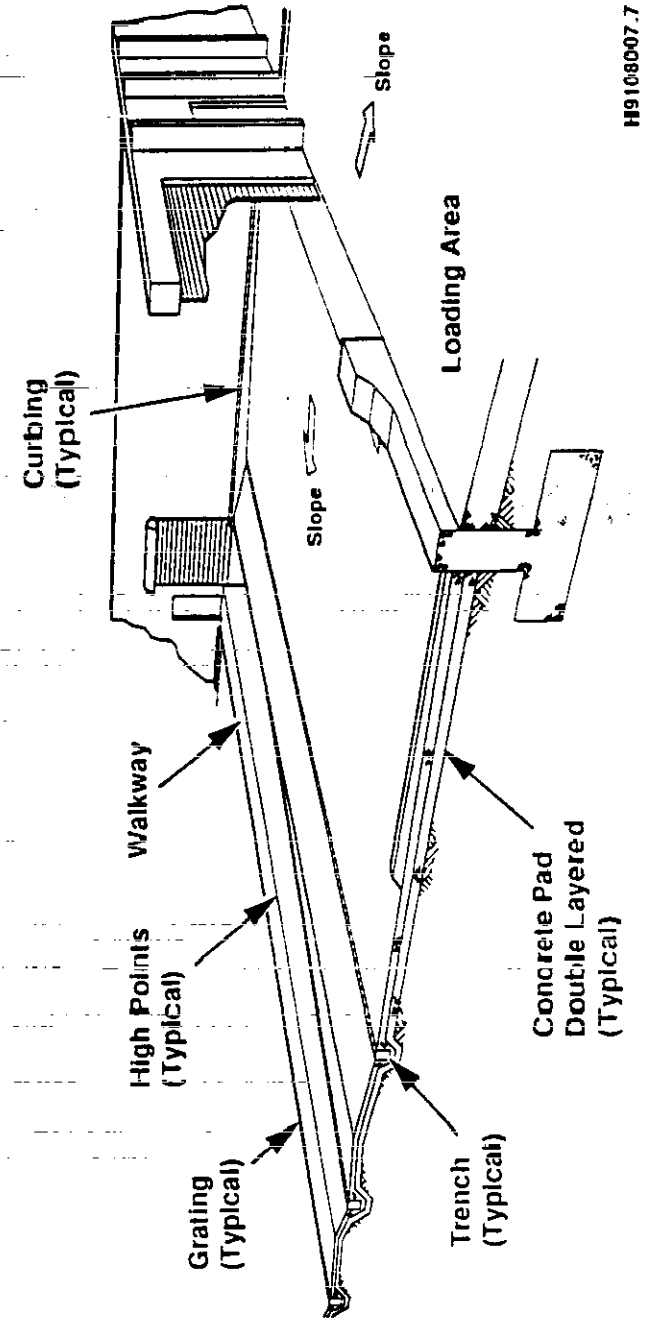

Figure 4-1. Design of the Secondary Containment System.

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Table 4-1. Common Containers Stored at the 616 Nonradioactive Dangerous Waste Storage Facility.

DOT[a] Spec.	Container type	Material	Ref.[b] (49 CFR 178)
12P/12U	CF[c] w/inner poly liner	Fiberboard/polyethylene	178.211/178.24
12B	CF	Fiberboard	178.205
17C	DM[d]	Low carbon steel	178.115
17E	DM	Low carbon steel	178.116
17H	DM	Low carbon steel	178.118
34	DF[e]	Polyethylene	178.19
37A	DM	Low carbon steel	178.131
37B	DM	Low carbon steel	178.132

[a]U.S. Department of Transportation specifications.
[b]Reference section of regulations.
[c]CF = fiberboard box.
[d]DM = drum, metal.
[e]DF = drum, fiberboard.

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Table 4-2. Container Management Per Storage Cell.

Cell	Maximum containers per tier: Tier 1 (ground)	Tier 2
Regular storage		
Caustics	50 (55 gal) (208.2 liters)	40 (55 gal) 10 (30 gal)[a] (113.6 liters)
Oxidizers	50 (55 gal) (208.2 liters)	40 (55 gal) 10 (30 gal)[a] (113.6 liters)
Combustibles	58 (55 gal) (208.2 liters)	40 (55 gal) 18 (30 gal)[b] (113.6 liters)
Acids	60 (55 gal) (208.2 liters)	40 (55 gal) 20 (30 gal)[b] (113.6 liters)
Flammable liquid storage		
Class 1A	32 (55 gal) (208.2 liters) 1 flammable liquid storage cabinet (135 gal) (512 liters)	32 (20 gal)[c] (75.7 liters)
Class 1B*	40 (55 gal) (208.2 liters)	40 (30 gal)[d] (113.6 liters)

[a]Tier 2, row 1 ≤ 30 gal (113.6 liters) (Chapter 6.0, Figure 6-4)

[b]Tier 2, rows 1 and 6 ≤ 30 gal (113.6 liters) (Chapter 6.0, Figure 6-4)

[c]Tier 2 ≤ 20 gal (75.7 liters)

[d]Tier 2 ≤ 30 gal (113.6 liters)

*A flammable liquid storage cabinet can be used in the Class 1B storage cell resulting in the following arrangement:

36 (55 gal) (208.2 liters) 1 flammable liquid storage cabinet (135 gal) (512 liters)	36 (30 gal)[d] (113.6 liters)

Because the total volume stored in this configuration [3,195 gal (12094.4 liters)] is less than the other [3,400 gal (12,870.4 liters)], the volume is not listed in Table 4-2. Table 4-4 also is based on the maximum volume stored.

Table 4-3. Storage Cell Stacking Restrictions.

Cell	Stacked container volume restrictions	
	Single row	Double row
Oxidizer	≤ 30 gallon (113.6 liters)	≤ 55 gallon (208.2 liters)
Caustic	≤ 30 gallon (113.6 liters)	≤ 55 gallon (208.2 liters)
Acid	≤ 30 gallon (113.6 liters)	≤ 55 gallon (208.2 liters)
Combustible	≤ 30 gallon (113.6 liters)	≤ 55 gallon (208.2 liters)
Class 1B flammable	≤ 30 gallon (113.6 liters)	≤ 30 gallon (208.2 liters)
Class 1A flammable	≤ 20 gallon (75.7 liters)	≤ 20 gallon (75.7 liters)

Note: Container stacking is limited to a base container and a second tier.

Table 4-4. Storage Cell Volume [gallons (liters)].

Cell	Total cell containment volume	Maximum volume of stored containers
Oxidizer	825 (3,123)	5,250 (19,873.4)
Caustic	825 (3,123)	5,250 (19,873.4)
Combustible	912 (3,452.3)	5,930 (22,447.5)
Acid	915 (3,463.7)	6,100 (23,091)
Class 1A flammable	637 (2,414.3)	2,535 (9,596)
Class 1B flammable	719 (2,723.1)	3,400 (12,870.4)

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5.0 GROUNDWATER MONITORING [E]

The 616 NRDWSF is not operated as a dangerous waste surface impoundment, waste pile, land treatment unit, or landfill as defined in WAC 173-303-645(1)(a). Therefore, groundwater monitoring is not required.

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6.0 PROCEDURES TO PREVENT HAZARDS [F]

The 616 NRDWSF is designed and operated to minimize exposure of the general public and operating personnel to dangerous waste.

6.1 SECURITY [F-1]

The following sections describe the security measures, equipment, and warning signs used to control entry into the 616 NRDWSF.

6.1.1 Security Procedures and Equipment [F-1a]

The following sections describe the 24-hour surveillance system, barrier, and warning signs used to provide security and control access to the 616 NRDWSF.

6.1.1.1 24-hour Surveillance System [F-1a(1)]. The entire Hanford Facility is a controlled access area and is expected to remain so for the foreseeable future. The Hanford Facility maintains around-the-clock surveillance for protection of government property, classified information, and special nuclear material. The Hanford Patrol maintains a continuous presence of armed guards to provide Hanford Facility security.

6.1.1.2 Barrier and Means to Control Entry [F-1a(2),(2a),(2b)]. Manned barricades are maintained around the clock at checkpoints on vehicular access roads leading to the operational areas of the Hanford Facility. All personnel accessing these areas must have a U.S. Department of Energy-issued security identification badge indicating the appropriate authorization. Personnel also might be subject to a search of items carried into or out of these areas.

The Hanford Facility operates 24 hours a day, 365 days a year. The 616 NRDWSF is and could be occupied at any time. Generally, the storage building is occupied during the day shift, beginning at 7:30 a.m. and ending at 4:00 p.m., Monday through Friday. The 616 NRDWSF is locked when unoccupied.

6.1.1.3 Warning Signs [F-1a(3)]. Warning signs stating "DANGER--UNAUTHORIZED PERSONNEL KEEP OUT" are posted at each entrance to the active portion of the 616 NRDWSF. These signs are in English, legible from a distance of 25 feet (7.6 meters) and visible from all angles of approach.

6.1.2 Waiver [F-1b,b(1),b(2)]

Waiver of the security procedures and equipment requirements for the 616 NRDWSF will not be requested. Therefore, the requirements of WAC 173-303-310(1)(a) and (b) are not applicable to the 616 NRDWSF.

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6.2 INSPECTION SCHEDULE [F-2]

This section describes the method and schedule for inspection of the 616 NRDWSF. The purpose of inspection procedures at the 616 NRDWSF is to identify leaking containers, improperly stored containers, and degradation of containment and safety equipment and/or systems. These inspections help ensure that situations do not exist that could cause or lead to the release of dangerous waste to the environment or pose a threat to human health. Abnormal conditions identified by an inspection must be corrected on a schedule that prevents hazards to workers, the public, and the environment.

6.2.1 General Inspection Requirements [F-2a]

The content and frequency of inspections are described in this section. The inspections are documented on inspection datasheets and logsheets. The schedule and inspection records are kept at the 616 NRDWSF in the inspection logbooks. Inspection records are retained for a minimum of 5 years.

6.2.1.1 Types of Problems [F-2a(1)]. Each day the 616 NRDWSF is occupied, a nuclear operator performs a daily inspection (personnel activities that are restricted to the office area do not require a daily inspection of the storage area, provided the ventilation system is fully operational). The inspector carries a Building 616 Daily Solid Waste Operations Inspection form (Figure 6-1) and checks off items as the inspection takes place. Discrepancies are noted in the comments section. Items inspected include the following:

- Condition of concrete floor, walls, and curbing
- Storage building structural integrity
- Safety equipment operational and in place
- Fire extinguishers in place
- Lights and fixtures
- Appropriate safety and packaging equipment
- Container structural integrity
- Secondary containment systems integrity
- Containers closed
- Corrosion of containers
- Evidence of spills or leaks
- Container labels and markings in place

When completed, the operator prints, signs, and dates the form. The form is placed in the inspection logbook and retained on file for 5 years.

A Solid Waste Engineering representative performs a weekly audit inspection of the 616 NRDWSF. The inspection is performed to oversee operation and management of the 616 NRDWSF. The inspector carries a Building 616 Weekly Solid Waste Engineering Inspection form (Figure 6-2) covering the same areas as listed previously. The Building 616 Weekly Solid Waste Engineering Inspection form is filled out as the inspection takes place. When finished, the inspector prints, signs, and dates the Building 616 Weekly Solid Waste Engineering Inspection form. The Building 616 Weekly Solid Waste Engineering Inspection form is given to the supervisor who reviews the comments section and countersigns the Building 616 Weekly Solid Waste Engineering Inspection form indicating the comments have been seen. The 616 NRDWSF Supervisor takes actions to address the comments as needed. The Building 616 Weeky Solid Waste Engineering Inspection form is placed in the 616 NRDWSF inspection logbook and retained on file for a minimum of 5 years.

The fire systems at the 616 NRDWSF are inspected annually by representatives of the Hanford Fire Department. Their inspection includes the following:

- Fire protection system inspection and testing
  - Fire alarm pull box inspection and test
  - Manual and automatic fire door inspection and test
- Wet-pipe sprinkler system inspection and testing
  - System visual inspection
  - System internal inspection
  - Pressure of incoming water supply inspection
  - Condition of gages by visual inspection
  - Flow alarm device testing
  - Zone indicated on fire alarm control panel by visual inspection
- Ignitable or reactive waste storage area inspection.

The 616 NRDWSF Supervisor conducts a monthly inspection and test of the communication and alarm systems. This inspection and test includes the following:

- Storage building evacuation alarms
- Storage building take cover alarms
- Public address system
- Portable radios and base station
- Crash alarm.

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6.2.1.2 Frequency of Inspections [F-2a(2)]. The 616 NRDWSF generally is occupied from 7:30 a.m. to 4:00 p.m., Monday through Friday. To ensure safety, the 616 NRDWSF (if occupied) and its waste inventory are inspected daily by 616 NRDWSF personnel (personnel activities that are restricted to the office area do not require a daily inspection of the storage area, provided the ventilation system is operational). Solid Waste Engineering performs a weekly audit inspection of the 616 NRDWSF and its waste inventory (regardless of occupation) to ensure compliance with applicable federal and state regulations.

Fire protection equipment, storage building alarms, and communication equipment are tested and inspected as identified in Section 6.2.1.1.

As required by WAC 173-303-395(1)(d), an annual inspection of the 616 NRDWSF areas where ignitable or reactive waste is stored is performed by a professional knowledgeable of the Uniform Fire Code. The following information is entered into the 616 NRDWSF logbook as a result of this inspection:

- The date and time of the inspection
- The name of the person who performed the inspection
- A notation of the observations made
- Any remedial actions that were taken as a result of this inspection.

6.2.2 Specific Process Inspection Requirements [F-2b].

The following sections detail the inspections to be performed at the 616 NRDWSF.

6.2.2.1 Container Inspection [F-2b(1)]. Specific items and/or problems identified during container inspection include the following:

- Condition of concrete floor, walls, and curbing
- Lights and fixtures
- Appropriate safety and packaging equipment
- Container structural integrity
- Containers closed
- Corrosion of containers
- Evidence of spills or leaks

- Container labels and markings in place

- Materials wrapped in plastic for signs of plastic deterioration.

These inspections are performed weekly by Solid Waste Engineering personnel. Records of inspection are maintained at the 616 NRDWSF as detailed in Section 6.2.1.

6.2.2.2 Tank Inspection [F-2b(2),(2)a-(2)f]. Operation of the 616 NRDWSF does not involve the placement of dangerous waste in tanks. Therefore, the inspection requirements of WAC 173-303-640 are not applicable to the 616 NRDWSF.

6.2.2.3 Waste Pile Inspection [F-2b(3),(3)a-(3)d]. Operation of the 616 NRDWSF does not involve the placement of dangerous waste in piles. Therefore, the inspection requirements of WAC 173-303-660 are not applicable to the 616 NRDWSF.

6.2.2.4 Surface Impoundment Inspection [F-2b(4),(4)a-(4)b]. Operation of the 616 NRDWSF does not involve the placement of dangerous waste in surface impoundments. Therefore, the inspection requirements of WAC 173-303-650 are not applicable to the 616 NRDWSF.

6.2.2.5 Incinerator Inspection [F-2b(5),(5)a-(5)b]. Operation of the 616 NRDWSF does not involve the incineration of dangerous waste. Therefore, the inspection requirements of WAC 173-303-670 are not applicable to the 616 NRDWSF.

6.2.2.6 Landfill Inspection [F-2b(6),(6)a-(6)d]. Operation of the 616 NRDWSF does not involve the placement of dangerous waste in landfills. Therefore, the inspection requirements of WAC 173-303-665 are not applicable to the 616 NRDWSF.

6.2.2.7 Land Treatment Facility Inspection [F-2b(7),(7)a-(7)b]. Operation of the 616 NRDWSF does not involve the land treatment of dangerous waste. Therefore, the inspection requirements of WAC 173-303-655 are not applicable to the 616 NRDWSF.

6.3 WAIVER OR DOCUMENTATION OF PREPAREDNESS AND PREVENTION REQUIREMENTS [F-3]

The following sections document the preparedness and prevention measures taken at the 616 NRDWSF.

6.3.1 Equipment Requirements [F-3a]

The following sections describe the internal and external communications systems and the emergency equipment required.

6.3.1.1 **Internal Communications [F-3a(1)].** The 616 NRDWSF is equipped with an internal communication system to provide immediate emergency instruction to personnel. The onsite communication system at the 616 NRDWSF includes telephones, a public address system, and alarm systems. The telephone system provides internal and external communication. Telephones are available in the operations office, Packaging Material and Handling Equipment Area, and on a telephone pole 75 feet (22.9 meters) east of the 616 NRDWSF, between the 616 NRDWSF and the primary staging area [the location of internal communication equipment and the primary staging area is identified in the building emergency plan (Appendix 7A)]. Alarm systems exist at the 616 NRDWSF to allow personnel to appropriately respond to various emergencies, including the following emergency situations: building evacuations, take cover events, and fire and/or explosion (Appendix 7A).

Immediate emergency instruction to personnel is provided by a public address system via speaker horns and ceiling-mounted speakers located throughout the storage building, as well as speaker horns located on the outside of the storage building.

6.3.1.2 **External Communications [F-3a(2)].** The 616 NRDWSF is equipped with devices for summoning emergency assistance from the Hanford Fire Department, the Hazardous Materials Response Team, and/or local emergency response teams, as necessary. External communication is made via a telephone communication system, a two-way radio base station, and two-way portable radios. Telephones are available in the operations office, Packaging Material and Handling Equipment Area, and on a telephone pole 75 feet (22.9 meters) east of the 616 NRDWSF, between the 616 NRDWSF and the primary staging area [the location of external communication equipment and the primary staging area is identified in the building emergency plan (Appendix 7A)]. In addition, the following external communication systems are available for notifying persons assigned to emergency response organizations.

- Fire alarm pull boxes and fire sprinkler flow monitoring devices--connected to a system monitored around the clock by the Hanford Fire Department.

- Telephone number 811--contact point for the Hanford Facility; on notification, the Hanford Patrol Operations Center notifies and/or dispatches required emergency responders.

- Telephone number 3-3800--single point of contact for the emergency duty officer; this number can be dialed from any Hanford Site telephone.

- Crash alarm telephone system--consists of selected telephones that are disassociated from the regular system and automatically are connected to control stations.

- Two-way radio system--the system accesses the Hanford Site emergency network and can summon the Hanford Fire Department, Hanford Patrol, and/or any other assistance requested to handle emergencies.

6.3.1.3 Emergency Equipment [F-3a(3)]. A detailed list of equipment is included in the building emergency plan (Appendix 7A).

6.3.1.4 Water for Fire Control [F-3a(4)]. The 616 NRDWSF has a potable water main installed for fire control. The available water pressure [measured at the 609-A Fire Station fire hydrant--across the street from the 616 NRDWSF (Chapter 2.0, Figure 2-2)] has a static pressure of 79 pounds per square inch, with a residual pressure of 39 pounds per square inch when flowing at 910 gallons (3,444.7 liters) a minute.

6.3.2 Aisle Space Requirement [F-3b]

The container storage arrangement and aisle spacing for each storage cell are shown in Figure 6-3. Aisle spacing is sufficient to allow the movement of personnel and fire protection equipment in and around the containers. A minimum 30 inch (0.76 meter) aisle space will be maintained between rows of containers as required by WAC 173-303-630(5)(c).

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

The following sections describe preventive procedures, structures, and equipment.

6.4.1 Unloading Operations [F-4a]

The loading and unloading areas of the 616 NRDWSF are described in Chapter 2.0, Section 2.1.2.6. All loading and unloading operations are carried out on concrete pads that are equipped with containment trenches. The nuclear operators ensure the following before waste is unloaded at the 616 NRDWSF.

- All trench and sump gratings are in place.
- All interior sumps and trenches are clean and dry.
- All exterior loading pad trenches have minimum residual water (Chapter 2.0, Section 2.5.1).
- Loading pad trench drain plugs are closed and locked.
- Necessary storage building access doors are open.
- Area from loading pad to appropriate storage cell is clear of obstructions.
- The truck is placed so that container movement occurs over the loading pad.

After a shipment has been accepted for storage (Chapter 2.0, Section 2.8.1), the transporter is requested to unload the truck. Multiple waste containers are placed on pallets for movement into the 616 NRDWSF using pallet jacks or a forklift; the forklift is prohibited from operating in the Class 1A flammable liquid storage cell. Single containers are hand carried or moved on a dolly. The containers are placed in the storage cell as assigned on the associated hazardous waste disposal analysis record (Chapter 3.0, Section 3.2). When the storage of containers is completed, all storage building doors are closed.

6.4.2 Run-Off [F-4b]

Chapter 4.0, Section 4.1.1.7, contains information on run-off and run-on of liquid at the 616 NRDWSF.

6.4.3 Water Supplies [F-4c]

Water is supplied to the 616 NRDWSF from the Columbia River via the Hanford Site potable water system. All hose connections to the potable water line have a one-way check valve installed to prevent back flow. These check valves prevent contamination from entering the water supply lines from within the 616 NRDWSF.

The water supply system (potable and fire sprinkler supply) for the 616 NRDWSF has no backup. A backup is not necessary because of the proximity of the 609-A Fire Station, which can provide a 2 minute response time (Drawing H-13-000014 in Appendix 2A).

6.4.4 Equipment and Power Failure [F-4d)

The only powered equipment at the 616 NRDWSF is a forklift and the ventilation system. If the forklift fails, the 616 NRDWSF Supervisor makes the necessary notifications to have it repaired or replaced. Actions taken in response to a loss of ventilation are detailed in the building emergency plan (Appendix 7A).

As described in Section 6.3.1.2, emergency communication equipment is available to summon emergency assistance in the event of a power loss.

6.4.5 Personnel Protection Equipment [F-4e]

At the 616 NRDWSF, procedures, structures, and equipment are used to prevent undue exposure of personnel to dangerous waste. The 616 NRDWSF includes eyewash stations and safety showers in the combustible storage cell and the packaging and sampling room. Protective clothing and equipment are used by personnel handling dangerous waste. Protective clothing used at the 616 NRDWSF consists of foot, eye, and face protection.

The following protective clothing is worn when handling waste containers:

- Safety glasses
- Chemical-resistant gloves
- Chemical-resistant coveralls
- Approved safety shoes
- Face shield.

The following protective clothing is worn when handling empty new containers:

- Safety glasses or goggles
- Leather gloves
- Approved safety shoes.

6.5 PREVENTION OF REACTION OF IGNITABLE, REACTIVE, AND INCOMPATIBLE WASTES [F-5]

The following sections describe prevention of reaction of ignitable, reactive, and incompatible waste.

6.5.1 Precautions to Prevent Ignition or Reaction of Ignitable or Reactive Waste [F-5a]

All waste, including ignitable waste, is stored in sealed U.S. Department of Transportation-approved containers. Ignitable waste is stored in the Class 1A or Class 1B flammable liquid storage cells (Chapter 2.0, Figure 2-3). The 1A cell is equipped with National Fire Protection Association 70 Class I/ Division I (NFPA 1989) electrical fixtures, intrinsically safe chemical transfer pumps and receptacles, an explosion relief wall, 'blow out' pressure relief ceiling panels, and grounding cables. Operation of the electric forklift is prohibited in the Class 1A flammable liquid storage cell.

The 616 NRDWSF does not store reactive waste as defined in WAC 173-303-090(7)(a) (vi), (vii), or (viii).

Water-reactive waste is stored in U.S. Department of Transportation-approved containers inside portable weatherproof storage cabinets. These cabinets are standalone units that are placed in the flammable liquid storage cells (Figure 6-3) on an as-needed basis. Other reactive waste is stored throughout the storage building depending on waste type and compatibility.

Smoking is prohibited in the storage building. Multiple "NO SMOKING" signs are present to remind occupants.

6.5.2 General Precautions for Handling Ignitable or Reactive Waste and Mixing of Incompatible Waste [F-5b]

Based on the dangerous characteristics identified by the generating unit, specific packaging instructions are provided by the Solid Waste Engineering staff. General guidance is provided to the generating unit in an internal document concerning waste packaging and disposal requirements. A compatibility analysis is performed on the waste as well. Incompatible waste is not packaged within the same container or placed in the same storage cell.

Building 616 Daily Solid Waste Operations Inspection. (sheet 2 of 3)

	Packaging and Sampling Room[a]	Oxidizer[a]	Caustic[a]	Acid[a]	Combustible[a]	Flammable 1B[a]	Flammable 1A[a]
5.0 Storage Areas							
A. Container Condition:							
Closed							
Corrosion							
Evidence of leakage							
Required labels							
Structural defects							
B. Structures:							
Curbing							
Exits unobstructed							
Floor							
Roof/walls							
C. Safety/Emergency Equipment							
Exit light operating							
Fire extinguisher in place	NA	NA	NA	NA			NA
D. Container Location[b]							
Waste Tracking form ID No./Location							
Waste Tracking form ID No./Location							
Waste Tracking form ID No./Location							

[a] N/A - Not applicable.
X - No problems noted.
C - See comments for problem description or remedial action required.

[b] Three container locations are verified against the storage building inventory. Record the waste tracking form ID No./location for each container checked above. Record discrepancies identified in the comments section.

Figure 6-1. Building 616 Daily Solid Waste Operations Inspection. (sheet 2 of 3)

Building 616 Daily Solid Waste Operations Inspection (sheet 1 of 3)

Inspection No._____ Status:_____ Date:_____ Time:_____

	Yes	No	If no, specify
1.0 Office Area			
Exit Unobstructed			
Fire extinguisher in place			
Public address system operating			
Ventilation indicator lights operating			
Telephone operating			
Radio operating			
2.0 Hallway			
Exit sign operating			
Fire extinguisher in place			
Exits unobstructed			
Protective equipment supply present			
Pressure differential gage working-reading:			
3.0 Receiving Material and Handling Equipment Area			
Absorbents present			
Emergency equipment present			
Exit light operating			
Exit unobstructed			
Fire extinguisher in place			
Overpack drums present			
Telephone operating			
Radio operating			
4.0 Structure Exterior			
Curbing in good condition			
Exits unobstructed			
Pads/loading area crack free			
Trenches locked closed/empty			
No combustibles stored within 50 feet of structure			
Roads/fire lanes unobstructed			
Exterior telephone operating			

Figure 6-1. Building 616 Daily Solid Waste Operations Inspection. (sheet 1 of 3)

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Building 616 Daily Solid Waste Operations Inspection. (sheet 3 of 3)

6. Comments

_____

_____

_____

_____

_____

_____

Inspector _____
(print name)

_____
(sign name)

7. Remedial Action Taken

_____

_____

_____

_____

8. Solid Waste Facility Operations Supervisor Acknowledgment of Action Completed:

Completion Date: _____

Today's Date: _____

_____
(print name)

_____
(sign name)

Figure 6-1. Building 616 Daily Solid Waste Operations Inspection. (sheet 3 of 3)

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Building 616 Weekly Solid Waste Engineering Inspection (sheet 1 of 3)

Inspection No._____ Status:_____ Date:_____ Time:_____

	Yes	No	If no, specify
1.0 Office Area			
Emergency light operable			
Exit unobstructed			
Fire extinguisher charged			
Public address system operating			
Ventilation indicator lights operating			
Telephone operating			
Radio operating			
Evacuation alarm tested once monthly; date tested:			
2.0 Hallway			
Exit sign operating			
Fire extinguisher charged			
Exits unobstructed			
Protective equipment supply present			
Pressure differential gage working-reading:			
3.0 Receiving Material and Handling Equipment Area			
Absorbents present			
Emergency equipment present			
Emergency light operable			
Exit light operating			
Exit unobstructed			
Fire extinguisher charged			
Overpack drums present			
Public address system (audible)			
Telephone operating			
Radio operating			
4.0 Structure Exterior			
Curbing in good condition			
Exits unobstructed			
Pads/loading area crack free			
Trenches locked closed/empty			
No combustibles stored within 50 feet of structure			
Roads/fire lanes unobstructed			
Exterior telephone operating			

Figure 6-2. Building 616 Weekly Solid Waste Engineering Inspection. (sheet 1 of 3)

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Building 616 Weekly Solid Waste Engineering Inspection. (sheet 2 of 3)

	Packaging and Sampling Room[a]	Oxidizer[a]	Caustic[a]	Acid[a]	Combustible[a]	Flammable 1B[a]	Flammable 1A[a]
5.0 Storage Areas							
A. Container Condition:							
Closed							
Corrosion							
Evidence of leakage							
Required labels							
Structural defects							
B. Structures:							
Curbing							
Exits unobstructed							
Floor							
Roof/walls							
Signs							
C. Safety/Emergency Equipment							
Emergency light operable		NA		NA			NA
Exit light operating							
Fire extinguisher charged	NA	NA	NA	NA			NA
Public address system (audible)							
Safety shower/eye wash tested/flushed (weekly); date tested:		NA	NA	NA		NA	NA
D. Container Location[b]							
Waste Tracking Form ID No./Location							
Waste Tracking Form ID No./Location							
Waste Tracking Form ID No./Location							
Waste Tracking Form ID No./Location							
Waste Tracking Form ID No./Location							

[a] N/A - Not applicable.
X - No problems noted.
C - See comments for problem description or remedial action required.

[b] Five container locations are verified against the storage building inventory. Record the waste tracking form ID No./location for each container checked above. Record discrepancies identified in the comments section.

Figure 6-2. Building 616 Weekly Solid Waste Engineering Inspection. (sheet 2 of 3)

Building 616 Weekly Solid Waste Engineering
Inspection. (sheet 3 of 3)

6. Comments

_____

_____

_____

_____

_____

Inspector _____
(print name)

_____
(sign name)

7. Remedial Action Taken

_____

_____

_____

_____

8. Solid Waste Facility Operations Supervisor Acknowledgment of Action Completed:

Completion Date: _____

Today's Date: _____

_____
(print name)

_____
(sign name)

Figure 6-2. Building 616 Weekly Solid Waste Engineering Inspection. (sheet 3 of 3)

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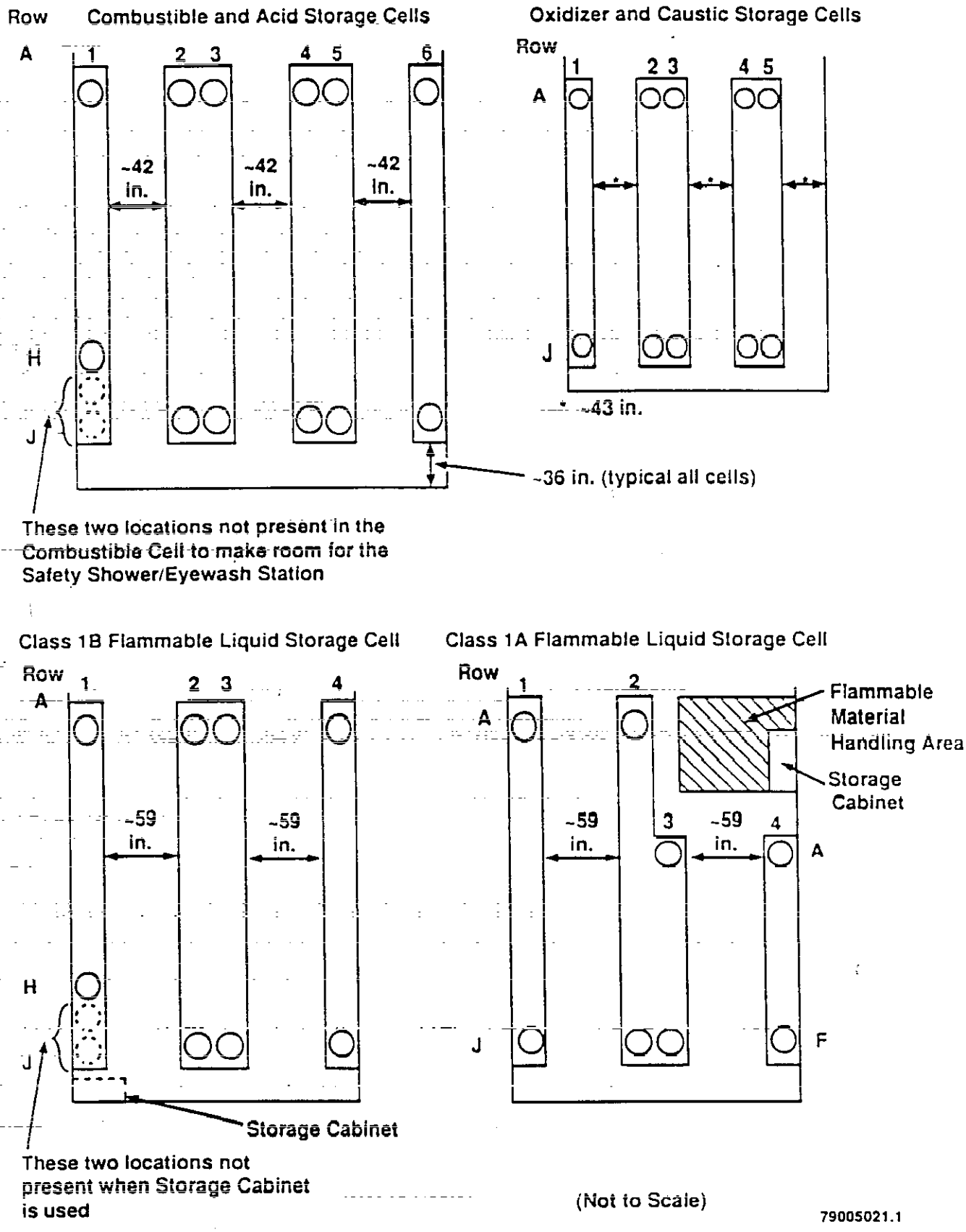

Figure 6-3. Current Container Storage Layout.

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APPENDIX

7A BUILDING EMERGENCY PLAN - 616 BUILDING . . . . . APP 7A-i

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7.0 CONTINGENCY PLAN [G]

The WAC 173-303 requirements for contingency plans are satisfied in the following documents: the DOE-RL emergency plan and procedures manual, the *Emergency Plan* (WHC 1989), and the *Emergency Plan - 616 Building*. The DOE-RL emergency plan and procedures manual and the *Emergency Plan* are available for review upon request. The *Building Emergency Plan - 616 Building* is provided as Appendix 7A.

The cited contingency plan documents also serve to satisfy a broad range of other requirements (e.g., Occupational Safety and Health Administration and U.S. Department of Energy Orders). Therefore, revisions made to portions of the contingency plan documents that are not governed by the requirements of WAC 173-303 will not be considered as modifications subject to review or approval by Ecology.

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8.0 PERSONNEL TRAINING [H]

This chapter outlines the training program developed and implemented for the Solid Waste Management employees whose duties are identified as being associated with dangerous waste management.

The Solid Waste Management training program uses existing courses. The program was designed to ensure that the 616 NRDWSF is operated and maintained in accordance with requirements of the EPA, Ecology, Occupational Safety and Health Administration, and the U.S. Department of Energy.

8.1 OUTLINE OF THE TRAINING PROGRAM [H-1]

The Solid Waste Management training program is designed to prepare employees to operate and maintain the 616 NRDWSF in a safe, effective, efficient, and environmentally sound manner. In addition to preparing employees to operate and maintain the 616 NRDWSF under normal conditions, the program ensures that employees are prepared to respond in a prompt and effective manner, should abnormal or emergency conditions occur. Emergency response training is consistent with emergency responses outlined in the contingency plan (Appendix 7A).

The Solid Waste Management training program includes a training course that covers training requirements for nuclear operators who operate the 616 NRDWSF. Solid Waste Management, in cooperation with Technical Training, Occupational Health and Safety, Solid Waste Engineering, and Fleet Operations, Transportation, and Maintenance Services, and other organizations, is responsible for the development and administration of the comprehensive training program for employees assigned to, or involved with, Solid Waste Management. Solid Waste Management is responsible for identifying training requirements for Solid Waste Management personnel and ensuring that personnel complete appropriate training. The responsibilities of the various organizations are discussed in Section 8.1.3.

An initial job analysis process was completed on the Solid Waste Management, which resulted in identifying the required training to operate the 616 NRDWSF in a safe and effective manner.

A job analysis process will be used to guide reevaluations of the Solid Waste Management training program to ensure that operational and dangerous waste training requirements continue to be met. These reevaluations could result in modifying or adding new material to the current training program.

8.1.1 Job Titles and Descriptions [H-1a]

Each employee is assigned a job title (from the salaried nonexempt or bargaining unit classifications) or position (from the exempt classifications). Job titles and positions for employees who are associated

with processing dangerous waste at the TSD units managed by Solid Waste Management are listed in the following sections with brief descriptions of associated responsibilities.

8.1.1.1 **Solid Waste Management Manager.** Responsibilities of the Solid Waste Management manager include the following:

- Operating and maintaining the TSD units managed by Solid Waste Management in compliance with U.S. Department of Energy directives and applicable policies and procedures

- Complying with all hazardous and dangerous waste policies, procedures, and regulations

- Recruiting and developing a trained cadre of managers, professionals, and nonexempt and bargaining unit employees

- Ensuring safe and disciplined operations by trained personnel who implement applicable policies and procedures

- Ensuring that documents related to the safe operation and maintenance of the TSD units managed by Solid Waste Management are accurate and up to date

- Ensuring the proper allocation of resources required to support the operation, maintenance, modification, and installation of new equipment required for safety; and meeting production schedules

- Providing operational requirements for support organizations to plan and provide services and resources when needed

- Promoting safe operations of TSD units managed by Solid Waste Management

- Planning, organizing, and coordinating Solid Waste Management operations

- Coordinating and directing the activities of the Solid Waste Facility Operations managers

- Responding to abnormal and/or emergency conditions according to established procedures

- Assuming charge during emergencies until properly relieved by the building emergency director.

8.1.1.2 **Solid Waste Facility Operations Manager.** Responsibilities of the Solid Waste Facility Operations manager include the following:

- Supervising, coordinating, and directing the activities of Solid Waste Facility Operations supervisors

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- Promoting safe operations of the TSD units managed by Solid Waste Management
- Enforcing safety, housekeeping, and general operating rules
- Maintaining control over Solid Waste Management operations in accordance with established operating procedures, applicable policies, U.S. Department of Energy Orders, and federal and state regulations
- Recognizing offnormal conditions and taking appropriate action
- Conducting operations according to established procedures
- Meeting quality assurance requirements
- Statusing and resolving action items arising from audits, inspections, and unusual occurrences
- Training and/or arranging training for personnel
- Supervising emergency response and recovery actions
- Maintaining administrative controls
- Maintaining essential records
- Supervising procedure compliance
- Minimizing injuries and/or equipment damage
- Ensuring compliance to operating limits and specifications
- Directing, controlling, and coordinating the receipt, transfer, and processing of dangerous waste
- Conducting pre-job safety and planning meetings with personnel involved with Solid Waste Management operations
- Ensuring that supervisors and nuclear operators are trained
- Ensuring that radiation exposure and dangerous waste exposure are maintained ALARA
- Notifying Solid Waste Management of any unplanned releases to the environment
- Responding to and providing remedial guidance and decisions for operations anomalies, offnormal conditions, and equipment malfunctions
- Coordinating the recovery from, and measuring and reestablishing control of, unplanned releases to the environmental and other emergency conditions

- Responding to abnormal and/or emergency conditions according to established procedures

- Performing the duties of the building emergency director during emergencies.

8.1.1.3 Solid Waste Facility Operations Supervisor. Responsibilities of the Solid Waste Facility Operations supervisors include the following:

- Supervising, coordinating, and directing the activities of the nuclear operators

- Promoting safe operation of TSD units managed by Solid Waste Management

- Enforcing safety, housekeeping, and general operating rules

- Conducting operations according to established procedures

- Maintaining control over Solid Waste Management operations in accordance with established operating procedures, applicable policies, U.S. Department of Energy Orders, and state and federal regulations

- Recognizing offnormal conditions and taking appropriate action

- Training and/or arranging training for personnel

- Ensuring that the nuclear operators are trained

- Maintaining essential records

- Supervising emergency response and recovery actions

- Maintaining administrative controls

- Supervising procedure compliance

- Conducting pre-job safety and planning meetings with personnel involved with Solid Waste Management operations

- Notifying Solid Waste Management of any unplanned releases to the environment

- Minimizing injuries and/or equipment damage

- Ensuring compliance with operating limits and specifications

- Ensuring that radiation exposure and dangerous waste exposure are maintained ALARA

- Serving as designated alternates to the building emergency director and the staging area manager

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- Responding to abnormal and/or emergency conditions according to established procedures

- Assuming charge during emergencies until properly relieved by the building emergency director.

8.1.1.4 **Nuclear Operator.** Responsibilities of the nuclear operators include the following:

- Performing Solid Waste Management operations work activities in accordance with current operating procedures

- Attending Solid Waste Management operations work plan and pre-job safety meetings

- Escorting supporting craftsmen and visitors entering Solid Waste Management TSD units

- Conducting routine inspections

- Packaging and labeling of dangerous waste for shipment

- Operating processes and equipment

- Handling dangerous waste for shipment

- Performing sampling as required by procedure

- Providing surveillance for abnormal conditions

- Responding to abnormal and/or emergency conditions according to established procedures

- Responding to leaks or spills of dangerous waste

- Responding to alarms at Solid Waste Management TSD units.

8.1.1.5 **Solid Waste Operations Engineering Manager.** Responsibilities of the Solid Waste Operations Engineering manager include the following:

- Developing, revising, and reviewing all operating procedures

- Performing self-audits and appraisals of operations

- Issuing, tracking, and closing out all Occurrence Reports

- Reviewing all new and future projects planned for Solid Waste Management Operations

- Supporting tours, audits, and readiness reviews of Solid Waste Operations TSD units.

8.1.1.6 Solid Waste Engineering Manager and Cognizant/Process Engineers. Responsibilities of the Solid Waste Engineering manager and cognizant/process engineers include the following:

- Providing the operating organizations with equipment and buildings that can be operated safely and productively
- Ensuring that the staff is knowledgeable of procedures, equipment, buildings, and processes such that staff can identify problem areas and provide remedial action in a timely fashion to keep TSD units operating safely and productively
- Planning and integrating all resources required to meet design objectives, schedules, and milestones identified on cost account plans and master schedules
- Negotiating and integrating supporting work from organizations within responsible cost accounts
- Conducting regular self-monitoring and appraisal of group performance and taking appropriate action when deemed necessary to improve group performance
- Preparing and/or approving engineering design documents and drawings that are in compliance with applicable policies, procedures, and instructions and in accordance with recognized national standards and codes
- Preparing all engineering change notices as specified
- Maintaining and updating design engineering drawing files
- Preparing and approving equipment and material specifications for new design and equipment purchase requisitions including quality statements and impact levels
- Performing business information data reviews on new design, equipment, and materials and approving vendor business information data systems qualifications
- Acting as the point of contact for resolution and disposition of nonconformance material and equipment via the Material Review Board
- Preparing design criteria, performing and approving design analysis, and assigning impact levels on design
- Preparing and approving excavation permits and tie-in permits
- Overseeing and directing the activities of the cognizant/process engineering staff such that the Solid Waste Management process can be operated in a safe, efficient, and technically sound manner

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- Ensuring that Solid Waste Management process equipment, procedures, design, etc., comply with U.S. Department of Energy Orders, federal and state regulations, national standards, and applicable engineering procedures and standards

- Issuing and maintaining or providing oversight and review of Solid Waste Management operating documentation, operating procedures, flowsheets, sample schedules, specifications, process test plans and procedures, operational safety requirements, and other documents necessary to operate the TSD units

- Performing routine and comprehensive evaluations of the Solid Waste Management processes to ensure compliance with process control requirements, procedure compliance, and equipment performance; and assessing problem areas and implementing timely corrective actions

- Providing support for process control engineers in troubleshooting of process upsets

- Recruiting, training, certifying, appraising, and developing a highly competent and professional engineering staff to carry out the section's responsibilities

- Preparing, issuing, and ensuring technical correctness of Solid Waste Management operating procedures and preparing and issuing procedure departure authorizations that are correct and that support process changes

- Performing daily, routine, and comprehensive evaluation of Solid Waste Management process parameters to ensure compliance with procedures

- Maintaining Solid Waste Management instrument and equipment flow diagrams that are technically correct and reflect the current configuration of process system

- Reviewing and approving engineering change notices for applicable process equipment changes

- Preparing and approving Solid Waste Management process memos, process test plans, and work plans

- Reviewing and approving Solid Waste Management work authorizations and assigning impact levels

- Providing technical direction for spill responses

- Providing input for environmental dangerous waste permits

- Responding to abnormal and/or emergency conditions according to established procedures.

8.1.1.7 Environmental Engineering/Safety Analysis Reports Manager and Environmental Control Officers. Responsibilities of the Environmental Engineering/Safety Analysis Reports manager and environmental control officers include the following:

- Overviewing Solid Waste Management environmental issues

- Reviewing and approving waste handling procedures

- Assessing environmental waste handling problem areas and implementing timely actions

- Ensuring that Solid Waste Management is in compliance with environmental regulations

- Reviewing and approving environmental data for Solid Waste Management

- Ensuring adherence to the EPA and Ecology reporting requirements

- Reviewing and approving new or revised permits

- Serving as the single point of contact for environmentally related matters

- Managing Solid Waste Management environmental program corrective actions status to achieve compliance with hazardous material and dangerous waste permits

- Coordinating the review and submittal of environmental data for the following:

  - Annual dangerous waste report
  - Waste minimization report
  - Waste volume projections (solid and liquid)
  - The *Superfunds Amendments and Reauthorization Act (SARA) of 1986* 312 Inventory
  - The SARA 313 Releases
  - EPA surveys

- Preparing and providing input to reporting of the following:

  - Spill information
  - Interim compliance status
  - Ecology and EPA reporting requirements

- Coordinating the development and review of new or revised permits including the following:

  - Part A notifications
  - Part B permits
  - Closure plans

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- Clean air permits
- National Pollution Discharge Elimination System permits and well registrations

- Ensuring implementation of permitting requirements and conducting periodic surveillances of compliance assessment with permits. Maintaining active permits in an up-to-date condition

- Resolving regulatory interpretations required to operate TSD units through interface with the applicable organizations, including the DOE-RL, Ecology, EPA, and health departments.

- Preparing, issuing, and approving environmental waste handling procedures

- Determining and issuing environmental waste handling, packaging, and shipping requirements

- Assessing environmental waste handling problem areas and implementing corrective action

- Approving waste container control

- Maintaining electronic tracking of environmental waste.

8.1.1.8 Quality Assurance Manager and Quality Assurance Engineers. Responsibilities of the Quality Assurance manager and Quality Assurance engineers include the following:

- Providing quality planning to ensure that requisite quality is attained and ensuring compliance with technical requirements, including all U.S. Department of Energy-approved requirements and applicable codes and standards

- In concert with engineering, investigating, analyzing, and evaluating all reported nonconformance from approved technical requirements and approving dispositions actions defined by nonconformance reports for all nonconforming items

- Reviewing supplier and contractor status reports, audit reports, inspection reports, nonconformance reports, and occurrence reports to determine existing or potential problems

- Establishing inspection procedures and controls that provide data necessary to resolve disposition of nonconformance or other quality problems. Obtaining commitments from supplier and contractor to take corrective action to solve root causes of problems and following up to ensure the effectiveness of actions taken

- Reviewing and approving engineering drawings, specifications, and other technical documents specifying design and fabrication requirements, and changes thereto, to ensure adequacy of definition of quality provisions

- Planning and performing quality assurance surveillance of contractors and individual organizations to assess compliance with quality requirements, issuing reports of findings, and following up as required to effect timely implementation of necessary corrective actions

- Performing quality engineering tasks and activities as related to design, procurement, program and project planning, procedures, event reporting, readiness reviews, surveillance and assessments, audits, trend analysis, corrective actions, and documentation

- Assisting in studies, development, testing, and analysis of designs, processes, and procedures

- Collecting and compiling technical information for review and assisting in the preparation of technical specifications, reports, procedures, and other quality related documents

- Performing cognizant quality engineering duties within the scope of the incumbents' abilities and the technical complexity of the system.

8.1.1.9 Quality Control Manager and Quality Control Inspector. Responsibilities of the Quality Control manager and Quality Control inspectors include the following:

- Managing and directing the conduct of compliance and conformance verification activities by quality control personnel to ensure consistent application with applicable requirements

- Selecting and assigning qualified personnel to implement the quality assurance and quality control procedures, management of information, and Solid Waste Management quality plans

- Establishing standards and goals for quality control personnel and implementing procedures and instructions for their accomplishment

- Implementing a quality control surveillance program to monitor and ensure that all critical characteristics are reviewed for strict compliance with applicable policies and procedures

- Developing and implementing systems to identify, control, and monitor nonconforming conditions and activities and providing investigative and verification support to include sound recommendations leading to prompt corrective actions

- Performing scheduled and unscheduled surveillances and inspections and documenting results for follow-up actions

- Participating in the planning and performance of complex surveillances and inspections of maintenance, fabrication, and operation activities, and verifying compliance with engineering and quality assurance parameters

- Performing source inspection and acceptance of procured equipment, materials, or assemblies

- Assisting quality engineers in tabulating, charting, and analyzing quality assurance data

- Researching and compiling information to evaluate quality performance trends.

8.1.1.10 Occupational Health and Safety Manager and Engineer. Responsibilities of the Occupational Health and Safety manager and engineers include the following:

- Supporting operations and activities through the provision of industrial hygiene, industrial safety, fire protection, and radiation safety expertise, assistance, and services

- Providing guidance for consistent, effective implementation of occupational health and safety requirements

- Assisting the line organizations in developing cost-effective occupational health and safety plans, systems, controls, procedures, and training

- Assisting the line organizations in preparing designs, specifications, work packages, incident and occurrence reports, corrective action plans, procurement documents and specifications; in conducting hazard evaluations, risk analyses and self-assessments; and in determining and resolving unreviewed safety questions

- Supplying or assisting in the procurement of services for health and safety engineering, dosimetry, radiological and chemical monitoring, respiratory protection, safety training resources, and medical scheduling

- Administering programs to control and minimize radiological, chemical, and industrial hazard exposures, and promoting improved occupational health and safety performance throughout operations

- Administering work permitting systems and approving hazardous and radiation work permits, and excavation, coredrill, welding, cutting, and braising permits

- Directing, advising, and assisting in the investigation and resolution of health and safety related complaints, employee concerns, accidents, occurrences, and conditions

- Assisting in the identification and application of lessons learned

- Conducting or assisting in TSD unit inspections and walkthroughs, pre-occupancy inspections, etc., and administering the Safety Observer Program

- Maintaining and coordinating active ALARA and safety awareness programs to minimize hazard exposures, increasing health and safety awareness, alerting personnel to known hazards, and recognizing positive safety performance

- Providing expertise and administrative support to the President's Safety Council, Accident Prevention Council, and similar unit or organization-specific activities

- Monitoring health and safety experience, providing performance and trend reports, and maintaining employee health and safety records

- Interfacing with the DOE-RL and other DOE-RL contractors regarding occupational health and safety programs, experience, and records

- Preparing and issuing health and safety performance measures, indicators, and trend analyses

- Preparing and submitting health and safety experience reports as required by the U.S. Department of Energy and other governmental agencies

- Developing and submitting to Pacific Northwest Laboratory and Hanford Environmental Health Foundation employee radiation and chemical exposure records

- Maintaining occupational health and safety records as required by the U.S. Department of Energy and contractors.

8.1.1.11 Health and Safety Assurance Manager and Engineers. Responsibilities of the health and safety assurance manager and engineers include the following:

- Supporting applicable controlled activities and programs through the performance and conduct of independent safety review and surveillance to ensure compliance with the letter and intent of applicable health, safety, and fire protection regulations, standards, directives, and recognized good practices

- Developing and interpreting applicable policy, standards, and programs to assist in achieving and maintaining full compliance with occupational health and safety requirements

- Reviewing external standards, public laws, and U.S. Department of Energy Orders and Directives

- Incorporating the appropriate requirements into applicable policy, standards, and programs for health, safety, and fire protection

- Reviewing documents, TSD units operations, and programs to ensure compliance

- Maintaining an organization staff qualified to interpret and apply U.S. Department of Energy Orders and other mandated requirements or recommended practices relative to fire protection, industrial hygiene, occupational safety, radiation protection, and nuclear safety

- Establishing and interpreting safety policies, standards, and limits, and originating Level 2 safety manuals to be used in applicable operations, activities, and TSD units

- Providing and conducting independent audits, appraisals, assessments, and surveillances in the technical safety areas for the purpose of determining compliance with U.S. Department of Energy Orders, other agency standards, and applicable requirements as appropriate

- Identifying deficiencies that require corrective action and following up corrective actions taken

- Conducting multidiscipline safety design and document reviews for the purpose of verifying compliance with mandated safety requirements, standards, and recommended practices

- Administering and coordinating contract 'work for others' relative to health and safety support requests

- Interfacing with the U.S. Department of Energy, other contractors, federal, state, and local agencies relative to health and safety regulation and compliance

- Eliciting and facilitating program improvements

- Directing that work be stopped or TSD units be shut down to protect personnel or property from imminent danger

- Interfacing with other organizational units and personnel in the conduct of assigned responsibilities.

8.1.1.12 Solid/Liquid Waste Maintenance Manager and Maintenance Engineer. Responsibilities of the Solid/Liquid Waste Maintenance manager and maintenance engineers include the following:

- Ensuring compliance with applicable requirements, applicable policies, programs, regulations, and U.S. Department of Energy directives to ensure personnel safety, environmental compliance, and public safety

- Assisting in detailed planning of schedules and budgets to ensure that work is performed in accordance with established schedules and within budget

- Evaluating and modifying maintenance procedures and work plans, and ensuring that procedures are current and accurate

- Providing assistance to equipment and system efforts through direct support to maintenance, and providing person-in-charge services for complex maintenance and/or installation activities

- Performing root-cause analyses as required to determine equipment, system, or personnel induced failures of maintenance systems or equipment, performing failure history analyses, and recommending changes as appropriate

- Ensuring that requirements are identified for each assigned TSD unit, giving particular attention to items supporting safety systems

- Identifying preventive maintenance requirements and deficiencies

- Conducting equipment and TSD unit walkdowns and providing recommendations for reliability improvements

- Providing for continued input and development of the equipment history file in support of trend analysis reviews and specific problem resolution

- Conducting critical equipment failure analysis with cognizant system engineer

- Providing direct technical guidance support to the maintenance performance group in conjunction with the cognizant system engineer

- Supervising, coordinating, and directing the activities of the Solid Waste Maintenance supervisor

- Promoting safe maintenance practices at the TSD units managed by Solid Waste Management

- Enforcing safety, housekeeping, and general operating rules

- Conducting maintenance activities according to established procedures

- Identifying offnormal conditions and taking appropriate action

- Ensuring that supervisors and crafts are trained

- Arranging training for personnel

- Supervising emergency response and recovery actions

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- Maintaining administration controls

- Conducting pre-job safety and planning meetings with personnel involved with the TSD units managed by Solid Waste Management

- Ensuring that radiation exposure and dangerous waste exposure are maintained ALARA

- Responding to abnormal and/or emergency conditions according to established procedures

- Assuming charge during emergencies until properly relieved by the building emergency director.

8.1.1.13 Solid Waste Maintenance Supervisor. Responsibilities of the Solid Waste Maintenance supervisor include the following:

- Supervising, coordinating, and directing the activities of maintenance crafts

- Promoting safe maintenance practices at the TSD units managed by Solid Waste Management

- Enforcing safety, housekeeping, and general operating rules

- Conducting maintenance activities according to established procedures

- Identifying offnormal conditions and taking appropriate action

- Training and/or arranging training for personnel

- Ensuring that maintenance crafts are trained

- Maintaining essential records

- Supervising emergency response and recovery actions

- Maintaining administrative controls

- Conducting pre-job safety and planning meetings with personnel involved with the TSD units managed by Solid Waste Management

- Minimizing injuries and/or equipment damage

- Ensuring that radiation exposure and dangerous waste exposure are maintained ALARA

- Responding to abnormal and/or emergency conditions according to established procedures

- Assuming charge during emergencies until properly relieved by the building emergency director.

8.1.1.14 **Maintenance Crafts.** Crafts include electricians, instrument technicians, iron workers and riggers, millwrights, pipefitters, and welders. Responsibilities of the maintenance crafts include the following:

- Providing routine schedule and emergency maintenance services
- Responding to abnormal and/or emergency conditions according to established procedures.

8.1.1.15 **Road, Delivery, and Equipment Operations Manager.** Responsibilities of the Road, Delivery, and Equipment Operations manager include the following:

- Supervising and coordinating the activities of Road, Delivery, and Equipment Operations supervisors and other employees
- Promoting safe operations of heavy-duty trucks and equipment
- Ensuring operations are conducted according to established procedures
- Statusing and resolving action items arising from audits, inspections, and unusual occurrences
- Supervising emergency response and recovery actions
- Maintaining administration controls
- Enforcing safety and general operating rules
- Ensuring proper response to truck dangerous waste spills
- Implementing training requirements for supervisors and heavy-duty truck drivers
- Ensuring that essential training and qualification records are maintained
- Ensuring that dangerous waste exposure is maintained ALARA.

8.1.1.16 **Road, Delivery, and Equipment Operations Supervisor.** Responsibilities of the Road, Delivery, and Equipment Operations supervisor include the following:

- Supervising, coordinating, and directing the activities of heavy-duty truck drivers and other employees
- Maintaining control over heavy-duty truck operations (including the transport of dangerous waste) in accordance with established operating procedures, applicable policies, U.S. Department of Energy Orders, and federal and state regulations
- Recognizing offnormal conditions and taking appropriate action

- Training and/or arranging training for personnel

- Maintaining essential records

- Supervising emergency response and recovery actions

- Ensuring procedure compliance

- Conducting safety and planning meetings with personnel involved with dangerous waste transport and loading and unloading operations

- Ensuring that the heavy-duty truck drivers are trained and qualified to operate heavy-duty trucks and to transport hazardous materials or dangerous waste

- Enforcing safety and general operating rules

- Ensuring compliance with operating limits and government regulations for operating trucks and transporting hazardous materials or dangerous waste

- Ensuring that dangerous waste exposure is maintained ALARA

- Reviewing completed truck pre-trip inspection form before transport of hazardous materials or dangerous waste

- Ensuring that transport of dangerous waste is in accordance with the schedule list provided by Solid Waste Management operations

- Reviewing and distributing hazardous material transport forms and daily logs

- Ensuring proper response to dangerous waste spills

- Ensuring Road, Delivery, and Equipment Operations management is notified of dangerous waste spills.

8.1.1.17 Road, Delivery, and Equipment Operations Heavy-Duty Truck Drivers. Responsibilities of Road, Delivery, and Equipment Operations heavy-duty truck drivers include the following:

- Performing work activities in accordance with current operation procedures

- Attending Road, Delivery, and Equipment Operations pre-job safety meetings

- Observing all safety precautions related to transport operations

- Responding to a spill or emergency in accordance with current procedures

- Notifying Road, Delivery, and Equipment Operations management in the event of a spill or emergency

- Ensuring that transport of dangerous waste is in accordance with the schedule list provided by Solid Waste Management operations

- Completing a pre-inspection of trucks at the beginning of a shift or whenever drivers are changed

- Reviewing dangerous waste shipping forms

- Inspecting dangerous waste drums for proper labeling

- Inspecting integrity of dangerous waste drums

- Signing dangerous waste shipping forms

- Loading trucks

- Transporting dangerous waste drums

- Observing standard safe driving practices for truck operations

- Unloading trucks at TSD units

- Providing a copy of shipping forms to Solid Waste Management operations

- Completing daily log sheets

- Providing copies of dangerous waste shipping forms and daily log sheets to Road, Delivery, and Equipment Operations supervisor.

8.1.1.18 **Hanford Fire Department.** Responsibilities of the Hanford Fire Department include the following:

- Responding to emergencies

- Providing fire suppression for fires and explosions

- Providing control and containment of nonradioactive hazardous materials accidents or incidents

- Providing emergency medical attention for injured personnel.

8.1.2 Training Content, Frequency, and Techniques [H-1b]

This section provides an overview of job-specific training provided to personnel in job positions discussed in the previous sections. In addition to normal operating conditions, personnel with these job positions are instructed

on communications and alarm systems and the proper response to abnormal conditions and emergencies such as fires, radiological incidents, dangerous waste incidents, and shutdown of operations.

8.1.2.1 Overview of Training for Specific Positions. All Solid Waste Management personnel receive applicable general, unit-specific, and job-specific training. The courses are given in classroom settings, on-the-job training, self-study units, and computer-based training. Tables 8-1 through 8-5 consist of matrices that relate job position to the individual training courses. Table 8-6 provides employee work categories definitions. The following sections provide an overview of job-specific training.

8.1.2.1.1 Solid Waste Management Manager Training. The Solid Waste Management manager completes specific courses in preparation for work assignments, including hazardous materials and dangerous waste training courses. The courses address Solid Waste Management procedures, U.S. Department of Energy directives, applicable policies, and federal and state regulations. The courses include the implementation of Solid Waste contingency plans and use of emergency and monitoring equipment.

8.1.2.1.2 Solid Waste Facility Operations Manager Training. The Solid Waste Facility Operations manager completes specific courses in preparation for work assignments, including hazardous material and dangerous waste training courses. The courses address Solid Waste Management procedures, U.S. Department of Energy directives, applicable policies, and federal and state regulations. The courses include the implementation of Solid Waste contingency plans and use of emergency and monitoring equipment. The Solid Waste Facility Operations manager is required to be qualified for assigned jobs through a systematic process as determined by management.

8.1.2.1.3 Solid Waste Facility Operations Supervisor Training. The Solid Waste Facility Operations supervisor completes specific courses in preparation for work assignments, including hazardous material and dangerous waste training courses. The courses address Solid Waste Management procedures, U.S. Department of Energy directives, applicable policies, and federal and state regulations. The courses include the implementation of Solid Waste contingency plans and use of emergency and monitoring equipment. Solid Waste Facility Operations supervisors are required to be qualified for assigned jobs through a systematic process as determined by management.

8.1.2.1.4 Nuclear Operator Training. Nuclear operators complete specific courses in preparation for work assignments, including hazardous material and dangerous waste training courses. The courses address Solid Waste Management procedures, U.S. Department of Energy directives, applicable policies, and federal and state regulations. The courses include implementation of Solid Waste contingency plans, routine inspections, and use of emergency and monitoring equipment.

Nuclear operators are required to be certified for assigned jobs. Those who are certified complete appropriate dangerous waste training. Operators recertify for assigned jobs at least biennially. Operators must complete the progression tests (general radio-chemical operator and unit-specific courses)

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at least annually. Once a nuclear operator reaches the nuclear process operator level, the progression tests are referred to as requalification tests and are a biennial requirement supplemented by an intervening biennial emergency procedures and abnormal plant conditions test. The combination of requalification tests and the emergency procedures and abnormal plant conditions tests ensures that nuclear process operators continue to comply with the annual emergency training requirement.

8.1.2.1.5 Solid Waste Operations Engineering Manager Training. The Solid Waste Operations Engineering manager completes specific courses in preparation for work assignments, including hazardous material and dangerous waste training courses. The courses address Solid Waste Management procedures, U.S. Department of Energy directives, applicable policies, and federal and state regulations. The courses include the implementation of Solid Waste contingency plans and use, inspections, repair, and replacement of emergency and monitoring equipment.

8.1.2.1.6 Solid Waste Engineering Manager and Cognizant/Process Engineer Training. The Solid Waste Engineering manager and cognizant/process engineers complete specific courses in preparation for work assignments, including hazardous material and dangerous waste training courses. The courses address Solid Waste Management procedures, U.S. Department of Energy directives, applicable policies, and federal and state regulations. The courses include the implementation of Solid Waste contingency plans and use, inspection, repair, and replacement of emergency and monitoring equipment. Process engineers are required to be qualified for assigned jobs through a systematic process as determined by management.

8.1.2.1.7 Environmental Engineering/Safety Analysis Reports Manager and Environmental Control Officer Training. The Environmental Engineering/Safety Analysis Reports manager and the environmental control officers complete specific courses in preparation for work assignments, including hazardous material and dangerous waste training courses. The courses address Solid Waste Management procedures, U.S. Department of Energy directives, applicable policies, and federal and state regulations. The courses include the implementation of applicable contingency plans and use of emergency and monitoring equipment.

8.1.2.1.8 Quality Assurance Manager and Quality Assurance Engineer Training. The Quality Assurance manager and Quality Assurance engineers complete specific courses in preparation for work assignments, including hazardous materials and dangerous waste training courses. The courses address waste management procedures, U.S. Department of Energy directives, applicable policies, and federal and state regulations. The courses include the implementation of applicable contingency plans and use of emergency and monitoring equipment.

8.1.2.1.9 Quality Control Manager and Quality Control Inspectors Training. The Quality Control manager and Quality Control inspectors complete specific courses in preparation for work assignments, including hazardous materials and dangerous waste training courses. The courses address waste management procedures, U.S. Department of Energy directives, applicable

policies, and federal and state regulations. The courses include the implementation of applicable contingency plans and use of emergency and monitoring equipment.

8.1.2.1.10 Occupational Health and Safety Manager and Engineer Training. The Occupational Health and Safety manager and engineers complete specific courses in preparation for work assignments, including hazardous material and dangerous waste training courses. The courses address Solid Waste Management procedures, U.S. Department of Energy directives, applicable policies, and federal and state regulations. The courses include the implementation of applicable contingency plans and use of emergency and monitoring equipment.

8.1.2.1.11 Health and Safety Assurance Manager and Engineer Training. The health and safety assurance manager and engineers complete specific courses in preparation for work assignments, including hazardous material and dangerous waste training courses. The courses address waste management procedures, U.S. Department of Energy directives, applicable policies, and federal and state regulations. The courses include the implementation of applicable contingency plans and use of emergency and monitoring equipment.

8.1.2.1.12 Solid/Liquid Waste Maintenance Manager and Maintenance Engineer Training. The Solid/Liquid Waste Maintenance manager and maintenance engineers complete specific courses in preparation for work assignments, including hazardous material and dangerous waste training courses. The courses address Solid Waste Management procedures, U.S. Department of Energy directives, applicable policies, and federal and state regulations. The courses include the implementation of applicable contingency plans and use, inspection, repair, and replacement of emergency and monitoring equipment.

8.1.2.1.13 Solid Waste Maintenance Supervisor Training. The Solid Waste Maintenance supervisors complete specific courses in preparation for work assignments, including hazardous material and dangerous waste training courses. The courses address Solid Waste management procedures, U.S. Department of Energy directives, applicable policies, and federal and state regulations. The courses include the implementation of applicable contingency plans and use, inspection, repair, and replacement of emergency and monitoring equipment.

8.1.2.1.14 Maintenance Crafts Training. Maintenance crafts complete specific courses in preparation for work assignments, including hazardous materials and dangerous waste training courses. The courses address Solid Waste Management procedures, U.S. Department of Energy directives, applicable policies, and federal and state regulations. The courses include the implementation of applicable contingency plans and use, inspection, repair, and replacement of emergency and monitoring equipment.

8.1.2.1.15 Road, Delivery, and Equipment Operations Manager Training. The Road, Delivery, and Equipment Operations manager completes specific courses in preparation for work assignments, including hazardous materials and dangerous waste training courses. The courses address fleet operations,

transportation, maintenance services waste management procedures (including implementation of applicable contingency plans), and use of emergency and monitoring equipment.

8.1.2.1.16 Road, Delivery, and Equipment Operations Supervisor Training. The Road, Delivery, and Equipment Operations supervisors complete specific courses in preparation for work assignments, including hazardous materials and dangerous waste training courses. The courses address fleet operations, transportation, maintenance services waste management procedures (including implementation of applicable contingency plans), and use of emergency and monitoring equipment.

8.1.2.1.17 Road, Delivery, and Equipment Operations Heavy-Duty Truck Driver Training. The Road, Delivery, and Equipment Operations heavy-duty truck drivers complete specific courses in preparation for work assignments, including hazardous materials and dangerous waste training courses. The courses address fleet operations, transportation, maintenance services waste management procedures (including implementation of applicable contingency plans), and inspection and use of emergency and monitoring equipment.

The Road, Delivery, and Equipment Operations heavy-duty truck drivers are required to be qualified for assigned jobs (e.g., hazardous materials-carrier/driver and valid Washington State commercial drivers license, Class A, with hazardous material endorsement). Those who are qualified complete appropriate dangerous waste training. Drivers must requalify for their assigned jobs at lease biennially. Drivers must renew their commercial drivers licenses every 4 years, complete a U.S. Department of Transportation physical, be medically certified biennially, and complete the Washington State hazardous materials endorsement test annually. The combination of requalification courses and renewing the Washington State commercial drivers license, Class A, with hazardous materials endorsement, ensures that drivers continue to comply with the annual emergency training requirements.

8.1.2.1.18 Hanford Fire Department Training. The Hanford Fire Department personnel complete specific courses in preparation for work assignments, including hazardous materials and dangerous waste training courses. The courses address waste management procedures, U.S. Department of Energy directives, applicable policies, and federal and state regulations. The courses include the implementation of applicable contingency plans and use of emergency and monitoring equipment.

Hanford Fire Department firefighters meet the requirements of the National Firefighters Protection Association [NFPA 472 and 1001 (1989)], 29 CFR 1910.1200 and 1910.120 (paragraph Q), and the Washington State requirements for emergency medical personnel response.

8.1.2.1.19 Nonessential Personnel Training. Employees not identified as essential personnel and other U.S. Department of Energy-contractor personnel who must enter the Solid Waste Management TSD units are required to complete "Solid Waste Operations Orientation" or must be escorted. Non-U.S. Department of Energy-contractor personnel must complete a security and safety orientation before working in or around the 616 NRDWSF.

8.1.2.2 **Training Matrix: Job Positions and Training.** The Solid Waste Management training program encompasses general, unit-specific, and job-specific training courses. Tables 8-1 through 8-5 consist of matrices that relate job title to the individual training courses applicable to the 616 NRDWSF. The matrices indicate if the courses are introductory or continuing and also if the course is part of a certification program required for specific personnel or required only for new employees.

Some courses are introductory and must be completed one time only (often referred to as orientation) and other introductory courses are the first course in a program. Continuing courses are those that must be repeated according to a specified frequency.

8.1.2.3 **Training Course Descriptions.** Appendix 8A contains brief descriptions of selected courses, including course description, the target audience, instructional delivery, evaluation method, length of course, and frequency of retraining.

8.1.3 **Training Director [H-1c]**

There is no one individual designated as training director. This responsibility is shared among Solid Waste Management, Technical Training, Solid Waste Engineering, Occupational Health and Safety, and Fleet Operations, Transportation, and Maintenance Services. This distribution of training responsibilities is provided in Figure 8-1. Using the system noted in Figure 8-1, 616 NRDWSF management can access training resources and experts in many different areas of dangerous waste and industrial safety, rather than relying on the knowledge of one person or a small number of individuals. General responsibilities for training are discussed in the following sections.

8.1.3.1 **Solid Waste Management Responsibilities.** Solid Waste Management has the following responsibilities related to training:

- Establishing operations training requirements
- Requesting and/or conducting training
- Maintaining field training records and certifications
- Tracking retraining.

8.1.3.2 **Solid Waste Engineering Responsibilities.** Solid Waste Engineering Services has the following responsibilities related to training:

- Establishing process engineering training requirements
- Developing and conducting process engineering training
- Maintaining field training records and certifications
- Tracking retraining.

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8.1.3.3 **Technical Training Responsibilities.** Section groups with technical training responsibilities are listed in the following sections.

8.1.3.3.1 **Training Support and Accreditation.** Training support and Accreditation is responsible for the following:

- Conducting job analysis
- Designing training programs
- Developing training programs
- Providing consultation to other training organizations regarding training development
- Providing training program accreditation assistance.

8.1.3.3.2 **Safety and Quality Technical Training.** Safety and Quality Technical Training is responsible for the following:

- Developing and implementing general training courses to comply with federal and state regulations
- Conducting safety training courses
- Developing and providing health physics technician classroom certification training
- Conducting radiation safety training courses
- Conducting respiratory protection classes.

8.1.3.3.3 **Environmental Training.** Environmental Training is responsible for the following:

- Developing and implementing general training courses to comply with U.S. Department of Energy directives and federal and state regulations
- Conducting hazardous and dangerous waste handling and management courses.

8.1.3.3.4 **Training Records.** Training Records is responsible for the following:

- Operating and maintaining central training record files
- Notifying management of retraining requirements for employees.

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8.1.3.3.5 Environmental Restoration and Remediation Training. Environmental Restoration and Remediation Training is responsible for the following:

- Developing training courses and/or programs for Solid Waste Management employees
- Developing and providing study material and examinations
- Tracking retraining
- Preparing and administering examinations
- Coordinating classes and other training requirements to complete and maintain certifications
- Conducting on-the-job training as applicable
- Developing and maintaining on-the-job training requirements
- Providing instructors for selected courses.

8.1.3.3.6 **Maintenance Training.** Maintenance training is responsible for developing training materials and providing instruction for maintenance personnel.

8.1.3.4 **Occupational Health and Safety Responsibilities.** Training responsibilities for this organization include the following:

- Maintaining current knowledge of Occupational Safety and Health Administration regulations
- Ensuring Solid Waste Management compliance with Occupational Safety and Health Administration regulations through audits, design and procedure reviews, and surveillances
- Consulting with Technical Training and Solid Waste Management in the development and reevaluation of current training programs.

8.1.3.5 **Fleet Operations, Transportation, and Maintenance Services Responsibilities.** Training responsibilities for Fleet Operations, Transportation, and Maintenance Services include the following:

- Maintaining current knowledge of Washington State commercial drivers license requirements and U.S. Department of Transportation regulations for transporting hazardous materials or dangerous waste
- Ensuring drivers compliance with Washington State commercial drivers license requirements and U.S. Department of Transportation regulations
- Establishing drivers training requirements

- Providing qualified instructors to administer driver proficiency tests for drivers with less than 2 years driving experience and a clean driving record

- Issuing a commercial drivers license certification for waiver of skill examination for drivers with 2 or more years driving experience and a clean driving record

- Requesting and/or conducting training

- Maintaining field training, physical, and certification records

- Tracking retraining.

8.1.4 Relevance of Training to Job Position [H-1d]

The training program for Solid Waste Management was developed after an initial job analysis was completed. Tasks performed by the nuclear operators, Solid Waste Facility Operations supervisors, and Solid Waste Facility Operations managers were identified and evaluated to determine training requirements. In addition, training needs are assessed in relation to current federal and state regulations on a continual basis. These evaluations could result in modifying or adding new material to the current training program.

Certification is required for the Solid Waste Facility Operations managers, Solid Waste Facility Operations supervisors, and nuclear operators who work at TSD units managed by Solid Waste Management. To become certified, an employee must successfully complete classroom training and on-the-job training. Classroom instruction is designed to provide employees with the fundamental knowledge required to perform work safely at TSD units.

On-the-job training requires operations personnel to gain experience with what is contained in the operating procedures. All work that involves hazardous materials and dangerous waste is performed according to approved operating procedures; therefore, an understanding of procedures is crucial to ensure the proper and safe operation of TSD units. Understanding is accomplished by having individuals perform, simulate, and/or describe a particular task as specified by the appropriate operating procedure. The individual demonstrating the required skills and knowledge is observed by another certified nuclear operator and the Solid Waste Facility Operations manager or Solid Waste Facility Operations supervisor before being certified.

Additionally, management must complete their own certification requirements, which include self-study and on-the-job training.

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8.1.5 Training to Emergency Response [H-1e]

Effective response to emergencies and familiarity with emergency equipment and emergency systems are covered under the classroom and on-the-job training requirements as outlined in Tables 8-1 through 8-5 and in Appendix 8A.

Federal and state regulations require that personnel be able to respond effectively to emergencies and that personnel be familiar with emergency procedures, emergency equipment, and emergency systems. Specific topics addressed include the following:

- Building emergency director's training
- Building emergency plan checklist training
- Solid waste unit-specific training
- Solid waste operations orientation
- Solid waste operations nuclear operator emergency procedures and abnormal plant conditions training
- Solid waste operations supervisor emergency procedures and abnormal plant conditions training.

8.2 IMPLEMENTATION OF TRAINING PROGRAM [H-2]

The Solid Waste Management training program is in place and has been fully implemented. Certification for Solid Waste Management personnel is required before working without supervision. Certification requires personnel to successfully complete identified classroom and on-the-job training requirements. Certification requires management to successfully complete self-study, classroom, and on-the-job training requirements. Training content is reviewed and updated as appropriate.

General training of new employees is to be completed within the first 6 months. After the initial training, employees are required to recertify annually or biannually as applicable. Uncertified employees are not permitted to work at the 616 NRDWSF without the supervision of a certified employee. The Solid Waste Facility Operations manager is responsible for ensuring new employees are trained and certifications are maintained.

Official training record files for Solid Waste Management employees are stored in the Training Records Information System. This database is managed by a training organization. The training organization inputs the completed training records into a computer file. The computer file is accessible on a local area network to allow remote accessing of employee training records via a computer terminal. A tickler file is available from the database to inform the Solid Waste Facility Operations manager when training is within 90 days of expiration. A copy of completed training and certifications for 616 NRDWSF

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employees is available at the 616 NRDWSF. All training records are maintained for a period of 3 years from the date the employee last worked at the TSD unit.

Specific employee training records are available, at reasonable times, to the regulators on a demonstrated need-to-know basis. Copies of these records will be marked *Sensitive Information* and are expected to be handled in accordance with the *Privacy Act of 1974*.

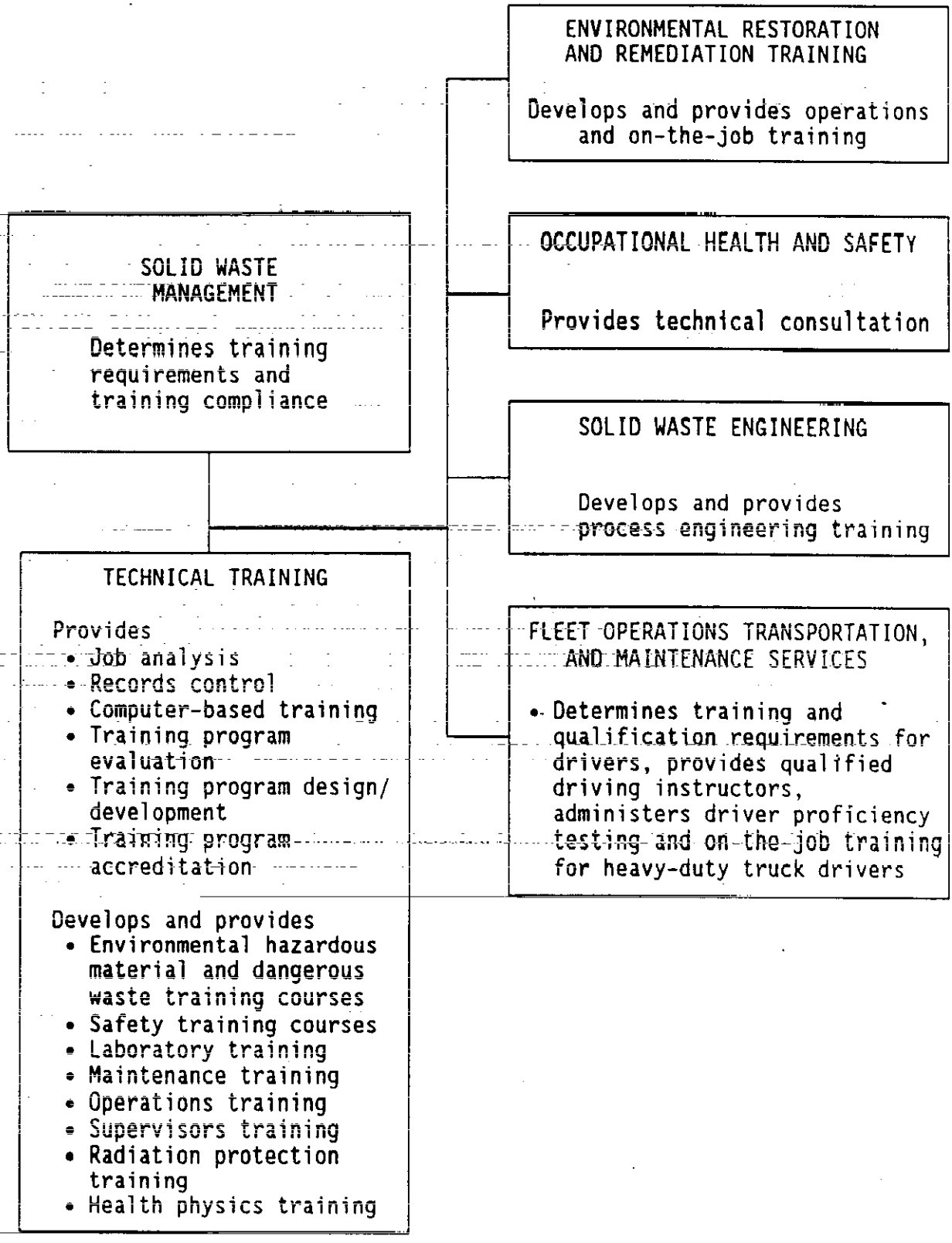

Figure 8-1. Distribution of Training Responsibility for Solid Waste Management Training.

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Table 8-1. General Training Matrix. (sheet 1 of 2)

Course	Type	Target Audience														
		PM	PO	OM	NO	MM	CM	PE	PC	QA	QC	SF	HZ	FD	RD	HD
General employee training	C	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
New employee safety training	I	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
On-the-job training instructor training	I	-	-	3	3	3	3	-	3	-	3	-	-	-	3	3
Environmental and hazardous material safety training requirements (Tables 8-4 and 8-5)	I,C	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3
Building emergency director training	C	X	X	X	-	-	-	-	-	-	-	-	-	-	-	-
Light-duty hoist training	C	-	-	X	X	-	-	-	-	-	-	-	-	-	-	-
Orientation to DOE Order 5000.3A occurrence reporting	I	X	X	X	X	X	-	X	X	X	X	X	X	-	X	-
Managers, first-line managers conduct of operations, DOE Order 5480.19	I	X	X	X	-	X	-	X	X	X	X	X	X	-	X	-
Basic crane and rigging training	C	-	-	-	-	X	X	-	-	-	-	-	-	-	-	-
Fork truck operator training	I	-	-	-	X	-	-	-	-	-	-	-	-	-	-	-
Fork truck operator requalification	C	-	-	-	X	-	-	-	-	-	-	-	-	-	-	-

Table 8-1. General Training Matrix. (sheet 2 of 2)

Target audience abbreviations				Legend	
PM	Solid Waste Management manager	QA	Quality Assurance manager and engineers	1	Introductory course
PO	Solid Waste Facility Operations manager	QC	Quality Control manager and inspectors	X	Continuing course
OM	Solid Waste Facility Operations supervisors	SF	Occupational Health and Safety manager and engineers, health and safety assurance manager and engineers	X	Required course
NO	Nuclear operators	HZ	Environmental Engineering/Safety Analysis Reports manager and environmental control officer	-	Not applicable
MM	Solid/Liquid Waste Maintenance manager, maintenance engineers, and Solid Waste Maintenance supervisors	FD	Hanford Fire Department	1	Completed as part of job-specific certification
CM	Maintenance crafts	RD	Road, Delivery, and Equipment Operations manager and supervisor	2	Required only for new employees
PE	Solid Waste Operations Engineering manager	HD	Road, Delivery, and Equipment Operations heavy-duty truck drivers	3	Required as determined by management for designated personnel
PC	Solid Waste Engineering manager and cognizant/process engineers				

Table 8-2. Unit-Specific Training Matrix.

Course	Type	Target audience														
		PM	PO	OM	NO	MM	CM	PE	PC	QA	QC	SF	HZ	FD	RD	HD
Solid Waste Operations orientation*	I	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
Building emergency plan checklist	C	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4

Target audience abbreviations				Legend	
PM	Solid Waste Management manager	QA	Quality Assurance manager and engineers	I	Introductory course
PO	Solid Waste Facility Operations manager	QC	Quality Control manager and inspectors	C	Continuing course
OM	Solid Waste Facility Operations supervisors	SF	Occupational Health and Safety manager and engineers, health and safety assurance manager and engineers	X	Required course
NO	Nuclear operators	HZ	Environmental Engineering/Safety Analysis Reports manager and environmental control officers	-	Not applicable
MM	Solid/Liquid Waste Maintenance manager, maintenance engineers, and Solid Waste Maintenance supervisors	FD	Hanford Fire Department	4	Required only for personnel assigned to TSD unit
CM	Maintenance crafts	RD	Road, Delivery, and Equipment Operations manager and supervisor	*	All other personnel in a supporting capacity, other than visitors, must complete this course
PE	Solid Waste Operations Engineering manager	HD	Road, Delivery, and Equipment Operations heavy-duty truck drivers		
PC	Solid Waste Engineering manager and cognizant/process engineers				

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Table 8-3. Job-Specific Training Matrix. (sheet 1 of 2)

Course	Type	Target audience														
		PM	PO	OM	NO	MM	CM	PE	PC	QA	QC	SF	HZ	FD	RD	HD
General radio-chemical operator training	C	-	-	-	X	-	-	-	-	-	-	-	-	-	-	-
Solid waste unit-specific training	C	-	-	-	X	-	-	-	-	-	-	-	-	-	-	-
Nuclear operator certifications	C	-	-	-	X	-	-	-	-	-	-	-	-	-	-	-
Solid waste operator certifications-Solid Waste	C	-	-	-	X	-	-	-	-	-	-	-	-	-	-	-
Solid Waste Operations nuclear operator emergency procedures and abnormal plant conditions training	C	-	-	-	X[a]	-	-	-	-	-	-	-	-	-	-	-
Solid Waste Operations supervisor certification	C	-	X	X	-	-	-	-	-	-	-	-	-	-	-	-
Solid Waste Operations supervisor emergency procedures and abnormal plant conditions training	C	-	X	X	-	-	-	-	-	-	-	-	-	-	-	-
Phase II process engineering certification (unit-specific training)	C	-	-	-	-	-	-	-	X	-	-	-	-	-	-	-
Hazardous material-carrier/driver course	C	-	-	-	-	-	-	-	-	-	-	-	-	-	X	X
Washington State commercial drivers license-Class A with hazardous materials endorsement	C	-	-	-	-	-	-	-	-	-	-	-	-	-	-	X

Target audience abbreviations				Legend	
PM	Solid Waste Management manager	QA	Quality Assurance manager and engineers	I	Introductory course
PO	Solid Waste Facility Operations manager	QC	Quality Control manager and inspection	C	Continuing course
OM	Solid Waste Facility Operations supervisor			X	Required course
				-	Not applicable
NO	Nuclear operators				
MM	Solid/Liquid Waste Maintenance manager, maintenance engineers, and Solid Waste Maintenance supervisors			X[a]	Nuclear process operators must complete this course in alternating years in conjunction with the general radio-chemical operator

Table 8-3. Job-Specific Training Matrix. (sheet 2 of 2)

Target audience abbreviations				Legend
CM	Maintenance craft	SF	Occupational Health and Safety manager and engineers, health and safety assurance manager and engineers	
PE	Solid Waste Operations Engineering manager	HZ	Environmental Engineering/Safety Analysis Reports manager and environmental control officers	
PC	Solid Waste Engineering manager and cognizant/process engineers	FD	Hanford Fire Department	
		RD	Road, Delivery, and Equipment Operations manager and supervisor	
		HD	Road, Delivery, and Equipment Operations heavy-duty truck drivers	

Table 8-4. Environmental and Hazardous Material Safety Initial Training Matrix.

Employee category [a]	Course title														Total hours
	Hazardous Communication and Waste Orientation (1 hour)	Generator Hazards Safety Training (4 hours)	Hazardous Materials Waste Job-Specific Training [b]	Radiation Worker Training (8 hours)	Waste Site-Basic (16 hours)	Scott SKA-PAK [c] Training (2 hours)	Cardiopulmonary Resuscitation (4 hours)	Fire Extinguisher Safety (1 hour)	Waste Site Advanced (24 hours)	Waste Site Field Experience (24 hours)	Hazardous Waste Shipment Certification (24 hours)	Certification of Hazardous Material Shipments (8 hours)	Hazardous Waste Site Supervisor/Manager (8 hours)	Compliance Category [d]	
1. All Employees	X														1
2. General Worker		X	X											1	5 + unit-specific training
3. General Supervisor/ Manager		X	X											1	5 + unit-specific training
4. General Nonradiological Shipper		X	X								X			1,2	29 + unit-specific training
5. General Hazardous Material Shipper		X	X									X		1,2	13 + unit-specific training
6a. Hazardous Waste Worker (known hazards)		X	X	X	X									1,3	28 + unit-specific training + field experience
6b. Hazardous Waste Worker (unknown hazards)		X	X	X		X	X	X	X	X				1,4	44 + unit-specific training + field experience
7. Hazardous Waste Supervisor/Manager		X	X	X		X	X	X	X	X			X	1,5	52 + unit-specific training + field experience
8. Hazardous Waste Shipper		X	X	X		X	X	X	X	X	X	X		1,2,4	76 + unit-specific training + field experience

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[a] Category definitions are in Table 8-6.
[b] Length varies for each TSD unit.
[c] Scott SKA-PAK is a trademark of Figgie International, Incorporated.
[d] Compliance categories:

1 WAC 173-303, 29 CFR 1910.1200
2 49 CFR 173
3 29 CFR 1910.120 (24 hour requirement)
4 29 CFR 1910.120 (40 hour requirement)
5 29 CFR 1910.120 (40 hour plus 8 hour requirement)

Table 8-5. Environmental and Hazardous Material Safety Retraining Matrix.

Employee category [a]	Course title (length/frequency)				
	Generator Hazards Safety Training (4 hours/2 years)	Hazardous Materials Waste Job-Specific Training (1 year) [b]	Hazardous Waste Site Retraining (8 hours/1 year)	Hazardous Waste Shipment Certification (24 hours/1 year)	Certification of Hazardous Material Shipments (8 hours/2 years)
1. All Employees	Not required				
2. General Worker	X	X			
3. General Supervisor/Manager	X	X			
4. General Nonradiological Shipper	X	X		X	
5. General Hazardous Material Shipper	X	X			X
6a. Hazardous Waste Worker (known hazards)	X	X	X		
6b. Hazardous Waste Worker (unknown hazards)	X	X	X		
7. Hazardous Waste Supervisor/Manager	X	X	X		
8. Hazardous Waste Shipper	X	X	X	X	X

[a] Category definitions are in Table 8-6.
[b] Length varies for each TSD unit.

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Table 8-6. Employee Work Categories Definitions.
(sheet 1 of 2)

Employee category	Definition
1. All Employees	All employees and unescorted contract personnel.
2. General Worker	Any employee who is or has the potential to be exposed to hazardous chemicals in the work place. Also, any employee who generates, packages, stores or ships dangerous waste or who directly affects the management of hazardous chemicals or dangerous waste.
3. General Supervisor or Manager	Supervisor or manager who qualifies under the definition of General Worker (No. 2) or who has subordinates who qualify as general workers.
4. General Nonradiological Dangerous Waste Shippers	Employees who are responsible for preparing and signing the Uniform Hazardous Waste Manifests.
5. General Hazardous Material (Radiological) Shippers	Employees who certify the compliance of radioactive Hanford Facility hazardous material shipments.
Categories 6 through 8 as defined in OSHA 29 CFR 1910.120, *Hazardous Waste Operations and Emergency Response* are as follows :	
6a. Hazardous Waste Site Worker-hazards known	Employees who work within or require entry into permitted portions of TSD units. Examples at the Hanford Facility: PUREX aqueous makeup; PUREX sampling gallery; PUREX operating and pipe gallery.
6b. Hazardous Waste Site Worker-hazards unknown	Employees who work within or require entry into CERCLA/RCRA remediation sites or TSD units where cleanup work could present unknown hazards or where there is potential for conditions to change and present unknown hazards.

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Table 8-6. Employee Work Categories Definitions.
(sheet 2 of 2)

Employee category	Definition
	Examples at the Hanford Facility: Decontamination and decommissioning work/operations; tank farms; Grout Treatment Facility; crib/ditch/pond work including but not limited to the following: characterization, monitoring, sampling, and maintenance.
7. Hazardous Waste Site Supervisor or Manager	Supervisors or managers who oversee work of employees who qualify as Hazardous Waste Site Workers (No. 6a and 6b).
8. Hazardous Waste Site Shipper	Employees who are responsible to certifying shipments of nonradioactive dangerous waste, hazardous material, and/or mixed waste.

CONTENTS

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9.0 EXPOSURE INFORMATION REPORT

The 616 NRDWSF does not store, treat, or dispose of hazardous waste in a surface impoundment or a landfill as defined in 40 CFR 270.10 and RCRA, Section 3019. Therefore, exposure information is not required.

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10.0 WASTE MINIMIZATION PLAN

This chapter discusses the program to minimize the volume or quantity and toxicity of waste generated at the 616 NRDWSF. The regulatory basis for, and objectives of, the waste minimization program are discussed. Waste generation is described and procedures for minimizing waste are discussed.

10.1 REGULATORY BASIS

The *Hazardous and Solid Waste Amendments of 1984* to RCRA require that, whenever feasible, the generation of hazardous waste be reduced or eliminated as expeditiously as possible. Section 3002(b) of RCRA requires the following certification.

- The generator of the hazardous waste has in place a program to reduce the volume or quantity and toxicity of such waste to the degree determined by the generator to be economically practicable.

- The proposed method of treatment, storage, and/or disposal is that practicable method currently available to the generator that minimizes the present and future threat to human health and the environment.

This chapter provides the means to certify that a waste minimization program is in place for the 616 NRDWSF.

10.2 THE 616 NONRADIOACTIVE DANGEROUS WASTE STORAGE FACILITY WASTE MINIMIZATION OBJECTIVES

The 616 NRDWSF waste minimization program is tied to the overall waste minimization program for the Hanford Facility. The 616 NRDWSF waste minimization program includes all practices that reduce, avoid, or eliminate dangerous waste generation.

The following are the 616 NRDWSF waste minimization program objectives:

- Minimize the volume of dangerous waste generated

- Segregate dangerous waste from nondangerous waste if practicable.

Annually a certification, as required by 40 CFR 264.73(b)(9), is placed in the 616 NRDWSF operating record stating that a waste minimization program is in place.

10.3 WASTE GENERATION

The 616 NRDWSF waste minimization program is designed to avoid or reduce the amount of dangerous waste generated. Waste generated at the 616 NRDWSF is

managed aggressively to minimize the total volume. Sources of waste at the 616 NRDWSF are as follows:

- Spills and spill cleanup
- Rainwater or snowmelt contaminated with dangerous waste
- Nonprocess waste such as office refuse.

Section 10.4 describes the procedures used to minimize this waste.

10.4 SPECIFIC WASTE MINIMIZATION PROCEDURES

As stated previously, the 616 NRDWSF is a storage building for waste generated at other locations on the Hanford Facility until the waste can be transported to a permitted offsite TSD facility. The 616 NRDWSF does not exercise direct control over the quantities accepted for storage. However, waste that does not meet acceptance criteria, as defined in Chapters 3.0 and 4.0, is not transferred to the 616 NRDWSF.

Waste generated at the 616 NRDWSF, while minimal, is managed to ensure that the quantity and toxicity are minimized.

The 616 NRDWSF operating procedures that are in place to address the disposal of generated waste are described in Chapter 2.0, Sections 2.5.1 and 2.7. These procedures include the proper responses for cleanup after dangerous waste spills and the disposal of rainwater or snowmelt that accumulates in the containment systems of the loading areas (Chapter 2.0, Figure 2-3) outside the 616 NRDWSF. The response to dangerous waste spills is aimed at minimizing liquid and material used during spill cleanup.

Rainwater or snowmelt that accumulates in the loading area containment systems is verified to be free of dangerous waste contamination (Chapter 2.0, Section 2.5.1) so that the liquid can be disposed of to the french drain (Chapter 2.0, Section 2.1.2.6). If the liquid is found to be regulated, the material is packaged and shipped as a dangerous waste. In either case, liquid in the loading area containment systems is removed in a rapid and proper manner to minimize the potential mixing of nondangerous waste with dangerous waste, thereby reducing the total volume of dangerous waste generated.

The 616 NRDWSF is cleaned in a manner that minimizes the potential for dangerous waste generation. During normal operations, the floors in the operating areas of the storage building are cleaned without the use of water. The use of free liquid and/or running water is not permitted without permission of the 616 NRDWSF Supervisor and Solid Waste Engineering management.

Waste such as office refuse is segregated from the dangerous waste stored at the 616 NRDWSF and disposed of in a solid waste landfill. This segregation procedure reduces the volume of waste that must be handled as dangerous waste.

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11.0 CLOSURE AND POSTCLOSURE REQUIREMENTS [I]

This chapter presents the closure plan for the 616 NRDWSF. The 616 NRDWSF is a clean, well-maintained dangerous waste container storage unit. Detailed records are maintained of materials stored at the 616 NRDWSF and spills and other unusual occurrences are handled promptly and are well documented. As a controlled container storage unit, the 616 NRDWSF is not anticipated to become extensively contaminated (the use of the word contaminated refers to contamination by dangerous chemicals regulated by Ecology); therefore, the closure approach will be clean closure. Consistent with the criteria that must be met to clean close a TSD unit, no postclosure activities will be necessary. Closure of the 616 NRDWSF will comply with WAC 173-303-610 regulations for the closure of TSD units. This chapter describes the performance standards that will be met, and closure activities that will be conducted to achieve clean closure.

11.1 CLOSURE PLAN [I-1]

The 616 NRDWSF became operational in 1986 and is designed for a 20-year operational life. The 616 NRDWSF Dangerous Waste Permit will be in effect for a maximum of 10 years. Before the end of the 10-year permit lifespan, the storage unit will be evaluated for operational fitness and repermitted. Any deficiencies (including deficiencies associated with the closure plan) will be corrected before continued use is considered.

Activities that are planned to achieve clean closure are presented in the following sections.

11.1.1 Closure Performance Standard [I-1a]

The following sections address closure performance standards and waste removal and decontamination standards.

11.1.1.1 Performance Standard [I-1a(1)]. Closure of the 616 NRDWSF will be conducted in a manner that meets the following closure performance standards of WAC 173-303-610(2)(a):

- Minimize the need for further maintenance
- Control, minimize, or eliminate to the extent necessary to protect human health and the environment, postclosure escape of dangerous waste, dangerous waste constituents, leachate, contaminated run-off, or dangerous waste decomposition products to the ground, surface water, groundwater, or the atmosphere
- Return the land to the appearance and use of surrounding land areas to the degree possible given the nature of the previous dangerous waste activity.

In general, these standards will be achieved by removing, to below background levels or regulatory thresholds, dangerous waste from the 616 NRDWSF and decontaminating or removing all equipment, structures, soils, or other materials containing or contaminated with dangerous waste.

11.1.1.2 Removal or Decontamination Standard [I-1a(2)]. Clean closure of the 616 NRDWSF will require removal and disposal of all dangerous waste, contaminated equipment, and rinsates to standards specified in WAC 173-303-610(2)(b). Sampling will ensure that all dangerous waste contamination is detected and removed as part of closure.

Contaminated equipment in the 616 NRDWSF will be decontaminated until wipe sample analyses of the portions of the equipment, which would be in contact with potentially contaminated materials or fluids, demonstrate that the equipment is not a dangerous waste. The level of quantitation will be used as the action level for wipe samples. Clean equipment will be reused. Any equipment that cannot be decontaminated will be disposed of as dangerous waste.

All concrete within the 616 NRDWSF boundary is susceptible to contamination and there are no other pours of the same concrete outside of the unit boundary. Because there is no other concrete available to establish a background level, the approach detailed in Table 11-1 will be used for the analysis of the concrete samples.

The concrete floor of the 616 NRDWSF includes the trenches and sumps. The trenches and sumps of the 616 NRDWSF are assumed to be the areas of the floor subjected to the highest level of contamination. Consequently, the disposition of the floor will be contingent on results of the core sampling of the trenches and sumps. In addition to the trenches and sumps, the loading areas of the 616 NRDWSF also will be core sampled. The floor, trenches, and sumps of the storage and loading areas will be removed and disposed of as dangerous waste if contamination is found in the designating sample. The designating sample will be considered to be the sample indicating the highest level of contamination. Action levels for the analysis of the core samples will be established in accordance with Table 11-1.

The soil immediately surrounding the loading areas will be sampled for verification that the environment has not been affected by the 616 NRDWSF operations. Should contaminants be detected above background levels, the soil will be excavated until the level of chemical constituents around the 616 NRDWSF is below or equal to that of soil background levels. Soil background levels will be based on established and accepted Hanford Site soil background information (WHC 1991) or established by soil sampling per SW-846 (EPA 1986).

To achieve the above-mentioned standards within the tolerances specified, distinct sampling strategies and methods have been determined for the floor of the cells, loading areas, equipment, and soil. These strategies and methods are discussed in Section 11.1.4.

11.1.2 Partial Closure Activities [I-1b]

No partial closure activity is anticipated for the 616 NRDWSF.

11.1.3 Maximum Waste Inventory [I-1c]

Of the 6 cells, the caustic cell and the oxidizer cell each can hold 5,250 gallons (19,873.4 liters), the combustible cell can hold 5,930 gallons (22,447.5 liters), and the acid cell can hold 6,100 gallons (23,091 liters) of waste. The remaining 2 cells, the Class 1A flammable cell and the Class 1B flammable cell, can hold 2,535 gallons (9,596 liters) and 3,400 gallons (12,870.4 liters), respectively. To achieve this capacity, the waste containers would have to be double stacked as detailed in Chapter 4.0, Section 4.1.1.2. In total, 28,635 gallons (108,395.3 liters) of waste can be stored in the 616 NRDWSF. Figure 11-1 shows the configuration and layout of a typical cell.

11.1.4 Inventory Removal, Disposal or Decontamination of Equipment, Structures, and Soils [I-1d]

Closure activities will entail sampling and decontamination or removal and disposal of the structure, equipment, and soil. These activities will consist of the following steps, as necessary, to determine what dangerous waste, if any, has contaminated the building, the associated equipment, the loading areas, and the surrounding soil.

1. Decontaminate the storage building floor and walls.

2. Decontaminate the associated storage building equipment.

3. Decontaminate the loading areas.

4. Perform verification sampling of the storage building trenches and sumps, associated equipment, and loading areas to determine the effectiveness of decontamination procedures.

5. Perform repeated decontamination and verification sampling until the removal of all contaminants is verified or the component is properly disposed of.

6. Excavate and dispose of any contaminated soil.

7. Perform repeated excavation and verification sampling until all contaminated soil has been removed.

8. Decontaminate any equipment used in performing closure activities.

9. Dispose of all contaminated materials and rinsates generated during the closure activities.

10. Restore the area after closure activities are complete.

11. Certify that closure activities were completed in accordance with the approved plan.

A sampling flow path for the 616 NRDWSF components is shown in Figure 11-2.

11.1.4.1 Inventory Removal. All waste inventory will be shipped offsite to a permitted TSD facility within 90 days after receiving the last volume of dangerous waste. Following the final shipment of waste, the 616 NRDWSF floor, walls, and loading areas will be washed down and decontaminated. An appropriate decontamination method such as high-pressure, low-volume steam cleaning coupled with detergent washes will be used. Such a combination is nondangerous in itself and will be effective for both organic and inorganic constituents. The decontamination rinsate will be containerized, sampled, designated and, if regulated, shipped offsite to a permitted TSD facility. All materials packaged for shipment to a permitted TSD facility will be in U.S. Department of Transportation-approved containers that are compatible with the waste contents. All containers will be labeled and shipped with an accompanying offsite manifest. All dangerous waste rinsate generated from decontamination of the 616 NRDWSF will be handled in the same manner.

11.1.4.2 Decontamination of Building Equipment. Most of the equipment at the 616 NRDWSF is used for drum handling. This equipment could become contaminated in the event of a leaking or ruptured drum. Storage building equipment includes the following:

- Barrel sling
- Drum dollies, hand trucks, pallet jacks, and/or electric forklift truck
- Chemical transfer pumps
- Gantry crane
- Barrel tongs.

Any contaminated storage building equipment will be decontaminated with an appropriate decontamination method, such as high-pressure, low-volume steam cleaning coupled with detergent washes. The equipment decontamination rinsate will be handled in the same manner as the storage building decontamination rinsate. Equipment will be decontaminated until wipe sample analysis shows no detectable contamination.

Other equipment within the storage building not associated with drum handling includes cold and hot water lines servicing the basins and safety showers. As shown in Drawing H-6-1559 in Appendix 4B, the cold water line enters the receiving area at the change rooms and is routed to various locations within the storage building. A counter top with two stainless steel basins with their own independent hot water heater is provided in the

packaging and sampling room. Both basins have hot and cold running water. The basins are provided for emergency use and do not have drains. The storage building has two safety showers, one in the packaging and sampling room and one in the combustible cell. The cold water line feeds these showers as well as hose bibs in each cell. The hose bibs serve as a wash water source if water is needed. To protect the water supply, each hose bib has a back flow preventor.

The hot water heater in the packaging and sampling room is piped to the hot water faucets at the basins as well as along the north wall to the combustible cell where the piping is capped off. The water from the showers drains to the floor and to the trenches (sampling and decontamination of the trenches are discussed in Section 11.1.5). The showers in the storage portion of the 616 NRDWSF are not expected to be contaminated with dangerous waste and will not be sampled for dangerous waste contamination. The tile field will be sampled for verification purposes (sampling of the tile field is discussed in Section 11.1.5.4.4). The basins will be sampled and decontaminated if, based on documentation, the basins have been used for handling of dangerous constituents. The basins will be wipe sampled and the samples will be analyzed for the documented constituents that were released to the basins.

11.1.5 The 616 Nonradioactive Dangerous Waste Storage Facility Sampling Plan

This section details the sampling plan that will be implemented following the removal of the dangerous waste inventory and the initial building decontamination.

The waste sampling and analysis plan has been prepared to evaluate contamination, if any, at the 616 NRDWSF. A flowchart for sampling activities is provided in Figure 11-2.

The walls of the storage cells are not expected to be contaminated with dangerous waste and therefore will not be sampled. The walls are sealed, to a height of 8 feet (2.4 meters), with an epoxy sealant (Chapter 2.0, Section 2.1.2.2), which prevents material from soaking into the concrete. The 616 NRDWSF uses rigid documentation showing the time, location, and analysis to verify that spills are cleaned up. Any material spilled in the 616 NRDWSF is removed and verification samples are taken to ensure that no residue remains (Chapter 4.0, Section 4.1.1.8). Therefore, it is not necessary to sample the walls of the 616 NRDWSF because the walls are known to be clean.

11.1.5.1. Sampling Plan Objectives. The objectives of the 616 NRDWSF sampling plan are as follows:

- Obtain local background concentrations for soil, if required (Section 11.1.1.2)

- Determine whether the concrete floor and loading pads contain dangerous waste constituents as defined by WAC 173-303

- Identify and quantify the specific dangerous waste constituents (if any) that are present using methods outlined in SW-846 (EPA 1986). If any other methods are used, the methods will be referenced and submitted to Ecology

- Evaluate sample analysis data to determine closure actions.

11.1.5.2 Site Safety. The following sections identify measures that will be in place during implementation of the sampling plan to ensure personnel safety.

11.1.5.2.1 Health and Safety Plan. A health and safety plan is required for all dangerous waste sampling sites. A health and safety plan is intended to specify information pertinent to field assignments and to be a guide in unusual situations or emergencies. A site-specific version of the general RCRA/CERCLA investigation health and safety manual will be developed to be used for sampling at the 616 NRDWSF. This plan will be completed and added to the closure plan before initiation of sampling activities. A description of the procedure to be used for preparing the site-specific health and safety plan is located in Appendix 11B.

11.1.5.2.2 Standard Safety Procedures. The following safety procedures will apply each time personnel make a site entry for sampling purposes.

- No personnel will be at the site without a designated 'buddy'.

- One of the people entering the site will be designated to be in charge.

- Personal protective equipment will be worn as specified in the health and safety plan. Approved deviations will be entered in the field logbook and signed by the field team leader (cognizant engineer) and the site safety officer.

- Field work will be planned before the site is entered.

- Equipment needed for work will be inventoried and inspected before the site visit to ensure that all equipment is present and in operable condition.

11.1.5.3 Analytical Parameters. All samples taken as part of the closure of the 616 NRDWSF will be analyzed for the constituents identified in Appendix IX of 40 CFR 264, unless specified otherwise in the text of this closure plan. The 616 NRDWSF sampling plan was developed to determine the presence of contamination that could have resulted from the storage of dangerous waste.

11.1.5.4 Sampling Activities. Sampling activities will be conducted in the 616 NRDWSF as follows:

- Collect local background soil samples
- Core the concrete floor and loading pads
- Collect samples of the soil immediately surrounding the loading pads
- Collect samples of the soil from the tile field and french drain.

Sampling procedures to be used for establishing local background concentrations and for determining whether chemical waste has contaminated the storage building and loading pads are described in this section. Sampling procedures will be conducted in conformance with procedures described in Appendix 11B.

11.1.5.4.1 **Background Soil Samples.** Background soil sampling will be done at the time of closure, if required (Section 11.1.1.2). Five initial samples will be taken at a distance from the 616 NRDWSF such that the soil would not be impacted by the storage unit operations, but would still be in a similar geologic strata. Standard statistical analyses will be performed to approximate the background population distribution function. Metals are expected to be found in a log normal distribution in the soil; therefore, the natural logarithm of the analytical value will be calculated for use in determining means and standard deviations and in comparing data from the soil immediately surrounding the 616 NRDWSF. Other dangerous constituents are expected to follow in a normal distribution in the soil, so actual analytical values will be used for calculations and comparisons. If the variance is large and, therefore, the computed background threshold value (based on at least 90 percent confidence) is too large, further background sampling might be necessary.

For those cases where comparisons with the background threshold value are not applicable, samples will be compared to regulatory thresholds. Soil samples will be considered contaminated if the constituent levels are above a 3-sigma tolerance limit on the background mean.

11.1.5.4.2 **Concrete Floor.** The floor of the 616 NRDWSF is poured concrete. A penetrating sealant has been applied to seal concrete pores and fill any cracks that might have developed while the concrete set up (Chapter 4.0, Section 4.1.1.4). Any further cracks are filled as the cracks are detected in the weekly inspection of the storage building or during regular 616 NRDWSF operations. Resealing also occurs at regular intervals. In accordance with existing operating procedures used at the storage building, spills are contained (with absorbent material if liquid), the area of the spill is contained and/or stabilized, and the area is cleaned up. The recovered material is shipped offsite to a permitted TSD facility.

The trenches and sumps are assumed to be the areas of the floor subject to the highest level of contamination. The disposition of the floor will be determined by sampling and verification of the trenches and sumps. Waste

entering the trenches and sumps is in a liquid state and is assumed to be relatively homogeneous. The sample locations have been placed based on this assumption. Cell trenches have center sumps that are 1 foot (0.3 meter) by 1 foot (0.3 meter) by 5 inches (12.7 centimeters) in size. Walkway trenches have no sumps, but the trenches slope down to one end. Room sumps are flat bottomed. The trench and sump configuration is shown in Figure 11-3. The areas to be sampled are shown in Figure 11-4.

For verification purposes, each trench and sump will be core sampled. Core samples will be taken to determine whether or not regulated constituents have penetrated the concrete sealant. Two samples will be taken in each trench, one random and one authoritative (in the deepest part of the trench). One sample will be taken in the center of each sump. A coring device will cut a core from each selected location.

The coring device employs a diamond bit that uses distilled water as a cutting lubricant to minimize dust generation. No organic-based lubricant will be used. An industrial-size shop vacuum will be used to remove excess water from around the core to minimize surface contamination flowing into the underlying material. The waste water from the shop vacuum will be emptied into a new U.S. Department of Transportation-approved container and will be stored at the 616 NRDWSF while awaiting disposal. A description of the procedure to be used for decontaminating the coring device is located in Appendix 11B. All decontamination fluids will be containerized with the waste water.

Once the core is cut, the core will be withdrawn and protected from cross-contamination. A laboratory will perform analyses on the core in accordance with procedures defined in Table 11-1.

If the analyses of the concrete cores indicate that contamination is present and has penetrated the sealant, the associated floor, trench, and sump will be removed, placed in a containment module, and disposed of as dangerous waste.

In the event that contaminants have penetrated the sealant, the core holes will be advanced through the concrete to determine the extent of contamination. Should the contamination go completely through the concrete, the core holes will be advanced through the soil. Soil samples will be taken at the surface, at a 1 foot (0.3 meter) depth, and at a 2 foot (0.61 meter) depth. It can be shown that concentrations of inorganic constituents added to the soil by sorption are greatest in the upper few inches (millimeters), and decreases with increased thickness of the soil column. Because of the well known process of sorption (Pendias and Pendias 1984; Routson et al. 1979; Conway 1982; Freeze and Cherry 1979), any contamination remaining in the soil would be the result of equilibrium reactions and/or irreversible sorption. In either case, residual contamination would be concentrated mostly in the uppermost part of the soil column, with rapidly decreasing concentrations downward. Therefore, the uppermost part of the soil column is most likely to contain contamination if contamination is present. Because the potential contamination from the 616 NRDWSF would remain in the upper part of the soil column, a maximum sampling depth of 2 feet (0.61 meter) is adequate.

A precleaned, hand-operated soil auger will be placed at each sampling location, and soil/gravel will be removed to a total depth of 2 feet (0.61 meter). If access to the sampling location is restricted, a small shovel or trowel will be used. Samples from the hole will be placed immediately in a laboratory-prepared sample container to minimize loss of volatiles and will be stored on ice in a cooler at 39 °F ±3.6 °F (4 °C ±2 °C). A description of the procedure to be used for decontaminating the soil auger, as well as all sampling equipment, is located in Appendix 11B. The equipment will be cleaned before use at each sample location.

Excess soil that is removed from each hole will be containerized in a U.S. Department of Transportation-approved container until results of the soil analyses are received. The container will be stored at the 616 NRDWSF until designated according to procedures. Each hole in the floor or pad will be sealed with grout after sampling is completed.

The soil samples will be analyzed for the constituents identified in the core samples. The analyses will follow the protocol outlined in SW-846 (EPA 1986). If contamination is detected, soil will be excavated to the determined depth of contamination. This approach assumes a decreasing concentration with depth, characteristic of a surface spill or leak such as those from the trenches and sumps. A verification sample will be taken after soil removal is complete. This sample will be taken at the surface. Further removal will be performed at 1-foot (0.3 meter) increments until verification samples demonstrate that contamination above background levels has been removed.

Metal gratings over the trenches and sumps will be steam cleaned with low-volume, high-pressure steam in conjunction with a detergent wash. For disposal purposes, the rinsate from the steam cleaning will be collected and analyzed for the dangerous waste stored in the 616 NRDWSF. The metal grates will be wipe sampled to verify that decontamination is adequate. Analyses will proceed according to the protocol outlined in SW-846 (EPA 1986). As with decontamination of other equipment, decontamination will continue until the grate wipe sample analyses show no detectable levels of constituents.

11.1.5.4.3 Loading Pads and Surrounding Soils. Although the concrete loading pad at the east end of the storage building is the primary pad used for waste acceptance, both the north and east loading pads will be sampled. Because the loading pads are similar in size and shape, the same sampling scheme will be used for both. The concrete loading areas have been sealed, but because of the potential for contamination, the loading areas will be core sampled. The loading pads and soil immediately surrounding the pads will be sampled at locations randomly selected on a 3.3-foot (1-meter) by 3.3-foot (1-meter) grid. Six random samples will be taken on the north pad and six random samples will be taken on the east pad. This represents a 5 percent coverage of the pads and soil. Sample locations are noted in Figure 11-5.

Concrete cores will be taken as described for the concrete floor. Once the concrete core is cut, the core will be withdrawn and protected from cross-contamination. A laboratory will perform analyses on the core samples in accordance with the procedures defined in Table 11-1. Core samples will be

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taken to determine whether or not penetration of the sealant by regulated constituents has occurred. The core samples will be analyzed for the constituents historically received at the 616 NRDWSF. After sampling is completed, the holes created by the core sampling will be filled with grout.

The trenches on the loading pads will be cored in the same manner as those in the storage building. One random sample will be taken along with another sample at the deepest part of the trench (Figure 11-4).

If dangerous constituents have penetrated the concrete (as determined by core analyses), the pads and trenches will be removed, placed in a containment module, and disposed of as dangerous waste, based on the results of the designating sample(s). The soil underneath, if necessary, and along the side of the loading pad will be sampled at the surface, at a 1 foot (0.3 meter) depth and at a 2 foot (0.6 meter) depth in the same locations as the initial samples. Soil samples will be placed in sample bottles appropriate for the type of analyses to be performed. Soil samples will be analyzed for the contaminants identified in the core samples. Samples will be analyzed in accordance with protocols outlined in SW-846 (EPA 1986).

If the soil samples are determined to be contaminated, when compared to the soil background levels (Section 11.1.1.2), the soil will be removed from the loading area(s) to the depth of contamination noted in the soil samples. Some soil removal might be necessary along the sides of the loading pads, even if soil under the loading pads is found not to be contaminated. This approach assumes a decreasing concentration of contaminants with depth-characteristic of surface spills. Pending analyses, contaminated soils will be placed in new open-head U.S. Department of Transportation-approved containers. Following soil removal, surface soil sampling will be repeated at the random locations for verification.

The samples will be analyzed for the contaminants reported in the previous sample analyses. Further removal will take place at 1-foot (0.3 meter) increments until verification samples demonstrate that contamination above background levels has been removed. These analyses will provide verification that contamination has been removed to the standards set forth in Section 11.1.1. Analyses will be conducted according to protocols outlined in SW-846 (EPA 1986). Soil containers will be disposed of based on the analytical results of the designating sample(s).

11.1.5.4.4 Tile Field and French Drain. The tile field is used for the disposal of sanitary waste generated at the 616 NRDWSF (Chapter 2.0, Figure 2-5). Although dangerous waste is not handled in areas serviced by the tile field, the tile field will be sampled to verify that no contaminants are present. The tile field will be sampled by taking three equally spaced soil samples across the center line of the tile field at the interface of the native soil and the tile field gravel. Samples will be taken at 1 foot (0.3 meter) and at 2 feet (0.6 meter) depths below the gravel and soil interface. The samples will be analyzed in accordance with SW-846 (EPA 1986). Samples will be compared to background constituent levels. Should any contamination be found, the tile field will be excavated to the depth prescribed by the soil sampling.

The french drain receives effluent from the trenches on the loading pads. The effluent is verified to be free of contamination (Chapter 2.0, Section 2.5.1) before the effluent is released to the french drain. The french drain will be sampled once in the center. As with the tile field, the samples will be completed at the interface of native soil and french drain gravel, at 1 foot (0.3 meter) and at 2 feet (0.6 meter) depths below the gravel and soil interface. Analyses will be conducted in accordance with protocols outlined in SW-846 (EPA 1986). Samples will be compared to background constituent levels. Should any contamination be found, the french drain will be excavated to the depth prescribed by the soil sampling.

11.1.5.5 Sampling Locations. Sampling locations have been selected randomly except where authoritative sampling is warranted in areas of potential contamination. Where appropriate, sections of the storage building have been gridded to facilitate the selection and identification of random sample locations. The use of a random-sampling strategy will ensure that data obtained will be representative of the population from which the samples were taken. Areas of potential contamination were selected for authoritative sampling because of the higher potential for contamination. The number and location of each type of sample is presented in Table 11-2. Random number table is included in Appendix 11A for each area to be sampled. The following sections discuss the sample locations.

11.1.5.5.1 Concrete Floor. The following describes the sampling locations for the concrete cell floors.

Packaging material and handling equipment area--The sampling locations for the packaging and handling equipment area sump are shown in Figure 11-4 (sheet 1). Two locations will be sampled.

Packaging and sampling room--The sampling locations for the packaging and sampling room sump are shown in Figure 11-4 (sheet 1). Two locations will be sampled.

Caustic cell--The sampling locations for the caustic cell trench are shown in Figure 11-4 (sheet 2). Two locations will be sampled.

Oxidizer cell--The sampling locations for the oxidizer cell trench are shown in Figure 11-4 (sheet 2). Two locations will be sampled.

Acid cell--The sampling locations for the acid cell trench are shown in Figure 11-4 (sheet 2). Two locations will be sampled.

Combustible cell--The sampling locations for the combustible cell trench are shown in Figure 11-4 (sheet 2). Two locations will be sampled.

Flammable 1A cell--The sampling locations for the flammable 1A cell trench are shown in Figure 11-4 (sheet 2). Two locations will be sampled.

Flammable 1B cell--The sampling locations for the flammable 1B cell trench are shown in Figure 11-4 (sheet 2). Two locations will be sampled.

Receiving area--The sampling locations for the receiving area trench are shown in Figure 11-4 (sheet 3). Two locations will be sampled.

Walkway between caustic and oxidizer cell--The sampling locations for the walkway trench between the caustic and oxidizer cell are shown in Figure 11-4 (sheet 3). Two locations will be sampled.

Walkway between acid and combustible cell--The sampling locations for the walkway trench between the acid and combustible cell are shown in Figure 11-4 (sheet 3). Two locations will be sampled.

Walkway between flammable 1A and 1B cells--The sampling locations for the walkway trench between the flammable 1A and 1B cell are shown in Figure 11-4 (sheet 3). Two locations will be sampled.

11.1.5.5.2 Loading Pad Trenches. Sampling locations for the loading pad trenches are shown in Figure 11-4 (sheet 3). A total of four locations will be sampled (two on the north pad and two on the east pad).

11.1.5.5.3 Loading Pads and Surrounding Soils. Sampling locations for the loading pads and surrounding soil are shown on Figure 11-5. A total of 12 locations will be sampled (six on the north pad and six on the east pad).

11.1.5.5.4 Tile Field and French Drain. The sample locations for the tile field and french drain are shown on Figure 11-6. Four locations will be sampled (three at the tile field and one at the french drain).

11.1.5.6 Evaluation of Data. After receiving the analytical results, the data will be judged for reliability, reviewed, and summarized to eliminate constituents whose results are below detection limits (making the data more manageable). The data will be statistically evaluated according to procedures described in Appendix 11B. Data from the 616 NRDWSF sampling will be evaluated and summarized by the following methodology:

- Evaluate the quality control of the sample handling and sample analyses to assess the reliability of the data
- Examine the analytical data according to guidance provided in *Statistical Analysis of Ground Water Monitoring Data at RCRA Facilities, Interim Final Guidance* (EPA 1989)
- Prepare summary statistics for constituents
- Test the significance of the location effects of analytical results using the analysis of variance procedure
- Have qualified personnel evaluate and interpret data
- Compare the sample results to the action levels.

11.1.5.7 Statistical Treatment of Data. All data collected will be analyzed and tabulated for evaluation using the methods described in SW-846 (EPA 1986). Other guidance documents and statistical references could be used where applicable [e.g., Barth and Mason 1984, and *Statistical Analysis of Ground Water Monitoring Data at RCRA Facilities, Interim Final Guidance* (EPA 1989)]. Laboratory data will be provided to Ecology on completion of sampling and analyses. Data for individual constituents will be summarized and will include the following information:

- Number of less than detection-limit values
- Total number of values
- Mean values
- Standard deviation
- Coefficient of variation
- Method detection limit values
- Quantitation limit values
- Representative method precision
- Minimum value
- Maximum value.

The data will be interpreted by qualified scientists and statisticians. The technical bases for establishing the local background threshold concentrations, the methods by which significant deviation from local background will be determined, and the appropriate sample sizes (i.e., numbers) are being developed for the Hanford Site. Methods such as those identified for the assessment of groundwater data [e.g., the tolerance interval approach to the analysis of variance (EPA 1989)] are being evaluated for application to soil and other media. The local background threshold concentrations, for example, can be based on information such as proportions of the population, mean concentrations, and standard deviations for each constituent of interest. Specific approaches, and the criteria and assumptions implicit in establishing concentration levels (levels that constitute significant deviation from local background or other control levels), as well as the numbers of samples, etc., will be related to Ecology when these factors have been resolved. Data evaluation will be based on statistical criteria and professional judgment as appropriate.

11.1.5.8 Assessment of Data Reliability. Data reliability will be assessed by evaluating the sample handling and analysis quality control according to procedures described in Appendix 11B. Sample handling quality control will be evaluated by reviewing field documentation and results of quality assurance samples to establish that sampling error was minimized. The review will be

conducted to verify that decontaminated equipment was used, that cross-contamination was minimized, that samples were preserved properly, and that sample chain of custody was not broken.

Analytical data received from any sampling performed at the 616 NRDWSF will be scrutinized against the quality control report provided by the contractor laboratory to assess the reliability of the results. Both organic and inorganic chemical analytical results will be checked, as follows:

- Inorganic chemical analysis laboratory assessment

  - Holding times are acceptable
  - Contractor's detection limits are below those required by the EPA
  - Laboratory blanks and replicates are within established quality control limits
  - Sample spike recoveries are within quality control limits.

- Organic chemical analysis laboratory assessment

  - Holding times are acceptable
  - Instrument detection limits, blank recoveries, surrogate recoveries, and spike recoveries are within the EPA established quality control limits.

11.1.5.9 **Reporting.** After completion of the sampling effort, verification documents will be provided for actual sample locations, number of samples, and specific methods used for collection, if different from those provided in this waste sampling and analysis plan. Data received from the laboratory will be reviewed, analyzed, and summarized statistically. The results will be used to provide further closure evaluations.

11.1.5.10 **Sampling Equipment, Containers, and Preservation.** Sampling equipment, containers, and preservation methods are discussed in the following sections.

11.1.5.10.1 **Sampling Equipment.** Sampling equipment to be used will be appropriate to the spectrum of media that might be encountered. The media to be sampled will consist of the following:

- Concrete

- Soils--The following are examples of the types of sampling equipment that could be used during the various sampling phases.

- Concrete

  - Coring device
  - Saw for obtaining chip samples

- Soils and gravel

  - Auger
  - Split spoon
  - Trowel
  - Scoop
  - Shovel.

If site conditions permit, an auger and split spoon will be used to collect soil and gravel samples. Otherwise, a trowel, scoop, or shovel will be used. The sampling equipment should be constructed of stainless steel or should have liners constructed of inert materials.

Additional equipment and supplies will be procured as required to perform the necessary sampling. Equipment could include, but not be limited to, the following items:

- Bore or wire brushes
- Stainless-steel mixing bowls
- Sized, heavy-duty plastic bags
- Stainless-steel spatulas, scoops, and spoons
- Adhesive tape
- 100-foot (30-meter) steel tape, 12-foot (3.7-meter) steel tape
- Compass
- Indelible marking pens or pencils
- Hammer and/or sledgehammer
- Ice chests and ice
- Security tape, flagging
- Gloves (of material suitable for anticipated hazards)
- Field radio
- Rags
- Appropriate drawings and maps
- Tags
- Plastic sheeting
- Water containers

- Extra glass and plastic bottles (in case of breakage or contamination)
- Industrial-size shop vacuum
- Teflon sheets.

11.1.5.10.2 Sample Containers and Preservation. Sample containers will be chosen based on compatibility with the samples, resistance to leaking or breakage, ability to seal tightly, and capacity to hold the required volume for an optimum sample. Containers for collecting and sorting samples will be made of high-density plastic or glass appropriate for the constituents to be analyzed. The containers will have tight, screw-type lids with Teflon cap liners for glass bottles.

All samples will be packaged according to the procedure described in Appendix 11B, placed in an ice chest, and cooled to 39 °F ±3.6 °F (4 °C ±2 °C) immediately after collection. A description of the soil and sediment sample containers to be used is located in Appendix 11B. Samples will be transported to the analytical laboratory within 24 hours of collection. All deviations from SW-846 (EPA 1986) protocols, including sample size, will be documented with a justification for the deviation.

11.1.5.11 Sampling Quality Control. The required quality control procedures will be followed to the extent necessary to adequately control sampling activities. The various quality control procedures are described in the following sections.

11.1.5.11.1 Data Quality. To ensure quality data, all of the sampling procedures will be conducted in conformance with procedures described in Appendix 11B. All laboratory analyses will be performed in accordance with standard EPA methods described in the most recent edition of SW-846. The analytical laboratory will submit all analytical and quality assurance and quality control procedures to the contractor for approval before samples are analyzed. The EPA guidelines for reporting accuracy, precision, and practical quantitation limit specified in the analytical methods will be met.

Quality control of sampling will be ensured through the use of field duplicates, equipment blanks, and field blanks. Quality control of records and documentation will be accomplished by following procedures described in Appendix 11B.

Sampling records to be kept on file include field notes, daily memoranda, records of meetings and activities concerning the sampling program, and chain-of-custody records. In addition, quality control will be implemented through the recording of field memoranda and field notes. Before sampling begins, a quality assurance project plan for sampling and analysis at the 616 NRDWSF will prepared.

11.1.5.11.2 Field Quality Control. Field quality control will be accomplished through the use of various sampling duplicates and blanks, as described in the following paragraphs.

Field duplicate samples will be taken for concrete and underlying soils. Duplicate samples are two separate samples collected from the same sampling point and placed into separate containers. The duplicates will be used as an indication of the repeatability of the analytical data.

Equipment blanks will serve as a check on sampling device cleanliness. An equipment blank will be composed of distilled water, which will be transported to the site, opened in the field, poured over or through the sample collection device, collected in a sample container, and returned to the laboratory for analysis. These samples will be collected daily.

If appropriate, trip blanks will be used to identify any possible contamination originating from container preparation methods. Trip blanks will consist of pure deionized, distilled water in a clean sample container, which will accompany each batch of containers shipped to the field. Trip blanks will be returned unopened to the laboratory for analysis.

Field blanks will consist of pure deionized, distilled water that is transferred to a sample container at the site and preserved with the reagent specified for the analyses of interest. Field blanks will be used to check for possible contamination originating with the reagent or the sampling environment and will be collected daily.

11.1.5.11.3 **Field Logbook.** The personnel conducting sampling will maintain an official logbook during sampling activities, as described in Appendix 11B. The book will be bound and will have consecutively numbered pages. All information pertinent to the sampling must be recorded in the logbook in a legible fashion. If changes are necessary, changes will be indicated by a single line drawn through the affected text. The individual responsible for the change will initial and date the entry. Each day's activities or separate sampling episodes must be signed. The logbook will be protected, stored in a safe file or other repository, and retained as a permanent record.

The following types of information will be included in the logbook:

- Site map, sketch, drawing, or other definitive site description
- Locations of all sampling points, including reference points and scale
- Sample method
- Date and time of collection
- Collector's name
- Number, type, and volume of samples taken
- Identification number for each sample
- Field observations (weather conditions, temperature, wind, wetness, and appearance of sample, etc.)

- Laboratory of destination

- Signature of recording personnel.

The following items can be included:

- Name and address of field contact

- Type and/or purpose of sampling

- Sample transportation method

- Photographs of site for field conditions and site location verification.

11.1.5.11.4 **Sample Labels.** Labels will be attached securely to each sample to prevent misidentification. Labels will be in the form of adhesive labels or tags and will be affixed to the proper sample containers before or at the time of collection. All information will be completed at the time of collection. Indelible pencil or ink must be used. Each label will contain at least the following information:

- Site contractor

- Collector's name

- Date and time collected

- Sample number.

11.1.5.11.5 **Sample Seals.** Sample seals will be used to prevent and/or detect tampering with samples between the time of collection and the beginning of analysis. Seals will be applied to the sample containers before the containers leave the sample location. The seals will be attached so the seal must be broken to open the container.

11.1.5.11.6 **Chain-of-Custody Records.** To ensure the integrity of the samples from collection through analysis to final disposition, documentation will be used to trace sample possession and handling. This documentation will provide a history of personnel having custody of the sample.

A chain-of-custody record will be completed and will accompany all samples from collection to analysis. Multiple copies will be required, and at least one copy will be maintained by the sampling supervisor. The following information will be included:

- Contractor

- Sample numbers

- Date and time collected

- Sample type
- Number of containers
- Collector's signature
- Signature of person receiving possession
- Inclusive dates of possession
- Condition of samples on receipt.

A description of the chain-of-custody procedure to be used is located in Appendix 11B.

11.1.5.11.7 Sample Analysis Request. The sample analysis request form is designed to accompany the samples to the laboratory and to designate the analyses to be performed on each sample. This form also provides a check to ensure that all samples have been received and that correlation between sample analysis and sample number is finalized and complete. The form includes the following information:

- Contractor
- Company contact
- Collector
- Sample number
- Sample type
- Analysis requested
- Data and time collected
- Laboratory sample custodian.

A description of the soil and sediment sampling procedure and chain-of-custody procedure to be used is located in Appendix 11B.

11.1.5.11.8 Laboratory Receipt and Logging of Sample. In the laboratory, a sample custodian will be assigned to receive the samples. On receipt of a sample, the custodian will inspect the condition of the sample and the sample seal, verify the information on the sample label and seal against that on the chain-of-custody record, assign a laboratory number, log in the sample in the laboratory logbook, and store the sample in a secured sample storage room or cabinet. Missing or damaged samples will be reported immediately.

11.1.5.11.9 **Laboratory Quality Control.** The contractor laboratory will ensure the integrity and validity of test results through implementation of an internal quality control program. The program will meet the quality control criteria of SW-846 (EPA 1986). A system of reviewing and analyzing the results of these samples will be maintained to detect problems caused by contamination, inadequate calibrations, miscalculations, improper procedures, or other factors. Standard methods will be used and alternative methods that are developed or adapted will be tested and completely documented. All methods and method changes will be approved by a contractor contracts representative.

The quality control procedures for hazardous chemical analyses will include [as appropriate to each analysis and as specified in Section 1.2 of SW-846 (EPA 1986)] evaluation of blanks, random matrix spikes (for 10 percent of the samples), internal standards, surrogates, and standard calibration curves. Spikes will be added in amounts comparable to the amount of analyte present in the sample. The quality control procedures specific to individual methods will be detailed in the laboratory's documented analytical procedures and will be included with each batch of samples analyzed.

11.1.5.11.10 **Sample Disposition.** At the completion of all analyses, the samples will be returned to the collector. In no case will the samples be retained longer than 3 years unless specifically designated by the cognizant engineer.

11.1.5.11.11 **Equipment Decontamination.** Extreme care is necessary in field sampling to ensure that there is no cross-contamination of samples by sampling equipment. To prevent this source of contamination, freshly cleaned or disposable sampling tools will be used. When equipment must be reused in the field, it will be cleaned as thoroughly as practical as described in Appendix 11B.

11.1.5.11.12 **Sampling Container Decontamination Procedures.** Containers will be purchased precleaned from the factory and maintained under strict chain of custody to preserve the integrity of the samples from collection through disposal. After analysis, sample containers will be disposed of.

11.1.5.12 **Analytical Procedures.** Analyses of all constituents will be performed by the laboratory in accordance with procedures identified in SW-846 (EPA 1986).

11.1.5.13 **Contamination Control.** Excess sample material will be containerized in a preconditioned 17-H open-headed 55-gallon (208-liter) container. Rinse water also will be containerized. In accordance with WAC 173-303-200(2) and the procedure described in Appendix 11B, the 55-gallon (208-liter) containers will be stored in a designated area at the dangerous waste site until each container is full. When the container is full, the contents will be tested for dangerous waste. If the contents are found to be dangerous, arrangements will be made for proper disposal of the material. The disposal will take place within a 90-day period after a container is full. If dangerous contamination is not found, materials will be laundered or disposed of according to onsite procedures that meet all applicable federal, state, and

U.S. Department of Energy regulations. Containers for temporary storage will be properly marked.

11.1.5.14 Decontamination of Equipment Used for Closure. The equipment used during the closure activities will be cleaned three times with a steam cleaner. The rinsate from steam cleaning will be collected, pumped into new bung-type 55-gallon (208-liter) containers, and sampled. The pump will be flushed three times with water, which will be managed as rinsate. Rinsate will be managed in accordance with Section 11.1.4.1.

11.1.5.15 Removal of Contaminated Material and Waste Residues. Waste remaining in the storage building and in the outside storage areas at the commencement of closure activities will be removed. General housekeeping cleanup procedures will be followed to remove any remaining waste residues.

11.1.5.16 Restoration. On removal of waste residues and contaminated structures or soil, the site might require some degree of reclamation. Reclamation would be justified to control dust, erosion, and surface water run-off, and to promote postclosure usage. Site restoration will include backfilling disturbed soil areas with noncontaminated native soil, compaction, grading, and revegetation.

11.1.5.17 Modifications to the Waste Sampling and Analysis Plan. Modification of the sampling plan could be necessary because of unanticipated or changing conditions. Factors adversely influencing sampling efforts can include equipment malfunction or breakdown, improper equipment, and physical barriers to coring equipment. When changes to the planned activity are necessary, the changes will be recorded in the field logbook along with circumstances requiring the action. The field logbook will be reviewed and signed daily by the project manager, as described in Appendix 11B. This procedure will provide an accurate record of changes and will allow sampling to proceed safely while maintaining efficient manpower and equipment use. Any deviation from procedures used during closure will be handled in accordance with the procedure described in Appendix 11B. In addition, any changes to the closure plan will be in accordance with the protocol established in the *Hanford Facility Dangerous Waste Permit Application* (DOE-RL 1991).

11.1.6 Closure of Containers [I-1d(1)]

At closure, all containers will be removed from the 616 NRDWSF. All dangerous waste residue will be removed from the containment system components. Contaminated equipment, floor, loading areas, and soil will be decontaminated or removed. All decontamination equipment and contained rinsate will be tested and if contaminated disposed of as dangerous waste. Sampling and testing will be conducted to ensure that no contamination remains on, in, or around the storage area and containment system.

11.1.7 Closure of Tanks [I-1d(2)]

Operation of the 616 NRDWSF does not involve the storage of dangerous waste in tanks. Therefore, the requirements of WAC 173-303-640 are not applicable to the 616 NRDWSF.

11.1.8 Closure of Waste Piles [I-1d(3)]

Operation of the 616 NRDWSF does not involve the placement of dangerous waste in piles. Therefore, the requirements of WAC 173-303-660 are not applicable to the 616 NRDWSF.

11.1.9 Closure of Surface Impoundments [I-1d(4)]

Operation of the 616 NRDWSF does not involve the placement of dangerous waste in surface impoundments. Therefore, the requirements of WAC 173-303-650 are not applicable to the 616 NRDWSF.

11.1.10 Closure of Incinerators [I-1d(5)]

Operation of the 616 NRDWSF does not involve the incineration of dangerous waste. Therefore, the requirements of WAC 173-303-670 are not applicable to the 616 NRDWSF.

11.1.11 Closure of Land Treatment Facilities [I-1d(6)]

Operation of the 616 NRDWSF does not involve the land treatment of dangerous waste. Therefore, the requirements of WAC 173-303-655 are not applicable to the 616 NRDWSF.

11.1.12 Closure of Disposal Units [I-1e-1e(8)]

The 616 NRDWSF does not contain any waste piles, landfills, or surface impoundments. In addition, the waste or contaminated materials will not remain at the 616 NRDWSF closure site; therefore, WAC 173-303 is not applicable.

11.1.13 Schedule for Closure [I-1f]

A schedule of the closure activities is presented in Figure 11-7. Closure will be completed 180 days after the last shipment of waste is received at the 616 NRDWSF [WAC 173-303-610(4)(b)]. The activities representing the greatest portion of time will be the sampling and decontamination iteration of the floor and the loading areas. At this time, an estimate of 90 days is given for these tasks. This estimate assumes a rapid turnaround time of 10 working days or less for laboratory analyses.

However, it is unknown how many iterations of decontamination will be required or if any will be required at all.

11.1.14 Extension for Closure Time [I-1g]

A petition for extension of closure time must be filed with Ecology if final closure activities at the 616 NRDWSF are expected to exceed 180 days after the final volume of waste is received [WAC 173-303-610(4)(b)]. It is expected that the final closure of the 616 NRDWSF will be completed within the 180-day period, allowed by regulations, after the last shipment of waste from the 616 NRDWSF. Factors such as the number of sampling iterations could impact the closure schedule and could necessitate an extension beyond the 180-day period. In that case, an extension will be requested.

11.1.15 Amendments to Closure Plan

Should changes be required to the approved closure plan, an amended plan will be prepared and submitted to Ecology for approval in accordance with 40 CFR 264.112(c) and WAC 173-303-610(3)(a).

11.1.16 Certification of Closure and Survey Plat

Within 60 days of closure of the 616 NRDWSF Facility, the DOE-RL will submit to Ecology a certification of closure. The certification will be signed by both the DOE-RL and an independent professional engineer registered in the state of Washington. The certification will state that the 616 NRDWSF has been closed in accordance with the approved closure plan. The certification will be submitted by registered mail or an equivalent delivery service. Documentation supporting the independent professional engineer's closure certification will be retained and furnished to Ecology upon request. This documentation will be maintained by the DOE-RL contact (or the successor) identified in Section 11.9 of this closure plan.

11.1.16.1 Closure Certification. The DOE-RL and the independent professional engineer registered in the state of Washington will certify that closure is complete with a document similar to Figure 11-8.

11.1.16.2 Survey Plat. The 616 NRDWSF is planned to be clean closed. Because dangerous waste will not be left in place following the operational period, the requirement for producing a survey plat is not applicable to the 616 NRDWSF.

11.1.17 Notice to Local Land Authority

The 616 NRDWSF is planned to be clean closed. Because dangerous waste will not be left in place following the operational period, the requirement for a notification to the local land authority is not applicable to the 616 NRDWSF.

11.2 POSTCLOSURE PLAN [I-2]

The 616 NRDWSF is planned to be clean closed. Because dangerous waste will not be left in place following the operational period, the requirement for postclosure activities is not applicable to the 616 NRDWSF.

11.3 NOTICE IN DEED [I-3]

The 616 NRDWSF is planned to be clean closed. Because dangerous waste will not be left in place following the operational period, the requirement for a notice in deed is not applicable to the 616 NRDWSF.

11.4 CLOSURE COST ESTIMATE [I-4]

In accordance with 40 CFR 264.140(c) and WAC 173-303-620(1)(c), this estimate is not required for federal facilities. The Hanford Facility is a federally owned facility for which the federal government is the operator, and this estimate is therefore not applicable to the 616 NRDWSF.

An annual report updating projections of anticipated closure and postclosure costs for the Hanford Facility TSD units having final status will be submitted to Ecology in accordance with WAC 173-303-390 by October 30 (beginning in 1992).

11.5 FINANCIAL ASSURANCE MECHANISM FOR CLOSURE [I-5]

In accordance with 40 CFR 264.140(c) and WAC 173-303-620(1)(c), this section is not required for federal facilities. The Hanford Facility is a federally owned facility for which the federal government is the operator and this section is therefore not applicable to the 616 NRDWSF.

11.6 POSTCLOSURE COST ESTIMATE [I-6]

In accordance with 40 CFR 264.140(c) and WAC 173-303-620(1)(c), this estimate is not required for federal facilities. The Hanford Facility is a federally owned facility for which the federal government is the operator, and this section is therefore not applicable to the 616 NRDWSF.

An annual report updating projections of anticipated closure and postclosure costs for the Hanford Facility TSD units having final status will be submitted to Ecology in accordance with WAC 173-303-390 by October 30 (beginning in 1992).

11.7 FINANCIAL ASSURANCE MECHANISM FOR POSTCLOSURE CARE [I-7]

In accordance with 40 CFR 264.140(c) and WAC 173-303-620(1)(c), this section is not required for federal facilities. The Hanford Facility is a

federally owned facility for which the federal government is the operator and this section is therefore not applicable to the 616 NRDWSF.

11.8 LIABILITY REQUIREMENTS [I-8]

In accordance with 40 CFR 264.140(c) and WAC 173-303-620(1)(c), this section is not required for federal facilities. The Hanford Facility is a federally owned facility for which the federal government is the operator and this section is therefore not applicable to the 616 NRDWSF.

11.9 CLOSURE CONTACTS

The following office (or its successor) is the official contact for the 616 NRDWSF:

Environmental Restoration Division
U.S. Department of Energy
Field Office, Richland
P.O. Box 550
Richland, Washington 99352
(509) 376-7277.

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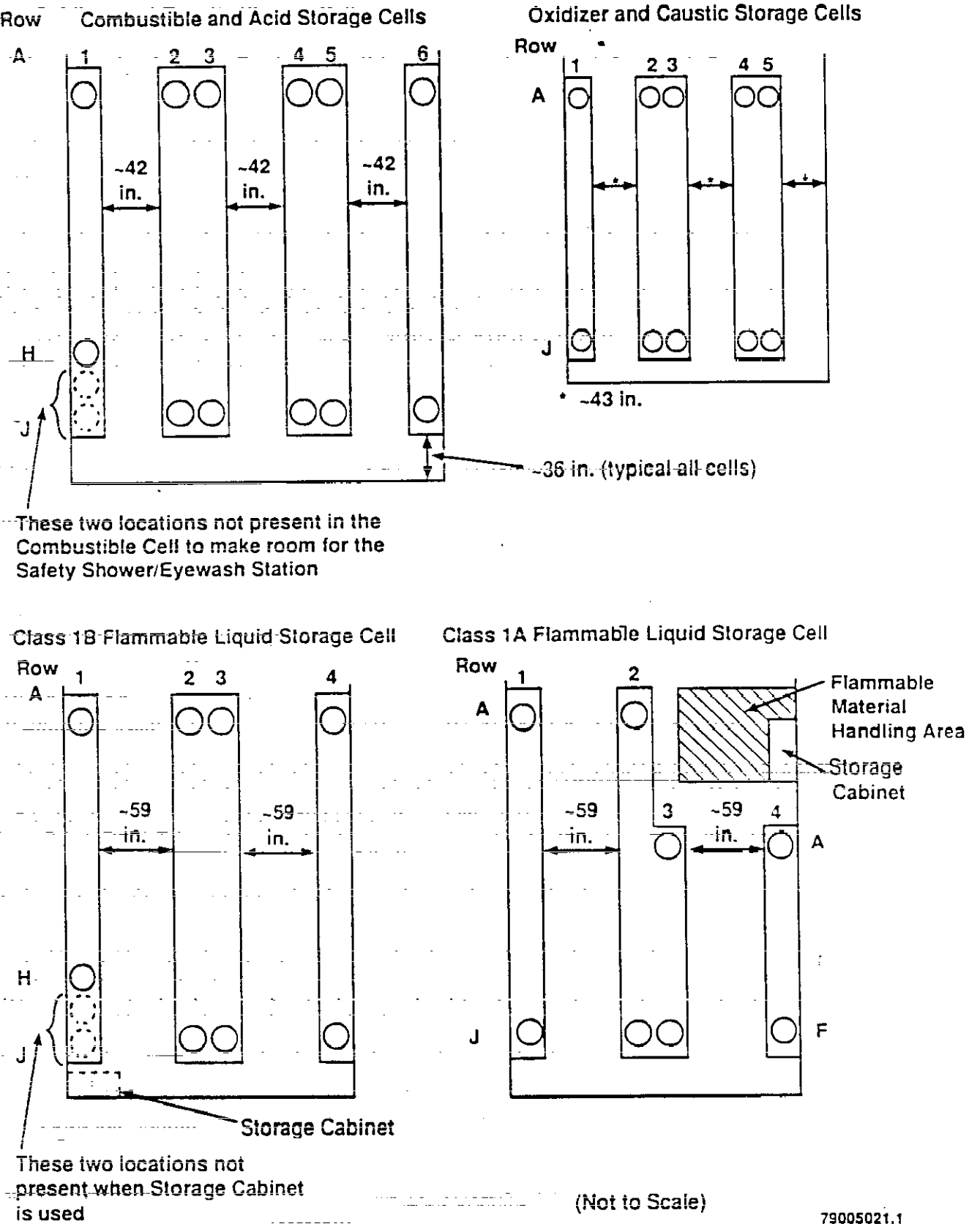

Figure 11-1. Configuration and Layout of a Typical Cell.

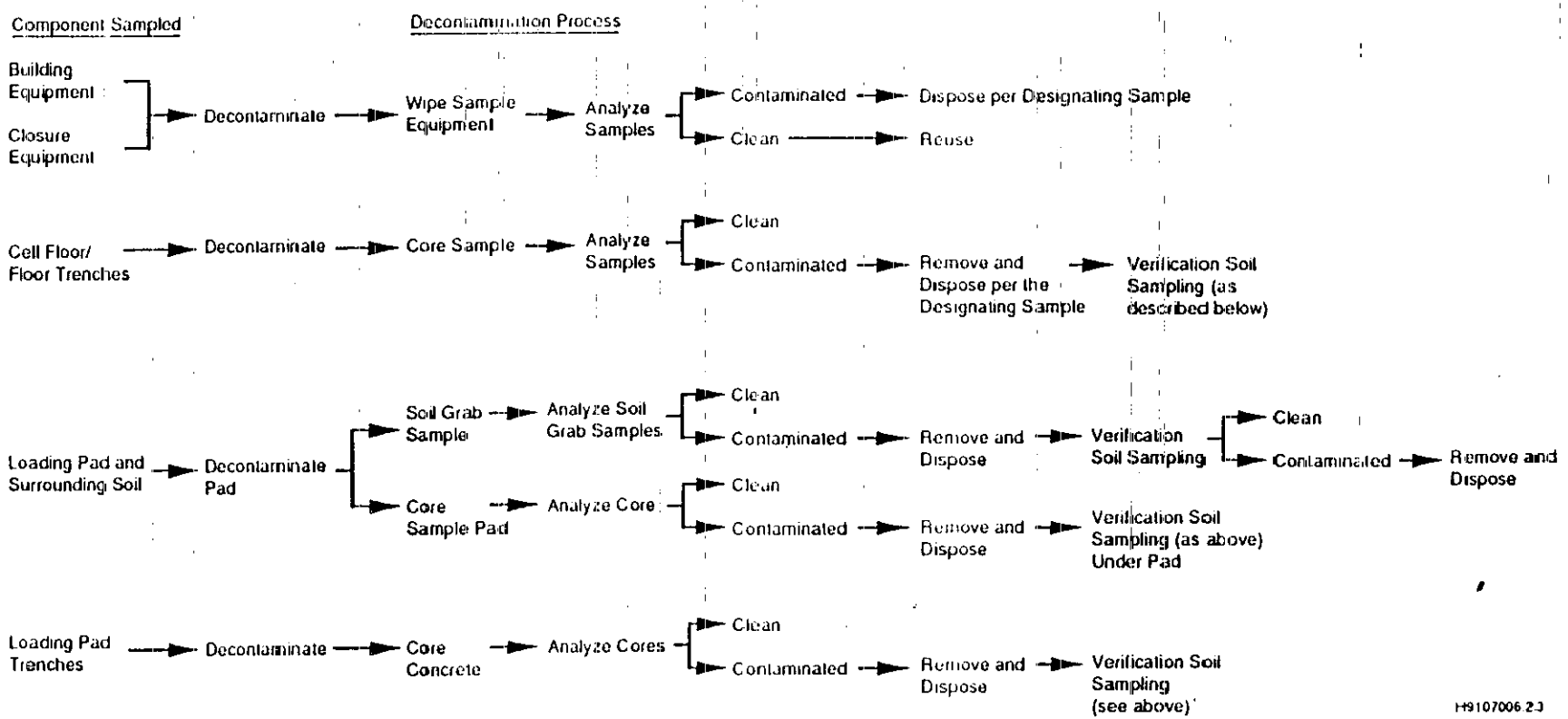

Figure 11-2. Sampling Flow Path.

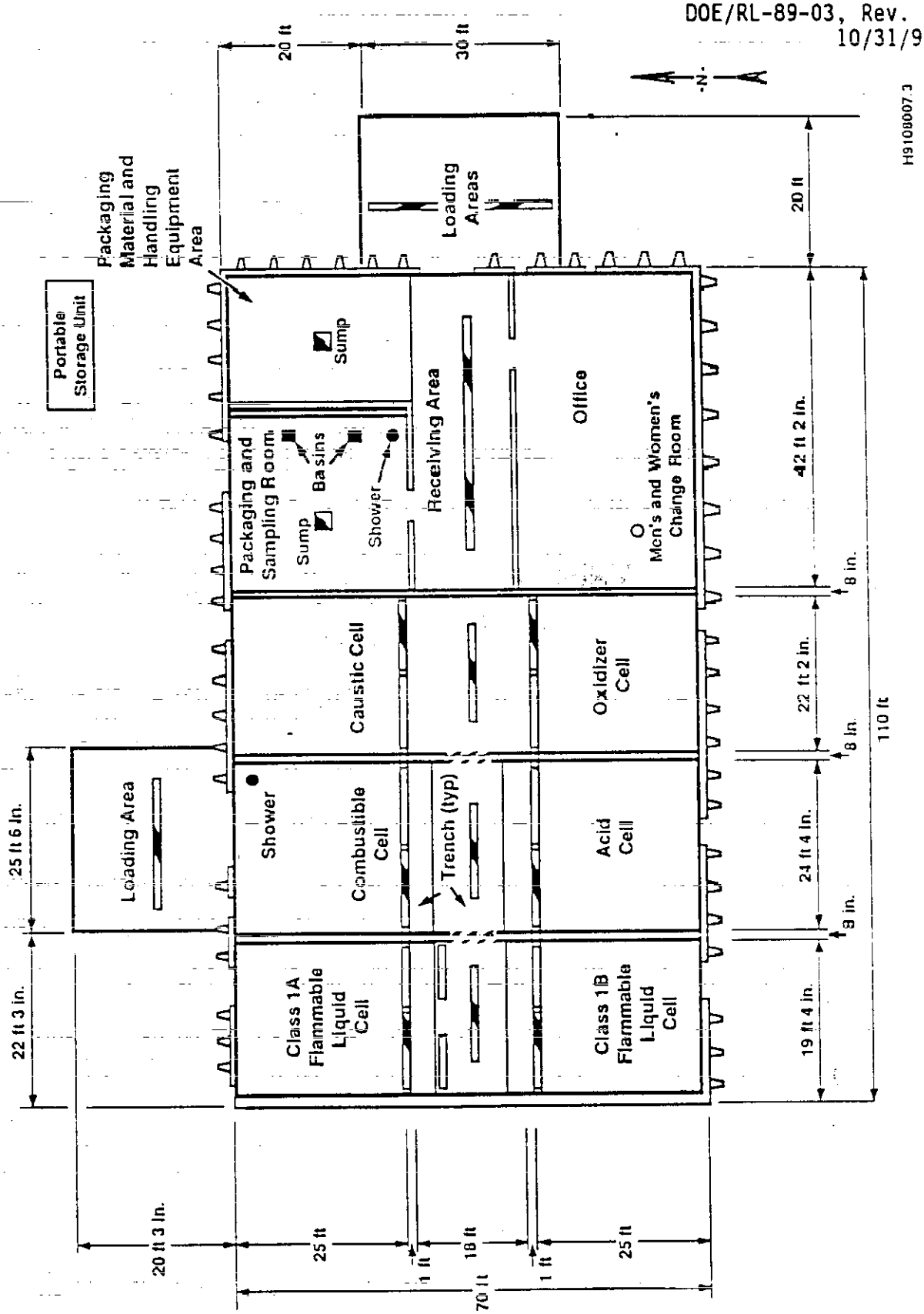

Figure 11-3. Floor Plan of the 616 Nonradioactive Dangerous Waste Storage Facility Showing Locations of the Trenches, Sumps, Water Lines, Basins, and Safety Showers.

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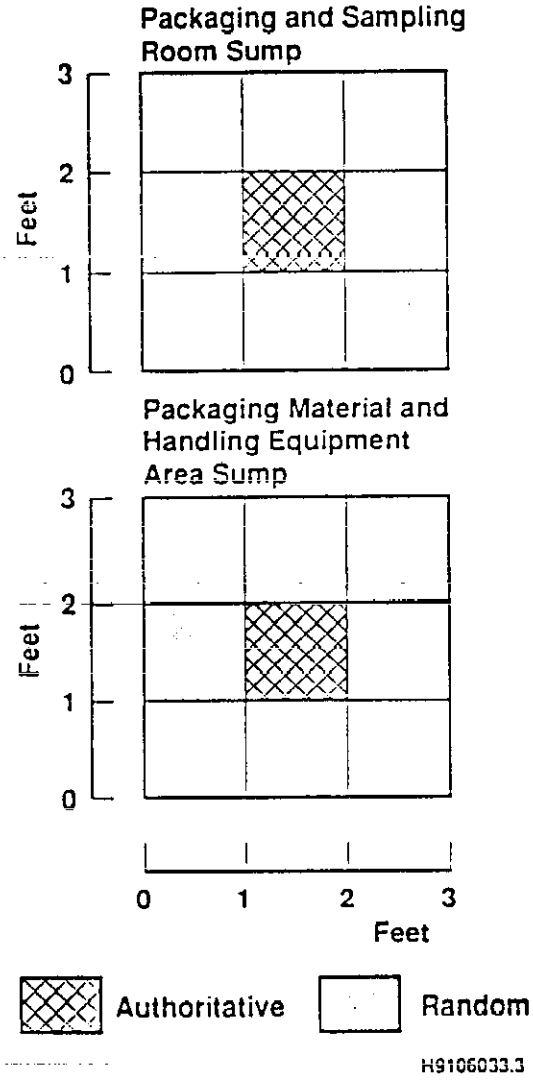

Figure 11-4. Trench and Sump Sample Locations. (sheet 1 of 3)

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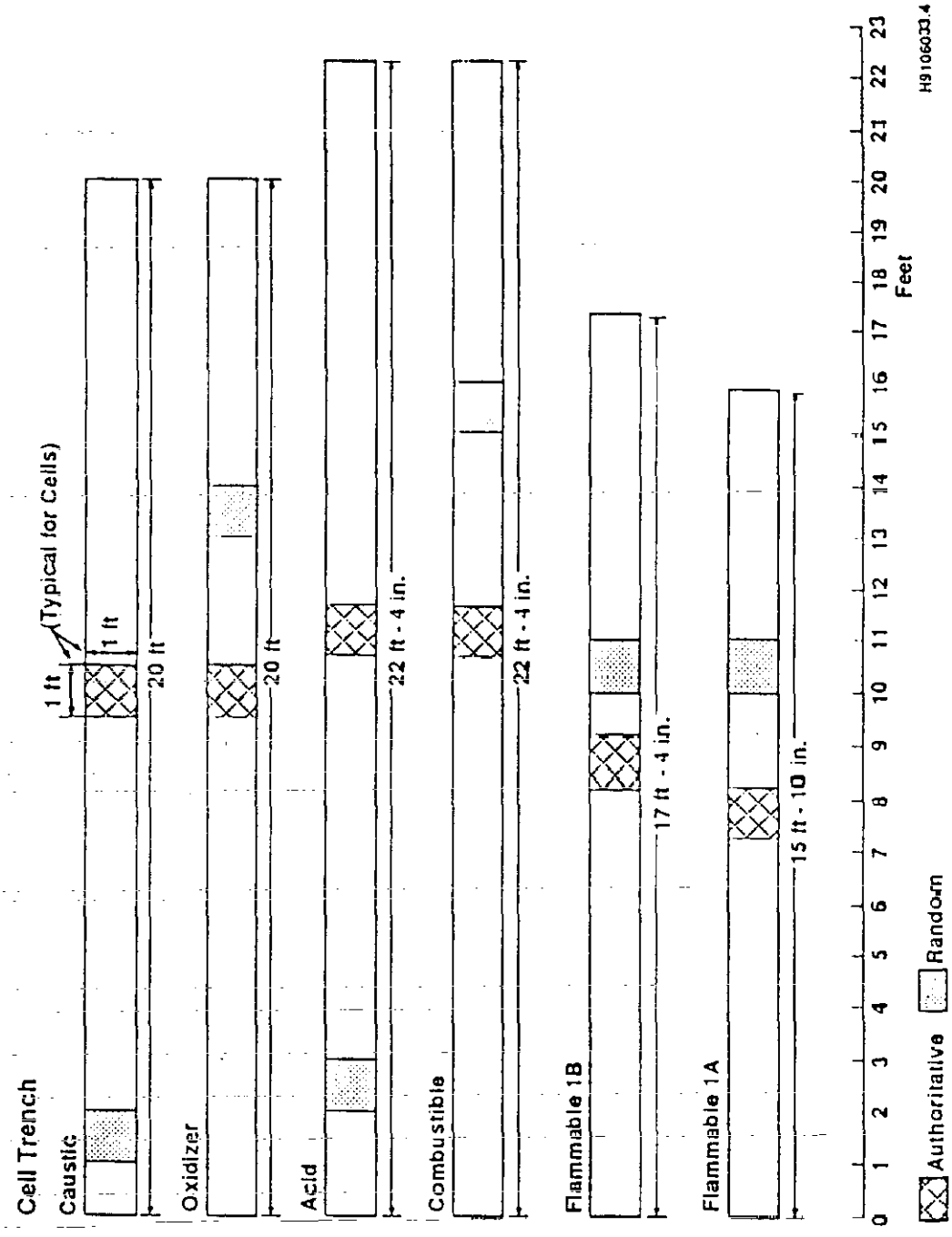

Figure 11-4. Trench and Sump Sample Locations. (sheet 2 of 3)

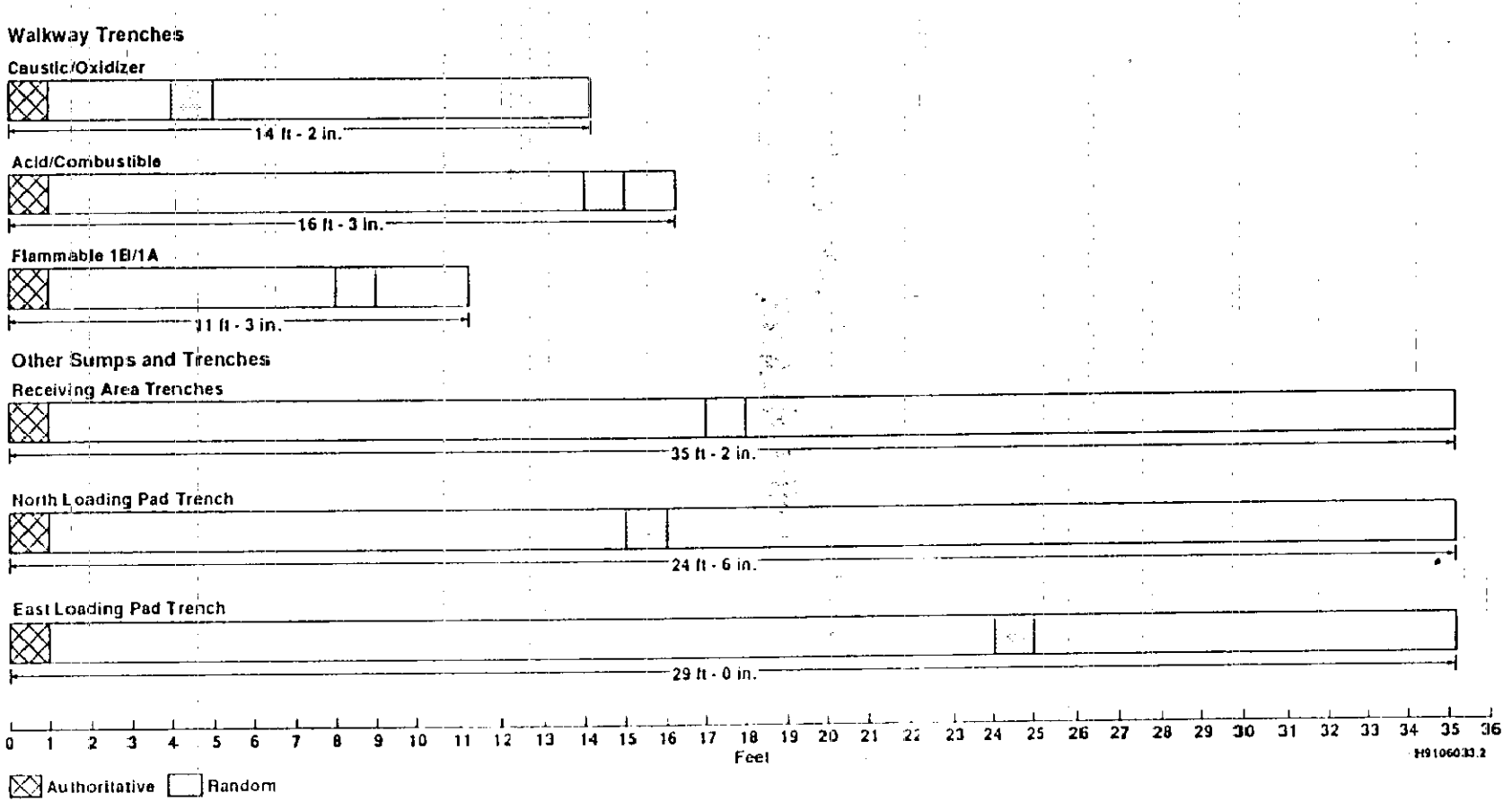

Figure 11-4. Trench and Sump Sample Locations. (sheet 3 of 3)

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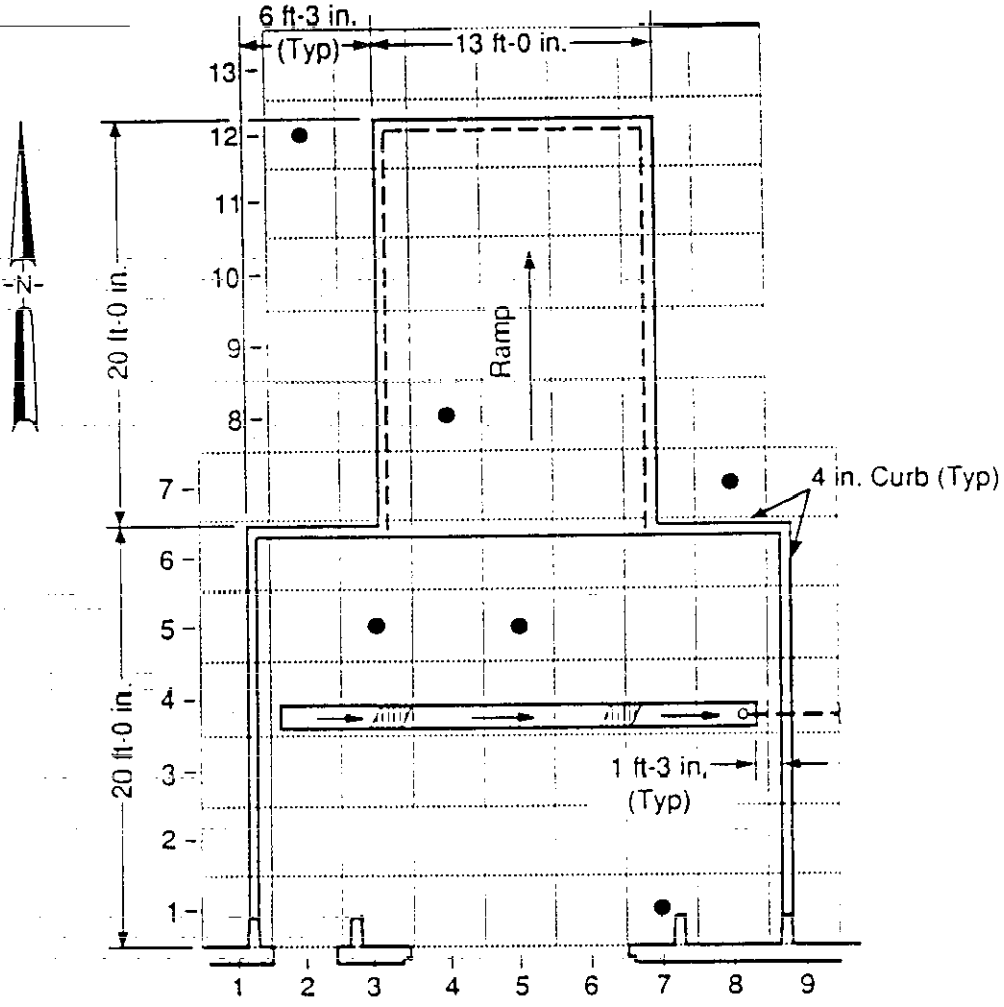

North Loading Pad Sample Points
● Sample Location
Scale: 1 inch (2.5 centimeters) = 9.41 feet (2.86 meters)
····· 1 Meter Gridding

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Figure 11-5. Loading Pad Sample Locations. (sheet 1 of 2)

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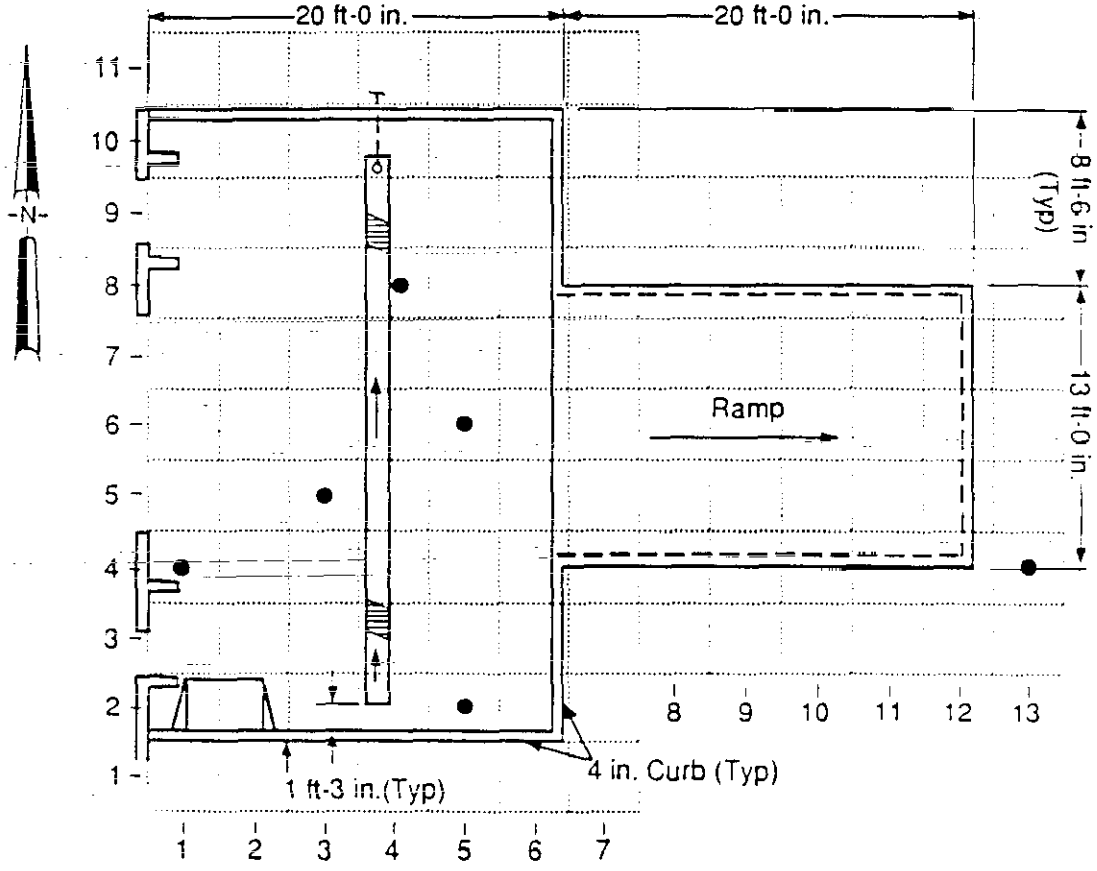

East Loading Pad Sample Points
● Sample Location
Scale: 1 inch (2.5 centimeters) = 9.41 feet (2.86 meters)
—1 Meter Gridding

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Figure 11-5. Loading Pad Sample Locations. (sheet 2 of 2)

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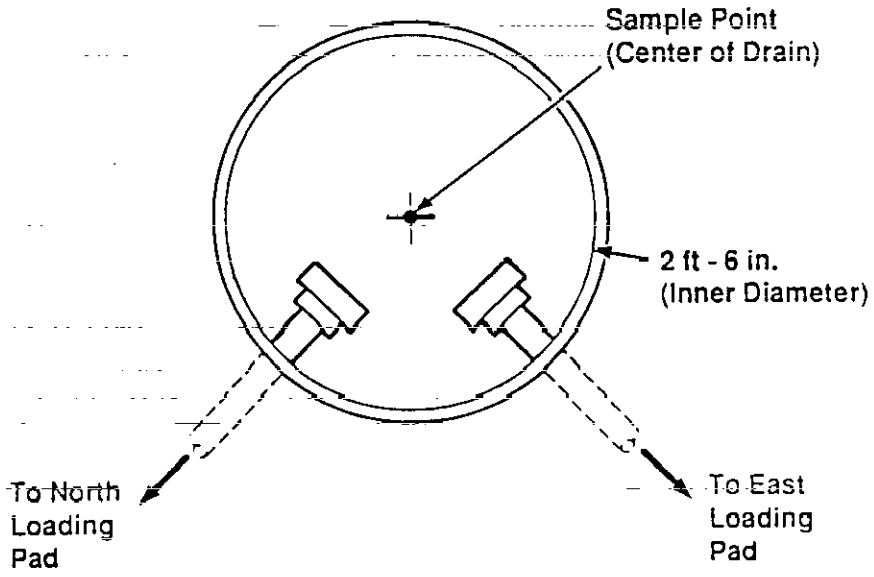
A. French Drain Sample Location



B. Tile Field Sample Location

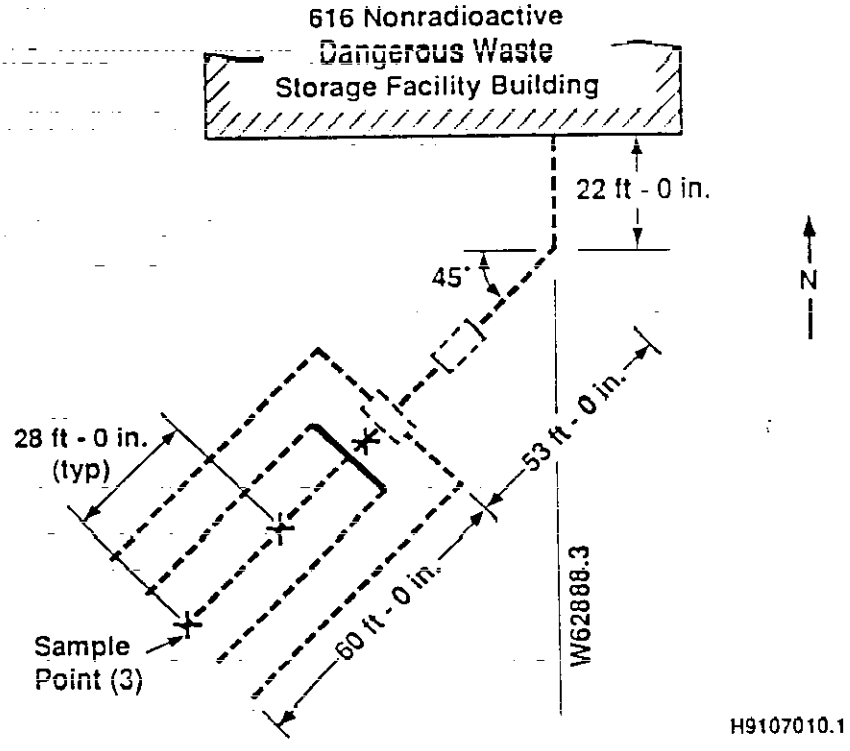


Figure 11-6. Tile Field and French Drain Sample Location.

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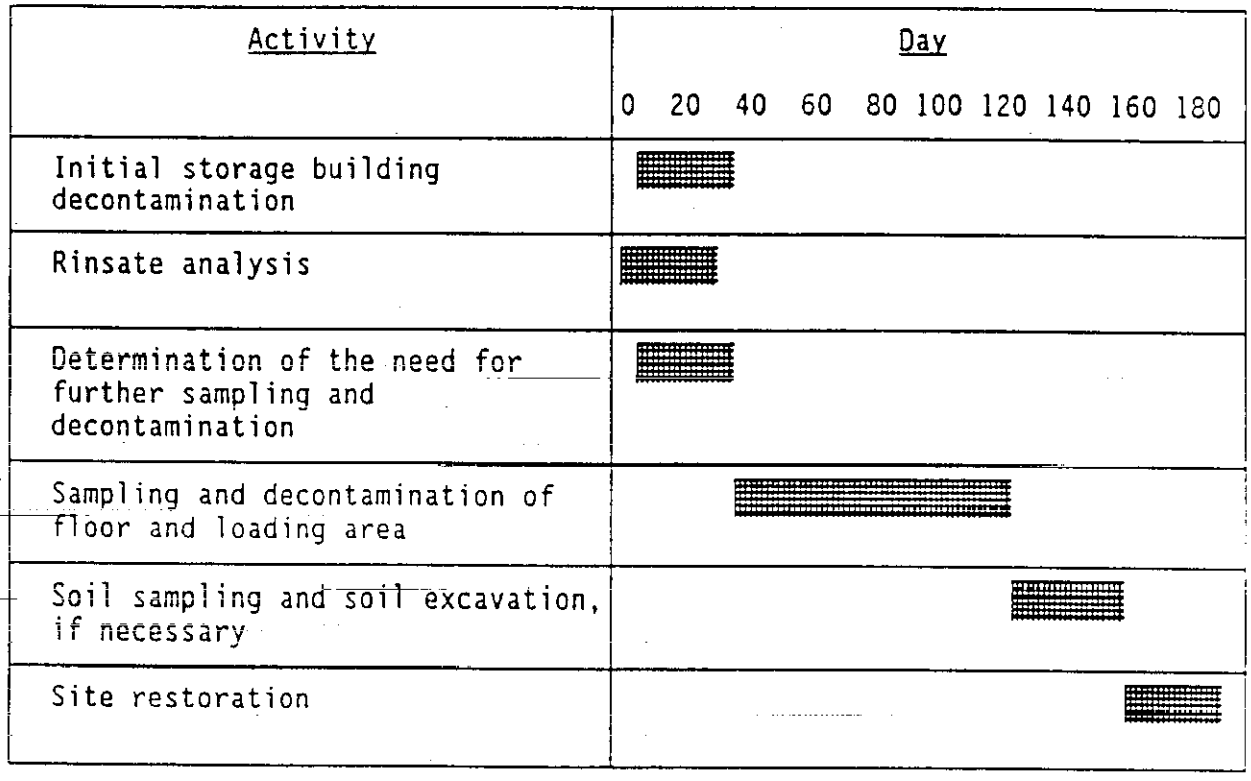

Figure 11-7. Schedule for Closure Activities.

CLOSURE CERTIFICATION
FOR

_____

Hanford Facility
U.S. Department of Energy Field Office, Richland

We, the undersigned, hereby certify that all _____ _____ closure activities were performed in accordance with the specifications in the approved closure plan.

_____
Owner/Operator Signature DOE-RL Representative Date
(Typed Name)

_____P.E.#_____
Signature Independent Registered Professional Engineer Date
(Typed Name and Washington State Professional Engineer License Number)

Figure 11-8. Typical Closure Certification Document.

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Table 11-1. Concrete Analysis.

Possible contaminant	Preparation method	Extract method	Analysis method	Initial action level	Second action level
Inorganic	None	TCLP[a] (3050)	SW 846 6010 AA	Level of quantitation	HB[b]
Organic		Thermal desorption	Gas chromatograph	Level of quantitation	HB[b]

[a]TCLP = toxicity characteristics leaching procedure.
[b]HB = health based.

Table 11-2. 616 Nonradioactive Dangerous Waste Storage Facility Sample Location Summary.

Location	Number of sampling locations
Local background samples	
Soil samples	
Random	5
Sump samples	
Authoritative	2
Random	2
Cell trench samples	
Authoritative	6
Random	6
Walkway trench samples	
Authoritative	3
Random	3
Other trench samples	
Receiving walkway trench	
Authoritative	1
Random	1
North loading pad trench	
Authoritative	1
Random	1
East loading pad trench	
Authoritative	1
Random	1
Tile field	
Authoritative	3
French drain	
Authoritative	1
North loading pad	
Random	6
East loading pad	
Random	6

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TABLE

12-1. Reports and Records T12-1

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12.0 REPORTING AND RECORDKEEPING

This chapter summarizes the 616 NRDWSF reporting and recordkeeping requirements. The reports are submitted to Ecology and/or the EPA as required by applicable regulations, and required records are maintained by the 616 NRDWSF or other Hanford Facility organizations as appropriate. Required reports and records will be accessible through a centralized Hanford Facility Regulatory File index, currently under development. This index, once fully developed, can be used to provide regulatory agency access to the 616 NRDWSF regulatory compliance required by WAC 173-303.

The Regulatory File is maintained by the Environmental Data Management Center. Each TSD unit will undergo a periodic review by an Environmental Data Management Center Regulatory File Custodian to ensure standardized collection and maintenance of unit-specific reports and records (operating records) (DOE-RL 1991b). A general reporting requirement applicable to all dangerous waste treatment, storage, and/or disposal units (notification) is described, as well as reporting and recordkeeping requirements for generators, transporters, and treatment, storage, and/or disposal facilities. Reports and records applicable to the 616 NRDWSF are summarized in Table 12-1.

12.1 NOTIFICATION OF DANGEROUS WASTE ACTIVITIES

Regulations require that facilities involved in the generation or transportation of dangerous waste, or the owner or operator of a TSD facility, have a current EPA/State identification number. The Hanford Facility is a single RCRA facility operating under EPA/State Identification Number WA7890008967. The 616 NRDWSF, a storage unit within the Hanford Facility, operates under this same EPA/State identification number.

12.2 GENERATOR REQUIREMENTS

The Hanford Facility complies with the generator reporting and recordkeeping regulations. The 616 NRDWSF generates only minor amounts of waste during the cleanup of container spills or leaks and this waste is handled together with other waste generated on the Hanford Facility. Hanford Facility waste generation records and required reports (e.g., annual reports) are compiled and issued as single records or reports for the entire Hanford Facility; information on waste generated by the 616 NRDWSF is compiled and provided together with other Hanford Facility generator records and reports. The regulations governing recordkeeping and reporting are discussed in the following sections.

12.2.1 Recordkeeping

Generator records maintained by the Hanford Facility include the following:

- Records of waste generated onsite
- Records of waste packaged to be shipped offsite
- A copy of each annual report
- Land disposal restriction records.

Waste generation records are retained as required by 40 CFR 262.40 and WAC 173-303-210.

12.2.2 Reporting

Generator reports required by 40 CFR 262, Subpart D, and WAC 173-303-220 submitted by the Hanford Facility include the annual report, exception reports, and any required additional reports.

The Hanford Facility submits an annual report of waste generation activities to Ecology. The annual report is submitted on the "Generator Annual Dangerous Waste Report--Form 4." All nonradioactive dangerous waste generated at the 616 NRDWSF is included in the annual report.

If a copy of a manifest is not returned within 45 days with the signature of the owner/operator of a permitted offsite TSD facility designated to receive nonradioactive dangerous waste, Solid Waste Management prepares and submits an exception report to Ecology. The report includes the following:

- A legible copy of the manifest for which delivery was not confirmed
- A cover letter explaining the efforts to locate the waste and the results of those efforts.

Copies of waste analysis reports or other documentation relating to the composition of dangerous waste shipped from the 616 NRDWSF are retained at the 616 NRDWSF. Documents relating to land disposal restrictions are discussed in Section 12.4.2.2.7.

Any additional reports deemed necessary by the EPA or Ecology will be furnished by the Hanford Facility upon request.

12.3 TRANSPORTER REQUIREMENTS

The Hanford Facility does not transport dangerous waste offsite. Transporters having their own EPA/State identification numbers are used to transport dangerous waste from the 616 NRDWSF to a permitted offsite TSD

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facility. Waste transfers onsite, including waste to the 616 NRDWSF, are recorded and tracked in accordance with Hanford Facility procedures (Section 12.4.1.1.1). Therefore, transporter records required by 40 CFR 263.22 and WAC 173-303-260 are not maintained by either the 616 NRDWSF or by the Hanford Facility. Reports such as discharge reports required by 40 CFR 263.30 and WAC 173-303-270 are not applicable.

12.4 TREATMENT, STORAGE, AND/OR DISPOSAL REQUIREMENTS

The reporting and recordkeeping procedures for TSD units are discussed in this section. The TSD reports are described, the operating records and miscellaneous support records contents are described, and plans maintained at the 616 NRDWSF and submitted with this permit application are described.

12.4.1 Reports

This section discusses the reporting requirements of WAC 173-303 and applicable parts of Title 40, Code of Federal Regulations relating to aspects of dangerous waste. The following are included in reporting requirements:

- Waste manifest reports
- Annual reports
- Biennial reports
- Groundwater monitoring reports
- Contingency plan incident reports
- Spills, discharges, and leaks reports
- Closure reports
- Postclosure reports.

Additional details of these reports are provided in the following sections. Copies of these reports are maintained by the 616 NRDWSF or other Hanford Facility organizations as appropriate.

12.4.1.1 **Waste Manifest Reports.** The waste manifest is the source of two possible reports, the manifest discrepancy report and the unmanifested waste report.

12.4.1.1.1 **Manifest Discrepancy.** Each nonradioactive dangerous waste transfer to the 616 NRDWSF from generating units must have a waste tracking form for the transfer to be approved (Chapter 2.0, Section 2.8). The onsite waste tracking forms are checked to verify that the forms are properly filled out and that the waste received is identical to the waste described on the manifest. Every effort is made to resolve manifest discrepancies with the

generating unit. Because the 616 NRDWSF only receives waste generated onsite, the manifest discrepancy reports to be submitted to the EPA and Ecology by 40 CFR 264.72 and WAC 173-303-370, respectively, are not required.

12.4.1.1.2 Unmanifested Waste. Because the 616 NRDWSF only receives waste generated onsite, the unmanifested waste reports to be submitted to the EPA and Ecology by 40 CFR 264.76 and WAC 173-303-390, respectively, are not required. However, care is taken to ensure that any waste transfer is recorded as required in the Hanford Facility waste tracking system and that the waste is accompanied by the appropriate EPA Uniform Hazardous Waste Manifest before the transfer is approved (Chapter 2.0, Section 2.8). No waste is accepted at the 616 NRDWSF without a proper waste tracking form.

12.4.1.2 Annual Report. The state of Washington, pursuant to WAC 173-303-390, requires an annual overall report for each facility that holds an active EPA/State identification number. The report is due to Ecology on March 1 of each year. The report contents for the 616 NRDWSF include the following:

- EPA/State identification number
- Name and address of the Hanford Facility
- Calendar year covered by the report
- Sources of the waste stored at the 616 NRDWSF
- Description and quantity of the waste received at the 616 NRDWSF
- TSD methods
- Certification statement signed by an authorized representative.

The report forms and instructions in the "Treatment, Storage, or Disposal Facility Annual Dangerous Waste Report--Forms 4 and 5" are used for this report.

A report updating projections of anticipated closure and postclosure costs for the Hanford Facility is due to Ecology by October 30 (beginning in 1992)

12.4.1.3 Biennial Report. The EPA requires, pursuant to 40 CFR 264.75, that an overall report describing each dangerous waste facility activity be submitted on March 1 of each even-numbered year. Ecology has been extended administrative responsibilities for biennial reporting as required by 40 CFR 264.75. A specific biennial report is not prepared and submitted as all reporting requirements are satisfied by submittal of the annual report to Ecology.

12.4.1.4 Groundwater Monitoring Reports. The 616 NRDWSF is not operated as a dangerous waste surface impoundment, waste pile, land treatment unit, or

landfill as defined in WAC 173-303-645-(1)(a). Therefore, no groundwater monitoring or reporting is required for this storage unit.

12.4.1.5 Contingency Plan Incident Notifications. The building emergency director, the 616 NRDWSF line management, and the contractor's environmental protection organization are responsible for making notifications (Chapter 2.0, Section 2.7.1 and Appendix 7A). Notifications of all emergency situations requiring contingency plan implementation are made as required by 40 CFR 264.56, WAC 173-303-360, and U.S. Department of Energy Order 5000.3A.

In the event of a fire or an explosion, the building emergency director or the 616 NRDWSF line management immediately must notify the Patrol Operations Center by telephone at 811. All emergency incident calls to the emergency number (811) are reported by the Patrol Operations Center to the Hanford Fire Department and the Occurrence Notification Center. In the event of an unplanned release of hazardous or dangerous waste or material, the building emergency director immediately notifies the contractor's environmental protection organization who notifies the DOE-RL and the Occurrence Notification Center. The DOE-RL must be notified by telephone as soon as possible on the day of the incident. The building emergency director or the 616 NRDWSF line management must document the incident on an Occurrence Report to the DOE-RL within 24 hours of categorization of the incident. A copy of the occurrence reports is retained at the 616 NRDWSF as part of the operating record.

If the 616 NRDWSF stops operations in response to a fire, an explosion, or a release that could present a hazard to human health or the environment, the building emergency director notifies DOE-RL, via line management, that the 616 NRDWSF is operational and emergency cleanup is complete.

The DOE-RL is responsible for three types of notifications: an immediate notification, the incident assessment report, and the unit restart notification. Details of these notifications are provided in the following sections.

12.4.1.5.1 Immediate Notification. The Occurrence Notification Center (509-376-2900) immediately will notify affected county emergency management, Ecology, and the individual designated as the on-scene coordinator for the southeastern Washington area of the National Response Center (800-424-8802) if the 616 NRDWSF has had a fire, an explosion, or a release that could threaten human health or the environment outside the Hanford Facility.

The report will contain the following information:

- Name and telephone number of reporter
- Name and address of the 616 NRDWSF
- Time and type of incident
- Name and quantity of material(s) involved to the extent known

- Extent of injuries if any

- Possible hazards to human health or the environment outside the 616 NRDWSF

- Actions already taken to mitigate the situation.

12.4.1.5.2 Incident Assessment Report. The DOE-RL will provide a written report to Ecology within 15 days of any incident that requires implementation of the contingency plan. This report will include the following information:

- Name, address, and telephone number of the owner or operator

- Name, address, and telephone number of the TSD unit

- Date, time, and type of incident

- Name and quantity of material(s) involved

- Extent of injuries if any

- Assessment of actual or potential hazards to human health or the environment where this is applicable

- Estimated quantity and disposition of recovered material that resulted from the incident

- Cause of the incident

- Description of corrective action taken to prevent recurrence of the incident.

12.4.1.5.3 Unit Restart Notification. If the 616 NRDWSF stops operations in response to a fire, an explosion, or a release that could present a hazard to human health or the environment, the DOE-RL will notify Ecology and the appropriate local authorities before operations are resumed in the affected area(s) of the storage unit. The notification will indicate that cleanup procedures are complete and that emergency equipment is clean and fit for its intended use.

12.4.1.6 Spills, Discharges, and Leaks Reports. This section discusses the reports prepared as a result of unpermitted spills and discharges to the environment.

In the event of any unplanned release of dangerous waste or hazardous substance, the building emergency director immediately notifies the contractor's environmental protection organization and the Occurrence Notification Center. The Occurrence Notification Center immediately will notify the Hanford Fire Department for appropriate action. The building emergency director documents the incident on an occurrence report. A copy of the occurrence report is retained at the 616 NRDWSF. If an unpermitted spill

or discharge exceeds the threshold or reportable quantities, the contractor's environmental protection organization performs the reporting necessary to comply with the EPA and Ecology regulations. The following information is transmitted to the Occurrence Notification Center:

- Name and telephone number of reporter
- Name and address of the 616 NRDWSF
- Time and type of incident
- Name and quantities of material(s) involved to the extent known
- Extent of injuries if any
- Possible hazards to human health or the environment outside the 616 NRDWSF.

The Occurrence Notification Center immediately notifies Ecology of all reportable spills to the environment or the atmosphere in accordance with the requirements of WAC 173-303-145.

12.4.1.7 Closure Reports. Reports regarding the closure of the 616 NRDWSF will be made in accordance with the requirements of 40 CFR 264.115 and .116 and WAC 173-303-610(6) and (9). These reports include notification of beginning of closure and certification of closure.

12.4.1.7.1 Notification of Closure. Ecology will be notified in writing at least 45 days before the date on which closure of the 616 NRDWSF is expected to begin.

12.4.1.7.2 Certification of Closure. Within 60 days of completion of closure of the 616 NRDWSF, a certification signed by the DOE-RL and an independent, registered professional engineer will be submitted to the regulatory authority. The certification will be sent by registered mail or an equivalent delivery service. The certification will state that the 616 NRDWSF was closed in accordance with the approved closure plan. Documentation supporting the independent registered engineer's certification will be supplied upon request of the regulatory authority.

12.4.1.7.3 Survey Plat. The 616 NRDWSF is not a disposal unit. This determination eliminates the requirement for producing a survey plat.

12.4.1.8 Postclosure Reports. Postclosure reports required by 40 CFR 264.119 and .120 and WAC 173-303-610(9), (10), and (11) are not required because the 616 NRDWSF is not a disposal unit.

12.4.2 Recordkeeping Requirements

Records retained by the 616 NRDWSF include plans described in other portions of this permit application, operating records, miscellaneous support

records, and records of reports made to the regulatory authority. These records are described in the following sections. Copies of these records will be accessible by contacting the Environmental Data Management Center Regulatory File Custodian (509-376-2530).

12.4.2.1 Permit Application Plans. Plans described in other portions of this permit application and retained at the 616 NRDWSF include the following:

- Waste analysis plan
- Contingency plan and amendments
- Training plan
- Closure plan
- Inspection plans.

Copies of these plans are included in this permit application. These plans are maintained at the 616 NRDWSF during the life of the storage unit. Modifications or amendments required as a result of changing regulatory or operational requirements will be submitted to the regulatory authority and added to the plans maintained at the 616 NRDWSF as required.

12.4.2.2 Operating Records. Operating records maintained at the 616 NRDWSF include the following:

- Description and the quantity of each dangerous waste received and the method(s) and date(s) of storage at the 616 NRDWSF in accordance with 40 CFR 264 Appendix I and WAC 173-303-380
- Location of each dangerous waste stored within the storage unit and the quantity at each location
- Waste analyses results
- Contingency plan incident reports
- Inspection records
- Waste minimization certification
- Land disposal restriction records.

12.4.2.2.1 Waste Description and Quantity. A description of and the quantity of each dangerous waste handled by the 616 NRDWSF are maintained in the storage unit records. Waste tracking records describing the types and quantities of waste are maintained as part of the operating record.

12.4.2.2.2 Waste Location. The location of each nonradioactive dangerous waste container stored within the 616 NRDWSF is documented and

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maintained. This record provides a cross-reference to associated waste tracking form numbers.

12.4.2.2.3 **Waste Analysis.** Waste analysis records maintained at the 616 NRDWSF are generated only when waste resulting from a spill or leak cannot be identified. All other waste analysis is performed by, and records maintained by, onsite generating units (Chapter 3.0). Records of all the information necessary for treating or disposing of the waste are maintained. Analyses are repeated, as necessary, to ensure accuracy and validity.

12.4.2.2.4 **Contingency Plan Incident Records.** Records documenting the details of any incidents requiring the implementation of the contingency plan (Chapter 7.0), as described in Section 12.4.1.5, are maintained as part of the 616 NRDWSF operating record as required by 40 CFR 264.73 and WAC 173-303-380. In addition to these records, occurrence reports are generated to document incidents. Occurrence reports describe all incidents, including those that are judged too minor to require the implementation of the contingency plan but that are identified as offnormal events, unusual occurrences or emergencies.

12.4.2.2.5 **Inspection Records.** Records of the 616 NRDWSF general inspections are maintained at the storage unit for at least 5 years from the inspection date. The records include the following:

- The date and time of inspection
- The inspector's printed name and handwritten signature
- Notations of observations
- The date and nature of any repairs or other remedial actions.

12.4.2.2.6 **Waste Minimization Certification.** Annual certification by the DOE-RL that the 616 NRDWSF is in compliance with the waste minimization requirements is inserted into the operating record as required by 40 CFR 264.73(b)(9).

12.4.2.2.7 **Land Disposal Restriction Records.** Records related to the generation or treatment and disposal of waste subject to land disposal prohibitions are maintained by the Hanford Facility as required by 40 CFR 264.73(b)(10) and (16). Possible records for waste shipped offsite include the following:

- Waste placed in land disposal units under an extension to the effective date of any land disposal restriction granted pursuant to 40 CFR 268.5
- Waste placed in land disposal units under a petition granted pursuant to 40 CFR 268.6
- The applicable notice and certification required by 40 CFR 268.7(a) or 40 CFR 268.7(b)

- The demonstration and certification required by 40 CFR 268.8, if applicable, for waste subject to land disposal prohibitions or restriction.

Additional discussion of land disposal records is provided in the following sections.

12.4.2.2.7.1 **Date Extension.** The 616 NRDWSF will not apply for an extension to the effective date of a land disposal restriction. The onsite generating unit or the permitted offsite TSD facility will apply for an extension if required. If such an extension is approved by the regulatory authority, the generating unit or permitted offsite TSD facility, as appropriate, will provide a copy of the approval indicating the waste subject to the extension. Copies of these records, as well as the quantities and the date of placement (information the permitted offsite TSD facility is requested to provide to the 616 NRDWSF following disposal) for each shipment of waste subject to the date of the extension, will be maintained at the Hanford Facility.

12.4.2.2.7.2 **Petition.** The 616 NRDWSF will not petition to allow land disposal of a waste subject to a land disposal restriction under 40 CFR 268, Subpart C. The permitted offsite TSD facility will petition to the regulatory authority for a variance to allow disposal of a restricted or prohibited waste if required. If such a petition is approved by the regulatory authority for waste shipped by the 616 NRDWSF, the permitted TSD facility will be requested to provide information related to the petition so that Solid Waste Engineering can ensure that the waste shipped complies with the petition. Copies of the records of the petition, as well as the waste quantities and date of placement (information the permitted offsite TSD facility is requested to provide to Solid Waste Engineering following disposal) for each waste shipment covered by the petition, will be maintained at the Hanford Facility.

12.4.2.2.7.3 **Notice.** Solid Waste Engineering determines if waste is subject to land disposal restrictions (Chapter 3.0, Section 3.2). Based on the information provided by the onsite generating unit, Solid Waste Engineering prepares the necessary notices and certifications that accompany the associated waste shipments to the permitted offsite TSD facility. The notices and certifications are required for the following cases:

- The waste does not meet the applicable treatment standards

- The waste meets the applicable treatment standards.

Copies of records detailing the waste quantities, and date of placement in the land disposal units (information the permitted offsite TSD facility is requested to provide to Solid Waste Engineering following disposal), as well as the appropriate notice, certification, and supporting documentation for each shipment of a waste subject to a land disposal restriction or prohibition, are maintained at the Hanford Facility.

<u>Waste Does Not Meet the Applicable Treatment Standards</u>--If Solid Waste Engineering determines that the waste does not meet the applicable treatment

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standards or exceeds an applicable prohibition level set forth in 40 CFR 268.32 or Section 3004(d) of RCRA, Solid Waste Engineering will prepare a notice that is provided to the offsite permitted TSD facility with each shipment of waste. This notice contains the following information:

- The EPA hazardous waste number
- Corresponding treatment standards and all applicable prohibitions set forth in 40 CFR 268.32 or Section 3004(d) of RCRA
- Waste analysis data where available or a statement of the basis of the determination with supporting data.
- The appropriate certification will be signed by an authorized representative.

Solid Waste Engineering submits the notice to the permitted offsite TSD facility with each shipment of waste subject to the restriction or prohibition.

Waste Meets the Applicable Treatment Standards--If Solid Waste Engineering determines that the waste meets the applicable treatment standards and can be land disposed without further treatment, Solid Waste Engineering will prepare a notice and certification that are provided to the permitted offsite TSD facility with each shipment of waste. The notice contains the following information:

- The EPA hazardous waste number
- Corresponding treatment standards and all applicable prohibitions set forth in 40 CFR 268.32 or Section 3004(d) of RCRA
- Waste analysis data where available or a statement of the basis of determination with supporting data

The appropriate certification will be signed by an authorized representative.

Solid Waste Engineering submits the notice and the certification to the permitted offsite TSD facility with each shipment of the waste subject to the restriction or prohibition.

12.4.2.2.7.4 Demonstration. Because the demonstration and certification records required in 40 CFR 268.8 apply to waste that was disposed of before May 8, 1990, demonstration and certification records required by 40 CFR 268.8 are not applicable to the 616 NRDWSF.

12.4.2.3 Miscellaneous Support Records. Miscellaneous support records include the following:

- Training documentation

- Liability coverage documentation

- Closure and postclosure cost estimates

- Report records.

12.4.2.3.1 Training Documentation. The name of each employee and the waste management position held are maintained by the 616 NRDWSF. Training records will document that employees have received the training or have the job experience required for that position. Training records on current employees are kept until closure of the unit. Training records on former employees are kept for 3 years from the date the employee last worked at the 616 NRDWSF. Auditable copies of these records are maintained by the contractor's training organizations. Specific employee training records are available on a demonstrated need-to-know basis. Copies of these records will be marked *Sensitive Information* and are expected to be handled in accordance with the *Privacy Act* (Chapter 8.0, Section 8.2).

12.4.2.3.2 Liability Coverage Documentation. In accordance with 40 CFR 264.140(c) and WAC 173-303, this documentation is not required for federal facilities. The Hanford Facility is a federally owned facility for which the federal government is the operator and this documentation is therefore not applicable to the 616 NRDWSF.

12.4.2.3.3 Closure and Postclosure Cost Estimates. In accordance with 40 CFR 264.140(c) and WAC 173-303, these estimates are not required for federal facilities. The Hanford Facility is a federally owned facility for which the federal government is the operator and these estimates are therefore not applicable to the 616 NRDWSF.

An annual report updating projections of anticipated closure and postclosure costs for the Hanford Facility TSD units having final status will be submitted in accordance with WAC 173-303-390 to Ecology by October 30 (beginning in 1992).

12.4.2.3.4 Report Records. The reports described in Sections 12.1, 12.2.2, and 12.4.1 are contained in records maintained either by the 616 NRDWSF or by other Hanford Facility organizations as noted in Table 12-1. Copies of the reports will be made available on the request of the EPA or Ecology.

Table 12-1. Reports and Records. (sheet 4 of 4)

Item	Storage	
	Retention time	Location[a]
Miscellaneous Support Reports and Records:		
Annual report	Life of 616 NRDWSF	Hanford Facility
Biennial report	Not required	NA
Training documentation	Life of 616 NRDWSF	616 NRDWSF
Liability coverage documentation	Not required	NA

NA = not applicable.

Note: At the time of closure, all 616 NRDWSF environmental records will be transferred to a Hanford Facility central retention area.

Table 12-1. Reports and Records. (sheet 3 of 4)

Item	Storage	
	Retention time	Location[a]
Waste Manifest Reports and Records:		
Manifests	Until closure	Hanford Facility
Manifest discrepancy	Not required	NA
Unmanifested waste	Not required	NA
Groundwater Monitoring Reports and Records:		
None required	Not required	NA
Contingency Plan Incident Reports and Records:		
Immediate notification--Occurrence Report	Life of 616 NRDWSF	616 NRDWSF
Assessment report	Life of 616 NRDWSF	616 NRDWSF
616 NRDWSF restart notification	Life of 616 NRDWSF	616 NRDWSF
Spills, Discharges, and Leaks Reports and Records:		
Immediate notification	Life of 616 NRDWSF	616 NRDWSF
Closure Reports and Records:		
Certification of closure	Life of 616 NRDWSF	Hanford Facility
Survey plat	Not required	NA
Closure cost estimates (latest)	Life of 616 NRDWSF	Hanford Facility
Postclosure Reports and Records:		
None required	Not required	NA

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Table 12-1. Reports and Records. (sheet 2 of 4)

Item	Storage: Retention time	Storage: Location[a]
TREATMENT, STORAGE, AND/OR DISPOSAL REPORTS AND RECORDS:		
Permit Application Plans:		
Waste analysis plan	Life of 616 NRDWSF	616 NRDWSF
Contingency plan and amendments	Life of 616 NRDWSF	616 NRDWSF
Training plan	Life of 616 NRDWSF	616 NRDWSF
Closure plan	Life of 616 NRDWSF	616 NRDWSF
Postclosure plan	Not required	NA
Inspection plans	Life of 616 NRDWSF	616 NRDWSF
Operating Reports and Records:		
Waste description and quantity	Life of 616 NRDWSF	616 NRDWSF
Waste location	Until closure	616 NRDWSF
Waste analysis data	Life of 616 NRDWSF	Hanford Facility
Inspection records	Varies from 5 years from inspection date to life of 616 NRDWSF	616 NRDWSF
Certification of waste minimization efforts	Life of 616 NRDWSF	616 NRDWSF
Land Disposal Restriction Records:		
Extension to an effective date	Life of 616 NRDWSF	Hanford Facility
Petition for a variance	Life of 616 NRDWSF	Hanford Facility
Notice and certification of treatment standards	Life of 616 NRDWSF	Hanford Facility
Demonstration and certification for a temporary extension to the effective date	Life of 616 NRDWSF	Hanford Facility

Table 12-1. Reports and Records. (sheet 1 of 4)

Item	Storage: Retention time	Storage: Location[a]
Notification of dangerous waste activities	Life of 616 NRDWSF	Hanford Facility
GENERATOR REPORTS AND RECORDS:		
Annual report	Life of 616 NRDWSF	Hanford Facility
Exception report	Life of 616 NRDWSF	Hanford Facility
Additional reports and records as required (e.g., inspection logs)	Life of 616 NRDWSF	Hanford Facility
Test and Waste Analysis Results:		
Waste generated onsite	Life of 616 NRDWSF	Hanford Facility
Waste packaged for offsite shipment	Life of 616 NRDWSF	Hanford Facility
Waste Manifest Reports and Records:		
Manifests	Life of 616 NRDWSF	Hanford Facility
Manifest discrepancy	Not required	NA
Unmanifested waste	Not required	NA
Land Disposal Restriction Records:		
Extension to an effective date	Life of 616 NRDWSF	Hanford Facility
Petition for a variance	Life of 616 NRDWSF	Hanford Facility
Notice and certification of treatment standards	Life of 616 NRDWSF	Hanford Facility
Demonstration and certification for a temporary extension to the effective date	Life of 616 NRDWSF	Hanford Facility
TRANSPORTER REPORTS AND RECORDS:		
None required	NA	NA

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13.0 OTHER RELEVANT LAWS [J] 13-1

13.1 CLEAN AIR ACT OF 1977 13-1

13.2 CLEAN WATER ACT OF 1977 13-2

13.3 ENDANGERED SPECIES ACT OF 1973 13-2

13.4 FISH AND WILDLIFE COORDINATION ACT OF 1934 13-2

13.5 NATIONAL HISTORIC PRESERVATION ACT OF 1966 13-2

13.6 WILD AND SCENIC RIVERS ACT OF 1968 13-3

13.7 TOXIC SUBSTANCES CONTROL ACT OF 1976 13-3

13.8 OTHER REQUIREMENTS 13-3

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13.0 OTHER RELEVANT LAWS [J]

The 616 NRDWSF was constructed and is operated in compliance with applicable laws and regulations. Relevant environmental laws and regulations have been reviewed, necessary notifications have been made, and necessary approvals or permits have been obtained. No additional approvals or permits for the 616 NRDWSF that would require action by either the EPA or Ecology have been identified.

This chapter provides a summary of the regulatory review performed to assist Ecology in determining that the 616 NRDWSF has met its obligations with respect to other federal or state laws. The major environmental laws evaluated include the following, all as amended:

- *Clean Air Act of 1977*
- *Clean Water Act of 1977*
- *Endangered Species Act of 1973*
- *Fish and Wildlife Coordination Act of 1934*
- *National Historic Preservation Act of 1966*
- *Wild and Scenic Rivers Act of 1968*
- *Toxic Substances Control Act of 1976.*

In addition, a summary of other requirements that could apply is provided. Full references for each of these acts are included in Chapter 15.0.

13.1 CLEAN AIR ACT OF 1977

No active processing occurs at the 616 NRDWSF to provide routine emissions. No radioactive material is, or will be, stored at the 616 NRDWSF. Storage involves sealed dangerous waste with possibly some occasional sampling activities. Other than a catastrophic event, no upset conditions internal or external to the 616 NRDWSF would result in release concentrations outside the storage unit that exceeds levels the Occupational Safety and Health Administration defines as immediately dangerous to life and health. Airborne releases from upset conditions would continue only until recovery actions were taken. Based on the above, airborne emissions from the storage unit would not include contaminants at concentrations or in sufficient amounts that currently require an air quality permit from any agency.

13.2 CLEAN WATER ACT OF 1977

Operation of the 616 NRDWSF will not result in the discharge of any liquid effluents that would require a National Pollutant Discharge Elimination System permit; therefore, no permits or reviews pursuant to the *Clean Water Act* are applicable.

13.3 ENDANGERED SPECIES ACT OF 1973

The 616 NRDWSF is located between the 200 East and 200 West Areas of the Hanford Facility (Chapter 2.0 provides site location information). These areas have been developed extensively during past construction activities and during nuclear fuel and chemical processing activities. The site of the 616 NRDWSF cannot be considered an undisturbed area or a major habitat for native plant and animal species. Also, this area is a very small fraction of the Hanford Facility and hence would not play a significant role in the ecology of the Hanford Facility. No listed or proposed endangered or threatened species or their habitats are expected to be affected by 616 NRDWSF activities.

13.4 FISH AND WILDLIFE COORDINATION ACT OF 1934

Operation of the 616 NRDWSF does not involve the impoundment, diversion, or other control or modification of any body of water. Therefore, no permits or reviews pursuant to this statute are applicable.

13.5 NATIONAL HISTORIC PRESERVATION ACT OF 1966

Operation of the 616 NRDWSF affects no areas that are eligible for nomination to the National Register of Historic Places. In addition, the area was reviewed for cultural resources.

Sites used as material 'borrow areas' for construction of the 616 NRDWSF have been reviewed for the presence of archaeological resources in accordance with regulations issued pursuant to, or other requirements of, the *American Antiquities Preservation Act of 1906*; the *American Indian Religious Freedom Act of 1978*; the *Historic Sites, Buildings and Antiquities Act of 1935*; the *Archaeological and Historic Preservation Act of 1960*; and the *Archaeological Resources Protection Act of 1979*. No known cultural resource impacts have occurred from 616 NRDWSF activities.

13.6 WILD AND SCENIC RIVERS ACT OF 1968

Operation of the 616 NRDWSF does not affect any rivers presently designated under the *Wild and Scenic Rivers Act*.

13.7 TOXIC SUBSTANCES CONTROL ACT OF 1976

The *Toxic Substances Control Act* was enacted to protect human health and the environment by requiring that specific chemicals be tested and that regulations restricting their processing and use be implemented. The objectives of the Act include the development of adequate data to determine the human health and environmental effects of chemicals and to control any chemicals that present an unreasonable risk of injury. The section of the Act most relevant to the 616 NRDWSF involves the storage and handling of chemical substances or mixtures that could present an unreasonable risk of injury to human health or the environment, specifically polychlorinated biphenyls. The regulation promulgated to prescribe the *Toxic Substances Control Act* methods for storage and handling of polychlorinated biphenyls is 40 CFR 761. The 616 NRDWSF will meet all the requirements as determined applicable by EPA.

13.8 OTHER REQUIREMENTS

The application of insecticides and herbicides on or in the immediate vicinity of the 616 NRDWSF will be conducted in compliance with the *Federal Insecticide, Fungicide, and Rodenticide Act of 1975*, the *Toxic Substances Control Act*, and the applicable provisions of the Washington State Water Quality Standards, WAC 173-201.

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14.0 CERTIFICATION [K] 14-1

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14.0 CERTIFICATION [K]

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

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.

Owner/Operator
John D. Wagoner, Manager
U.S. Department of Energy
Field Office, Richland

Date 10/30/91

Co-operator
Thomas M. Anderson, President
Westinghouse Hanford Company

Date 10/4/91

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15.4 WASHINGTON ADMINISTRATIVE CODE 15-5

15.5 U.S. DEPARTMENT OF ENERGY ORDER 15-5

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15.0 REFERENCES

15.1 DOCUMENTS

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15.2 CODE OF FEDERAL REGULATIONS (AND FEDERAL REGISTER)

29 CFR 1910.120, "Hazardous Waste Operations and Emergency Response," Title 29, Code of Federal Regulations, Part 1910.120, *Federal Register*, 54 FR 12792, March 28, 1989, Occupational Safety and Health Administration, Washington, D.C.

40 CFR 261, *Identification and Listing of Hazardous Waste*, Title 40, Code of Federal Regulations, Part 261, U.S. Environmental Protection Agency, Washington, D.C.

40 CFR 262, *Standards Applicable to Generators of Hazardous Waste*, Title 40, Code of Federal Regulations, Part 262, U.S. Environmental Protection Agency, Washington, D.C.

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40 CFR 264, *Standards of Owners and Operators of Hazardous Waste Treatment, Storage, and Disposal Facilities*, Title 40, Code of Federal Regulations, Part 264, U.S. Environmental Protection Agency, Washington, D.C.

40 CFR 268, *Land Disposal Restrictions*, Title 40, Code of Federal Regulations, Part 268, as amended, U.S. Environmental Protection Agency, Washington, D.C.

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40 CFR 302, *Designation, Reportable Quantities, and Notification*, Title 40, Code of Federal Regulations, Part 302, U.S. Environmental Protection Agency, Washington, D.C.

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49 CFR 172, *Hazardous Materials Tables and Hazardous Materials Communications Regulations*, Title 49, Code of Federal Regulations, Part 172, U.S. Department of Transportation, Washington, D.C.

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55 FR 61, "U.S. EPA Final Rule," Code of Federal Regulations, *Federal Register*, Vol. 55, No. 61, pp. 11799-11877, March 29, 1990, U.S. Environmental Protection Agency, Washington, D.C.

15.3 FEDERAL AND STATE ACTS

American Antiquities Preservation Act of 1906, 16 USC 432.

American Indian Religious Freedom Act of 1978, 42 USC 1996.

Archeological and Historic Preservation Act of 1960, 16 USC 469.

Archeological Resources Protection Act of 1979, 16 USC 470 aa.

Atomic Energy Act of 1954, as amended, 42 USC 2011.

Clean Air Act of 1977, as amended, 42 USC 7401.

Clean Water Act of 1977, as amended, 33 USC 1251.

Comprehensive Environmental Response, Compensation, and Liability Act of 1980, as amended, 42 USC 9601 et seq.

Endangered Species Act of 1973, as amended, 16 USC 1531 et seq.

Federal Insecticide, Fungicide, and Rodenticide Act of 1975, as amended, 7 USC 136 et seq.

Fish and Wildlife Coordination Act of 1934, as amended, 16 USC 661.

Hazardous and Solid Waste Amendments of 1984, 42 USC 6912(a), 6921, 6922, 6924, 6925, 6926, 6930, 6935, 6937, 6939, 6991, and 6993.

Historic Sites, Buildings and Antiquities Act of 1935, 16 USC 461-467.

National Historic Preservation Act of 1966, as amended, 16 USC 470 et seq.

Privacy Act of 1974, as amended, 5 USC 552a.

Resource Conservation and Recovery Act of 1976, as amended, 42 USC 6901 et seq.

Safe Drinking Water Act of 1974, as amended, 42 USC 300f et seq.

Shoreline Management Act of 1971, Revised Code of Washington 90.58.010 et seq, Olympia, Washington.

State of Washington Hazardous Waste Management Act of 1976, as amended, Revised Code of Washington 70.105, Olympia, Washington.

Superfund Amendment and Reauthorization Act of 1986.

Toxic Substances Control Act of 1976, 15 USC 2601 et seq.

Wild and Scenic Rivers Act of 1968, as amended, 16 USC 1271.

15.4 WASHINGTON ADMINISTRATIVE CODE

WAC 173-201, *Water Quality Standards for Surface Waters of the State of Washington*, 1987, Washington State Department of Ecology, Olympia, Washington.

WAC 173-303, *Dangerous Waste Regulations*, 1991, Washington State Department of Ecology, Olympia, Washington.

15.5 U.S. DEPARTMENT OF ENERGY ORDER

5000.3A *Occurrence Reporting and Processing of Operations Information*, U.S. Department of Energy, Washington, D.C.

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APPENDICES

2A HANFORD SITE MAPS

3A RADIATION EXEMPT FACILITY LIST

4A CONSTRUCTION SPECIFICATION

4B DESIGN DRAWINGS

4C CONTAINMENT CALCULATIONS

4D CONCRETE SEALANT PROPERTIES AND PERFORMANCE DATA

7A BUILDING EMERGENCY PLAN - 616 BUILDING

8A TRAINING COURSE DESCRIPTIONS

11A RANDOM NUMBERS TABLE

11B DESCRIPTION OF PROCEDURES

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APPENDIX 2A

HANFORD SITE MAPS

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APPENDIX 2A

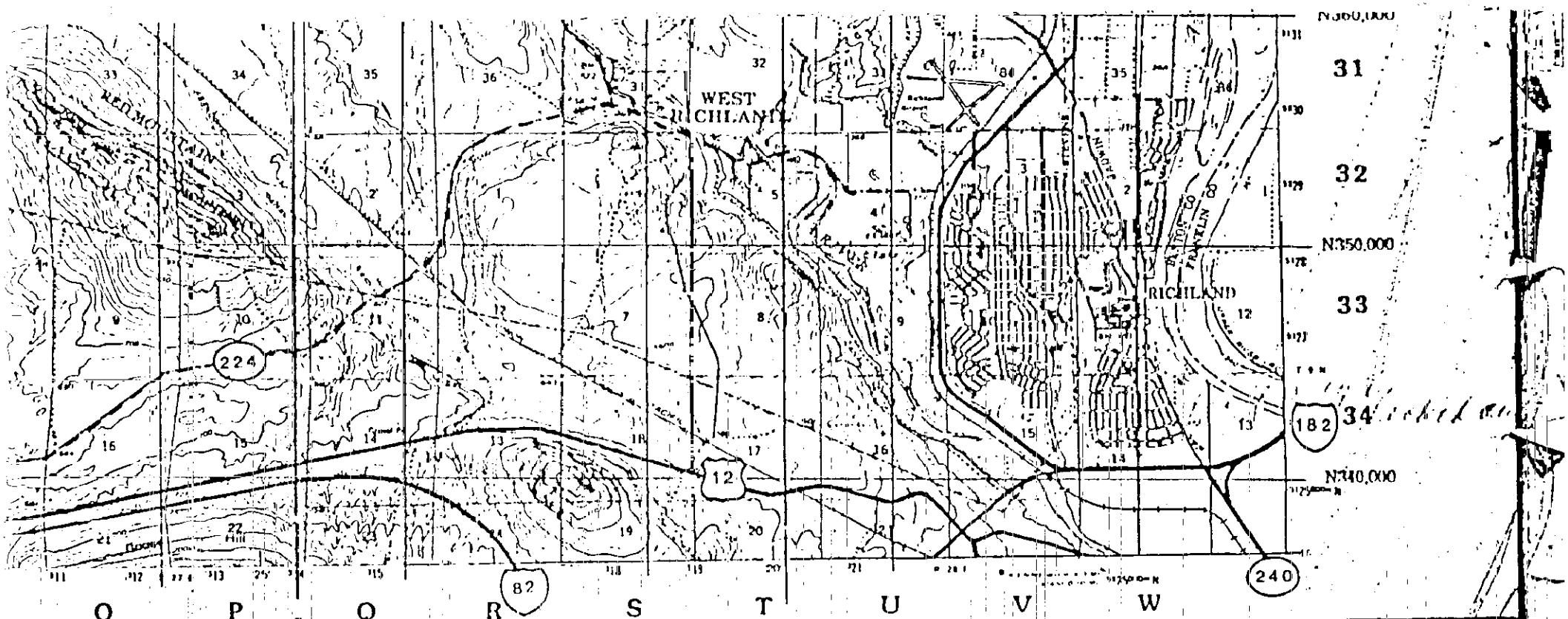
HANFORD SITE MAPS

H-6-958 Overall Hanford Facilities

H-13-000014 616 NRDWSF Topographic Map

Legal Description of the 616 Nonradioactive Dangerous Waste Storage Facility

9113294.0757



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		12/2/91	12-12-90	REV PER ECN-145778	1
ENGR. PR	DRAFTING	CHKD BY DATE	REV BY DATE	DESCRIPTION	

ON APPROVALS

REVISIONS

DRAWING STATUS

LAST REV 2

DRAWING APPROVALS	DATE
APPD FOR QUALITY ASSURANCE	
APPD	7/89
APPD	
APPD	
RESPONSIBLE ENGINEER R.L. MARTELL	
DRAFTING APPD	
CHECKED	
DRAWN K.D. JUNT	
CLASSIFICATION NONE	BY NOT REQ'D

U. S. Department of Energy
Richland Operations Office

Westinghouse Hanford Company

OVERALL HANFORD FACILITIES

SCALE	BLDG NO	INDEX NO
AS SHOWN	600 GEN	0100

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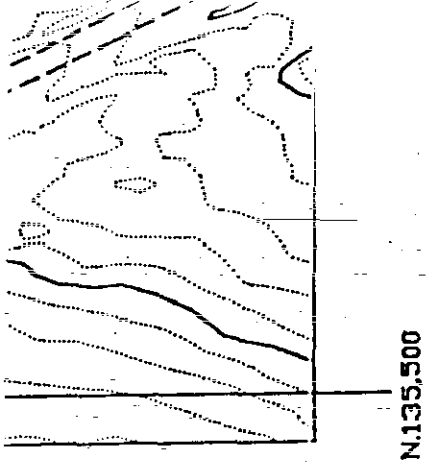

DWG NO H-13-000014 SH 1 OF 1 REV 0

OFFICIAL RELEASE
BY
DATE SEP 10 1991

EDT 145790

	DATE
ASH	7-11-91
	9-9-91
	9-9-91
ATION	
DATE	

U.S. DEPARTMENT OF ENERGY
Richland Operations Office
Westinghouse Hanford Company

616 NRDWSF TOPOGRAPHIC MAP

SIZE	BLDG NO	INDEX NO	DWG NO	REV
F	616	0103	H-13-000014	0

SCALE 1:2000 SHEET 1 OF 1

A

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1

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ARE FROM GLOBAL POSITIONING SYSTEM MEASUREMENTS ON THE NE AND NW CORNERS OF THE HEREON SHOWN PARCEL OF LAND, BASED ON MONUMENT PUG 1947 NGS GEODETIC CONTROL DIAGRAM WALLA WALLA.

SITE BOUNDARY SURVEY MADE WITH LIETZ SET-2 TOTAL STATION. ALL BOUNDARY DIMENSIONS ARE GROUND LEVEL DISTANCES EXPRESSED IN FEET.

ALL COORDINATES ARE BASED ON THE WASHINGTON COORDINATE SYSTEM OF 1983, SOUTH ZONE (WCS 83S) PER 58.20 RCW.

SITE LOCATION WITHIN SECTION OR SECTIONS IS SCALED FROM A 7.5' QUADRANGLE MAP, USING LATITUDE AND LONGITUDE.

INDICATES MAGNETICALLY LOCATABLE 3" ALUMINUM MONUMENT WITH 2 FOOT ALUMINUM SHAFT, MARKED WITH SITE DESIGNATION No., CORNER No. AND SURVEYOR IDENTIFICATION.

0 200

FT

KAISER ENGINEERS HANFORD CO.

RICHLAND, P.O. BOX 888 WASHINGTON 99352
509-373-2615

NW 1/4 SW 1/4, 4-12-26
NE 1/4 SE 1/4, 5-12-26

DATE: 3/5/91

JOB No: ER 1505

SHEET 1 OF 1

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APPENDIX 3A

RADIATION EXEMPT FACILITY LIST

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FACILITIES WHERE UNCONDITIONAL RELEASE SURVEY IS NOT REQUIRED

100 Area Facilities

181-B
181-D
182-B
182-D
183-D
1720-K
1100-N
1101-N
1102-N
1103-N
1104-N
1107-N
1109-N
1110-N
1111-N
1112-N
1113-N
1114-N
1115-N
1116-N
1117-N
1118-N
1120-N
1123-N
1124-N
1125-N
1132-N
1133-N
1134-N
1135-N
1142-N
1144-N
1145-NA
1145-NB
1146-N
1147-N
1148-N
1149-N
1150-N
1151-N
1152-N
1153-N
1154-N
1155-N
1156-N
1158-N
1159-N
1160-N
1161-N
1162-N
1163-N

Trailers
MO-200
MO-314
MO-911
Structural Analysis Mobile Unit
MO-920
64-15316
64-15354

200 Area Facilities

222-B
222-SA
222-T
222-U
272-W
273-E
273-EA
273-W
274-E
274-W
275-E
275-EA
275-W
283-E
283-W
284-E
2101-M*
2701-A
2400-E
2403-EA
2701-EA
2701-ED
2701-EF
2701-WA
2701-ZB
2703-E
2704-S
2704-W
2709-W
2713-E
2715-E
2715-EA
2715-ED
2715-W
2716-S
2719-EA
2719-W
2719-WA
2720-W
2721-EA
2722-E
2722-W
2723-W
2727-E
2728-W
2750-E
2751-E
2752-E
2753-E

Trailers
MO-015
MO-016
MO-017
MO-019
MO-021
MO-027
MO-028
MO-029
MO-031
MO-032
MO-037
MO-039
MO-040
MO-042
MO-043
MO-047
MO-056
MO-104
MO-107
MO-201
MO-206
MO-215
MO-221
MO-222
MO-223
MO-224
MO-240
MO-257
MO-321
MO-346
MO-355
MO-381
MO-400
MO-405
MO-407
MO-408
MO-410
MO-413
MO-419
MO-909
MO-922
MO-924
MO-931
MO-934
MO-936
MO-939
MO-947
MO-995
MO-3204

Kaiser Trailers
Includes entire Kaiser Trailer Complex at 4th & Baltimore in 200 East Area

*Except Geo Technical Library

910910.1650

FACILITIES WHERE UNCONDITIONAL RELEASE SURVEY IS NOT REQUIRED (continued)

300 Area Facilities

305	3701-R	3718-N
328	3701-S	3732-N
335/336	3701-T	3732-S
337	3701-U	3763
337 High Bay	3702	3764
338	3703	3765
339-A	3705	3766
382	3707-A	3767
384	3707-B	3768
3506-A	3707-C	3769
3621-B	3707-H	3770
3621-C	3709	3790
3621-D	3711	
3701-A	3715	**Trailers**
3701-D	3717-B	323-2
3701-L	3717-C	335-1
	3718	340-1
		335-2
		MO-046
		MO-394
		MO-395
		MO-903
		MO-904
		MO-926
		MO-933

400 Area Facilities

401	4732-C
427	4734-B
436	4734-C
451-A	4734-D
451-B	4790
4701-A	4791-TC
4701-B	4802
4701-C	4813
4702	4814
4706	4831
4707	4831
4710	Lay Down Area
4713-A	
4713-B	4842-A
4719	Lay Down Area
4721	
4722-B	4862
4722-C	N Dewar Pad
4722-D	
4726	
4726-D	**Trailers**
4732-A	MO-353
4732-B	MO-378
	MO-379
	MO-908

600 Area

251 Substation	Yakima Barricade
622-G Building	Wye Barricade
622-R Building	Battelle Observatory
Patrol Training Academy Facilities	609 & 609A Fire Stations
Near Surface Test Site (Gable Mountain)	6290 Crane and Rigging Services
Services	MO-245
616-Nonradioactive/Dangerous Waste Storage Facility	MO-247
	MO-248

1100 Area

PSL - 1120	1170	1100 Jadwin	1163
1166	Sky Park	TCPC	1171 Offices
1167	HAPO	Vitro	1135 Jadwin
MO-404	MO-916	MO-940	

FACILITIES WHERE UNCONDITIONAL RELEASE SURVEY
IS NOT REQUIRED (continued)

700 and 3000 Areas

All 700 Area Facilities
All 3000 Area Facilities: except PSL, LSL-2, EDL and RTL.

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APPENDIX 4A

CONSTRUCTION SPECIFICATION

This appendix contains the construction specification for the 616 Nonradioactive Dangerous Waste Storage Facility prepared by Kaiser Engineers Hanford Company, B-526-C1, dated July 25, 1985.

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MARKED-UP SPECIFICATION

EE Upson 8-1-86
Prepared by Date

J D Palmer 8-6-86
Concurrence Date

B-526-C1

DFC's affecting Specification
#5
#7
#8
#10

DT's affecting Specification
#8
#18C
#18D
#22
#24.A
#33.A.1
#33.A.2
#39
#103.2
#105
#106
#108
#109
#113.B
#117

SC's affecting Specification
JAJ-1791 SC-12
JAJ-1791 ADD-1

CONSTRUCTION SPECIFICATION FOR

NONRADIOACTIVE HAZARDOUS CHEMICAL WASTE FACILITY

Work Order X52602

Prepared By:

KAISER ENGINEERS HANFORD COMPANY
Richland, Washington

For the US Department of Energy

Contract DE-AC06-82RL10367

KEH Job R688A2

Lead Lead Engineer	6-24-85 Date	Specifications Department	6-21-85 Date
Safety	6/21/85 Date	Chief Design Engineer	6-24-85 Date
Quality Assurance	6-21-85 Date	Project Engineer	7-25-85 Date

ROCKWELL HANFORD OPERATIONS

J. J. Noble 7/25/85
J. J. Noble Date
Cognizant Engineer

4459K/0240K

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DIVISION 4 - MASONRY		
Section 04220	Concrete Unit Masonry	4
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Section 05500	Metal Fabrications	3
DIVISION 6 - WOOD		
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DIVISION 7 - THERMAL AND MOISTURE PROTECTION		
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Section 07700	Explosion Relief Vent	1
Section 07920	Sealants and Caulkings	2
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Section 08710	Finish Hardware	3
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Section 10500	Lockers	1
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Section 10800	Toilet Room Accessories	2
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Section 15400	Plumbing	12
Section 15500	Heating, Ventilating, and Air Conditioning	9
DIVISION 16 - ELECTRICAL		
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Section 16400	Service and Distribution (600-Volt and Below)	15
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SECTION 01060

REFERENCED STANDARDS AND SPECIFICATIONS

REFERENCED STANDARDS AND SPECIFICATIONS

The following standards and specifications of the issues listed below, but referred to thereafter by basic designation only, form a part of this Specification to the extent indicated by subsequent references in this Specification.

A. American Concrete Institute (ACI)

301-84	Specifications for Structural Concrete for Buildings
318-83	Building Code Requirements for Reinforced Concrete

B. American Institute of Steel Construction, Inc (AISC)

November, 1978	Specification for the Design, Fabrication and Erection of Structural Steel for Buildings
1980 Edition	Manual of Steel Construction Eighth Edition
August, 1980	Specification for Structural Joints Using ASTM A 325 or A 490 Bolts

C. American Iron and Steel Institute (AISI)

1980 Edition	Manual of Steel Construction

D. American National Standards Institute (ANSI)

05.1	Specification and Dimensions for Wood Poles
A13.1-81	Identification of Piping Systems
B16.3-1977	Malleable-Iron Threaded Fittings, Class 150 and 300
B31.1-1983 Edition, w/Addenda thru Summer 1984	Standard Code for Pressure Piping-Power Piping

C2-1984	National Electrical Safety Code
C57.12.00	General Requirements for Liquid-Immersed Distribution, Power, and Regulating Transformers
C57.12.20	Requirements for Overhead-Type Distribution Transformers 500 kVA and Smaller: High-Voltage, 67,000 Volts and Below; Low Voltage, 15,000 Volts and Below
C80.1-83	Standard for Rigid Steel Conduit Zinc-Coated
C82.1	Specification for Fluorescent Lamp Ballasts
C97.1-72 (R1978)	Standard for Low-Voltage Cartridge Fuses 600 Volts or Less
Z53.1	Safety Color Code for Marking Physical Hazards

E. American Society of Mechanical Engineers (ASME)

Section IX	Welding and Brazing Qualifications

F. American Society for Testing and Materials (ASTM)

A 36-81a	Structural Steel
A 53-83	Pipe, Steel, Black and Hot-Dipped, Zinc-Coated Welded and Seamless
A 74-82	Standard Specification for Cast Iron Soil Pipe and Fittings
A 82-79	Cold-Drawn Steel Wire for Concrete Reinforcement
A 108-81	Standard Specification for Steel Bars, Carbon, Cold Finished, Standard Quality
A 120-76	Pipe, Steel Black and Hot-Dipped, Zinc Coated (Galvanized) Welded and Seamless, for Ordinary Uses

A 123-78	Standard Specification for Zinc-Coating on Products Fabricated from Rolled, Pressed, and Forged Steel Shapes, Plates, Bars, and Strip
A 153-82	Zinc Coating on Iron and Steel Hardware
A 185-79	Welded Steel Wire Fabric for Concrete Reinforcement
A 307-83a	Carbon Steel Externally Threaded Standard Fasteners
A 325-83c	High Strength Bolts for Structural Steel Joints
A 416-80	Uncoated Seven-Wire Stress-Relieved Strand for Prestressed Concrete
A 490-83a	Heat-Treated Steel Structural Bolts, 150 ksi Minimum Tensile Strength
A 527-80	Steel Sheet, Zinc-Coated (Galvanized) by Hot-Dip Process, Lock Forming Quality
A 563-83a	Standard Specification for Carbon and Alloy Steel Nuts
A 615-82	Deformed and Plain Billet-Steel Bars for Concrete Reinforcement
B 32-83	Solder Material
C 33-84	Concrete Aggregates
C 90-75 (1981)	Hollow Load-Bearing Concrete Masonry Units
C 94-83	Ready Mix Concrete
C 150-84	Portland Cement

C 260-77	Air-Entrained Admixtures for Concrete
C 270-84	Mortar for Unit Masonry
C 476-83	Grout for Masonry
C 494-82	Chemical Admixtures for Concrete
C 636-76	Installation of Metal Ceiling Suspension Systems for Acoustical Tile and Lay-In Panels
D 653-83	Standard Terms and Symbols Relating to Soil and Rock
D 1785-83	Poly (Vinyl Chloride) (PVC) Plastic Pipe, Schedule 40, 80, and 120
D 2464-76	Poly (Vinyl Chloride) (PVC) Plastic Pipe Fittings, Schedule 80
D 2466-78	Poly (Vinyl Chloride) (PVC) Plastic Pipe Fittings, Schedule 40
D 2564-80	Solvent Cements for Poly (Vinyl Chloride) (PVC) Plastic Pipe and Fittings
D 2729-83	Poly (Vinyl Chloride) (PVC) Sewer Pipe and Fittings
D 2855-83	Solvent-Cemented Joints with Poly (Vinyl Chloride) (PVC) Pipe and Fittings
D 3034-83	Type PSM Poly (Vinyl Chloride) (PVC) Sewer Pipe and Fittings
E 84	Surface Burning Characteristics of Building Materials
F 436-83b	Hardened Steel Washers

G. Air-Conditioning and Refrigeration Institute (ARI)

240-81	Standard for Air-Source Unitary Heat Pump Equipment

H. Architectural Woodwork Institute (AWI)

1984	Architectural Woodwork Quality Standards, Guide Specifications and Quality Certification Program

I. American Welding Society (AWS)

D1.1-84	Structural Welding Code
D1.3-81	Structural Welding Code-Sheet Steel
D1.4-79	Structural Welding Code-Reinforcing Steel
D9.1-84	Specification for Welding of Sheet Metal

J. American Wood-Preservers' Association (AWPA)

C7	Western Red Cedar, Northern White Cedar, and Alaska Yellow Cedar Poles -- Preservative Treatment of Incised Pole Butts by the Thermal Process
P1	Coal Tar Creosote for Land and Fresh Water Use

K. American Water Works Association (AWWA)

C104-80	Standard for Cement-Mortar Lining for Ductile-Iron and Gray-Iron Pipe and Fittings for Water
C110-82	Standard for Gray-Iron and Ductile-Iron Fittings, 3 Inch through 48 Inch, for Water and Other Liquids
C111-80	Standard for Rubber Gasket Joints for Gray-Iron and Ductile-Iron Pressure Pipe Fittings

	C151-81	Standard for Ductile-Iron Pipe, Centrifugally Cast in Metal Molds or Sand-Lined Molds for Water or Other Liquids
	C500-80	AWWA Standard for Gate Valves, 3 Through 48 In. NPS, for Water and Sewage Systems
	C502-80	AWWA Standard for Dry-Barrel Fire Hydrants
	C600-82	AWWA Standard for Installation of Gray and Ductile Cast-Iron Water Mains and Appurtenances
	C601-81	AWWA Standard for Disinfecting Water Mains
L.	Cast Iron Soil Pipe Institute (CISPI)	
	301-82	Specification Data for Hubless Cast Iron Sanitary System with No-Hub Pipe and Fittings
M.	Factory Mutual System (FM)	
	1985 Edition	Approval Guide
	Loss Prevention Data Sheets 1-28	Insulated Steel Deck
N.	Federal Specification (FS)	
	RR-G-661E	Grating, Metal, Bar Type
	TT-E-489G	Enamel, Alkyd, Gloss (for Exterior and Interior Surfaces)
	TT-P-645A	Primer, Paint, Zinc Chromate, Alkyd Type
	TT-S-00230C Including AMD 2	Sealing Compound, Elastomeric Type, Single Component
	W-C-1094A	Conduit and Conduit Fittings, Plastic, Rigid
	W-F-406C	Fittings for Cable, Power, Electrical And Conduit, Metal, Flexible

W-P-115B	Panel, Power Distribution
W-S-896E/Gen Including AMD 2	Switches, Toggle, Flush Mounted
WW-C-00540C Including INT AMD 1	Conduit, Metal, Rigid: And Coupling, Elbow, and Nipple, Electrical Conduit: Aluminum
WW-C-566C	Conduit, Metal, Flexible
WW-U-531E	Unions, Pipe, Steel or Malleable Iron; Threaded Connection, 150 Lb. and 250 Lb.

O. Federal Standards (Fed Std)

141b	Paint, Varnish, Laquer, and Related Materials: Method for Sampling and Testing
595A, including Chgs Nos 1, 2, 3, 4, 5, and 6	Colors Vol 1

P. International Association of Plumbing and Mechanical Officials (IAPMO)

IS-6-75	Hubless Cast Iron Sanitary Systems
1982 Edition	Uniform Plumbing Code

Q. International Conference of Building Officials (ICBO)

UBC 1982	Uniform Building Code

R. Institute of Electrical and Electronics Engineers (IEEE)

Std 28	Surge Arresters for Alternating-Current Power Circuits

S. National Electrical Manufacturers Association (NEMA)

FB 1-77 w/Rev thru Dec 80	Fittings and Supports for Conduit and Cable Assemblies
ICS-2-78	Industrial Controls and Systems

ICS-6-78	Enclosures for Industrial Controls and Systems
KS1	Enclosed Switches
RN 1-74	Polyvinyl-Chloride Externally Coated Galvanized Rigid Steel Conduit and Electrical Metallic Tubing
ST20	Dry-Type Transformer for General Applications
WD-1	General-Purpose Wiring Devices

T. National Fire Protection Association (NFPA)

NFPA 13 - 1985	Standard for Installation of Sprinkler Systems
NFPA 24 - 1984	Standard for the Installation of Private Fire Service Mains and Their Appurtenances
NFPA 70 - 1984	National Electrical Code (NEC)
NFPA 72B-1979	Standard for the Installation, Maintenance and Use of Auxiliary Protective Signaling Systems for Fire Alarm Service
NFPA 80-1983	Standard for Fire Doors and Windows
NFPA 1221 - 1984	Standard for the Installation, Maintenance and Use of Public Fire Service Communications
1963	Standard for Screw Threads and Gaskets for Fire Hose Connections, 1985 Edition

U. Prestressed Concrete Institute (PCI)

MNL-116-77	Manual for Quality Control for Plants and Production of Precast Prestressed Concrete Products

V. Sheet Metal and Air Conditioning Contractors National Association, Inc (SMACNA)

1974	Testing, Balancing, and Adjusting of Environmental Systems
1976, 5th Edition	Low Pressure Duct Construction Standards

W. Steel Deck Institute (SDI)

1981-82	Steel Deck Institute Design Manual for Floor Decks and Roof Decks

X. Steel Door Institute

100-83	Standard Specifications for Steel Doors and Frames

Y. Underwriters Laboratories, Inc (UL)

January 1985	Fire Protection Equipment Directory
1984, Including Nov 1984 Supplement	Electrical Appliance and Utilization Equipment Directory
1984, Including Nov 1984 Supplement	Electrical Construction Materials Directory
UL 38-1981 w/Rev thru Sep 1981	Manually Actuated Signaling Boxes for Use with Fire Protection Signaling Systems
UL 555-1979	Standard for Safety, Fire Dampers and Ceiling Dampers
UL 797-1977	Standard for Electrical Metallic Tubing
UL 1242-1977	Standard for Safety, Conduit, Intermediate, Metal
January 1985	Building Materials Directory

Z. Washington State Department of Transportation (WSDOT)

M 41-10-84	Standard Specification for Road, Bridge, and Municipal Construction

END OF SECTION

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SECTION 01300

SUBMITTALS

1.1 DESCRIPTION

1.1.1 This section summarizes the requirements for the submittal of documents which are defined in Part 1 of each Section of this Specification and describes procedures for "Supplemental" submittals.

1.2 SUBMITTALS

1.2.1 Submittals listed in Part 1 of each of the sections of this Specification requires either review and approval or review for record.

1.2.1.1 Submittals requiring review and approval shall have been approved and returned to the Contractor before proceeding with procurement, fabrication, or construction.

a. Approved submittals are identified by a submittal stamp with the "Approved" or "Approved with Exception" box checked. "Approved" signifies general concurrence to achieve conformance with the design concept of the project and compliance with the requirements of the contract documents. "Approved with Exception" signifies general concurrence with noteworthy comments or clarifications. Approval of Contractor submittals does not relieve the Contractor of responsibility for errors which may be contained therein.

b. A submittal which is Not Approved is identified on the submittal stamp as "Not Approved, Revise and Resubmit." Said submittal is considered, by the Architect-Engineer (A-E), to be technically deficient or incomplete and therefore, unacceptable. Resubmittal is required, hence fabrication, procurement, or performance of procedures shall not proceed.

1.2.1.2 Review For Record indicates that the Contractor may proceed with procurement, fabrication, or construction; however, said acceptance is contingent upon strict compliance with the Drawings and Specification. Incomplete or inaccurate submittal data will be returned to the Contractor with appropriate comments and items procured or work performed shall be corrected.

1.2.2 Supplemental Submittals: Submittals initiated by the Contractor for consideration of "equal substitute" products or corrective procedures shall contain sufficient data for review and approval. "Equal Substitute" product submittals must contain outline dimensions, operating clearances, and sufficient engineering data to indicate substantial compliance with the Drawings and Specification. Identify each submittal by the Specification number, section, and paragraph number; or a referenced drawing number and detail. Improperly identified submittals will be returned without consideration.

1.3 SUBMITTAL PROCEDURES

1.3.1 Submittals are itemized in Article 1.4, Schedule of Submittals, and are identified by Submittal Number and Title. Identify each submittal by the Specification Number and Submittal Number noted in the Schedule.

1.3.2 The Contractor shall review all submittals before forwarding such data to the A-E. The Contractor shall sign Data Transmittal form indicating that the submittal has been reviewed for compliance with the contract documents. The Contractor's signature represents that he has verified all materials and field measurements, and has checked and coordinated the information contained within such submittals with the requirements of the contract documents. Only signed submittals shall be forwarded to the A-E. Any submittal which is not signed will be returned by the A-E without review.

1.4 SCHEDULE OF SUBMITTALS

Submittal Number	Submittal Title	Review and Approval	Review For Record
PIPED UTILITIES			
02650/1.1.1	Leak/Pressure Test Procedures	Before testing	
02650/1.1.2	Method for Disposal of Flushing Water		Before flushing
FIRE WATER SYSTEMS			
02668/1.1.1	Approval Data	Before delivery	
02668/1.1.2	Certified Vendor Information (CVI)		Before installation
02668/1.1.3	NFPA Test Certificate		Within 10 days after completion
CAST-IN-PLACE CONCRETE			
03300/1.1.1	Form Coating Materials	Before use	
03300/1.1.2	Reinforcing Steel Drawings	Before delivery	
03300/1.1.3	Block Diagram	Before installation of forms	

Submittal Number	Submittal Title	Review and Approval	Review For Record
03300/1.1.4	Concrete Materials, Mix Design, and Mix Proportions	Before mixing	
03300/1.1.5	Curing Procedure	Before mixing	
PRECAST PRESTRESSED CONCRETE SECTIONS			
03419/1.1.1	Fabrication Drawings	Before delivery	
03419/1.1.2	Concrete Materials and Mix Design	Before mixing	
03419/1.1.3	Record of Tests	Before mixing	
CONCRETE UNIT MASONRY			
04220/1.1.1	Method to Heat Masonry Units	Before erection	
STRUCTURAL STEEL			
05120/1.1.1	Fabrication and Erection Drawings	Before fabrication	
METAL DECKING			
05300/1.1.1	Installation Drawings	Before installation	
05300/1.1.2	Metal Deck Certificate of Compliance	Before installation	
PREFORMED METAL SIDING			
07411/1.1.1	Fabrication Drawings	Before fabrication	
07411/1.1.2	Performance Test Conformation	With delivery	
EXPLOSION RELIEF VENT			
07700/1.1.1	Fabrication Drawings	Before fabrication	
METAL DOORS AND FRAMES			
08100/1.1.1	Fabrication Drawings	Before delivery	

Submittal Number	Submittal Title	Review and Approval	Review For Record
BLAST-RESISTANT DOORS			
08315/1.1.1	Fabrication Drawings	Before delivery	
08315/1.1.2	Calculations	Before delivery	
OVERHEAD COILING DOORS			
08332/1.1.1	Fabrication Drawings	Before delivery	
08332/1.1.2	Certified Vendor Information (CVI)		Before installation
FINISH HARDWARE			
08710/1.1.1	Hardware List	Concurrent with doors and frames	
FIRE PROTECTION			
15300/1.1.1	Approval Data	Before delivery	
15300/1.1.2	Certified Vendor Information (CVI)		Before installation
15300/1.1.3	Design/Fabrication Drawings	Before fabrication	
15300/1.1.4	Calculation Data Sheets	Before fabrication	
15300/1.1.5	As-Built Drawings		Within 10 days after completion
15300/1.1.6	NFPA Test Certificate		Within 10 days after completion
PLUMBING			
15400/1.1.1	Approval Data	Before delivery	
15400/1.1.2	Certified Vendor Information (CVI)		Before installation
15400/1.1.3	Method for Disposal of Flushing Water		Before flushing

Submittal Number	Submittal Title	Review and Approval	Review For Record
HEATING, VENTILATING, AND AIR CONDITIONING			
15500/1.1.1	Certified Vendor Information (CVI)		Before installation
15500/1.1.2	Test and Balance Procedure	Before testing	
15500/1.1.3	Test and Balance Data		Within 10 days after test completion
HIGH VOLTAGE DISTRIBUTION (ABOVE 600-VOLT)			
16300/1.1.1	Approval Data	Before delivery	
16300/1.1.2	Certified Vendor Information (CVI)		Before installation
SERVICE AND DISTRIBUTION (600-VOLT AND BELOW)			
16400/1.1.1	Approval Data	Before delivery	
16400/1.1.2	Certified Vendor Information (CVI)		Before installation
ALARM AND DETECTION SYSTEMS			
16720/1.1.1	Approval Data	Before delivery	
16720/1.1.2	Certified Vendor Information (CVI)		Before installation

END OF SECTION

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SECTION 02200

EARTHWORK

PART 1 - GENERAL

1.1 SUBMITTALS: Refer to Section 01300 for submittal procedures.

PART 2 - PRODUCTS

2.1 SOIL MATERIALS

2.1.1 General: Obtain select soils from the excavation or from other designated locations. Obtain on-site approval for soils.

2.1.2 Structural Fill or Backfill: Well-graded soil mixtures which may contain cobbles up to 3 inches in greatest dimension provided same are uniformly distributed and do not constitute more than 20% of the volume of the fill.

2.1.3 Common Fill or Backfill: Well-graded soil mixtures containing cobbles up to 8 inches in greatest dimension provided same are uniformly distributed and do not constitute more than 40% of the volume of the fill.

2.1.4 Cushion for Underground Pipe: Sand, as defined in ASTM D 653, or excavated sandy material having a maximum dimension of 1/2 inch.

2.1.5 Stabilization Material: Gravel as defined in ASTM D 653. Maximum size of particles 3/4 inch for parking area and 2 inch minus for other areas.

2.2 PLASTIC SHEET MARKER

2.2.1 Plastic Sheet Marker for Buried Piping and Conduit: 6-inch-wide, yellow nondetectable tape similar to "Terra Tape" as manufactured by Griffolyn Co, Inc. Tape shall be imprinted with a warning such as "Caution Buried Installation Below" at intervals of not more than 4 feet.

PART 3 - EXECUTION

3.1 EXCAVATION

3.1.1 Before performing any excavation, obtain an excavation permit for the area to be excavated. Excavation permits will be furnished by the Government's Representative upon advance notice of the scheduled activity.

3.1.2 Shore excavations which are more than 4 feet deep and which have sides sloped steeper than 1-1/2 horizontal to one vertical. Install shoring as excavation progresses and remove as backfilling is accomplished.

3.1.3 Do not store excavated or other material closer than 2 feet from the edge of the excavation unless a barrier is erected to retain the

excavated materials. Store and maintain materials in such a manner that they are prevented from falling or sliding into the excavation.

3.1.4 Wherever the slopes of excavations will intersect existing underground piping, electrical ducts, or direct buried electrical lines; install shoring or other means of support to prevent overstressing underground lines or to prevent interrupting service to existing buildings.

3.1.5 Footings and Foundations

3.1.5.1 Make excavations for footings to the depth shown on the drawings or to such further depth as is necessary to provide an undisturbed surface to receive the footing. Make excavations to the proper width with allowances made for forms and bracing. Make bottom of excavations compact, level, true, and free of loose material.

3.1.5.2 If over-excavation occurs where footings are designed to be placed on undisturbed earth, correct at the time of placing concrete by extending the concrete down to undisturbed earth, or by placement of backfill, compacted in accordance with Subparagraph 3.2.2.2(a).

3.1.6 Trenches for Underground Piping or Conduit

3.1.6.1 Make excavations for piping or conduit to the line and grade shown on the Drawings and wide enough to make the connections. Excavate with near vertical sides from bottom of trench up to 1 foot above the pipe or conduit. Excavate the trench deep enough to permit the placement of a compacted sand cushion (4 inches minimum thickness) beneath the pipe or conduit except where excavation is in undisturbed sand which will serve as a cushion or where lines are to be encased in concrete. Pare holes in trench bottoms for pipe couplings so that the pipe will bear full length of the barrel or section.

3.1.6.2 Install shoring (if required) to hold all materials and the surcharge pressure for the full depth of the trench.

3.1.6.3 Keep trenches free from standing water when pipe or conduit laying is in progress.

3.1.6.4 If over-excavation occurs, correct by placement of structural backfill.

3.2 FILLING AND BACKFILLING

3.2.1 General

3.2.1.1 Backfill Permit: Obtain all signatures required on a backfill permit for the area to be backfilled. Forms will be furnished by the Government's Representative. Work not started within five calendar days from the time the permit is approved shall not be started until a new permit has been approved. A continuing job that has not had backfill installed within the past five calendar days will require a new backfill permit.

3.2.1.2 The terms "fill" and "backfill" refer to the placement and compaction of soil excavated and stockpiled at the site or obtained from other locations.

3.2.1.3 Remove all debris and organic matter from the area to be filled or backfilled.

3.2.1.4 Use only select materials for fill or backfill. Keep materials free from frozen particles, lumps, organic matter, and trash.

3.2.1.5 Do not place fill or backfill on frozen ground.

3.2.1.6 Filling or backfilling by sluicing or flooding with water will not be permitted.

3.2.1.7 Bring fill or backfill up evenly on the sides of walls, structures, and pipes to avoid unbalanced loading.

3.2.1.8 Do not place fill or backfill against any concrete structure or foundation wall less than 14 days after completion of the structure or wall unless written permission is obtained. Provide wall support, where noted on the Drawings, before filling or backfilling.

3.2.1.9 Where stabilization is required, finish the subgrade 3 inches below the elevations shown on the Drawings.

3.2.2 Structural Fill or Backfill

3.2.2.1 Before placement of structural fill or backfill, demonstrate, to the Government's Representative, by physical test at the site, that the procedure proposed for the installation and compaction of the soils will provide the degree of compaction specified. Prepare a "Soil Compaction Procedure" Form KEH-382 (sample appended) in accordance with the printed instructions. Forms will be furnished by the Government's Representative.

3.2.2.2 Place structural backfill in accordance with WSDOT M41-10, Paragraph 2-03.3(14)C and the approved procedure as follows:

a. Use Method C under foundations, slabs, and pipelines.

b. Use Method B under pavements and roads, and within 5 feet of structures or poles supporting electric lines or pipes.

3.2.2.3 Compaction control tests will be in accordance with WSDOT M41-10, Paragraph 2-03.3(14)D.

3.2.3 Common Fill or Backfill

3.2.3.1 Place common fill or backfill in layers not more than 12 inches thick, loose measurement.

3.2.3.2 Compact each layer, full width, by at least one pass of a vibratory or rammer-type compactor, pneumatic-tired roller, loaded scraper wheel, grader wheel, or power roller.

3.2.3.3 Mound over top layer of backfill to a depth of 1 inch for each 12 inches of trench depth to a maximum mound height of 6 inches.

3.2.4 Filling or Backfilling for Underground Piping or Conduit

3.2.4.1 The sand cushion placed beneath pipe or conduit in trenches shall be material meeting the requirements of Paragraph 2.1.4.

3.2.4.2 Place and compact the sand cushion in trench prepared according to Subparagraph 3.1.6.1 before laying pipe or conduit. Compact sand cushion as specified for structural backfill.

3.2.4.3 Place backfill over joints in underground pipes only after pressure testing of the line has been completed.

3.2.4.4 Backfill under conduit and the haunches of the pipe, around the sides, and up to 1 foot above the top of the pipe or conduit with sand cushion material. Place and compact the material the same as specified for structural backfill. Compact with care, to avoid misalignment of the pipe and to provide uniform bearing along the barrel of the pipe.

3.2.4.5 Backfill pipe or conduit trenches from an elevation 1 foot above the top as follows:

a. For locations specified in Paragraph 3.2.2, use structural backfill.

b. Use common backfill in accordance with Paragraph 3.2.3 for all other locations.

3.2.4.6 Do not allow heavy construction equipment to pass over buried lines until at least 2 feet of backfill has been placed over the line or until bridging has been placed across trenching and has been approved by the Government's Representative.

3.3 INSTALLATION OF PLASTIC SHEET MARKER

3.3.1 Place plastic sheet marker continuous over all buried piping or conduit. Place marker tape directly over the line and 1 foot below finish grade. Place a marker over each of the outside pipes of multiple lines. Place intermediate markers at a maximum of 4 feet apart.

3.4 FINISH GRADING AND STABILIZATION

3.4.1 Rake the area disturbed by the work, remove surface stones larger than 6 inches and dispose of excess material and debris at an area designated by the Government's Representative.

3.4.2 Stabilize the area around the perimeter of the building (approximately 4 feet), with a 3 inch course of gravel meeting the requirements of Paragraph 2.1.5. Finish the stabilization course to the elevations shown on the Drawings.

3.5 TESTING

3.5.1 All sampling and testing of compacted fill and backfill will be performed by the Government's Representative.

SOIL COMPACTION PROCEDURE

Project No.	Project Title	Date
Contract No.	Procedure No.	Location of Demonstration

A

REQUIREMENTS	EQUIPMENT DEMONSTRATED
Applicable Spec./Dwg.	Type
Compaction Required %	Manufacturer
Maximum Lift Size	Model

B

LABORATORY SOIL TEST RESULTS

☐ Non-granular Materials (WSDOT Test Method No. 609)

☐ Granular Materials (WSDOT Test Method No. 606-A)

C

COMPACTION DEMONSTRATION TEST RESULTS

Formula for Percent Compaction:

$$\frac{\text{dry density}}{\text{max density}} \times 100 = \text{Percent Compaction}$$

No. of Passes	Depth of Lift	Percent Moisture	Lbs/ft³ Dry	Maximum Density	Percent Compaction	Accept	Reject

Observations or Comments

TEST METHOD USED FOR DEMONSTRATION ☐ Nuclear Gage (ASTM D2922 & D3017) ☐ Sand Cone (ASTM D1556) ☐ Other _____

Apparatus No. _____

D

Contractor Representative		Date
Government Representative		Date

INSTRUCTIONS

This Soil Compaction Procedure form, when approved by the Government Representative, constitutes an approved compaction procedure.

Section A is the responsibility of the Construction Contractor. It is to be completed at the time of backfill compaction demonstration and presented to the Government Representative.

Section B is completed by the Government Representative. Data entered is obtained from the agency that performs the laboratory testing.

Section C is completed by the Government Representative as the demonstration is performed. Using the applicable formula, the percent compaction achieved is determined and entered. Acceptance is based on the results as compared with the compaction percent required in Section A.

Section D is signed and dated by the Construction Contractor Representative acknowledging responsibility for this procedure and compliance thereto for applicable backfill operations. Section D is signed and dated by the Government Representative to signify approval.

END OF SECTION

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SECTION 02650

PIPED UTILITIES

PART 1 - GENERAL

1.1 SUBMITTALS: Refer to Section 01300 for submittal procedures.

1.1.1 Leak/Pressure Test Procedures: Submit procedures outlining proposed methods of testing joints in piping systems.

1.1.2 Method for Disposal of Flushing Water: Prepare a method for disposal of flushing water.

PART 2 - PRODUCTS

2.1 PIPE AND FITTINGS

2.1.1 Piping and fittings for sanitary water shall be PVC meeting the requirements of ASTM D 2464 and ASTM D 2466, and the details on the drawing.

2.1.2 Pipe joint sealant shall meet the requirements of ASTM D 2564 and ASTM D 2855.

2.1.3 Piping for 6-inch sanitary sewer shall be PVC meeting the requirements of ASTM D 3034-SDR 35.

2.1.4 Perforated piping for 4-inch and smaller sanitary sewer shall be PVC meeting the requirements of ASTM D 2729.

PART 3 - EXECUTION

3.1 GENERAL

3.1.1 Keep piping systems clean during all phases of the work. Once fabrication has started on any length of pipe, plug or cap the open ends of the piping when erection is not in progress to prevent the entry of dirt and other foreign material.

3.1.2 Where piping is laid in a trench, the trench shall be free from frost or frozen earth and standing water.

3.2 POLYVINYL CHLORIDE (PVC) PIPE

3.2.1 Install piping and piping accessories in conformance with the manufacturer's written installation procedure, the Drawing, and this Specification.

3.2.2 For sanitary water pipe installation, provide thrust restraint at all tees, plugs, caps, and bends in accordance with NFPA 24, Article 8-6. For thrust block for pipe sizes less than 6 inches in diameter use thrust block for 4 inches in diameter pipe.

3.3 FLUSHING

3.3.1 After installation and immediately before pressure testing a completed system, and before connecting a completed system into any existing system; flush all piping with water for one minute, minimum, or until the effluent is clean and contains no visible particulate matter, but in no case for less than one minute.

3.3.2 Raw water may be used for flushing the sanitary sewer, use sanitary water for flushing sanitary waterlines.

3.3.3 Use a flushing velocity of at least 5 feet per second with the pipe full.

3.3.4 Provide documented evidence that flushing has been accomplished in accordance with this Specification. Deliver to the Government's Representative before leak/pressure testing.

3.4 HYDROSTATIC TESTING

3.4.1 Furnish all instruments, facilities, and labor required to conduct the tests.

3.4.2 Document leak/pressure testing of each piping system on "Leak/Pressure Test Certification" Form RL-F-6410.2 (sample appended) by preparing Section A of the form and signed by the Contractor Representative. Forms will be furnished by the Government's Representative.

3.4.3 Perform all leak tests as designated in the applicable pipe codes in the presence and to the satisfaction of the Government's Representative.

3.4.4 Perform tests before backfilling or application of exterior protective coating.

3.4.5 Before applying test pressure to piping, install any necessary restraining devices to prevent distortion or displacement of the piping.

3.4.6 Install one temporary relief valve during pressure testing of piping systems. The relief valve shall have a discharge capacity of not less than 125% of the capacity of the pressurizing device and shall be set to operate at not more than 110% of the test pressure. Demonstrate the proper operation of the relief valve to the Government's Representative at the following times: Before each series of leak tests before the relief valve is attached to the system; whenever the Government's Representative has cause to question the operating accuracy of the relief valve.

3.4.7 Coat all joints and connections of threaded lines with a mixture of powdered blue chalk and water or isopropyl alcohol, and allow to dry before filling piping with water and inspecting for leaks.

3.4.8 Test all other new piping for at least 30 minutes with no visible leaks or loss of test water. Examine all piping joints, fittings, and other potential leak sources carefully during testing. Repair all detectable leaks; re-examine by the same test method originally prescribed and retest.

3.4.9 If lines are subject to freezing, remove all water from lines immediately upon completion of the hydrostatic test.

3.4.10 Use the test pressures shown on the Pipe Codes Sheet.

3.5 DISINFECTION OF SANITARY WATERLINES

3.5.1 Disinfect sanitary waterlines in accordance with AWWA C601.

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PIPE CODE A

Service:	Max Operating Pressure:	Test Pressure:	Max Operating Temp:
Sanitary Water	120 psig	180 psi	100 F

Sizes : 4" and smaller

Pipe : PVC 1120 per ASTM D 1785

Fittings : PVC, Schedule 80 per ASTM D 2464, or Schedule 40 per ASTM D 2466

PIPE CODE B

Service:	Max Operating Pressure:	Test Pressure:	Max Operating Temp:
Sanitary Sewer	-	Per Uniform Plumbing Code	100 F

Sizes : 4" and Smaller

Pipe : PVC, ASTM D 2729

PIPE CODE C

Service	Max Operating Pressure:	Test Pressure:	Max Oper Temp:
Sanitary Sewer	---	Per Uniform Plumbing Code	100 F

Sizes : 6"

Pipe : PVC, ASTM D 3034-SDR 35

LEAK/PRESSURE TEST CERTIFICATION

Project No.	Work Order No./Shop Order No.	Report No.	Code or Standard

Class	Year	Addenda	Stamp	Const. Spec.	Rev.	Test Procedure Title & No.	Rev.
			☐ Yes ☐ No				

Description of Component(s)

CONTRACTOR PRE-TEST CHECK LIST

Customer Representative Notified

Date _____ Time _____

Safety Representative Notified

Date _____ Time _____

Item	Acceptance	Exception	Item	Acceptance	Exception
Flushing of component to be tested completed.			All lines not required for test disconnected or isolated.		
Vents, openings, and relief valve discharge checked.			All test equipment checked for tightness.		
Test medium per requirements. Medium _____			Test medium temp. equalized. Temp. _____ (ASME Section III, VIII only)		

Test set up in accordance with above referenced procedure. If exception, explain:

Test gauge correct range and currently calibrated.

Serial No. _____ Range _____ Calib. Due Date _____

Pressure relief valve properly set and currently calibrated.

Serial No. _____ PSI Setting _____ Calib. Date _____

Areas to be inspected chalked prior to pressurization. If exception, explain:

Soap solution applied to all areas examined while component was pressurized.

No Leakage Found _____ Leaks Found and Repaired _____

Specified test pressure obtained.

Pressure Specified _____ Hold Time Specified _____ Test Press. Obtained _____ A.M. P.M.

CONTRACTOR REPRESENTATIVE ➤ Date

INSPECTION VERIFICATION

Actual test pressure during inspection _____

All joints and welded attachments to pressure retaining components chalked/soaped as applicable. ☐ Yes ☐ No*

Specified hold time verified at _____ A.M. P.M.

All joints and welded attachments to pressure retaining components visually inspected for leakage. ☐ Yes ☐ No*

Pressure test: ☐ Accepted ☐ Rejected*

* Basis of Rejection and/or Comment:

CUSTOMER REPRESENTATIVE ➤ Date

WITNESS - ASME AUTHORIZED INSPECTOR ➤ Date

INSTRUCTIONS

1. THE FABRICATION OR CONSTRUCTION CONTRACTOR IS RESPONSIBLE TO FILL IN THE UPPER PORTION OF THE LEAK/PRESSURE TEST CERTIFICATION, INCLUDING THE CONTRACTOR PRE-TEST CHECK LIST SECTION. PORTIONS OR BLOCKS NOT APPLICABLE SHALL BE NA'd.

2. THE CONTRACTOR SHALL PRESENT THE LEAK/PRESSURE TEST CERTIFICATION TO THE CUSTOMER'S REPRESENTATIVE AT THE TIME OF TESTING.

3. THE CUSTOMER'S REPRESENTATIVE SHALL COMPLETE THE INSPECTION VERIFICATION SECTION OF THE LEAK/PRESSURE TEST CERTIFICATION AT THE TIME OF TESTING, AND THE RESULTS OF THE TEST WILL BE SO INDICATED. (THE ASME AUTHORIZED INSPECTOR SIGNATURE BLOCK WILL BE NA'd AS APPROPRIATE BY THE CUSTOMER'S REPRESENTATIVE.)

4. THE CUSTOMER'S REPRESENTATIVE WILL PROVIDE A COPY OF THE LEAK/PRESSURE TEST CERTIFICATION TO THE CONTRACTOR UPON COMPLETION OF THE TEST. THE ORIGINAL WILL BE RETAINED BY THE CUSTOMER FOR PERMANENT RECORD.

END OF SECTION

SECTION 02668

FIRE WATER SYSTEMS

PART 1 - GENERAL

1.1 SUBMITTALS: Refer to Section 01300 for submittal procedures.

1.1.1 Approval Data: Submit the information requested in Column 5 of the Vendor Data List in this section.

1.1.2 Certified Vendor Information (CVI): Submit the information listed in Column 6 of the Vendor Data List in this section.

1.1.3 NFPA Test Certificate: Submit a completed Contractor's Material and Test Certificate in accordance with NFPA 13, Section 1-12.

PART 2 - PRODUCTS

2.1 GENERAL

2.1.1 All components of the new underground fire protection system, if not designated in this Specification and the Drawings by a manufacturer's name and model or figure number, shall be current products of the manufacturer and shall be FM approved or UL listed for the intended use.

2.1.2 The system is designed for a maximum operating pressure of 125 psig.

2.2 PIPING

2.2.1 Pipe, pipe joints, and fittings shall meet the requirements of NFPA 24, the Drawings, and this Specification.

2.2.2 Pipe shall be cement-lined, meeting the requirements of AWWA C104 and be ductile iron, Class 50 (minimum) meeting the requirements of AWWA C151. Pipe shall have rubber-gasketed, mechanical joints or push-on joints meeting the requirements of AWWA C111.

2.2.3 Fittings shall be cement-lined, meeting the requirements of AWWA C104, with joints and pressure class ratings compatible with the pipe used and shall meet the requirements of AWWA C110.

2.3 POST INDICATOR VALVE (PIV)

2.3.1 The gate valve shall be a nonrising stem valve with an indicator post flange. The valve shall open in counterclockwise direction.

2.3.2 The indicator post shall be of the adjustable, telescoping barrel type with locking handle and shall have clearly visible, position indicator sign plates, protected by nonbreakable plastic windows. The indicator post shall be matched for assembly to the gate valve.

2.3.3 The valve position supervisory limit switch for installation on the post indicator valve shall be tamperproof. The switch shall be operated during the first two revolutions of the handle in the closing direction.

2.4 POST INDICATOR VALVE (PIV) WITH TAPPING SLEEVE

2.4.1 The tapping sleeve and post indicator gate valve shall be provided as a unit.

2.4.2 The gate valve shall be a nonrising stem valve with an indicator post flange. The valve shall open in the counterclockwise direction.

2.4.3 The indicator post shall be of the adjustable, telescoping barrel type with locking handle and shall have clearly visible, position indicator sign plates, protected by nonbreakable plastic windows. The indicator post shall be matched for assembly to the gate valve.

2.4.4 The valve position supervisory limit switch for installation on the post indicator valve shall be tamperproof. The switch shall be operated during the first two revolutions of the handle in the closing direction.

2.5 FIRE HYDRANTS

2.5.1 Fire hydrants shall meet the requirements of AWWA C502 and be dry barrel type with compression type main valve which opens against pressure. Inlets shall be 6 inches with a minimum 5 inch valve opening. The hydrants shall have one 4-1/2 inch pumper nozzle and two 2-1/2 inch hose nozzles, including caps and chains. Nozzle threads shall be National Standard Fire Hose Coupling Threads in accordance with NFPA 1963. The hydrant operating nut and cap nuts shall be National Standard Pentagon in accordance with AWWA C502 and shall open in the counterclockwise direction. Stem seals shall be the O ring type.

2.6 HYDRANT CONNECTION VALVE: Hydrant connection valve shall be a 6 inch gate valve meeting the requirements of AWWA C500 and be provided with an adjustable cast iron valve box.

2.7 REFLECTIVE SHEETING: 6 inch wide reflective sheeting for placement around the fire hydrant body shall be Scotchlite No. 3270 silver "Wide-Angle Flat Top", adhesive coated.

2.8 DRAINAGE MATERIAL FOR FIRE HYDRANT BASE: 3/8 inch to 1 inch clean crushed rock or gravel.

2.9 BITUMASTIC: Koppers No. 550 or Superservice black.

2.10 PAINTING MATERIALS

2.10.1 Primer: FS TT-P-645, (alkyd type zinc chromate) National Lead No. 200-41.

2.10.2 Paint: FS TT-E-489, Class A, Composition G.

PART 3 - EXECUTION

3.1 INSTALLATION

3.1.1 Install piping and piping accessories in accordance with NFPA 24, AWWA C600, the Drawings, and this Specification.

3.1.2 Protect pipe and fittings from impact shocks and dropping. Immediately before laying, inspect the pipe and discard damaged components. Remove the damaged components from the job site.

3.1.3 Keep piping systems clean during all phases of the work. Once fabrication has started on any length of pipe, plug or cap the open ends of the piping when erection is not in progress to prevent the entry of dirt and other foreign material. Inner surfaces of all pipe, valves, and fittings shall be smooth, clean, and free from sand, debris, and dirt when installed.

3.1.4 Where piping is laid in a trench, the trench shall be free from frost or frozen earth and standing water.

3.1.5 Install restraints on pipe and piping components in accordance with NFPA 24, Articles 8-6 and A-8-6.2. Restraining mechanical joints as listed in the UL Fire Protection Equipment Directory may be substituted for conventional anchoring. Where thrust blocks are used, make the bearing area equal to the area shown in Table 8-6.2.9, multiplied by a factor of 1.33.

3.1.6 Coat all carbon steel accessories which will be buried, such as tie-rods and clamps, with bitumastic. Allow time for bitumastic to dry before backfilling.

3.1.7 Install fire hydrants and hydrant sectionalizing valves in accordance with AWWA C600 and NFPA 24.

3.1.8 Install post barricades around fire hydrants and post indicator valves in accordance with the Drawings.

3.1.9 Excavation, backfill, and grading work shall meet the requirements of Section 02200 of this Specification as it applies.

3.1.10 Place drainage material at the base of the fire hydrant in accordance with AWWA C600, Section 3.7. The interface between the drainage material and compacted earth fill shall be separated by a layer of 30 pound roofing paper.

3.1.11 The fire hydrant base pad shall bear on undisturbed or compacted earth and shall be a minimum 16 inch diameter or square by 4 inch thick precast concrete.

3.1.12 The centerline of the fire hydrant pumper nozzle shall be between 18 and 22 inches above the adjacent finished grade. Orient the pumper toward the roadway or street.

3.1.13 Paint the entire fire hydrant with one coat of primer meeting the requirements of FS TT-P-645, and two coats of safety yellow enamel meeting the requirements of FS TT-E-489. Colors shall be as defined in ANSI Z53.1. Place a reflective sheeting band around the body of the fire hydrant immediately below the pumper nozzle.

3.2 FLUSHING AND TESTING

3.2.1 General

3.2.1.1 Furnish all equipment and instruments required to perform the flushing and testing.

3.2.1.2 Perform all flushing and testing while being witnessed by the Government's Representative.

3.2.1.3 Remove and replace or repair apparatus, material, or work which fails in flushing or testing operations and repeat the operation.

3.2.1.4 Repair any damage resulting from flushing or testing.

3.2.2 Flushing

3.2.2.1 Flush all new piping in accordance with NFPA 24, Article 8-8.

3.2.2.2 Prepare the method for disposal of flushing water. Deliver to the Government's Representative for approval before flushing.

3.2.2.3 Provide documented evidence that flushing has been accomplished in accordance with this Specification. Deliver to the Government's Representative before testing.

3.2.3 Hydrostatic Testing

3.2.3.1 Perform testing in accordance with NFPA 24, Article 8-9. A relief valve will be required. SC-12

3.2.3.2 Perform testing after piping has been flushed and before backfill is placed over pipe joints.

3.2.3.3 Verify that all air has been expelled from piping before applying the hydrostatic pressure.

3.2.3.4 Examine all piping joints, fittings, and other potential leak sources carefully during the test. Leaks in the piping system are not acceptable. Repair all leaks and retest.

3.2.3.5 If the piping system is subject to freezing, remove all water from the lines immediately upon completion of the tests.

3.3 DISINFECTING

3.3.1 Arrange for bacteriological testing of water samples with the Government's Representative before performing disinfection procedures. The

bacterial analysis is four days in length from the time samples are received in the laboratory. The analysis provides "presumptive" results in two days with "confirmation" at the end of the test.

3.3.2 Disinfect sanitary waterlines in accordance with AWWA C601.

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Project No. B-526

Title: Non-Radioactive Hazardous Chemical Waste Facility

KAISER ENGINEERS HANFORD

VENDOR DATA LIST

("X" Indicates Required Data)

1 EPN Identification	2 Description	3 Reference Drawing	4 Specification Paragraph	5 Approval/Data: Dimensional Drawings	Equipment Weights	Specifications	Material Description	Performance Data	Circuit or Control Diagrams	Data Sheets	Illustrative Cuts	Installation Instructions	6 Certified Vendor Information (CVI): Dimensional Drawings	Equipment Weights	Specifications	Certified Test Data	Circuit or Control Diagram	Instructions: Installation	Operation	Maintenance	Spare Parts List	7 Remarks
1	Post Indicator Valve (PIV)		2.3								X											
2	Post Indicator Valve (PIV) with Tapping Sleeve		2.4								X											
3	Fire Hydrant		2.5								X									X	X	
4	Hydrant Connection Valve with Valve Box		2.6								X											
5	Pipe		2.2			X					X											

END OF SECTION

SECTION 03300

CAST-IN-PLACE CONCRETE

PART 1 - GENERAL

1.1 SUBMITTALS: Refer to Section 01300 for submittal procedures.

1.1.1 Form Coating Materials: Submit proposed form coating materials in accordance with ACI 301, Section 4.4.

1.1.2 Reinforcing Steel Drawings: Submit complete reinforcing fabrication and placing drawings based on the block diagram in accordance with ACI 301, Section 5.1, including splices not shown on contract drawings.

~~1.1.3 Block Diagram: Submit a block diagram of scheduled concrete pours. Identify all pours.~~ DT #8

1.1.4 Concrete Materials, Mix Design, and Mix Proportions: Submit the concrete materials, mix design, and mix proportions in accordance with ACI 301, Sections 3.8 and 16.7.3. Define each of the materials to be used in the concrete and state the amount, by weight, to be utilized per cubic yard of plastic mix.

1.1.5 Curing Procedure: Submit description of materials and methods of curing in accordance with ACI 301, Section 12.2.

PART 2 - PRODUCTS

2.1 CONCRETE

2.1.1 Cement: ASTM C 150, Type II (Low Alkali).

2.1.2 Aggregates: ASTM C 33, maximum size 1-1/2 inch.

2.1.3 Air-Entraining Admixture, Meeting the Requirements of ASTM C 260: Sika Chemical Company "SIKA AER", Chem-Masters Corp "Adz-Air" or Protex Industries "Protex".

2.1.4 Properties

2.1.4.1 Minimum allowable compressive strength: 3000 psi at 28 days.

2.1.4.2 Slump: 4 inch maximum in accordance with ACI 301, Section 3.5.

2.1.4.3 Air content: In accordance with ACI 301, Table 3.4.1.

2.1.4.4 Proportions: In accordance with ACI 301, Section 3.8, Method 2 or 3.

2.1.5 Mixing: In accordance with ASTM C 94.

2.1.6 Delivery: In accordance with ASTM C 94.

2.2 REINFORCING STEEL

2.2.1 Steel Bars: ASTM A 615, deformed, Grade 60.

2.2.2 Welded Wire Fabric: ASTM A 185.

2.2.3 Tie Wire: Black annealed steel, 16 gauge minimum.

2.3 JOINT MATERIALS

2.3.1 Expansion Joint Filler: See Section 07920.

2.3.2 Sealant: ~~See Type II, Section 07920.~~ See Building Sealant, Section 07920

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2.4 NONSHRINK GROUT

2.4.1 Nonmetallic Type: "Five Star Grout" by US Grout Corp; "Por-Rok" Anchoring Cement by Hallemite; or "Masterflow 713" by Master Builders.

2.5 FORMS: Wood, steel, plywood, or Masonite Corporation "Concrete Form Presdwood", as required for the various specified finishes.

PART 3 - EXECUTION

3.1 FORM CONSTRUCTION AND REMOVAL

3.1.1 Install formwork in accordance with ACI 301, Section 4.2. The interior shape and rigidity shall be such that the finished concrete will meet the requirements of the Drawings within the tolerances specified in ACI 301, Table 4.3.1.

3.1.2 Prepare form surfaces in accordance with ACI 301, Section 4.4.

3.2 REINFORCING STEEL

3.2.1 Fabricate reinforcing bars accurately to the dimensions shown on the Drawings, within the tolerances shown in ACI 301, Section 5.4.

3.2.2 Place reinforcing steel as shown on the approved submittals within the tolerances specified in ACI 301, Sections 5.4 and 5.5.

3.2.3 Tie all bars securely to prevent displacement during placement of concrete.

3.2.4 Do not force reinforcing bars into concrete after initial set has started.

3.2.5 Place reinforcing with the dimension of concrete protection equal to the minimum given in ACI 301, Section 5.5, except where shown otherwise on the Drawings.

3.2.6 Place welded wire fabric on chairs and lap two mesh at splices. Tie splices with wire.

3.3 CONCRETE

3.3.1 Before ordering concrete, obtain approval of required submittals.

3.3.2 Before concrete is batched, obtain approval of formwork and reinforcement by the Government's Representative.

3.3.3 Before Placing Concrete

3.3.3.1 Obtain approval of the "Pour Slip" by the Government's Representative. "Pour Slip" shall include the appropriate reference to the specific portion of the structure to be placed, the maximum size of coarse aggregate, the design strength, the admixture, and the slump. "Pour Slip" forms can be obtained from the Government's Representative.

3.3.3.2 For each truck load of concrete, deliver "Trip Ticket" to the Government's Representative. The "Trip Ticket" shall contain the information listed in ASTM C 94, Subparagraphs 16.1.1 through 16.1.10, and shall include water/cement ratio.

3.3.4 Place concrete in accordance with ACI 301, Sections 8.1, 8.2, and 8.3. Do not drop (free fall) more than 5 feet. Insert the vibrator (vertically if possible) into the concrete and reach a small distance into the concrete in the next lower layer. Do not insert vibrators into lower courses that have reached initial set. Take care to avoid allowing the head of vibrator to come in contact with forms or embedded items.

3.3.5 Temper concrete only as permitted in ACI 301, Section 7.5.

3.3.6 Place nonshrink grout where shown on the Drawings and in accordance with the manufacturer's written instructions.

3.3.7 Weather Conditions: Protect concrete during placement in accordance with ACI 301, Section 8.4.

3.3.8 Construction Joints: Make construction joints in accordance with ACI 301, Section 6.1, and as detailed on the Drawings.

3.3.9 Embedded Items: Install embedded items in accordance with ACI 301, Sections 6.4 and 6.5.

3.3.10 Expansion Joints: Locate expansion joints as shown on the Drawings and construct with premolded expansion joint filler and sealant.

3.3.11 Placing Concrete Against Earth: Place concrete only upon or against firm, damp surfaces free from frost, ice, and free water. Do not place concrete until the required compaction has been obtained. Dampen earth surfaces to receive fresh concrete.

3.3.12 Consolidation: Consolidate concrete slabs in accordance with ACI 301, Section 11.6.

3.4 REPAIRING CONCRETE

3.4.1 Cracks or defects in the concrete surfaces which may compromise the ability of the surfaces to retain liquids shall be repaired.

3.4.1.1 Place concrete repair mortar within one hour after mixing. Do not retemper the mortar.

3.4.1.2 Immediately after removal of forms, cut back all form ties and inspect concrete surfaces for defects. Repair only after permission for patching is given by the Government's Representative.

3.4.2 Repair of Surface Defects: Repair surface defects in concrete in accordance with ACI 301, Sections 9.1, 9.2, and 9.3. Cure concrete repairs the same as new concrete.

3.5 CONCRETE FINISHES AND TOLERANCES

3.5.1 Formed Surfaces

3.5.1.1 Start the finishing of concrete immediately following concrete repair and complete said finishing within 96 hours after the forms have been removed. Finish formed surfaces in accordance with the sections of ACI 301 noted below:

a.	Formed surfaces exposed to earth backfill	Section 10.2.1
b.	Formed interior surfaces	Section 10.2.2
c.	Formed exterior surfaces exposed to weather	Section 10.2.2
d.	Related unformed surfaces	Section 10.5
e.	Tolerances for formed surfaces	Section 4.3.1

3.5.2 Unformed Surfaces

3.5.2.1 Finish unformed surfaces in accordance with the sections of ACI 301 noted below:

a.	Surfaces of interior floors	Section 11.7.3
b.	Surfaces of exterior equipment slabs	Section 11.7.3
c.	Exterior slabs subject to foot traffic	Section 11.7.4

3.6 CURING AND PROTECTION

3.6.1 Cure concrete in accordance with ACI 301, Section 12.2. Clear curing compounds shall be tinted or applied surfaces marked to delineate extent of spraying.

3.6.2 Do not use curing compound on concrete surfaces which are to receive flooring or special protective coating.

3.6.3 Protect concrete during extreme weather conditions in accordance with ACI 301, Section 12.3.

3.6.4 Protect concrete from mechanical injury in accordance with ACI 301, Section 12.4.

3.7 CONCRETE TESTING

3.7.1 Sampling and testing of concrete will be the responsibility of the Government's Representative. The concrete will be tested in accordance with ACI 301, Sections 16.3.4, 16.3.5, 16.3.6, and 16.3.8.

END OF SECTION

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SECTION 03419

PRECAST PRESTRESSED CONCRETE SECTIONS

PART 1 - GENERAL

1.1 SUBMITTALS: Refer to Section 01300 for submittal procedures.

1.1.1 Fabrication Drawings: Prepare and submit complete drawings and calculations for the prestressing and erection methods, materials, and equipment. Drawings shall indicate the plan, elevations, and sections of all units, and shall show the methods and sequence of stressing, including specifications and details of prestressing steel and anchoring devices, anchoring stresses, type of enclosure, arrangement of prestressing steel, erection procedures, location of pick-up points for handling, and details of pick-up devices.

1.1.2 Concrete Materials and Mix Design: Define each of the materials to be used in the concrete and state the amount, by weight, to be utilized per cubic yard of plastic mix.

1.1.3 Record of Tests: Maintain and submit the records of all tests performed to determine the properties of the materials to be used in the concrete.

1.2 PRODUCT DESIGN CRITERIA

1.2.1 Structural Loads

1.2.1.1 Roof live loads: 20 psf.

1.2.1.2 HVAC unit loads on the roof in accordance with the Drawings.

1.2.1.3 Wind load: 25 psf.

1.2.1.4 Seismic: UBC Zone 2.

1.2.1.5 Internal building pressure: The north side of Class 1A flammable liquids cell area is to be designed for 200 psf internal pressure.

1.2.1.6 Walls: Wall panels shall be insulated as shown on the Drawings. Insulation shall be R-13 or greater.

1.3 PRODUCT DELIVERY AND HANDLING

1.3.1 Precast concrete members shall be lifted and supported during manufacturing, stockpiling, transporting, and erecting operations only at the lifting or supporting points, or both, as shown on the Fabricator Drawings, and with approved lifting devices. All lifting devices shall have a minimum safety factor of 4.

PART 2 - PRODUCTS

2.1 GENERAL

2.1.1 Each of the aggregates, cement, water, and admixtures shall be supplied by a single source capable of producing a consistent quality within the quantity of materials required for the project. Aggregates, cement, and admixtures shall each have been produced by the same manufacturer and shall, when the quantity required is less than one batch or mix, be from the same batch or mix. The type, brand, and source of supply of the ingredients of the concrete will not be changed without prior written approval of the Government's Representative.

2.1.2 Design precast prestressed concrete sections in accordance with ACI 318.

2.2 MATERIALS

2.2.1 Portland Cement: ASTM C 150, Type I or III.

2.2.2 Admixtures

2.2.2.1 Air-entraining admixtures: ASTM C 260.

2.2.2.2 Water reducing, retarding, accelerating admixtures: ASTM C 494.

2.2.3 Aggregates: ASTM C 33.

2.2.4 Water: Potable or free from foreign materials in amounts harmful to concrete and embedded steel.

2.2.5 Reinforcing Steel

2.2.5.1 Bars: Deformed billet steel, ASTM A 615.

2.2.5.2 Wire Fabric: Welded steel, ASTM A 185.

2.2.6 Strand: Uncoated, 7-wire, stress-relieved strand; ASTM A 416, Grade 250K or 270K.

2.2.7 Anchors and Inserts

2.2.7.1 Materials: Structural steel, ASTM A 36.

2.2.8 Grout

2.2.8.1 Cement grout: Portland cement, sand and water sufficient for placement and hydration. Minimum strength of 3000 psi at 28 days.

2.2.8.2 Nonshrink grout: Nonmetallic type; "Five Star Grout" by US Grout Corp, "Por-Rok" Anchoring Cement by Hallemite, or "Masterflow 713" by Master Builders.

2.2.9 Welded Studs: In accordance with AWS D1.1.

2.3 CONCRETE MIXES

2.3.1 28 Day Compressive Strength: 5000 psi, minimum.

2.3.2 Release Strength: 4000 psi, minimum.

2.3.3 Use of calcium chloride, chloride ions, or other salts is not permitted.

2.4 MANUFACTURE

2.4.1 Manufacturing procedures shall be in accordance with PCI MNL-116. The manufacturer shall be a registered PCI Plant, certified by the plant certification program prior to start of production.

2.4.2 Manufacturing tolerances shall meet the requirements of PCI MNL-116.

2.4.3 Finishes

2.4.3.1 Standard underside: Resulting from casting against approved forms using good industry practice in cleaning of forms, design of concrete mix, placing and curing. Small surface holes, caused by air bubbles, normal color variations, normal form joint marks, and minor chips and spalls will be tolerated, but no major or unsightly imperfections, honeycomb, or other defects will be permitted.

2.4.3.2 Standard top: Result of vibrating screed and additional hand finishing at projections. Normal color variations, minor indentations, minor chips and spalls will be permitted. No major imperfections, honeycomb, or defects will be permitted.

2.4.3.3 Exposed vertical ends: Strands shall be recessed and the ends of the member shall receive sacked finish.

2.4.4 Openings: The manufacturer shall provide openings as shown on the Drawings.

2.4.5 Patching: Patching will be acceptable, providing the structural adequacy of the product and the appearance are not impaired.

2.4.6 Fasteners: The manufacturer shall cast in structural inserts, bolts, and plates as detailed or required by the Drawings.

PART 3 - EXECUTION

3.1 ERECTION

3.1.1 Installation: Installation of precast prestressed concrete shall be in strict accordance with approved Fabrication Drawings and shall be performed by the manufacturer or an erector with 5 years of similar installation experience. Members shall be lifted by means of suitable lifting devices at points provided by the manufacturer. Temporary shoring and bracing, if necessary, shall be in accordance with the manufacturer's written instructions.

3.1.2 Alignment: Members shall be properly aligned and leveled as required by the approved Fabricator Drawings. Variations between adjacent members shall be reasonably leveled out by jacking, loading, or any other feasible method in accordance with the manufacturer's written instructions and acceptable to the Government's Representative.

3.1.3 Grouting: Grout joints between wall panel edges (interior surfaces only). DFC

3.1.4 Caulking: Caulk joints between wall panel edges (exterior surfaces only) using backer rod per Section 07920, Sealants and Caulkings. The caulking material shall be Sonoplastic NP1 or Sonoplastic NP2 manufactured by Sonneborn. Standard manufacturer color shall closely match with the precast concrete panels.

3.2 FIELD WELDING

3.2.1 Field welding shall be done by qualified welders using equipment and materials compatible to the base material. Weld structural steel in accordance with AWS D1.1 and reinforcing steel in accordance with AWS D1.4. *Personnel and procedures for welding structural steel shall have been qualified in accordance with AWS D1.1 before welding. Qualification in accordance with ASME Section IX may be substituted for this requirement. Personnel and procedures for welding reinforcing steel shall have been qualified in accordance with AWS D1.4 before welding. Visual weld examination and acceptance criteria for structural steel welds and reinforcing steel welds shall meet the requirements of AWS D1.1 and AWS D1.4, respectively. *SC-12

END OF SECTION

SECTION 04220

CONCRETE UNIT MASONRY

PART 1 - GENERAL

1.1 SUBMITTALS: Refer to Section 01300 for submittal procedures.

1.1.1 Method to Heat Masonry Units: Submit a written description of the methods proposed to heat masonry materials and protect masonry from freezing.

PART 2 - PRODUCTS

2.1 HOLLOW CONCRETE MASONRY UNITS

2.1.1 Provide units meeting the requirements of ASTM C 90, Grade N, Type I, with half pumice aggregate and half sand aggregate.

2.1.2 Use nominal 8 by 8 by 16 inch or 12 by 8 by 16 inch size as required with standard smooth face and natural gray color. Furnish all special shapes shown on the Drawings; including closures, jambs, headers, lintels, and bond beam units, as required to complete the work.

2.2 MORTAR: ASTM C 270, Type M.

2.3 GROUT: ASTM C 476, Type PL.

2.4 REINFORCEMENT

2.4.1 Horizontal Mortar Joints: Fabricated from steel wire meeting the requirements of ASTM A 82; deformed 3/16 inch side rods and 9 gauge cross wires in truss pattern sized for nominal 8-inch and 12-inch walls; manufactured by Durowal Products "Durowal", Southern Wire Mesh Co "Bet-R-Wal", or AA Wire Products Co "Blok-Lok" with zinc coating in accordance with Paragraph 2.7.1.

2.4.2 Steel Bars: ASTM A 615, deformed, Grade 60.

2.5 ANCHOR BOLTS: ASTM A 307.

2.7 ANCHORS, TIES, AND CENTERING DEVICES

2.7.1 Wire Devices: Factory fabricated from steel wire meeting the requirements of ASTM A 82.

2.7.2 Centering clips shall be formed from not lighter than 9 gauge wire. Clips shall be of a design that will prevent displacement of the reinforcing bars during the course of construction.

2.7.3 Wire anchors for use with embedded slots or wire inserts shall be formed from not lighter than 9 gauge wire, looped and closed.

2.7.4 Dovetail anchors, where noted on the Drawings, shall be not lighter than 16 gauge steel at least 1 inch wide, crimped, corrugated, or bent at the end to provide anchorage, and shall be hot-dip zinc coated in accordance with ASTM A 153, Class B-2.

PART 3 - EXECUTION

3.1 HANDLING AND STORAGE

3.1.1 Deliver masonry units to the job site in air-dry condition. Handle, store, and protect masonry units to avoid chipping, breakage, contact with soil or contaminating material, and exposure to the elements. Anchors, ties, and joint reinforcement shall be free of loose scale and rust.

3.2 MORTAR: Mix Type M mortar in accordance with ASTM C 270.

3.3 COARSE GROUT: Mix 2000 psi (minimum) compressive strength grout in accordance with ASTM C 476.

3.4 ERECTION

3.4.1 Lay only clean and surface dry units. Do not use frozen or saturated units. Lay masonry plumb, true to line, with level courses accurately spaced. Keep bond pattern, corners and reveals plumb and true throughout. Vertical joints shall be shoved tight. Adjust each unit to final position while mortar is still plastic. Remove all units that are disturbed after mortar has stiffened and re-lay with fresh mortar. Units used in exposed surfaces or in walls and partitions to be painted shall be free from chipped edges or other imperfections detracting from the appearance of the finished work.

3.4.2 Hot Weather Installation .

3.4.2.1 Protect masonry, erected when the ambient temperature is more than 99 F or when winds are in excess of 10 miles per hour from these elements during erection and for 48 hours following.

3.4.2.2 During hot, windy, or dry weather moisten the masonry units to prevent excessive absorption of water in the mortar.

3.4.3 Cold Weather Installation

3.4.3.1 Do not erect masonry if the temperature is below 40 F until the proposed methods to heat masonry materials and to protect masonry from freezing have been approved by the Government's Representative.

3.4.3.2 Maintain masonry unit temperature of 30 F, minimum, when laid. Maintain mortar and grout temperature between 70 F and 110 F. Temperature of mixing water or of water and sand introduced to cement shall not exceed 160 F. Maintain air temperature on both sides of the masonry above 40 F for at least 48 hours. When temperatures are below 20 F, do not lay masonry.

3.4.4 Wherever possible, use full units of the proper size instead of cut units. Cutting and fitting, including that required to accommodate the work of others shall be done by masons using power masonry saws. Concrete masonry units may be either wet or dry cut. Dry wet cut units, before being placed in the work, to the same surface-dry appearance as uncut units being laid in the wall. Cut edges shall be clean, true, and sharp. Make openings carefully so that wall plates, cover plates, or escutcheons required by the installation will completely conceal the openings and have bottoms aligned with the masonry joints. Use of broken units is prohibited.

3.4.5 Set masonry units in full bed of mortar under both face shells and webs at starting courses on foundation walls and where cells are filled with grout or concrete. Lay all other blocks in shell mortar bedding.

3.4.6 Strike off all mortar joints flush. Compact all joints exposed to view or scheduled for painting with a shallow, oval-faced, grooving tool, after the mortar has taken an initial set.

3.4.7 Reinforce horizontal joints in masonry walls at every other course. Lap reinforcement side rods 6 inches at all splices. Use prefabricated reinforcement at corners or hook and side lap the side rods.

3.4.8 Reinforce vertical cores where shown on the Drawings. Install vertical reinforcing steel full height of the masonry wall. Make splices bar-to-bar and bar-to-dowel lapping at least 30 diameters and tie with wire.

3.4.9 Install structural steel framed openings and doorways as masonry walls are erected. Shore all openings which are more than three feet wide.

3.4.10 Fill spaces around metal door frames and other built-in items solid with mortar. Fill cells receiving anchor bolts; and cells of first masonry course below bearing plates solid with grout.

3.4.11 Where the Drawings call for cores to be filled or reinforced:

3.4.11.1 Vertical cores shall have vertical alignment sufficient to maintain a clear, unobstructed continuous opening not less than 3 inches by 3 inches.

3.4.11.2 Fill cores with coarse grout.

3.4.11.3 Rod the grout in solid to eliminate honeycomb.

3.4.11.4 Fill the cores in lifts no greater than 6 courses high.

3.4.11.5 When the grouting is stopped for one hour or longer, form horizontal construction joints by stopping the pour of grout not less than 1/2 inch below the top of the uppermost unit grouted.

3.4.11.6 Fully embed horizontal steel by grout in an uninterrupted pour.

3.4.12 Make bond beams with loadbearing units filled with coarse grout and continuous reinforcement. Lap reinforcement 30 bar diameters or 12 inches, whichever is greater where splices are required for continuity. Maintain a minimum clearance of 1/2 inch between reinforcement and interior faces of units.

3.4.13 Unless shown otherwise on Drawings, intersecting walls shall be tied together with a metal tiebar 1/4 inch thick, 1-1/4 inches wide, and 28 inches long, with 2 inch right angle bends on each end. Tiebars shall be placed in alternate courses in the wall with the bends at the ends of the tiebars embedded in cores filled with grout.

3.4.14 Clean masonry walls after mortar has set. Remove excess mortar and mortar stains by scrubbing with a stiff fiber brush and clean water.

3.5 PROTECTION

3.5.1 Cover masonry to protect it from frost, ice, and snow and to prevent collection of moisture in the core of the wall. Protect all corners subject to damage.

END OF SECTION

SECTION 05120

STRUCTURAL STEEL

PART 1 - GENERAL

1.1 SUBMITTALS: Refer to Section 01300 for submittal procedures.

1.1.1 Fabrication and Erection Drawings: Submit fabrication drawings, erection diagrams, and bills of material for all structural steel framing.

1.2 QUALIFICATION OF WELDING PERSONNEL AND PROCEDURES

1.2.1 Personnel and procedures for welding structural steel shall have been qualified in accordance with AWS D1.1 before welding. Qualification in accordance with ASME Section IX may be substituted for this requirement.

1.2.2 Maintain a file of welding procedure specifications, procedure qualification records, and welder performance qualification test results at the joo site for review at any time by the Government's Representative.

1.3 PRODUCT HANDLING AND STORAGE

1.3.1 Deliver anchor bolts and other anchorage devices which are to be embedded in concrete or masonry construction to the project site in time to be installed before the start of concrete operations or masonry work.

1.3.2 Provide setting drawings, templates, and directions for the installation of the anchor bolts and other devices which are to be embedded.

1.3.3 Store structural steel members at the project site above ground on platforms, skids, or other supports.

1.3.4 Protect steel from corrosion.

1.3.5 Store materials in a weathertight and dry place, until ready for use in the work.

1.3.6 Store packaged materials in their original unbroken package or container.

PART 2 - PRODUCTS

2.1 MATERIALS

2.1.1 Rolled Steel Shapes and Plates: ASTM A 36.

2.1.2 Steel Bars and Rods: ASTM A 108, minimum yield 36,000 psi, maximum carbon content 0.35%.

2.1.3 Steel Pipe: ASTM A 53, Type E or S, Grade B.

2.1.4 Fasteners

2.1.4.1 Bolts:

a. For general application: ASTM A 307, Grade A or B, except that the requirement for bolt head marking is waived.

b. For all permanent structural steel column and beam connections: ASTM A 325, Type 1 or 2, galvanized; or ASTM A 490, Type 1 or 2.

2.1.4.2 Nuts:

a. For ASTM A 307 bolts: ASTM A 563, Grade A, heavy hex.

b. For ASTM A 325 bolts: ASTM A 563, Grade C, plain, heavy hex.

c. For ASTM A 325 galvanized bolts: ASTM A 563, Grade DH, galvanized, heavy hex.

d. For ASTM A 490 bolts: ASTM A 563, Grade DH, heavy hex.

2.1.4.3 Washers for ASTM A 325 or ASTM A 490 Bolts: ASTM F 436, circular washers.

2.1.4.4 Expansion Anchors: Hilti Kwik-Bolt or HDI drop-in anchors.

2.1.4.5 Weld Studs: Nelson Stud Welding Company, Type H4L.

2.1.5 Nonshrink Grout: Nonmetallic type, "Five Star Grout" by US Grout Corp; "Por-Rok" Anchoring Cement by Hallemite; or "Masterflow 713" by Master Builders.

2.1.6 Paint: See Section 09900.

PART 3 - EXECUTION

3.1 GENERAL

3.1.1 Fabricate and erect structural steel in accordance with the AISC "Specification for the Design, Fabrication and Erection of Structural Steel for Buildings", except that welding shall be in accordance with this Specification.

3.1.2 Perform welding in accordance with AWS D1.1.

3.1.3 Visual weld examination and acceptance criteria shall meet the requirements of AWS D1.1, paragraph 6.5.5. SC-1

3.2 FABRICATION

3.2.1 Fabricate structural steel for close fit, with erection holes aligned within the tolerances given in the AISC Specification noted in Paragraph 3.1.1 above.

3.2.2 Fabricate beam-to-column and beam-to-beam connections in accordance with the AISC "Manual of Steel Construction", Part 4 (Connections) and Table I, or Table I in combination with Table III. Connections shall be high-strength-bolted or welded unless otherwise noted on the Drawings.

3.2.3 One-sided or other type of eccentric connections will not be permitted except where shown on the Drawings.

3.2.4 Fabricate welded connections in accordance with Table IV, Part 4, of the AISC "Manual of Steel Construction".

3.2.5 Mill the ends of columns square at splices and base plates.

3.2.6 Install weld studs in accordance with the manufacturer's written instructions.

3.2.7 Use E70XX electrodes for welding.

3.3 SHOP PAINTING

3.3.1 Prepare and prime coat steel in accordance with Section 09900.

3.3.2 Do not apply primer to surfaces within 3 inches of welds before welding.

3.3.3 Do not apply primer to contact surfaces within friction-type joints.

3.4 ERECTION

3.4.1 Do not use oxy-fuel cutting for correcting fabrication errors on any major member in the structural framing. Holes shall not be made or enlarged by oxy-fuel cutting. Oxy-fuel cutting will be permitted only on minor members and only after permission of the Government's Representative is obtained.

3.4.2 Contact surfaces within friction-type joints shall be free from oil, paint, and other foreign materials.

3.4.3 Do not make holes in framing members for supporting equipment, unless shown on the Drawings, without specific approval from the Government's Representative.

3.4.4 Drift pins may be used in connections to bring together the several parts, but not in a manner which will enlarge bolt holes or distort or damage the framing.

3.4.5 Connections using high-strength bolt fasteners shall meet the requirements of AISC "Specification for Structural Joints Using ASTM A 325 or A 490 Bolts", except any ASTM A 490 bolt or nut turned by the job inspecting torque shall require replacement of both bolt and nut. ASTM A 490 bolts shall not be substituted for ASTM A 325 bolts.

3.4.6 Use high-strength bolts for connections in structural framing. Tighten nuts by use of torque wrenches or by the "turn-of-the-nut" method in accordance with the AISC Specifications.

3.4.7 Install expansion anchors in accordance with the manufacturer's written instructions.

3.5 GROUTING BASE PLATES

3.5.1 Grout-in column base plates, where shown on the Drawings, with nonshrink grout mixed in accordance with the manufacturer's written instructions.

3.5.1.1 Before grouting, clean concrete (and masonry) bearing surfaces and roughen to improve bond. Clean the bottom surfaces of the base plates.

3.5.1.2 Pack grout solidly between bearing surfaces and base plates to ensure that no voids remain. Bevel the exposed surfaces.

3.6 TOUCH-UP

3.6.1 After erected steel has been approved, clean and paint all connections with primer. Touch-up the shop prime coat wherever it has been damaged. Prime and touch-up with the same primer as used for shop coat.

END OF SECTION

SECTION 05300

METAL DECKING

PART 1 - GENERAL

1.1 SUBMITTALS: Refer to Section 01300 for submittal procedures.

1.1.1 Installation Drawings: Submit erection drawings including a specification of the materials, quantities of materials, layout, and erection details.

1.1.2 Metal Deck Certificate of Compliance, ~~Submit a standard SDI Certificate of Compliance,~~ signed by the metal deck supplier, stating that the metal decking furnished ~~meets the requirements of the Drawings and this Specification,~~ conforms to the standards of the SDI. DFC #

1.2 QUALIFICATION OF WELDING PERSONNEL AND PROCEDURES

1.2.1 Personnel and procedures for welding sheet steel in structures shall have been qualified in accordance with AWS D1.3 before welding any material or components which will become a part of the work covered by this Specification. Qualifications in accordance with ASME Section IX may be substituted for this requirement.

1.2.2 Maintain a file of welding procedure specifications, procedure qualification records, and welder performance qualification test results at the job site for review at any time by the Government's Representative.

1.3 SHIPPING, STORAGE, AND HANDLING

1.3.1 Deliver materials to the site in a dry, undamaged condition. Store off the ground under weathertight cover.

PART 2 - PRODUCTS

2.1 METAL DECKING UNITS

2.1.1 Standard Wide Rib Deck, meeting the requirements of SDI Publication No. 24 and manufactured from zinc-coated steel sheets. Decking shall be as manufactured by Inryco Inc.

2.1.1.1 Roof: Inryco, Type B Deck, 1-1/2 inches deep, 20 gauge.

2.1.2 Furnish decking in lengths which shall cover a minimum of two spans of support framing wherever possible, allowing for a minimum of 2 inches of bearing on end supports.

2.1.3 Ship decking to the job site in standard widths and cut to proper lengths. Prefabricate all penetration openings which are larger than 16 square feet.

2.2 METAL DECK ACCESSORIES

2.2.1 Furnish accessories such as spacer plates, bridging, and other sheet metal items that are to be attached directly to the deck to provide a finished surface for the application of roof insulation.

2.2.2 Furnish welding washers 16 gauge or heavier, or other approved method, for plug-welding.

2.2.4 Sheet metal or neoprene closers shall be the standard product of the decking manufacturer.

2.3 ZINC-RICH COMPOUND

2.3.1 Galvicon as manufactured by the Galvicon Corp, or ZRC as manufactured by the Sealube Co.

PART 3 - EXECUTION

3.1 INSTALLATION

3.1.1 Erection of Decking

3.1.1.1 Place decking in accordance with the approved Erection Drawings and the SDI Specifications. Handle decking units in a manner to avoid damage to the units. Limit temporary loads on roof decking to avoid overloading.

3.1.1.2 Place units on supporting steel framework, and adjust to final position before being permanently fastened. Bring each unit to proper bearing on supporting members.

3.1.1.3 Cut penetrating openings which are smaller than 16 square feet, and reinforce as shown on the Drawings.

3.1.2 Span and Lap of Panels

3.1.2.1 Lay decking panels across the support framing and span a minimum of two support members for each length of deck panel wherever possible. Lap ends of panels only over support framing.

3.1.2.2 Provide additional metal reinforcement and closure pieces as required for strength, continuity of decking and support of other work.

3.1.3 Welding of Decking

3.1.3.1 Plug weld decking to steel framing in accordance with approved Erection Drawings and AWS D1.3. Use welding washers or other approved methods for welding to steel framing.

3.1.3.2 Fasten units to steel framework at ends of units and at intermediate supports by welds at least 3/4 inch in diameter, spaced not more than

12 inches across width of the deck unit. Where two units abut, each unit shall be fastened to the steel framing. Welds shall be free of sharp points or edges.

3.1.3.3 Fasten side laps of adjacent units between supports at intervals not exceeding 3 feet between supporting members.

3.1.3.4 Visual weld examination and acceptance criteria shall meet the requirements of AWS D1.3. SC-1

3.1.4 Accessories

3.1.4.1 Cant Strips: Weld cant strips to top surface of roof decking at 12 inches on centers. Lap end joints at least 3 inches.

3.1.4.2 Closure Strips: Install metal closure strips at all open uncovered ends and edges of decks, and in voids between decking and other construction where shown on the Drawings. Weld into position to provide complete decking installation.

3.2 CLEANING AND TOUCH-UP

3.2.1 Thoroughly clean decking to be left unpainted and exposed to view by wire brushing or other effective means. Remove weld flux, spatter, slag, rust, oil, and other deleterious matter to provide clean, bright metal surfaces.

3.2.2 Touch-up zinc coated units with zinc-rich compound as specified. Apply in accordance with compound manufacturer's printed instructions.

3.2.3 Touch-up shop painted surfaces with the same paint used in shop, and apply in accordance with the manufacturer's written instructions.

END OF SECTION

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SECTION 05500

METAL FABRICATIONS

PART 1 - GENERAL

1.1 SUBMITTALS: Refer to Section 01300 for submittal procedures.

1.2 QUALIFICATION OF WELDING PERSONNEL AND PROCEDURES

1.2.1 See Section 05120 for welding of structural steel.

PART 2 - PRODUCTS

2.1 MATERIALS

2.1.1 Rolled Steel Shapes and Steel Plate: ASTM A 36.

2.1.2 Steel Bars and Rods: ASTM A 108, minimum yield 36,000 psi, carbon content not to exceed 0.35%.

2.1.3 Fasteners

2.1.3.1 Expansion Anchors: Hilti Kwik-Bolt or HDI drop-in anchors.

2.1.3.2 Weld Studs: Nelson Stud Welding Company, Type H4L.

2.1.4 Steel Grating: Meeting the requirements of FS RR-G-661, Type I, ~~pressure locked~~ (riveted grating not acceptable), with end banding bars, and hot-dip galvanized. Steel grating to be Irving welded rectangular design, Type GW-2 as manufactured by IKG Industries. Main bearing bars to be spaced 1-3/16 inches center to center. Crossbars to be resistance welded at right angles to the bearing bars and spaced 2 inches center to center. No notching or cutting of bearing or crossbars before welding is permissible. Maximum panel length at low end of trenches is to be 5 feet. ADD-1

2.1.5 Paint: See Section 09900.

2.1.6 Supports: Unistrut P-1000.

2.1.7 Support Clamps: Unistrut P-1111 and P-1112.

2.2 MISCELLANEOUS METAL FABRICATIONS

2.2.1 Ladders: Fabricate in accordance with the Drawings. Rungs shall be solid-section rods, fitted into punched or drilled holes in rails, and welded. All splices and connections shall have a smooth transition with original members without projections that are sharp or more extensive than required for joint strength. Rails shall be fitted with brackets at the spacing shown for anchorage to structure.

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SECTION 07411

PREFORMED METAL SIDING

PART 1 - GENERAL

1.1 SUBMITTALS: Refer to Section 01300 for submittal procedures.

1.1.1 Fabrication Drawings: Submit fabricator erection drawings. Include a description of the sheet materials, fastening devices, and sealants to be supplied, the quantity of each type of material, and the layout of each area to be covered with the wall system.

1.1.2 Performance Test Confirmation: Performance test information shall be submitted confirming the ability of the controlled wall system to function within a ± 10% variation under release-out conditions.

PART 2 - PRODUCTS

2.1 Controlled release wall system and standard wall system as designed and manufactured by ~~H. H. Robertson Co.~~ North Star Industries. DT 1

2.1.1 Prefinished steel siding panels shall be 22 gauge "box rib" exterior siding.

2.1.2 Prefinished steel liner panels shall be 20 gauge, "L2" interior liners, with 1-1/2 inches of fiberglass insulation.

2.1.3 Finish shall be standard off-white color Versacor coating system.

2.1.4 The wall insulation system, consisting of insulated steel liner panels and fiberglass blankets, shall have an insulating value of R-13. Insulation containing asbestos will not be acceptable.

2.1.5 Sub-girts to be the standard product of the manufacturer, shall be cold formed sections designed to receive attachment of face and liner panel fasteners.

2.1.6 Closures and Sealants

2.1.6.1 Closures shall be of contoured material designed to meet the configuration of the siding panels.

2.1.6.2 Metal closure strips, top, base, head, sill and jamb or corner trims shall be the same material, gauge, and finish as the siding.

2.1.6.3 Sealant shall be the manufacturer's standard and shall be provided in accordance with the manufacturer's written recommendations and as shown on the Drawings.

2.1.7 Fasteners DT #1

2.1.7.1 Fasteners shall be Fabco Top Seal Fasteners and Weath-R-Seal Washers. ~~400 Series, stainless steel, self tapping screws, painted to match siding and shall be manufacturer's standard product~~.

2.1.7.2 Explosion release fasteners shall be designed to fail at 30 lbs/ft^2 and be tested and approved by FM.

2.1.7.3 Concealed fasteners shall be the manufacturer's standard product, designed to interlock with the siding for attachment without panel perforation.

PART 3 - EXECUTION

3.1 METAL SIDING AND LINER PANELS

3.1.1 Store all materials at the project site in a dry place away from excess moisture, uncured concrete, cement, lime, or any strong chemicals.

3.1.2 Plastic protection film shall be applied to prefinished surfaces and must be removed before the panels are installed or immediately after installation.

3.1.3 Field assemble and install panel systems in accordance with Erection Drawings and in accordance with the manufacturer's written instructions.

3.1.4 Protect exposed surfaces of prefinished panels used on the project during their installation. Shop or field applied painting will not be acceptable except for minor touch-up.

3.1.5 See Drawing for location of controlled release wall system and the standard wall system.

END OF SECTION

SECTION 07510

BUILT-UP BITUMINOUS ROOFING
ON CONCRETE & METAL DECK

PART 1 - GENERAL

1.1 SUBMITTALS: Refer to Section 01300 for submittal procedures.

PART 2 - PRODUCTS

2.1 MANUFACTURER

2.1.1 Products specified herein are manufactured by ~~Manville Building Materials Corporation~~ Gilsonite Inc. unless noted otherwise. DT 1

2.2 ROOF INSULATION

2.2.1 Insulation shall be Fes-core, with a thermal resistance rating of R-20, and listed as acceptable for Class I construction by FM for application on a steel deck, in accordance with FM Loss Prevention Data Sheet 1-28.

2.3 VAPOR RETARDER

2.3.1 Vapor barrier shall be GlasPly and listed by FM as acceptable for Class I construction.

2.3.2 The vapor barrier adhesive shall be a fire-retardant material approved by FM as acceptable in Class I construction. The vapor retarder and the adhesive used shall be products of the same manufacturer, or the adhesive shall be a product recommended by the vapor retarder manufacturer's written instructions.

2.4 ROOFING SYSTEMS

2.4.1 Four-ply, smooth-surface, GlasPly felt, Specification No. 4GIS, Type III asphalt, with a final finish coating of fibrated aluminum roof coating over Topgard Type-B fibrated.

2.5 LUMBER FOR NAILING STRIPS AND CURBS

2.5.1 Lumber for nailing strips and curbs shall be of treated wood using the pressure process with a water-borne salt. Oil based preservatives are not allowed.

2.5.2 Nailing strips shall be the same thickness as the insulation used and shall be lapped a minimum of 2 feet at joints.

2.6 WALKWAY SYSTEM

2.6.1 Walkway material shall be a mineral-granule-surfaced asphalt cap sheet, 90 lb weight. Color shall be white or off-white.

2.7 METAL FLASHING AND GRAVEL STOPS

2.7.1 For metal flashing and gravel stops, see the Drawings and Section 07600 for product and execution.

2.8 CANT STRIPS AND CRICKETS

2.8.1 Cant strips and crickets shall be the standard product of the roof insulation manufacturer.

PART 3 - EXECUTION

3.1 STORAGE, HANDLING, AND PREPARATION OF MATERIALS

3.1.1 Keep all materials clean, dry, and protected from weather during storage and application. Insulation which has become damp or wet shall not be used.

3.1.2 Store rolls of felt in upright position and protect from damage during storage and application.

3.1.3 Deliver all roofing and insulating materials to the job site in their original sealed packages or containers with the manufacturer's label intact, showing name and grade of material. Roofing materials for application of insulation shall be of the same manufacturer as used for the roofing application.

3.1.4 Use extreme care to control the temperature of the asphalt during heating. Any evidence that a batch has been overheated shall be cause for rejection of that batch.

3.1.5 Asphalt shall not be heated above 500 F for Type III asphalt. Temperature of asphalt when applied shall be at least 350 F.

3.1.6 Asphalt shall not be adulterated in any way.

3.1.7 Leaky containers shall not be used for handling vapor barrier adhesive, asphalt, or roofing cement. If such materials are spilled or spattered on permanently exposed surfaces of structures, completely remove the material from the surface of the structure.

3.1.8 Equip material handling dollies and other wheeled equipment with low-pressure pneumatic tires when used on roof.

3.1.9 Materials and equipment shall not be used on, stored on, or transported over the new roofs unless protection is provided to prevent damaging or overloading the roof deck, built-up roofing components, or the structural system. The Contractor shall verify roof loading conditions with the Government's Representative.

3.2 SURFACE PREPARATION

3.2.1 All surfaces to receive vapor retarder, insulation, and roofing materials shall be completely dry and free from dirt, dust, loose materials, and frost, or effects of freezing. Sweep surfaces clean before applying materials. Materials shall not be applied when the ambient temperature or the temperature of the roof deck is 40 F or lower, or where there is frost or dampness visible on the deck.

3.2.2 Roofing materials shall not be applied to the deck until the deck surface preparation is complete. The Government's Representative will verify the condition of the roof deck prior to application of roofing materials.

3.2.3 Install cant strips, at least 3 inches high, at the intersection of all vertical surfaces with the roof deck. Install crickets where shown on the Drawings. Crickets shall be constructed with the peak a minimum of 4 inches high.

3.3 APPLICATION OF VAPOR RETARDER

3.3.1 Apply vapor retarder in accordance with the roof insulation specifications and written instructions.

3.3.2 A cut-back asphalt concrete primer shall be applied to the concrete roof surface prior to application of the vapor retarder.

3.3.3 Apply only that amount of vapor retarder which can be covered with insulation and roofing on the same day.

3.3.4 Patch all holes and damaged areas in vapor retarder with a layer of vapor retarder material set in a continuous coating of adhesive. Extend patch a minimum of 2 inches beyond edges of damaged area.

3.4 APPLICATION OF ROOF INSULATION

3.4.1 The roof insulation shall be installed in accordance with Manville Specification No. 501, for concrete deck roof areas and Manville Specification No. 503 for steel deck roof areas. Edges of insulation shall bear on or across flutes in steel decking. Edges parallel to flutes shall not extend over the voids in decking. Tape insulation joints with Owen-Corning "Fiberglas" roof tape welded to the insulation joints with hot steep asphalt.

3.4.2 All insulation applied to the deck shall be completely covered and sealed with built-up roofing on the same day the insulation is applied. Where additional insulation is to be laid on succeeding shifts, seal the exposed edges of the insulation to the vapor retarder with 12 inch wide strips of vapor retarder material and cement to prevent the entry of water into or under the insulation. Remove vapor retarder at edge of insulation prior to starting new work.

3.4.3 Insulation shall be adhered to the vapor barrier over 100% of the area, and all end flaps, protective felt strips, and strips for sealing edges of insulation between shifts shall be adhered over 100% of their area.

3.5 APPLICATION OF BUILT-UP ROOFING

3.5.1 Application of the built-up roofing system shall be as shown on the Drawings, this Specification, Manville Specification No. 4GIS and Manville Application Procedures.

3.5.2 Prior to application of roofing plies, a sealing envelope at the edge of the built-up roofing shall be provided as follows: Lay two roofing plies, a minimum of 12 inches wide, in a coating of roofing cement 4 inches wide and nailed through tin discs on 12 inch centers to the wood nailer along edges of roof decks and roof penetrations before laying built-up plies. This will provide a 6-inch flap for sealing ends and edges of plies after roofing has been applied. After all roofing plies are in place, turn the flaps back over and mop to the top of the roofing membrane.

3.6 FLASHING SYSTEMS

3.6.1 Application of roof flashing systems shall be as shown on the Drawings and by Manville Specification number listed below:

Gravel stops: FE-4 Modified, Dynakap to be used in lieu of GlasPly
Concrete parapet and concrete masonry unit walls: FE-1 (LB) Modified, Dynakap to be used in lieu of GlasPly
Equipment curbs and relief vent curbs: FE-8 Modified, Dynakap to be used in lieu of GlasPly

3.7 INSTALLATION OF WALKWAY SYSTEM

3.7.1 Install walkway system where shown on the Drawings. Set each cap sheet in a solid mopping of asphalt. Top surface shall not receive asphalt.

3.8 INSTALLATION OF METAL FLASHING AND GRAVEL STOPS

3.8.1 Install metal roof flashing and gravel stops as shown on the Drawings after all built-up roofing plies are in place. See Section 07600 for execution.

3.8.2 Lap joints in counterflashing over base flashing and in gravel stops and edging 4 inches. Seal laps in gravel stops and roof edging over the entire roof flange and bead area with roofing cement. Carefully and completely remove all excess roofing cement from permanently exposed metal surfaces.

3.9 CERTIFICATION

3.9.1 Provide a typewritten information card, under glass, in a weathertight frame, for each roof. This card shall contain the information listed on the Roofing and Sheet Metal Work Form (sample appended). Install the card near the point of access to the roof, as directed. Deliver a duplicate card to the Government's Representative.

ROOFING AND SHEET METAL WORK

1. Contract Number

2. Date Work Completed

3. Type of Deck

4. Slope of Deck

5. Insulation	a. Type
	b. Thickness
	c. Manufacturer's Name
6. Felt Application	a. Type
	b. Weight
	c. Method (hand or machine nailing)
	d. Manufacturer's Name
7. Bitumen	a. Type
	b. Quantity per square
	c. Manufacturer's Name
8. Flashing	a. Type
	b. Weight or Gauge
	c. Manufacturer's Name

SAMPLE COPY

(The Contractor shall provide a similar card, typewritten and framed under glass with a weathertight frame. Install near the point of roof access as directed.)

9. Statement of Compliance or Exceptions

Contractor's Signature Date Signed

Inspector's Signature Date Signed

END OF SECTION

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SECTION 07600

FLASHING AND SHEET METAL

PART 1 - GENERAL

1.1 SUBMITTALS: Refer to Section 01300 for submittal procedures.

1.2 DELIVERY AND STORAGE: Store all sheet metal off the ground and protected from damage.

PART 2 - PRODUCTS

2.1 SHEET METAL: Galvanized sheet steel, coating Class G90, meeting the requirements of ASTM A 527.

2.2 SOLDER: 50% tin, 50% lead meeting the requirements of ASTM B 32.

2.3 REGLET FLASHING: Fry Reglet Corporation galvanized steel, Type MA.

2.4 MATERIAL GAUGES

2.4.1 Gravels stops: 24 gauge.

2.4.2 Copings: 24 gauge.

2.4.3 Gutters: 24 gauge.

2.4.4 Downspouts: 26 gauge.

2.4.5 Counterflashing/cleats: 26 gauge.

2.4.6 Reglet: 24 gauge.

2.4.7 Downspout/gutter hangers: 10 gauge.

PART 3 - EXECUTION

3.1 FABRICATION

3.1.1 General

3.1.1.1 Form sheet metal accurately to the profiles shown on the Drawings, free from buckles and waves.

3.1.1.2 Hem all exposed edges 1/2 inch.

3.1.1.3 Make provision in all fabrication for expansion and contraction.

3.1.1.4 Clean and flux metals before soldering. Sweat solder completely through seam width.

3.1.1.5 Neutralize excess flux, as work progresses, with 5% to 10% washing soda solution, and rinse thoroughly.

3.1.2 Gravel Stops

3.1.2.1 Fabricate with lap joints spaced 10 feet apart, maximum.

3.1.2.2 Pre-form and solder corners.

3.1.2.3 Provide continuous cleat to lock-in gravel stop. Provide 6 inch wide cleat, 2 feet on center, at gutter.

3.1.3 Copings

3.1.3.1 Fabricate with lap joints spaced 8 feet apart, maximum,

3.1.3.2 Pre-form corners with mitered and soldered joints.

3.1.3.3 Fabricate coping to lock over continuous cleats on the outside edge and 8 inch long cleats at the joints on the inside edge.

3.1.4 Gutters and Downspouts

3.1.4.1 Solder one inch high end caps at gutter ends.

3.1.4.2 Provide expansion joints in gutters, midway between downspouts, and provide end caps spaced 1/2 inch apart. Close the top of expansion joints with loose-lock covers. Extend the cover over the outer face of the gutter and under the gravel stop.

3.1.4.3 Provide a 2 inch long thimble at each downspout location. Make the thimble 1/8 inch smaller than the downspout and solder the flange of the thimble to the gutter.

3.1.4.4 Solder lap joints 1 inch minimum.

3.1.4.5 Provide concealed removable basket type strainers at each downspout.

3.1.4.6 Downspout upper sections shall telescope into lower sections a minimum of 2 inches.

3.2 INSTALLATION

3.2.1 Verify that surfaces to receive sheet metal are clean and smooth and that blocking has been installed.

3.2.2 Install sheet metal watertight, without waves, warps, buckles, fastening stresses, or distortion.

3.2.3 Set the lap joints of copings in cold application cement and install over cleats.

3.2.4 Set the flanges of gravel stops in cold application cement. Lap 4 inches at the joints and apply cement in the joints. Nail the flange at 3 inches on center into wood nailers. Stagger the nails.

3.2.5 Seal expansion joint covers of gutters with cold application cement.

3.2.6 Attach downspouts with hangers at tops and bottoms, at joints, and spaced at 8 feet maximum.

3.2.7 Brace gutter with metal hangers at 4 feet maximum.

3.2.8 Nails for attaching metal flashing shall be 1-1/2 inches long, 10 gauge, hot dipped galvanized, with minimum 3/8 inch head.

END OF SECTION

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SECTION 07700

EXPLOSION RELIEF VENT

PART 1 - GENERAL

1.1 SUBMITTALS: Refer to Section 01300 for submittal procedures.

1.1.1 Fabrication Drawings: Submit Fabrication and Erection Drawings of the explosion relief vents.

1.2 DELIVERY, STORAGE, AND PROTECTION: Deliver materials in their original sealed packages. Store and handle materials in a manner which will protect them from damage. Store above ground and protect against moisture and physical damage.

PART 2 - PRODUCT

2.1 EXPLOSION RELIEF ROOF VENT

2.1.1 Vent shall comply with current National Fire Test Standards for automatic shrink out vents and release automatically at an outward pressure of 30 lbs/ft^2. Model XRV-P, Catalog No. 40, as manufactured by APC Corporation.

PART 3 - EXECUTION

3.1 INSTALLATION

3.1.1 Assemble and install explosion relief roof vent in strict accordance with the manufacturer's written instructions and recommendations.

3.2 PROTECTION

3.2.1 Protect all finish until completion of this project.

3.2.2 Replace or repair any damaged or defaced items.

END OF SECTION

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SECTION 07920

SEALANTS AND CAULKINGS

PART 1 - GENERAL

1.1 SUBMITTALS: Refer to Section 01300 for submittal procedures.

1.2 DELIVERY AND STORAGE OF MATERIALS

1.2.1 Deliver materials to the job site in manufacturer's original containers, unopened and labels intact. Handle and store all materials to prevent inclusion of foreign materials or exposure to temperatures exceeding 90 F.

PART 2 - PRODUCTS

2.1 GENERAL: Container labels shall show name of material, date of manufacture, mixing instructions, shelf life, and curing time. Color to closely match adjacent surfaces.

2.2 BUILDING SEALANT: One-part, low modulus, silicone sealant, Gesil N 2600, General Electric Company.

2.3 FIRE BARRIER SEALANT: 3M brand fire barrier caulk CP 25.

2.4 PRIMER: Nonstaining type, in accordance with the sealant or caulking compound manufacturer's written instructions.

2.5 BACKER ROD: Closed-cell polyethylene foam rod; Haskon Inc. "Minicel", approximately 25% larger than the width of the joint in which it is to be installed.

2.6 EXPANSION JOINT FILLER: WR Grace Co. Standard Cork Code 4323.

2.7 BOND BREAKER: Polyethylene tape with pressure-sensitive adhesive.

PART 3 - EXECUTION

3.1 PREPARATION OF JOINTS

3.1.1 Follow the written instructions of the manufacturer of the sealant or caulking materials for each condition of application. Unless the written instructions of the manufacturer state otherwise, make depth of sealant joints 1/2 of the joint width.

3.2 BACK-UP

3.2.1 Install backer rod in all joints where sealant is to be applied. Install with the proper tool, in accordance with the manufacturer's written instructions and to the correct depth for the sealant shape specified.

Where the depth of joint is not sufficient for installation of backer rod, use bond-breaker tape to prevent three-point adhesion.

3.3 INSTALLATION OF SEALANT

3.3.1 Perform all sealant work using experienced workers, specified materials, and proper tools in accordance with the manufacturer's written instructions for the conditions of each application. Tool the sealant after installation as required to properly fill the joint and produce a smooth surface. Take all necessary precautions to prevent contact of sealants with adjacent surfaces.

END OF SECTION

SECTION 08100

METAL DOORS AND FRAMES

PART 1 - GENERAL

1.1 SUBMITTALS: Refer to Section 01300 for submittal procedures.

1.1.1 Fabrication Drawings: Submit drawings indicating the size, elevations, and location of each door and frame. Include location and details of hardware reinforcement and frame anchors.

1.2 DELIVERY AND STORAGE

1.2.1 Deliver to the site in undamaged condition and store above ground and under cover. Storage of doors and frames shall be in accordance with SDI-100.

PART 2 - PRODUCTS

2.1 HOLLOW METAL DOORS: Hollow metal doors and frames shall be fabricated in accordance with SDI-100 and this Specification.

2.1.1 Grade II, Model 2, full flush, hollow steel construction. Doors scheduled for fire rating shall bear appropriate UL or FM rating label.

2.1.2 Top shall have flush end closure and bottom shall have recessed channel end closure.

2.1.3 See details and Door Schedule on Drawings for types and sizes.

2.1.4 Internal construction shall be polystyrene foam board core meeting the requirements of SDI-100-2.3.3.3.

2.1.5 Frames installed for glazed openings (vision lite) where scheduled. Glazing system shall be minimum 20 gauge steel.

2.2 HOLLOW METAL FRAMES (DOORS AND WINDOWS)

2.2.1 See details and Door Schedule on Drawings for profile and dimensions. Frames scheduled for fire rating shall bear appropriate UL or FM rating label.

2.2.2 Frames shall be welded construction.

2.2.3 Provide two weld studs, 3/8 inch diameter, at each side of framing.

2.2.4 Provide four wall anchors per side in openings in precast concrete walls.

2.2.5 Plaster guards installed at hardware cut-outs.

2.3 SHOP FINISH

2.3.1 Primer containing lead will not be acceptable and shall not be yellow color.

PART 3 - EXECUTION

3.1 INSTALLATION

3.1.1 Frames shall be installed in accordance with SDI-100 and this Specification.

3.1.2 Leave temporary spreaders in place until the frames are securely attached to wall framing.

3.1.3 Align anchors with hinges and the strike at door frames.

3.1.4 Install doors in conjunction with application of hardware, and with uniform clearance at head and jambs. Leave in smooth operating condition.

3.1.5 Installation of window frames will be executed by the precast concrete wall panel manufacturer. Glass panes shall be installed after wall panels have been erected.

END OF SECTION

SECTION 08315

BLAST-RESISTANT DOORS

PART 1 - GENERAL

1.1 SUBMITTALS: Refer to Section 01300 for submittal procedures.

1.1.1 Fabrication Drawings: Submit Drawings showing all features of construction and installation details.

1.1.2 Calculations: Submit certification that door assembly is in compliance with design requirements.

1.2 STORAGE: Store door and frame units off ground and under cover.

PART 2 - PRODUCTS

2.1 LOW RANGE BLAST DOOR

2.1.1 Low range blast door and frame shall be as manufactured by ~~Overly Manufacturing Company.~~ Krieger Steel Products Co. DT #2.

2.1.2 Door and frame shall bear UL label.

2.1.3 Door assembly, including door, frame, hardware, and seals, shall be designed to withstand a pressure of 200 pounds per square foot. Rebound pressure shall be 100% of design pressure.

2.1.4 The door shall be sized to accommodate a concrete masonry opening of 6 feet 8 inches wide by 7 feet 4 inches high.

2.1.5 The door shall be equipped with the following hardware:

Closer - Norton 7700
Lockset - Corbin 863 x 455
Keyway - per Hardware Schedule (Section 08710)

PART 3 - EXECUTION

3.1 Install door and frame in accordance with the Drawings, approved submittals, and manufacturer's written instructions.

3.2 Install plumb and square. Adjust doors as required and leave in smooth operating condition.

END OF SECTION

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SECTION 08332

OVERHEAD COILING DOORS

PART 1 - GENERAL

1.1 SUBMITTALS: Refer to Section 01300 for submittal procedures.

1.1.1 Fabrication Drawings: Submit Drawings showing each door type and location. Describe all features of construction and show installation details.

1.1.2 Certified Vendor Information (CVI): Submit the information specified in Column 6 of the vendor data list in this Section.

1.2 DELIVERY AND STORAGE: Deliver to the job site in undamaged condition. Store above ground and under cover.

PART 2 - PRODUCTS

2.1 OVERHEAD COILING DOORS: As manufactured by ~~Atlas~~ Overhead Door Corporation. See Drawings for Door Schedule for type and location. DT #2

2.1.1 Exterior doors: Insulated thermal series-standard.

2.1.2 Interior doors: Rolling fire door and rolling service door. Fire door assemblies shall be UL listed or FM approved.

2.1.3 Doors manually operated by means of a chain hoist using gear reduction and galvanized hand chain.

2.1.4 Hood and slat construction to be galvanized steel.

2.1.5 Guides to be structural steel angles. Provide windlock bar at exterior doors.

2.1.6 Galvanized slats and hood to be shop primed with baked-on finish. Other surfaces, except bearings, to be shop primed.

2.1.7 Equip doors with locking devices, suitable for padlocking.

PART 3 - EXECUTION

3.1 INSTALLATION

3.1.1 Install all doors in accordance with the Drawings and the approved submittals. Fire rated assemblies shall be installed in accordance with NFPA 80.

3.1.2 At completion, adjust as required for the door to operate freely.

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Project No. B-526

Title: Non-Radioactive Hazardous Chemical Waste Facility

KAISER ENGINEERS HANFORD

VENDOR DATA LIST

("X" Indicates Required Data)

1 EPN Identification	2 Description	3 Reference Drawing	4 Specification Paragraph	5 Approval/Data: Dimensional Drawings	Equipment Weights	Specifications	Material Description	Performance Data	Circuit or Control Diagrams	Data Sheets	Illustrative Cuts	Installation Instructions	6 Certified Vendor Information (CVI): Dimensional Drawings	Equipment Weights	Specifications	Certified Test Data	Circuit or Control Diagram	Instructions: Installation	Operation	Maintenance	Spare Parts List	7 Remarks
1	Low Range Blast Door		2.1																	X		

END OF SECTION

SECTION 08710

FINISH HARDWARE

PART 1 - GENERAL

1.1 SUBMITTALS: Refer to Section 01300 for submittal procedures.

1.1.1 Hardware List: Submit complete hardware list. List the hardware for each door separately under the door number and hardware requirement.

PART 2 - PRODUCTS

2.1 SPECIFIC REQUIREMENTS: See the Hardware Schedule at the end of this Section for specific requirements.

2.2 Refer to Section 08315 for hardware supplied and installed by the blast resistant door manufacturer.

PART 3 - EXECUTION

3.1 PACKING AND MARKING: Pack each item of hardware separately, with all necessary fasteners and instructions. Mark each item with the hardware number shown on the Hardware Schedule.

3.2 FASTENERS: Install all necessary screws, bolts, or other fasteners of suitable size and type to anchor the hardware in its intended position. Match hardware finish. Supply with expansion shields, toggle bolts, or other appropriate anchors.

3.3 PROTECTION: Protect hardware from damage at all times during construction, both prior to and after installation.

3.4 INSTALLATION AND FIT: Verify the installation and be responsible for the fit of hardware in the location specified. Install each hardware item in accordance with the manufacturer's written instructions.

3.5 KEYWAY: Furnish 6 pin-tumbler cylinders compatible with 67 Keyway system.

3.6 COMPLETION: Remove protective coverings and clean all hardware before completion of this project. Leave all hardware in smooth operating condition. Deliver all keys to the Government's Representative.

HARDWARE SCHEDULE

GROUP NO.	ITEM	QUANTITY	TYPE	FINISH/MFR
1	Hinges	3 Pairs	4-1/2 x 4-1/2 Butts FBB179	US26D/STANLEY
	Lockset	1	#836 x 1410	US26D/CORBIN
	Closer	2	#7700HFL-3	AL/NORTON
	Flush Bolts	1 Pair	#458	B26D/IVES
	Coordinator	1	#469 x 478	B26D/IVES
	Astragal	1-(7'-0")	#357A	PEMKO
	Kick Plate	1 Pair	#48-8" x 36"	GRAY/QUALITY
NOTE: Lockset and Astragal shall be installed on the active leaf.				
2	Hinges	1-1/2 Pairs	4-1/2 x 4-1/2 Butts FBB179	US26D/STANLEY
	Lockset	1	#836 x 1410	US26D/CORBIN
	Closer	1	#7700-3	AL/NORTON
3	Hinges	1-1/2 Pairs	4-1/2 x 4-1/2 Butts FBB179	US26D/STANLEY
	Lockset	1	#836 x 1410	US26D/CORBIN
	Closer	1	#7700HFL-3	AL/NORTON
4	Hinges	1-1/2 Pairs	4-1/2 x 4-1/2 Butts FBB179	US26D/STANLEY
	Closer	1	#7500-3	AL/NORTON
	Push Plate	1	#40-6 x 16	AL/QUALITY
	Pull Plate	1	#1546A	AL/QUALITY
	Kick Plate	1	#48-8" x 34"	QUALITY
	Door Stop	1	#306TB	SS/QUALIT

GROUP NO.	ITEM	QUANTITY	TYPE	FINISH/MFR
5	Hinges	1-1/2 Pairs	4-1/2 x 4-1/2 Butts FBB179	US26D/STANLEY
	Exit Device	1	#29 x 2K	SBL/CORBIN
	Closer	1	#7500-5	AL/NORTON
	Threshold	1	#272A	PEMKO
	Weatherstripping	1 Set	#297AV	PEMKO
	Door Bottom	1	#345AV	PEMKO
	Door Stop	1	#138	AL/QUALITY
6	Hinges	1-1/2 Pairs	4-1/2 x 4-1/2 Butts FBB179	US26D/STANLEY
	Exit Device	1	#29 x Exit Only	SBL/CORBIN
	Closer	1	#7500-3	AL/NORTON
	Threshold	1	#157A	PEMKO
	Weatherstripping	1 Set	#297AV	PEMKO
	Door Bottom	1	#345AV	PEMKO
	Door Stop	1	#138	AL/QUALITY
7	Hinges	1-1/2 Pairs	4-1/2 x 4-1/2 Butts FBB179	US26D/STANLEY
	Exit Device	1	#LA 29 x 2K	SBL/CORBIN
	Closer	1	#7700-3	AL/NORTON
	Door Stop	1	#W302-S	SS/QUALITY

END OF SECTION

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SECTION 08800

GLASS AND GLAZING

PART 1 - GENERAL

1.1 SUBMITTALS: Refer to Section 01300 for submittal procedures.

1.2 Deliver glass to the job with labels, designating manufacturer, type, thickness, and quality of glass.

PART 2 - PRODUCTS

2.1 GLASS

2.1.1 Wire Glass: Clear, 1/4" nominal thickness polished plate reinforced with standard Misco polished wire. Mississippi wire glass as manufactured by Hordis Brothers, Inc.

2.1.2 Insulating Glass: Bronze tint with inboard clear lite, minimum 1/4 inch air space.

PART 3 - EXECUTION

3.1 INSTALLATION

3.1.1 Install glass in conformance with the manufacturer's written instructions.

3.2 CLEANING: At the completion of the work, remove all excessive glazing compound from window assembly, remove all labels and paint from the glass, clean and polish.

END OF SECTION

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3.4 APPLICATION OF GYPSUM BOARD (GENERAL)

3.4.1 Inspect all framing scheduled to receive gypsum board. Deficiencies shall be corrected prior to gypsum board application.

3.4.2 Apply gypsum board first to ceilings and then to walls. Use boards of maximum practical lengths in order to minimize joints. Bring boards into contact, but do not force into place. Fit boards neatly where ends or edges abut.

3.4.3 Install fasteners at least 3/8 inch from edges.

3.4.4 Apply corner bead to all external angles, in accordance with the manufacturer's written instructions. Casing bead shall be installed at all locations where gypsum board abuts a dissimilar material.

3.4.5 Ceiling Installation

3.4.5.1 Single Ply: Apply gypsum board with long dimension at right angles to the furring members.

3.4.6 Wall Installation

3.4.6.1 Single-Ply Application: Apply with long dimension of panels horizontally according to the manufacturer's written instructions. Make joints over framing or furring members. When installing board horizontally attach upper board first. Stagger end joints on different framing members and on opposite sides of the wall.

3.4.6.2 Control Joints: Make control joints with casing bead installed back-to-back and attached to separate framing or furring members. Install at a maximum of 30 feet on center in continuous runs.

3.5 APPLICATION TO STEEL FURRING OR FRAMING

3.5.1 Fasten gypsum board to furring and framing with screws. Drive screws with clutch-controlled, power screwdrivers. Drive slightly below the surface.

3.5.2 Space screws at 12 inches on center into each bearing for ceilings and at 16 inches on center into each bearing for walls.

3.6 TAPING AND FINISHING

3.6.1 Apply compound over joints in a thin uniform layer, spread at least 3 inches wide, center reinforcing tape on the joint and embed in the compound. When dry, apply second coat of compound in a thin uniform coat, a minimum of 6 inches wide. Sand to eliminate ridges and high points.

3.6.2 Apply a third coat of compound after second coat is dry and has been sanded. Feather out to a minimum width of 12 inches. After compound has dried, sand as necessary to obtain a uniformly smooth surface.

3.6.3 Finish over fasteners to be similar to finishing over joint tape.

3.6.4 Treat internal corners in the manner specified for joints except fold reinforcing tape lengthwise through the middle and fit neatly into the corner.

3.6.5 Fit corner bead neatly over external corner and fasten with screws at approximately 6 inches on center and driven into framing members. Treat with joint compound and reinforcing in the manner specified for joints. Feather out joint compound from 8 to 10 inches on each side of the corner.

3.6.6 Apply medium "orange peel" texture to exposed finished surfaces, USG Texture II finish system.

END OF SECTION

SECTION 09500

ACOUSTICAL SYSTEM

PART 1 - GENERAL

1.1 SUBMITTALS: Refer to Section 01300 for submittal procedures.

1.2 DELIVERY, STORAGE, AND PROTECTION: Deliver materials in their original sealed packages. Store and handle materials in a manner which will protect them from damage. Store above ground and protect against moisture and physical damage.

PART 2 - PRODUCTS

2.1 ACOUSTICAL UNITS

2.1.1 Acoustical Lay-In Panels: Armstrong Cork Company "Minaboard", Cortega design, Class 25 or less flame spread.

2.1.1.1 NRC (Noise Reduction Coefficient) Range: .50 - .60 mechanically supported.

2.1.1.2 Finish: Factory applied washable white paint with light reflectance of over 75%.

2.1.1.3 Size: 24 x 48 x 5/8 inch and 12 x 48 x 5/8 inch.

2.2 SUSPENSION SYSTEM: Exposed two way tee grid system for lay-in acoustical panels. "DX System" as manufactured by Donn Corporation.

2.2.1 Exposed Finish: Low sheen white satin baked enamel.

2.2.2 Wall Moldings: Angle shape.

2.2.3 Hanger Wire: Galvanized steel wire, not less than 12 gauge.

PART 3 - EXECUTION

3.1 GENERAL

3.1.1 Do not start acoustical work until work on adjacent surfaces has been completed, the area in which the work is to be performed is clean and the building has been closed in and heated to at least 50 F.

3.1.2 Install acoustical units in straight, perfectly level, and true lines.

3.2 LAY-IN PANELS ON T-BAR SUSPENSION SYSTEM

3.2.1 Support main runners with hanger wires spaced at not more than 48 inches on center.

3.2.2 Where above-ceiling equipment prevents installation of hanger wire from structure to ceiling, support ceiling on 1-1/2 inch cold-rolled runner channels hung from structure.

3.2.3 Install an intermediate hanger wire at all cross runners spanning more than 48 inches.

3.2.4 Install hanger wires supporting T-bars at each corner of each lighting fixture.

3.2.5 Fasten wall moldings to walls at not more than 32 inches on center.

3.2.6 Install in conformance with ASTM C 636.

END OF SECTION

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SECTION 09650

RESILIENT FLOORING

PART 1 - GENERAL

1.1 SUBMITTALS: Refer to Section 01300 for submittal procedures.

1.2 DELIVERY, STORAGE, AND PROTECTION: Deliver materials in their original sealed packages. Store and handle materials in a manner which will protect them from damage. Store above ground and protect against moisture and physical damage.

PART 2 - PRODUCTS

2.1 TILE FLOORING: 12 x 12 x 1/8 inch vinyl composition tile, supreme vinyl Corlon, color No. 55507 beige. Manufacturer: Armstrong.

2.2 RUBBER BASE: 4 inches high, 1/8 inch thick cove base. Color No. 23 dark brown. Manufacturer: Flexco.

2.3 EDGE STRIPS: Homogeneous vinyl, 1 inch wide, with tapered edge. Color No. 200 Brown. Manufacturer: Flexco.

2.4 PRIMER: Cut-back type in accordance with the tile manufacturer's written instructions.

2.5 ADHESIVES: In accordance with the manufacturer's written instructions for the type of flooring or base being installed, and the condition and type of underlayment or subfloor receiving the floor covering.

PART 3 - EXECUTION

3.1 INSPECTION: Inspect all surfaces which are to receive resilient flooring. Report in writing to the Government's Representative all surface defects that need corrective work. Proceed with installation only after all corrective work has been performed and the surfaces are acceptable.

3.2 PREPARATORY WORK: Clean all subfloors before installation. Sweep the subfloor clean, scrape off all spatters, remove with solvent all materials which may affect the adhesion of resilient flooring. Patch all cracks, holes, joints, and score marks with a latex type underlayment in accordance with the tile manufacturer's written instructions. Vacuum the subfloor immediately before installation.

3.3 MOISTURE TESTS

3.3.1 Moisture test for concrete floors in contact with the ground. Spread patches of cut-back primer in several locations in each room and

allow to dry overnight. If the dry primer can be peeled easily from the floor surface, the floor is not sufficiently dry. Repeat test until the primer adheres properly.

3.4 INSTALLATION

3.4.1 General

3.4.1.1 Start installation only after the work of all other trades, including painting, has been completed.

3.4.1.2 Maintain a temperature of at least 70 F for 48 hours before installation, during installation, and 48 hours after installation. Maintain a temperature of at least 55 F thereafter.

3.4.1.3 Install in accordance with the written instructions of the manufacturer of the product being installed.

3.4.2 Tile Flooring

3.4.2.1 Lay tile in straight pattern starting at the center of room working toward walls. Do not install perimeter tile with less than one half tile width except where unavoidable. Butt all joints and make all lines of joints straight and parallel to the walls.

3.4.2.2 Install tiles flat and smooth. Replace tiles with bumps and uneven surfaces with new tiles.

3.4.2.3 Where tiles adjoin different floor surfaces, terminate with reducer strips firmly cemented in place.

3.4.3 Rubber Base

3.4.3.1 Install using the longest lengths practicable. Butt joints of rubber base tightly.

3.4.3.2 Install preformed corners at external corners; accurately cut, miter, and fit internal corners.

3.5 CLEAN-UP: Leave the floor broom-clean and remove all excess adhesive from surface of floor and other exposed surfaces. Remove all adhesive containers, tools, and other implements used in installation from the job site.

3.6 PROTECTION: Avoid rolling loads for 48 hours after installation. Cover tile exposed to traffic with heavy-duty kraft paper. Leave paper in place until final acceptance.

END OF SECTION

SECTION 09900

PAINTING

PART 1 - GENERAL

1.1 SUBMITTALS: Refer to Section 01300 for submittal procedures.

1.2 HANDLING AND STORAGE OF MATERIALS

1.2.1 Deliver all materials to the job site in the manufacturer's unopened containers with labels intact. Do not open containers or remove labels until after inspection and acceptance by the Government's Representative.

1.2.2 Store materials in accordance with the manufacturer's written instructions and in a well ventilated place not exposed to excessive heat, smoke, sparks, flame, or direct rays of the sun.

PART 2 - PRODUCTS

2.1 The terms used herein are as defined in Pittsburgh Paint (PPG) Architectural Finishing System and PPG Rez Stain Systems unless noted otherwise.

2.2 MATERIAL USE

2.2.1 Materials for use shall be of the same manufacturer; materials of different manufacturers shall not be used over one another, except for applications for prime coats on materials or assemblies shop primed.

2.2.2 Primer, sealers, or surface conditioners shall be the product of the manufacturer of the top coats; shall be fully compatible and of the type necessary or required by the manufacturer for the type of system listed or scheduled to produce the suitability of the system for a given surface or problem, and shall be furnished and applied whether listed or not.

2.3 PRIMER

2.3.1 Interior

2.3.1.1 Gypsum wallboard: Latex, Speedhide Quick Drying Latex Primer-Sealer, 6-2.

2.3.1.2 Ferrous Metal: Acrylic latex, Speedhide Water Base Inhibitive Metal Primer, 6-712, white.

2.3.1.3 Concrete and Concrete Masonry Units: Latex, Speedhide Masonry Block Filler, 6-7. Aquapon Polyamide Epoxy Coating - thinned with PPG Epoxy Thinner 97-725 for specific conditions.

2.3.2 Exterior

2.3.2.1 Ferrous Metal: Acrylic latex, Speedhide Water Base Inhibitive Metal Primer, 6-712, white.

2.3.2.2 Galvanized Metal: Acrylic latex, pretreatment with acid wash, Speedhide Water Base Inhibitive Metal Primer, 6-712, white.

2.4 PAINT

2.4.1 Interior

2.4.1.1 Gypsum Wallboard: Acrylic latex, Speedhide Semi-Gloss Latex Enamel, 6-510; acrylic epoxy, Pitt-Glaze Acrylic-Epoxy Semi-Gloss Water Base Coating, 16-line.

2.4.1.2 Ferrous Metal: Acrylic latex, Speedhide Semi-Gloss Latex Enamel, 6-510.

2.4.1.3 Concrete and Concrete Masonry Units: Acrylic latex, Speedhide Semi-Gloss Latex Enamel, 6-510; Acrylic Epoxy, Pitt-Glaze Acrylic-Epoxy Semi-Gloss Water Base Coating, 16-line.

2.4.2 Exterior

2.4.2.1 Ferrous Metal: Acrylic latex, sun-proof, Semi-Gloss Latex House and Trim Paint, 78-300.

2.4.2.2 Galvanized Metal: Acrylic latex, sun-proof, Semi-Gloss Latex House and Trim Paint, 78-300.

2.5 STAIN

2.5.1 Wood: Stain, Semi-transparent Alkyd-Oil Interior Stain, 77-302.

2.5.2 Wood: Finish, Polyurethane Satin Clear Plastic Interior Coating, 77-9.

2.6 SEALER

2.6.1 Concrete: Clear sealer, Horn Clear Seal 150, A. C. Horn, Inc.
2.6.2 Concrete Masonry Units: Clear sealer, Thompson Water Seal, Thompson. ADD

PART 3 - EXECUTION

3.1 SURFACES TO BE COATED: Coat all surfaces except those which have been finished by the manufacturer. Coat factory-primed materials in conformance with this Specification except for the prime coat.

3.2 SAFETY: Furnish and maintain closed metal containers for the disposal of waste materials at the job site. Place materials that have become spotted or soaked with paint, oil, or solvents in these containers. Remove such containers from the job site each day.

3.3 ENVIRONMENT FOR COATING

3.3.1 Coat interior surfaces after all doors and windows have been installed and glazed, the heating equipment has been installed and is in operation, and the building has been maintained above 50 F for at least 72 hours. Do not apply coating materials when the temperature of the surface exceeds 90 F.

3.3.2 Immediately before the application of coating materials, the space or area to receive such coating shall be swept and thoroughly dusted in such a manner as to preclude the precipitation of deleterious materials on the coated surfaces or their entrainment in the coating materials.

3.3.3 Provide and install drop cloths, masking tape, and any other protective devices required to protect material adjacent to the areas being coated. Spatter, smears, droppings, and over-run of coating materials shall be removed as coating progresses.

3.4 SURFACE PREPARATION

3.4.1 Surfaces to be coated shall be in proper condition to accept and assure the proper adhesion of the coating system.

3.4.2 In addition to preparatory sanding, each coat, except the last, shall be lightly sanded as required to remove surface blemishes. Use sandpaper appropriate to the finish required.

3.5 MIXING MATERIALS

3.5.1 Agitate ready-mixed material, in original containers, in a vibratory-type paint mixer for a period of from three to ten minutes, then stir thoroughly and "box" for uniformity.

3.6 COATING

3.6.1 Apply coating materials to a uniform film thickness, showing no runs, sags, crawls, brush marks, overspray, or other defects.

3.6.2 Succeeding coats shall not be applied until preceding coat is thoroughly dry. Follow coating manufacturer's written instructions regarding time required for curing of materials between coats.

3.7 CLEAN-UP

3.7.1 At the completion of each day, remove all painting materials, containers, rags, cloths, brushes, or other equipment from the building.

3.7.2 After painting has been completed, make a detailed inspection of paint finish and carefully remove spatter from adjoining work, particularly from glass, plumbing fixtures, tiles, and trim.

3.8 PAINTING SYSTEMS

		Minimum Dry Film
3.8.1	Interior	
3.8.1.1	Gypsum drywall, acrylic latex	
	Primer - one coat latex	1.0 mils/coat
	Finish - two coats acrylic latex	1.4 mils/coat
3.8.1.2	Gypsum drywall, acrylic epoxy	
	Primer - one coat latex	1.0 mils/coat
	Finish - two coats acrylic epoxy	2.7 mils/coat
3.8.1.3	Ferrous metal, acrylic latex	
	Primer - one coat acrylic latex	2.0 mils/coat
	(touch-up primer for shop primed surfaces)	
	Finish - two coats acrylic latex	1.4 mils/coat
3.8.1.4	Concrete and CMU, acrylic latex	
	Primer - one coat latex	5.5 mils/coat
	Finish - two coats acrylic latex	1.4 mils/coat
3.8.1.5	Concrete and CMU, acrylic epoxy	
	Primer - one coat latex	1.0 mils/coat
	Finish - two coats acrylic epoxy	2.7 mils/coat
3.8.1.6	Wood - stain and finish	
	Finish - one coat stain	1.2 mils/coat
	Finish - two coats polyurethane finish	1.1 mils/coat
3.8.1.7	Safety Shower Area - acrylic latex	
	Primer - one coat latex	2.0 mils/coat
	Finish - two coats acrylic latex	1.4 mils/coat
3.8.1.8	Concrete floors, clear sealer	
	Finish - one coat at rate of 200 square feet per gallon	
3.8.2	Exterior	
3.8.2.1	Ferrous metal, acrylic latex	
	Primer - one coat acrylic latex	2.0 mils/coat
	Finish - two coats acrylic latex	1.3 mils/coat
3.8.2.2	Galvanized metal, acrylic latex	
	Primer - pretreatment and one coat acrylic latex	2.0 mils/coat
	Finish - two coats acrylic latex	1.3 mils/coat
3.8.2.3	Concrete masonry units	
	Sealer finish - 2 coats at the rate of 100 sq ft per gallon	

3.9 COLOR SCHEDULE: Colors selected from PPG Design-a-Color System.

3.9.1 Interior

3.9.1.1 Storage Cells, Packaging, and Sampling Area, Packaging/Material Handling Area: Walls and structural steel, No. 2541 Abbey; doors and frames, including door Nos. 8 and 22, No. 2751 Chromium Gray.

3.9.1.2 Corridor, Restroom/Locker Rooms, Office: Walls and ceiling, No. 2517 Abbey white; doors and frames, No. 3606 Cork.

3.9.1.3 Safety Shower Areas: Provide 4-inch wide diagonal stripes, alternating colors of safety green and porcelain white, at locations as follows:

Floor: 3 foot wide square directly below shower head and adjacent to walls.

Walls: 3 foot wide by 7 foot high directly behind and adjacent to the painted floor area.

3.9.1.4 Class I, Division I Area: Provide 4 inch wide diagonal stripes, alternating colors of safety green and porcelain white at floor location shown on Drawing H-6-1561.

3.9.1.5 Wood Cabinets: Stain, Butternut.

3.9.2 Exterior

3.9.2.1 Doors and Frames: No. 2751, Chromium Gray.

3.9.2.2 Gutters, Downspouts, Fascia, Miscellaneous Metals: No. 2751, Chromium Gray.

END OF SECTION

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SECTION 10160

METAL TOILET COMPARTMENTS

PART 1 - GENERAL

1.1 SUBMITTALS: Refer to Section 01300 for submittal procedures.

1.2 DELIVERY, STORAGE, AND PROTECTION: Deliver materials in their original sealed packages. Store and handle materials in a manner which will protect them from damage. Store above ground and protect against moisture and physical damage.

PART 2 - PRODUCTS

2.1 TOILET PARTITIONS:

2.1.1 Overhead-braced type, with baked enamel finish on galvanized-bonderized steel for partitions, pilasters, and doors. Color: ~~66 Apricot~~ 823-Buff Manufactured by ~~Sanymetal Products Co.~~ U. S. Gypsum Co.

2.1.2 Doors and Partitions: 1 inch thick, with honeycomb cores bonded to face panels.

2.1.3 Pilasters: 1-1/4 inch thick, assembled over a honeycomb core, equipped with integral adjustable floor anchors and leveling devices, covered with vandal-proof stainless steel shoes.

2.1.4 Hardware and Trim: Stainless steel or chromium-plated brass in accordance with the manufacturer's written instructions. Tamperproof screws. One combination coat hook and bumper on the inside of each door.

2.2 URINAL SCREENS: Flush wall-hung type, 30 inch x 42 inch x 1 inch thick, with porcelain enamel finish. Provide with manufacturer's standard fastening devices. Color: ~~66 Apricot~~ 823-Buff Manufactured by ~~Sanymetal Products Co.~~ U. S. Gypsum Co.

2.3 SHOWER: Showermaster shower stall, solid phenolic core, baked acrylic finish. Size 36 inches x 36 inches x 82 inches with precast terrazo receptor and curtain. Color: To match toilet partitions. Manufactured by Sanymetal Products Co.

PART 3 - EXECUTION

3.1 PREPARATION: Install blocking in cavity walls for attachment of partitions and screens.

3.2 INSTALLATION

3.2.1 Install partitions straight, level, and plumb as shown on the Drawings.

3.2.2 Install floor anchors and wall anchors to structure to provide rigid anchorage.

END OF SECTION

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SECTION 10440

SIGNS

PART 1 - GENERAL

1.1 SUBMITTALS: Refer to Section 01300 for submittal procedures.

PART 2 - PRODUCTS

2.1 SIGNAGE

2.1.1 Signage shall be as manufactured by Inland Pacific Architectural Signage Systems.

2.1.2 Lettered plaques shall be minimum .080 mil finish aluminum. Letters shall be pre-spaced, applied vinyl die-cut, adhered to front surface. Letter style shall be Helvetica Medium. Copy margins shall be 1 inch top and sides.

2.1.3 Graphic symbols shall be Type A6 and A7 (men and women symbols). Graphic process shall be Type A.

2.2 Provide the following signage at locations as follows:

2.2.1 Caution Explosion Relief Area: 6 inch high letters, mount at height of 6 feet above grade and centered on the controlled release wall system, one required.

2.2.2 Caution Explosion Relief Area: 3 inch high letters, center mount on door No. 13, two feet from top, one required. Copy to be multiple line arrangement.

2.2.3 214D: 3 inch high letters, mount at height 6 feet above grade and adjacent to door No. 8, one required.

2.2.4 A 6 inch by 6 inch graphic symbol shall be provided for the men's and women's restroom entry door.

2.2.5 Dispensing Area: 4 inch high letters, mount at height of 6 feet above floor on the inside surface of the controlled release wall system, centered in the Class I, Division 1 Area.

PART 3 - EXECUTION

3.1 Signage shall be surface mounted with appropriate fasteners as required for the specific conditions of use. Exterior fasteners shall provide weathertight condition.

END OF SECTION

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SECTION 10500

LOCKERS

PART 1 - GENERAL

1.1 SUBMITTALS: Refer to Section 01300 for submittal procedures.

1.2 DELIVERY, STORAGE, AND PROTECTION: Deliver materials in their original sealed packages. Store and handle materials in a manner which will protect them from damage. Store above ground and protect against moisture and physical damage.

PART 2 - PRODUCTS

2.1 METAL LOCKERS

2.1.1 Manufactured by the Interior Steel Equipment Co. ~~As manufactured by Lyon Metal Products.~~ DT #1

2.1.2 Single-tier locker 15 inches wide by 15 inches deep by 72 inches high.

2.1.3 Lockers to be furnished with continuous sloping tops.

2.1.4 Color to be ~~No. 7 Maize,~~ #53 Tan.

2.2 BENCHES

2.2.1 As manufactured by Lyon Metal Products.

2.2.2 Hardwood seat, 9-1/2 inches wide by 46 inches long by 1-1/4 inches thick, with manufacturer's standard clear finish.

2.2.3 Tubular steel pedestals, flanged for bolt attachment to the floor, finish to match lockers.

PART 3 - EXECUTION

3.1 INSTALLATION

3.1.1 Assemble and install all metal lockers and benches in accordance with the manufacturer's written instructions. Install lockers accurately aligned, flush, level, and plumb. Make all joints and fastenings tight.

3.1.2 Anchor lockers and benches securely to the floor, base, and wall.

3.1.3 Protect all finish until the completion of this project.

END OF SECTION

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SECTION 10670

STORAGE SHELVING

PART 1 - GENERAL

1.1 SUBMITTALS: Refer to Section 01300 for submittal procedures.

1.2 DELIVERY, STORAGE, AND PROTECTION: Deliver materials in their original sealed packages. Store and handle materials in a manner which will protect them from damage. Store above ground and protect against moisture and physical damage.

PART 2 - PRODUCTS

2.1 OPEN SHELVING: Modular open wire shelving, Postmaster series, as manufactured by Hodges, size 18 inches by 48 inches by 84 inches. All stainless steel construction with four shelves per unit. See Drawing for locations. Include side ledges, Part No. SPE 300-3 and back ledges, Part No. SPD 048-3 to the open shelving. OFC

2.2 STORAGE CABINET AND CLOSED SHELVING: Clip style steel shelving, ~~8000 Series as manufactured~~ by ~~Lyon Metal Products, Inc.~~ Penco Products. See Drawing for locations. DT #1C

2.2.1 Six shelf unit, capacity per shelf of 600 lbs minimum, with one-piece back and sides for each unit.

2.2.2 Finish to be manufacturer's standard grey color.

2.2.3 Storage cabinets: Size 18 inches deep by 36 inches wide by 84 inches high with swing doors, base strip, and built-in keylock.

2.2.4 Closed shelving: Size 12 inches deep by 36 inches wide by 84 inches high.

PART 3 - EXECUTION

3.1 INSTALLATION

3.1.1 Assemble and install all storage shelving in strict accordance with the manufacturer's written instructions. Install accurately aligned, flush, level, and plumb. Make all joints and fastenings tight.

3.2 PROTECTION

3.2.1 Protect all finish until completion of this project.

END OF SECTION

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SECTION 10800

TOILET ROOM ACCESSORIES

PART 1 - GENERAL

1.1 SUBMITTALS: Refer to Section 01300 for submittal procedures.

1.2 DELIVERY, STORAGE, AND PROTECTION: Deliver materials in their original sealed packages. Store and handle materials in a manner which will protect them from damage. Store above ground and protect against moisture and physical damage.

PART 2 - PRODUCTS

2.1 COMBINATION PAPER TOWEL DISPENSER AND WASTE RECEPTACLE: Parker No. 695-2, semi-recessed unit with 2 inch skirt. DT #1

2.2 TOILET PAPER HOLDER: ~~Parker No. 964 single holder,~~ Bobrick No. B-264 single roll toilet tissue holder

2.3 MIRROR: ~~Parker No. 54020~~ Bobrick No. B-294. Tilted mirror with shelf, #B-295 Mirror size 16" x ~~30"~~ 24".

2.4 SOAP DISPENSER: ~~Parker No. 30-L-SS, horizontal dispenser for liquid soap.~~ Bobrick B-12, liquid soap dispenser.

2.5 SANITARY NAPKIN DISPENSER: ~~Parker No. 6932A~~ Bobrick No. B-2802. Mechanism set for no coin operation. Surface mounted.

2.6 SANITARY NAPKIN RECEPTACLE: ~~Parker No. 6065~~ Bobrick No. B-271, surface mounted with shelf.

2.7 MOP AND BROOM HOLDER: ~~Parker No. 608x24~~ Bobrick No. B-223, with 3 holders.

2.8 GRAB BAR

a. ~~Parker No. 624-10-X2-36"~~ Barker No. B-490 exposed Type J imbedded plate.

b. ~~Parker No. 624-24-X2-52"~~ Barker No. B-4937 exposed partition mounting.

2.9 FASTENERS

2.9.1 All exposed fasteners to match finish of accessories.

2.9.2 Provide back-up plates for attachment of accessories to cavity walls.

PART 3 - EXECUTION

3.1 Install back-up plates for toilet accessories in all stud and furred walls.

3.2 Install all accessories securely with fasteners extending into the surrounding construction, back-up plates, or anchors.

3.3 Install accessories as shown on the Drawings and in accordance with the manufacturer's written instructions.

3.4 Install accessories in the following locations except where shown otherwise on the Drawings:

3.4.1 Combination Paper Towel Dispenser and Waste Receptacle: 1 in each toilet room.

3.4.2 Toilet Paper Holder: 1 in each water closet.

3.4.3 Mirror: 1 in each toilet room.

3.4.4 Soap Dispenser: 1 for each lavatory

3.4.5 Sanitary Napkin Dispenser: 1 in women's toilet room.

3.4.6 Sanitary Napkin Receptacle: 1 in women's toilet room.

3.4.7 Mop and Broom Holder: 1 in janitor's area.

3.5 Mount grab bars at 33 inches to center line.

END OF SECTION

SECTION 15300

FIRE PROTECTION

PART 1 - GENERAL

1.1 SUBMITTALS: Refer to Section 01300 for submittal procedures.

1.1.1 Approval Data: Submit the information listed in Column 5 of the Vendor Data List in this Section.

1.1.2 Certified Vendor Information (CVI): Submit information listed in Column 6 of the Vendor Data List in this Section.

1.1.3 Design/Fabrication Drawings: Submit Design, Fabrication, and Installation Drawings of the wet pipe sprinkler system. All hydraulic data points shall be shown on the Drawings. The complete fire sprinkler system design package, at the time of submittal for approval, shall be stamped by a professional fire protection engineer.

1.1.4 Calculation Data Sheets: Submit hydraulic calculations for each design area in an easy to read tabular format, meeting the requirements and recommendations of NFPA 13, including Appendix A.

1.1.5 As-Built Drawings: Submit As-built Drawings of the wet pipe sprinkler system.

1.1.6 NFPA Test Certificate: Complete a Contractor's Material and Test Certificate, in accordance with NFPA 13, Section 1-12.

1.2 WELDING DOCUMENTATION: The fabricator shall ensure that welders in his employ are properly qualified in accordance with AWS and/or ANSI requirements before performing shop or field welding on structural steel components which are a part of this section. Welder qualification test results shall be made available to the Government's Representative upon request. AWS and/or ANSI welding procedures proposed for the work of this Section shall be subject to review by the Government's Representative.

PART 2 - PRODUCTS

2.1 GENERAL

2.1.1 All components of the new wet pipe sprinkler system, if not designated in this Specification and the Contract Drawings by a manufacturer's name and model/figure number, shall be current products of the manufacturer and shall be UL listed or FM approved for the use intended.

2.1.2 The sprinkler system shall include a minimum 6 inch alarm check valve supplied with standard trim including a retard chamber, a fire department connection, flow alarm pressure switch, a system main drain valve, and water motor alarm gong.

2.2 PIPING

2.2.1 Pipe and fittings shall meet the requirements of NFPA 13. Piping shall be steel with threaded or grooved type (rubber gasketed) fittings. Rubber gasketed fittings for use with plain end pipe shall not be used.

2.2.2 Flexible Couplings: Bolted sleeve type for use with grooved-end pipe, with rubber rings for sealing.

2.3 FIRE DEPARTMENT CONNECTION: The Fire Department connection shall be brass finish and furnished with self-closing double clappers, plugs and chains, automatic balldrip valve, and escutcheon plate. The connection shall be a 4 inch IP x 2-1/2 inch HT x 2-1/2 inch HT. Hose threads shall be National Standard Fire Hose threads, 7-1/2 TPI.

2.4 WATER MOTOR ALARM GONG: Weatherproof mechanical gong with hood, complete with drain and interconnecting piping.

2.5 SWITCHES

2.5.1 The flow alarm pressure switch for installation on the sprinkler system retard chamber shall have pressure-actuated, normally-open contacts.

2.6 AUTOMATIC SPRINKLERS

2.6.1 Automatic sprinklers shall have nominal 1/2 inch diameter orifices and be rated for ordinary temperature classification, unless other temperature ratings are required by the sprinkler code.

2.7 SPRINKLER HEAD GUARDS: Formed wire or forged steel, suitable for use with upright or pendent sprinklers, and which can be attached or removed without disturbing the sprinkler head.

2.8 IDENTIFICATION LABELS AND SIGNS

2.8.1 Labels: Fire protection piping identification shall consist of a label approximately 2-1/4 inches by 14 inches bearing the words "FIRE PROTECTION WATER" and a direction arrow approximately 2-1/4 inches by 7 inches. Labels shall have adhesive backing.

2.8.2 Signs: Permanent type identification signs shall be installed at all control, drain, test, and alarm valves. The legend shall include the warning of Fire Department response to the operation of the valve.

2.9 SEALANT: Elastomeric sealant for pipe penetrations shall be a light-colored, polysulfide-base compound, meeting the requirements of FS TT-S-00230, Type II.

2.10 PAINTING MATERIALS: See Section 09900 of this Specification.

2.11 SPRINKLER CABINET: Provide a sprinkler cabinet with the required number of sprinkler heads of all ratings and types installed and a sprinkler wrench for each system and locate adjacent to the riser.

PART 3 - EXECUTION

3.1 INSTALLATION OF PROTECTION SYSTEMS

3.1.1 General

3.1.1.1 The detailed design of the fire sprinkler system shall be prepared under the supervision of a licensed professional fire protection engineer.

3.1.1.2 The personnel area will be designed for ordinary hazard, Group I requirements. Density shall be .14 gpm per square foot.

3.1.1.3 The packaging/sampling area and the loading area will be designed for ordinary hazard, Group 3 requirements. Density shall be .19 gpm per square foot.

3.1.1.4 The storage cells will be designed for extra hazard, Group 1 requirements. Density shall be .25 gpm per square foot except the flammable liquid storage areas shall be .30 gpm per square foot.

3.1.1.5 Outside hose requirements shall be as defined in NFPA 13, Table 2-2.1(B). Available water supply at the 609A Building fire hydrant is static of 79 psi, residual of 39 psi, and with 910 gpm flowing.

3.1.1.6 Install the wet pipe sprinkler system in accordance with NFPA 13 for the specified area classifications. Design areas for sprinkler operation shall be as defined by the 2-hour and 4-hour fire walls.

3.1.1.7 Supply the new sprinkler system from the new 8 inch underground main shown on Drawing No. H-6-1556.

3.1.1.8 Coordinate requirements for interruption of existing services and for Fire Department stand-by with the Government's Representative.

3.1.1.9 Protect new sprinkler system piping from damage by earthquake, by use of proper clearance around penetration holes, flexible couplings, and sway bracing, in accordance with NFPA 13, Sections 3-10.3 and A-3-10.3.

3.1.1.10 Pack all sprinkler pipe penetrations through concrete and partition walls with fiberglass or mineral wool packing and seal on both sides with*~~polysulfide sealant.~~ Install escutcheons on sides exposed to view. DFC

*a minimum of 1" of 3M brand fire barrier caulk CP 25.

3.1.1.11 Repair all damaged surfaces. Refinish repaired or defaced surfaces to match adjacent undisturbed areas.

3.1.1.12 Terminate exterior discharge, inspectors test, and auxiliary drain lines with 45° elbows, turned down.

3.1.1.13 Provide suitable concrete splash-pads, at exterior discharge locations, on other than paved surfaces.

3.1.1.14 Paint all new wet pipe sprinkler system piping exposed to view, with one coat of zinc chromate primer and one coat of semigloss enamel. Finish color shall be red (No. 21105) as shown in FED STD 595. Surface preparation, including cleaning and primer, shall be in accordance with the requirements specified in Section 09900.

3.1.2 Welding

3.1.2.1 Welding shall be limited to the fabrication of supports or braces, if necessary. No other welding on site will be allowed, except as specified in this Specification or the Design Drawings.

3.1.2.2 Perform all welding of piping and attachments to pressure retaining components in accordance with ANSI/ASME B31.1 and NFPA 13.

3.1.2.3 Perform all welding of steel structural elements in accordance with AWS D1.1.

3.1.2.4 Do not perform welding or flame cutting on or within the building without prior written approval of the Government's Representative.

3.1.2.5 Perform visual weld examination in accordance with the requirements of AWS D1.1, Paragraph 6.5.5, or ANSI/ASME B31.1, Paragraph 136.4.2 as applicable.

3.1.2.6 Perform Dye Penetrant weld examination on tie-in welds, which will not be hydrostatically tested, in accordance with ANSI/ASME B31.1, Paragraph 136.4.4.

3.1.2.7 & 3.1.2.8 SEE PAGE 15300 - 4a SC-1

3.1.3 Identification

3.1.3.1 Identify piping in accordance with the following:

a. Install labels after painting is completed.

b. Locate labels on the pipe where they can be read easily. Place labels on the bottom quadrant of overhead pipe and the top quadrant of pipe lower than eye level.

c. Identify only feed mains, cross mains, and risers 3 inch nominal diameter and larger.

d. Locate line identification at intervals of approximately 40 feet on unobstructed runs, and on each side of partitions and floors.

3.2 FLUSHING AND TESTING

3.2.1 Furnish all equipment and instruments required to perform the flushing and testing operations described below:

3.2.1.1 Conduct the flushing and testing operations while witnessed by the Government's Representative.

3.2.1.2 Remove and replace all pieces of apparatus, material, or work which fails in flushing or testing operations and retest.

3.2.1.3 Repair damage resulting from flushing or testing to the satisfaction of the Government's Representative.

3.1.2.7 Liquid penetrant examinations shall be performed in accordance with a procedure as required by Article 6, Section V, of the ASME Boiler and Pressure Code. The procedure shall be available at the job site for review at any time by the Government's Representative.

3.1.2.8 Personnel performing liquid penetrant examinations shall have been certified in accordance with the Contractor's written practive which shall meet the requirements of ASNI No. SNT-TC-1A.

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3.2.2 Flushing: Flush the new sprinkler system piping as described below:

3.2.2.1 Flush sprinkler piping by feeding water into the system through the alarm valve to provide velocity of not less than 7 feet per second in the piping being flushed.

3.2.2.2 Discharge flushing water from the end of the cross mains.

3.2.2.3 Discharge flushing water to a point designated by the Government's Representative. Flushing shall continue until the effluent runs clear and free of foreign matter.

3.2.2.4 Provide documented evidence that flushing has been accomplished in accordance with this Specification. Deliver to the Government's Representative before testing.

3.2.3 Hydrostatic Test

3.2.3.1 Hydrostatically test the new sprinkler system in accordance with NFPA 13, Section 1-11.2.

3.2.3.2 Use a hydrostatic test pressure of 200 psi.

3.2.3.3 Leaks in piping will not be acceptable.

9413294.0872

Project No. B-526

Title: Non-Radioactive Hazardous Chemical Waste Facility

KAISER ENGINEERS HANFORD

VENDOR DATA LIST

("X" Indicates Required Data)

1 EPN Identification	2 Description	3 Reference Drawing	4 Specification Paragraph	5 Approval/Data: Dimensional Drawings	Equipment Weights	Specifications	Material Description	Performance Data	Circuit or Control Diagrams	Data Sheets	Illustrative Cuts	Installation Instructions	6 Certified Vendor Information (CVI): Dimensional Drawings	Equipment Weights	Specifications	Certified Test Data	Circuit or Control Diagram	Instructions: Installation	Operation	Maintenance	Spare Parts List	7 Remarks
1	Alarm Check Valve		2.1.2								X		X							X	X	Including all trim
2	Water Motor Alarm Gong		2.4								X											
3	Fire Department Connection (FDC)		2.3								X											
4	Check Valve for FDC		2.1.2								X											
5	Flow Alarm Pressure Swtch		2.5								X	X										
6	Sprinkler Heads		2.6								X											
7	Flexible Couplings		2.2								X											

END OF SECTION

SECTION 15400

PLUMBING

PART 1 - GENERAL

1.1 SUBMITTALS: Refer to Section 01300 for submittal procedures.

1.1.1 Approval Data: Submit the information requested in Column 5 of the Vendor Data List in this Section.

1.1.2 Certified Vendor Information (CVI): Submit the information specified in Column 6 of the Vendor Data List in this Section.

1.1.3 Method for Disposal of Flushing Water: Prepare a method for disposal of flushing water used for testing.

1.2 QUALIFICATION OF WELDING PERSONNEL AND PROCEDURES

1.2.1 See Section 05120 for welding of structural steel.

PART 2 - PRODUCTS

2.1 GENERAL REQUIREMENTS

2.1.1 The equipment to be furnished under this Specification shall be new and the standard product of the manufacturer. Where two or more units of the same class of equipment are required, these units shall be products of a single manufacturer; however, the component parts of the system need not be the products of the same manufacturer unless otherwise specified. Size and capacity of the equipment and materials shall be as shown on the Contract Drawings, or as specified.

2.1.2 Equipment ratings and sizes are intended to establish minimum requirements for the equipment.

2.1.3 All fixtures shall be provided with isolation valves in addition to those provided as part of the fixture trim.

2.2 PLUMBING FIXTURES

2.2.1 Water Closets: Wall mounted vitreous china siphon jet elongated bowl, Kohler Co, "Kingston Water Guard" No. K-4430-ET, with No. K-4670-C white seat, Sloan 110-3 flush valve, and floor mounted adjustable supporting chair carrier.

2.2.2 Lavatories: Kohler Co, 20 inches by 18 inches "Greenwich" No. K-2032, drilled for concealed arm carrier. Furnish with K-7401 faucet, K-7606 angle supplies with stops, K-9000 "P" trap, and ~~floor~~ mounted fixture support with concealed arms. Smith fig. 417-D-Y DT #33

2.2.3 Urinal: Kohler Co, "Bardon Water-Guard" K-4980-T with Sloan 186 flush valve and wall hangers.

2.2.4 Service Sink: Kohler Co, "Sudbury" K-6650 with wall hangers, K-8905 faucet, K-8934 stainless steel rim guards, and K-6673 3 inch trap with strainer.

2.2.5 Electric Water Cooler: Wall mounted, air cooled, self contained refrigerated type with one piece basin and back-splash. Capacity shall be 8 gph of 50 F water from 80 F entering water and an ambient of 90 F. Unit wiring shall be suitable for 120 volt, single phase electric power. Unit shall be Elkay Manuf. Co., Model No. EHFS-8 for handicapped application. Color shall be grey beige.

2.2.6 Kitchen Sink: Kohler Co, "Mayfield" 24 inches x 21 inches No. K-5960 with K-11925 faucet, K-8801 strainer, K-9000 "P" trap, and K-6699 metal frame trim.

2.2.7 Lab Sink and Basin: See Drawing H-6-1554 for lab sink and basin. Equip lab sink with Duralab combination deck mount mixing faucet, 9 inch swing spout, aerator outlet, integral mounting shank, and crumb cup sink outlet basket strainer, 1-1/2 inch size.

2.2.8 Water Heater: A. O. Smith, Model KEN-52, 50 gallon capacity, 18.95 gph recovery with 4.5 kW at 100 F rise, 230 volt, single phase.

2.2.9 Water Heater: A. O. Smith, Model ELS-10, 10 gallon capacity, 6.15 gph recovery with 1.5 kW at 100 F rise, 120 volt, single phase.

2.2.10 Floor Drains: Zurn Model Z-455 with integral trap, floor level cleanout, and adjustable nickel bronze strainer, size 2 inch with 5 inch strainer.

2.2.11 Shock Absorbers: Zurn Model Z-1700, size 400. See Drawings for locations.

2.2.12 Backflow Preventer: Hersey Products Inc., "AERGAP" Model FRP-II, with air gap drain funnel. See Drawing for size and location.

2.2.13 Wall Hydrant: Nonfreeze type, Zurn Z-1315, 3/4 inch with loose key, 3/4 inch hose threads, with Watts Model No. 8A vacuum breaker.

2.2.14 Hose Bibb: McMaster-Carr, Model 4800K12, 3/4 inch male pipe thread inlet, 3/4 inch hose thread outlet with Watts Model No. 8A vacuum breaker.

2.2.15 Safety Shower/Eyewash: Bradley Model S1931 with self-closing shower and eyewash valves.

2.2.16 Shower: Shower stalls shall be equipped with brass drain, mixing valve, pressure balancing line valve, and shower head. See Section 10160 for shower stalls.

2.2.17 Air Gap: Zurn Model Z-1025, with female thread inlet and outlet. See Drawings for location and size.

2.3 PIPE AND FITTINGS: As specified in the Pipe Codes and detailed on the Drawings.

2.4 PIPE JOINING MATERIALS: Sealants for threaded piping joints shall be Teflon type tape, Scotch Brand Pipe Sealant Tape No. 547; Chemtrol Dri-Seal No. 5; or Crane Packing Co "Thread-Tape".

2.5 HANGERS AND SUPPORTS

2.5.1 Hilti HDI drop-in anchors, 3/8 inch bolt size.

2.5.2 Unistrut channels and clamps.

2.6 PIPE PENETRATION MATERIALS

2.6.1 Sealer for Floor Penetrations: WR Grace "Hornflex", Dap "Flexiseal", or PRC 5000, or GE Penetration RTV 7403. DT

2.6.2 Floor and Ceiling Plates: Chrome-plated, spring-loaded type.

2.7 PIPE INSULATION

2.7.1 Interior Sanitary Hot and Cold Water Piping: Johns-Manville Flame-Safe fiberglass insulation with average thermal conductivity not to exceed 0.22 BTU-In/Hr-F^2-F at a mean temperature of 75 F. Accessories, such as adhesives, mastics, cements, tapes, and cloth for fittings shall have the same component ratings as given above. Insulation thickness shall be 1/2 inch.

2.7.2 Jacketing: A laminate of white kraft and foil reinforced with glass and applied to the insulation at the factory. Jackets shall have a minimum 1-1/2 inch longitudinal sealing lap. Butt joints shall be sealed with a 3 inch wide strip of jacket material. Longitudinal jacket laps and butt strips shall be secured with an adhesive in accordance with the insulation manufacturer's written instructions.

2.7.3 Insulation for Fittings and Valves: Same type as used for pipe. Open-weave fiberglass tape or cloth shall be used where necessary to hold insulation in place and to fair-in fittings and valves.

PART 3 - EXECUTION

3.1 FABRICATION AND INSTALLATION OF PIPING

3.1.1 Fabricate and install piping in accordance with the UPC, the attached Pipe Codes, the Drawings, and this Specification.

3.1.2 Promptly report all conflicts in design locations of piping with ductwork, lighting fixtures, etc, to the Government's Representative.

3.1.3 Keep piping systems clean during all phases of work. Once fabrication has started on any length of pipe, keep the open ends of piping plugged or capped when installation is not in progress to prevent the entry of dirt and other foreign materials.

3.1.4 Remove burrs from mating threads in threaded piping before assembly. Ream pipe to the nominal inside diameter after cutting.

3.1.5 Seal floor and wall penetrations airtight and watertight with the sealing compound specified in this Section.

3.1.6 Install floor and ceiling plates at piping penetrations in building floors and at all piping penetrations in building walls, partitions, and ceilings.

3.2 CAST IRON SOIL PIPE

3.2.1 Lay cast iron soil pipe in accordance with the following:

3.2.1.1 Protect pipe against impact shocks and dropping. Immediately before laying, inspect the pipe and discard all damaged sections.

3.2.1.2 Start laying pipe in finished trenches at the lowest point of the run and progress upgrade with spigot ends pointed in the direction of flow. Support the full length of the pipe.

3.2.1.3 Carefully center all pipe joints so when the pipe is laid, a pipeline with a uniform invert is formed.

3.2.1.4 Firmly set pipe to resist deformation, according to line and grade, preparatory to making pipe joints.

3.2.2 Hubless soil pipe installation shall meet the requirements of IAPMO IS 6.

3.3 INSTALLATION OF PIPE HANGERS AND SUPPORTS

3.3.1 Except where shown otherwise on the Drawings, pipe supports and hangers shall be as follows:

3.3.1.1 Support vertical piping at least once each 12 feet of run.

3.3.1.2 Location of supports shall be the suggested maximum spacing in the UPC, with additional supports close to all concentrated loads such as valves and specialties.

3.3.1.3 Installation of drop-in anchors shall be in accordance with the manufacturer's written instructions. (Cutting of embedded steel is unacceptable.)

3.4 CLEANING

3.4.1 Flush piping with water, immediately before leak testing, until the effluent is clear and contains no visible particulate matter, but in no case for less than one minute.

3.4.2 Raw water may be used for flushing sanitary waste, vent, and drain lines. Use cold sanitary water for flushing hot and cold waterlines. Flush sanitary waterlines before disinfecting.

3.4.3 The flow for flushing shall be sufficient to produce a velocity of at least 5 feet per second with the pipe full.

3.4.4 Remove all water from lines immediately after flushing is completed.

3.4.5 Prepare the method for disposal of flushing water. Deliver to the Government's Representative for approval before flushing.

3.4.6 Provide documented evidence that flushing has been accomplished in accordance with this Specification. Deliver to the Government's Representative before leak/pressure testing.

3.5 HYDROSTATIC TESTING

3.5.1 Perform hydrostatic tests as designated in the applicable Pipe Codes (attached).

3.5.1.1 Furnish all instruments, facilities, and labor required to conduct the tests.

3.5.1.2 Perform testing in the presence of and to the satisfaction of the Government's Representative.

3.5.1.3 Complete testing before pipe insulation is applied to above ground lines and before backfilling is completed over lines to be buried or encased.

3.5.1.4 Verify that all air has been expelled from piping before applying the hydrostatic pressure.

3.5.1.5 Slowly raise pressure in section of piping undergoing test to the specified test pressure.

3.5.1.6 Carefully examine all piping, fittings, and joints during testing and check manual valves for proper operation. All leaks shall be repaired and the leaking section of piping retested.

3.5.1.7 Duration of leak tests shall be at least ten minutes with no leaks or drop in test pressure, and for such additional time as may be necessary to conduct the examination for leakage.

3.5.1.8 Install one temporary relief valve during leak testing of piping systems. The relief valve shall have a discharge capacity of at least 125% of the capacity of the pressurizing device and be set to operate at not more than 110% of the test pressure. Tag each relief valve used to show serial number, calibration date, and pressure setting.

3.5.1.9 Test hot and cold sanitary waterlines in accordance with the UPC.

3.5.1.10 Test soil and vent lines in accordance with the UPC.

3.5.1.11 Document leak/pressure testing of each piping system on "Leak/Pressure Test Certification" Form RL-F-6410.2 (sample appended) in accordance with the printed instructions. Forms will be furnished by the Government's Representative. Use one or more forms to describe and record each of the piping systems. Under "Description of Components" describe each piping system in enough detail to be readily correlated to Contract Drawings. For systems tested segmentally, indicate continuity in the "Description" to assure that the entire system has been tested.

3.5.1.12 Remove all water from lines immediately after testing is completed.

3.6 PIPE INSULATION

3.6.1 Method of application and finish shall be as specified unless modifications are approved by the Government's Representative.

3.6.2 Insulate sanitary hot and cold water piping. Unless specified otherwise, it shall include bends, fittings, flanges, and valves forming part of such piping, installed to the thickness for the piping in which they occur.

3.6.3 Insulation shall not be applied on piping until the systems have been leak tested and approved by the Government's Representative.

3.6.4 Insulation shall be of uniform thickness for each pipe size and piece of equipment and shall fit to the surface to which it is applied.

3.6.5 Apply molded pipe covering with end joints butted together. Remove all insulation that does not fit properly and replace.

3.6.6 All insulation shall be free of moisture at time of application.

3.6.7 Surfaces shall be clean and dry and free from moisture, oil, dirt, scale, loose rust, or other foreign material, before any layer of insulating material is applied.

3.6.8 Groove and score insulation where necessary to fit the contours of equipment.

3.6.9 Where pipe hangers are attached directly to the pipe by clamps, cover the clamps, removing part of the inside surface of the insulation, when necessary, to maintain the continuous unbroken outer surface of the pipe covering. Seal the insulation around the hanger clamp with finish cement.

3.6.10 Install insulation in a neat, uniform manner. Seal ends of insulation with insulation cement or with specially-prepared ends supplied with the insulation.

3.6.11 Insulation shall be continuous through wall and other openings and through pipe sleeves.

3.7 DISINFECTING

3.7.1 Following flushing and hydrostatic testing, disinfect all sanitary waterlines in accordance with AWWA C601.

3.7.2 Remove equipment parts subject to damage by the disinfecting solution before the operation, and disinfect before reinstallation.

3.8 PIPE IDENTIFICATION

3.8.1 Identify all piping as to service and direction of flow, in accordance with ANSI A13.1.

PIPE CODE P-1

Service:	Max Operating Pressure:	Max Operating Temperature:	Test Pressure:
Cold Sanitary Water (CSW)	60 psig	80 F	90 psig
Hot Sanitary Water (HSW)	60 psig	160 F	90 psig

Sizes	1/2" thru 2-1/2"
Pipe	Galvanized steel, seamless or welded, ASTM A 120
Wall Thickness	Standard weight
Fittings	Class 150 malleable iron, galvanized, threaded, in accordance with ANSI B16.3
Unions	Galvanized malleable iron, threaded, FS WW-U-531, Type B, Class 2
Valves Ball: Gate: Check:	 NIBCO T-590-W NIBCO T-124 NIBCO T-413-B
Cleaning	Flush with water in accordance with this Specification
Test	Hydrostatic in accordance with this Specification
Disinfect	Disinfect all sanitary waterlines in accordance with this Specification

PIPE CODE P-2

Service:	Max Operating Pressure:	Max Operating Temperature:	Test Pressure:
Sanitary Sewer (SNS)	Atmospheric	160 F	Per UPC
Sanitary Sewer Vent (V)	Atmospheric	160 F	

Size	Above Ground: 2" and Larger	Underground: All sizes
Pipe	Hubless cast iron sanitary system in accordance with CISPI 301	Service weight cast iron soil pipe in accordance with ASTM A 74
Joints	Sealing sleeve with shield and clamp assembly in accordance with CISPI 301	Hubless cast iron in accordance with the UPC, Section 802.
Fittings	Hubless cast iron in accordance with CISPI 301	Service weight cast iron soil fittings in accordance with ASTM A 74
Cleaning	Flush with water in accordance with this Specification.	
Test	In accordance with the UPC, Section 318, Par. 2, Water Test	

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Project No. B-526

Title: Non-Radioactive Hazardous Chemical Waste Facility

KAISER ENGINEERS HANFORD

VENDOR DATA LIST

("X" Indicates Required Data)

1	2	3	4	5 Approval/Data									6 Certified Vendor Information (CVI)									7
																		Instructions				
EPN Identification	Description	Reference Drawing	Specification Paragraph	Dimensional Drawings	Equipment Weights	Specifications	Material Description	Performance Data	Circuit or Control Diagrams	Data Sheets	Illustrative Cuts	Installation Instructions	Dimensional Drawings	Equipment Weights	Specifications	Certified Test Data	Circuit or Control Diagram	Installation	Operation	Maintenance	Spare Parts List	Remarks
1	Backflow Preventer		2.2.12					X				X								X		

LEAK/PRESSURE TEST CERTIFICATION

Project No.	Work Order No./Shop Order No.	Report No.	Code or Standard

Class	Year	Addenda	Stamp ☐ Yes ☐ No	Const. Spec.	Rev.	Test Procedure Title & No.	Rev.

Description of Component(s)

CONTRACTOR PRE-TEST CHECK LIST

Customer Representative Notified

Date _____ Time _____

Safety Representative Notified

Date _____ Time _____

Item	Acceptance	Exception	Item	Acceptance	Exception
Flushing of component to be tested completed.			All lines not required for test disconnected or isolated.		
Vents, openings, and relief valve discharge checked.			All test equipment checked for tightness.		
Test medium per requirements. Medium _____			Test medium temp. equalized. Temp. _____ (ASME Section III, VIII only)		

Test set up in accordance with above referenced procedure. If exception, explain:

Test gauge correct range and currently calibrated.

Serial No. _____ Range _____ Calib. Due Date _____

Pressure relief valve properly set and currently calibrated.

Serial No. _____ PSI Setting _____ Calib. Date _____

Areas to be inspected chalked prior to pressurization. If exception, explain;

Soap solution applied to all areas examined while component was pressurized.

No Leakage Found _____ Leaks Found and Repaired _____

Specified test pressure obtained.

Pressure Specified _____ Hold Time Specified _____ Test Press. Obtained _____ A.M. P.M.

CONTRACTOR REPRESENTATIVE ➤ Date

INSPECTION VERIFICATION

Actual test pressure during inspection _____

Specified hold time verified at _____ A.M. P.M.

All joints and welded attachments to pressure retaining components chalked/soaped as applicable. ☐ Yes ☐ No*

All joints and welded attachments to pressure retaining components visually inspected for leakage. ☐ Yes ☐ No*

Pressure test: ☐ Accepted ☐ Rejected*

* Basis of Rejection and/or Comment:

CUSTOMER REPRESENTATIVE ➤ Date

WITNESS - ASME AUTHORIZED INSPECTOR ➤ Date

INSTRUCTIONS

1. THE FABRICATION OR CONSTRUCTION CONTRACTOR IS RESPONSIBLE TO FILL IN THE UPPER PORTION OF THE LEAK/PRESSURE TEST CERTIFICATION, INCLUDING THE CONTRACTOR PRE-TEST CHECK LIST SECTION. PORTIONS OR BLOCKS NOT APPLICABLE SHALL BE NA'd.

2. THE CONTRACTOR SHALL PRESENT THE LEAK/PRESSURE TEST CERTIFICATION TO THE CUSTOMER'S REPRESENTATIVE AT THE TIME OF TESTING.

3. THE CUSTOMER'S REPRESENTATIVE SHALL COMPLETE THE INSPECTION VERIFICATION SECTION OF THE LEAK/PRESSURE TEST CERTIFICATION AT THE TIME OF TESTING, AND THE RESULTS OF THE TEST WILL BE SO INDICATED. (THE ASME AUTHORIZED INSPECTOR SIGNATURE BLOCK WILL BE NA'd AS APPROPRIATE BY THE CUSTOMER'S REPRESENTATIVE.)

4. THE CUSTOMER'S REPRESENTATIVE WILL PROVIDE A COPY OF THE LEAK/PRESSURE TEST CERTIFICATION TO THE CONTRACTOR UPON COMPLETION OF THE TEST. THE ORIGINAL WILL BE RETAINED BY THE CUSTOMER FOR PERMANENT RECORD.

END OF SECTION

SECTION 15500

HEATING, VENTILATING, AND AIR CONDITIONING

PART 1 - GENERAL

1.1 SUBMITTALS: Refer to Section 01300 for submittal procedures.

1.1.1 Certified Vendor Information (CVI): Submit the information specified in Column 6 of the Vendor Data List in this Section.

1.1.2 Test and Balance Procedure: Submit the forms and a procedure for testing and balancing the air distribution system.

1.1.3 Test and Balance Data: Submit documentation of test and balance data, dated and signed by the Contractor executing said test.

1.2 QUALIFICATION OF WELDING PERSONNEL AND PROCEDURES

1.2.1 See Section 05120 for welding of structural steel.

1.2.2 Personnel and procedures for welding sheet metal shall have been qualified in accordance with AWS D9.1 before welding. Qualification in accordance with ASME Section IX may be substituted for this requirement.

PART 2 - PRODUCTS

2.1 GENERAL REQUIREMENTS

2.1.1 Standard Products: Equipment shall be new and essentially the standard product of the manufacturer. Where two or more units of the same class of equipment are required, these units shall be products of a single manufacturer. The component parts of the system, however, need not be the product of the same manufacturer unless otherwise specified.

2.2 HEAT PUMP SYSTEMS

2.2.1 The heat pump shall be furnished with demand activated electric heat package, emergency heat control, compressor short cycle control, economizer, and indoor thermostat package. The heat pump wiring shall be compatible with a 208 volt, single phase, power supply. Electric heat package wiring shall be compatible with a 208 volt, 3 phase, power supply. Color shall match building trim.

2.2.2 The heat pump shall be Carrier Corp. Model 50YQ030, with Stiles Corp. Model DPPC-5054YQ curb, PPM-5036YQ plenum and platform, and 5-504-8Q economizer with pkg No. 3WR controls (all components including the transformer shall be mounted in the unit). Cooling capacity shall be 28,600 BTUH at ARI 240 Standard conditions. Heat pump shall be supplied with 7.5 kW supplemental heat.

2.2.3 Provide low voltage adjustable thermostat to provide night and weekend setback, automatic or manual changeover from cooling to heating, controls first stage of electric resistance heating, and allows for continuous or cycling indoor fan operation.

2.3 HEAT RECOVERY/EVAPORATIVE COOLING UNIT: The packaged unit shall be completely factory assembled, wired, tested, and shipped in one piece. Unit shall be suitable for outdoor operation with weatherproof construction.

2.3.1 Design and Construction Features

2.3.1.1 Structural and Frame - the base shall be constructed from a minimum 12-gauge, 8-inch deep, formed steel channel having welded construction. The frame shall have welded cross-members to support all major components, prevent bending or deforming, maintain weathertight integrity, and ensure proper equipment alignment. Prior to having the final paint coating applied, the welded steel frame shall be completely coated with chromate-oxide primer. Lugs, for lifting the unit, shall be an integral part of the structural frame.

2.3.1.2 Floor to be continuously welded 14-gauge aluminized steel. Coated steel or materials other than specified will not be accepted. There shall be no penetrations through the floor except for air duct openings and utility openings, which shall have 2-inch high continuously welded collars around entire peripheries. The floor shall be welded to the base frame. The manufacturer shall leak-test the floor at the factory and certify that it will be watertight and leakproof for a period of 5 years from the date of shipment. Thermal insulation having a thickness of 2 inches shall be firmly affixed under the entire floor in a manner such that no floor panels will be visible from below. Insulation will be held in place by adhesives and welded and capped stud pins.

2.3.1.3 The cabinet's outer casing shall be constructed for outdoor use with watertight, 16-gauge galvanized steel throughout to house all components. Cabinets shall be coated with 100% acrylic latex, corrosion and weather-resistant paint meeting FED STD 141b and ASTM E 84 as minimum. Color shall match building trim. The entire cabinet shall be thermally insulated with a minimum of 1 inch thick, 1-1/2 pound density insulation. The thermal insulation shall be fastened to the outer casing by adhesives. All roof and side wall seams shall be positively sealed and capped to prevent water and air leakage. All screws and fasteners penetrating the outer casing shall be gasketed and sealed to prevent leakage. All access doors shall be full double-wall construction, thermally insulated and gasketed to prevent water and air leakage. Access doors shall be swing-out type hinged for ease of access and with positive sealing latches. All openings and access doors shall have rain gutter or full weather hoods with bird screen.

2.3.2 Indirect Cooler Section shall be the air-to-air heat exchanger having a minimum of 500 square feet of surface area per 1000 cfm of supply air. The heat exchanger shall be made of .006 inch thick 1100 alloy aluminum with the surface exposed to water being fully epoxy coated to

protect against corrosion. The heat exchanger shall not be constructed from plastics or treated paper.

2.3.2.1 The indirect cooler shall be furnished with water distribution headers, solenoid valves, drain, overflow, and other components necessary for operation as specified.

2.3.3 Supply fan shall be heavy duty backwardly inclined DWDI centrifugal type with pillow block regreaseable ball bearings, mounted on a spring isolated welded structural steel base. The 2-speed motor shall be mounted on the structural base by means of an adjustable cast steel motor rail-type mounting. The drive shall be adjustable pitch and rated at 150% of the motor horsepower.

2.3.4 Exhaust fan shall be non-sparking, heavy-duty, backwardly-inclined, SWSI centrifugal type with pillow block regreaseable ball bearings, mounted on a spring isolated welded structural steel base. The 2-speed motor shall be mounted on the structural steel base by means of an adjustable cast steel motor rail-type mounting. The drive shall be adjustable pitch and rated at 150% of the motor horsepower.

2.3.5 Connections between the blowers and any stationary member shall be by means of flexible duct connectors.

2.3.6 Standard filters shall be 2 inch thick FARR 30/30 throwaway.

2.3.7 Traversing defrost plate shall be a motor driven plate on a drive screw which is approximately 8 inches wide. The plate blocks the supply air from leaving the core, thereby allowing the hot exhaust air to keep its side of the core free from frost. This control will allow maximum heat recovery during the winter cycle.

2.3.8 Face and by-pass dampers shall be of opposed blade design with a factory mounted modulating damper motor.

2.3.9 Electric heating coils shall be of the open resistive type with all factory mounted controls including, but not limited to: airflow switch, auto reset thermal cutouts, manual reset thermal cutouts, circuit fuses, control transformer, step controller, unit mounted thermostat, and disconnect. Provide a minimum of three stages of electric heat.

2.3.10 Roof curb shall be galvanized, reinforced, heavy gauge, section with 2-inch insulation and wood nailing strip for securing flashing. Curb shall be 12 inches high and provide uniform and level support.

2.3.11 Service outlet shall be supplied by the manufacturer to allow 120 volt service.

2.3.12 Electrical equipment panel shall be a NEMA 12 control panel provided as an integral part of the unit and be provided with hinged access door, an integral NEMA 4 lockable fused-disconnect switch, 2-speed motor starters, and 200 volt-amp, 480/120 volt control transformer.

2.3.13 Controls shall be factory mounted, wired, and tested. Controls shall consist of but not be limited to: heating, discharge modulating thermostat, cooling modulating thermostat, traversing defrost plate thermostat, traversing defrost plate drive motor, indirect evaporative cooling water solenoid valves, summer/winter auto change over thermostat. Provide a remote panel with on/off switch for both exhaust fan and supply fan and manual override on motor speeds.

2.3.14 The packaged heat recovery/evaporative cooling unit shall be ~~Des~~ *~~Champs Laboratories, Inc. Model PKS-8.~~ Unit wiring shall be compatible with a 480 volt, 3 phase, power supply. Control wiring shall be 120 volt, single phase, power supply. DT #33

*York-Shipley, Inc. Model HRC-80.

PERFORMANCE SCHEDULE

Heat Recovery/Evaporative Cooling Unit	Winter Data	Summer Data
CFM	6500	8000
Aux Heat	75 kW	--
Btuh Recovered	258,000	203,000
Btuh Required	500,000	200,000
HP Supply Fan*	5	5
E.S.P. Available	1.5"	1.5"
Wheel Size	20" BI-DWDI	20" BI-DWDI
HP Exhaust Fan*	5	5
E.S.P. Available	1.5"	1.5"
Wheel Size	27" BI-SWSI	27" BI-SWSI
GPH Water	--	60
OA Temperature	9 F db	99 F db
IA Temperature	65 F db	75 F db

*2-speed motor, 1800/1200 rpm

2.4 RESTROOM EXHAUST FANS: Restroom exhaust fans shall be Nutone Model QT-110 with 885 weather louver wall cap. Unit wiring shall be 120 volt, 1 phase.

2.5 EXHAUST FAN

2.5.1 Exhaust fan shall be Kewaunee No. 5-3301-B2, 510 cfm at 3/4 inches S.P. Equipment fan with weather cover, vibration isolators, fan inlet adapter No. 5-3424-00, and vertical exhaust duct stackhead and transition section No. 5-3400-00.

2.6 DUCT

2.6.1 HVAC Duct

2.6.1.1 Galvanized steel sheet meeting the requirements of ASTM A 527, G90 coating.

2.6.2 HVAC Duct Reinforcement

2.6.2.1 Carbon steel shapes meeting the requirements of ASTM A 36 galvanized in accordance with ASTM A 123.

2.6.3 HVAC Duct Supports and Hangers

2.6.3.1 Unistrut channels and clamps.

2.6.3.2 Carbon steel shapes meeting the requirements of ASTM A 36.

2.6.3.3 Carbon steel rods meeting the requirements of ASTM A 108 with ASTM A 563 nuts and plain washers.

2.6.3.4 Hilti HD1 drop-in anchors, 3/8 inch bolt size.

2.6.4 Fasteners: ASTM A 307, Grade A or B bolts, with heavy hex nuts meeting the requirements of ASTM A 563, UNC threads, bolt head marking not required. Finish to be cadmium plating or electro-galvanizing.

2.6.5 Rivets: Marsen "Klik-Fast" blind pop rivets.

2.6.6 Fabric: Ventfabrics Inc. "Ventglas", 30 ounces per square yard, (finished weight), glass cloth double-coated with neoprene.

2.7 DUCT ACCESSORIES

2.7.1 General Requirements: Duct accessories that are the standard products of a manufacturer may be acceptable, subject to the approval of the Government's Representative. Duct accessories shall be of the same material as the duct.

2.7.2 Turning vanes are required in all rectangular section square elbows. Vanes shall be double thickness, tubular blades tapered to a fine edge. Blades shall be assembled with, and equally spaced on, side runners for installation in elbows with bolts or rivets.

2.7.3 Zinc-Rich Coating: Galvicon MZP metallic zinc paint or ZRC zinc rich coating.

2.8 DUCT INSULATION

2.8.1 Duct insulation and ~~sealant~~ adhesive shall be listed in UL Building Materials Directory and shall carry the UL mark. Insulation and adhesive shall have a UL fire hazard classification for flame spread of not more than 25 and for smoke developed of not more than 50. ADD 1

2.8.2 Thermal insulation for the exterior surfaces of concealed supply and return duct shall be 1½ inch thick, *~~Johns-Manville Flexible 800 Series,~~ DT #[illegible] spin-glass fiberglass insulation, 1.6 pcf density, with FSK facing.

*Owens-Corning Faced Duct Wrap Series ED-75,

2.8.3 Thermal insulation for the exterior surfaces of exposed supply duct shall be 1-inch thick, Johns-Manville Rigid 800 Series, spin-glass fiberglass, 6.0 pcf density, with FSKL facing.

2.8.4 ~~Sealant~~ Adhesive for the insulation shall be in accordance with the written instructions of the insulation manufacturer. ADD-

2.9 SUPPLY DIFFUSERS

2.9.1 Office/Restroom Area: Tuttle and Bailey Type DA, with modular panels for installation in suspended (office only) and opposed blade dampers, WI finish. See Drawing for sizes.

2.9.2 Packaging and Sampling Area: Tuttle and Bailey Type M, with opposed blade dampers, WI finish. See Drawing for sizes.

2.10 SUPPLY GRILLES: Tuttle and Bailey Series T55 with integral opposed blade dampers, WE finish. See Drawing for sizes.

2.11 RETURN AIR GRILLES: Tuttle and Bailey Series NT-CT, White No. 8-377 finish. See Drawing for sizes.

2.12 RETURN AIR REGISTERS: Tuttle and Bailey Series CR500 with opposed blade dampers, RL finish. See Drawing for sizes.

2.13 FIRE DAMPERS

2.13.1 Ruskin Model IBD23, Style A, UL listed, 3 hour rating, with 165 F fusible link. See Drawing for size and location.

2.13.2 Ruskin Model IBD2, Style A, UL listed, 1-1/2 hour rating, with 165 F fusible link. See Drawing for size and location.

PART 3 - EXECUTION

3.1 EQUIPMENT INSTALLATION

3.1.1 Install equipment where shown on the Drawings in accordance with the manufacturer's written instructions.

3.1.2 Install fire dampers in accordance with the Drawings and UL 555. Provide access panels adjacent to fire dampers, fusible link side, for inspection.

3.2 DUCT FABRICATION

3.2.1 Fabricate heating and cooling duct in accordance with SMACNA Low Pressure Duct Construction Standards.

3.2.2 Provide companion angle flanges at duct-to-equipment joints unless otherwise noted. Gasket material shall be neoprene.

3.2.3 Install turning vanes, meeting the requirements of Paragraph 2.7.2, in rectangular section square elbows.

3.2.4 Air Test Connections: Install permanent connections for pitot tube traverse and static pressure readings where necessary to perform the testing and balancing specified in SMACNA Testing, Balancing, and Adjusting Publication, Chapter 17. Pitot tube connections shall consist of a 1 inch drilled hole in the duct, capped with a 1 inch plugged coupling brazed in place. Where it is not possible to read static pressure with a pitot tube, static pressure connections shall be installed and shall consist of a 1/16 inch drilled hole in the duct, capped with a 1/8 inch plugged coupling brazed in place. Inner surface of duct shall be smooth and flush. Arrange the test connections as shown in SMACNA Testing, Balancing, and Adjusting Publication, Chapter 17.

3.2.5 Touch up damaged zinc with zinc-rich coating.

3.2.6 Visual examination and acceptance criteria shall meet the requirements of AWS D9.1 SC-1

3.3 DUCT INSTALLATION

3.3.1 Attach hangers and supports rigidly to the primary structure of the building, equipment, and duct. Furnish and install secondary steel structures where required to support the duct or equipment. Installation of drop-in anchors shall be in accordance with the manufacturer's written instructions. (Cutting of embedded steel is unacceptable.) Hanger spacing shall be in accordance with SMACNA Low Pressure Duct Construction Standards.

3.4 DUCT CLEANING

3.4.1 Provide cleaning equipment, scaffolding, materials, and labor necessary to clean the ductwork.

3.4.2 Remove debris from the inside of the new duct and plenums. Then vacuum to remove small particles of foreign matter.

3.4.3 Duct removed for cleaning or damaged shall be replaced.

3.4.4 Install filters after debris has been removed.

3.5 DUCT INSULATION

3.5.1 Surfaces which are to receive insulation shall be clean, free of moisture, oil, dirt, scale, rust, and other foreign material.

3.5.2 Insulation and finish materials shall be thoroughly dry when applied.

3.5.3 Score or groove the insulation to fit the contours of the duct. Fill and seal scores, grooves, joints, and penetrations with insulating cement.

3.5.4 Install thermal insulation meeting the requirements of Article 2.8 on the exterior surfaces of interior duct.

3.5.5 Insulation shall be attached to metal surface with 100% coverage coat of insulation cement and held in place with adhered clips and washers. Fasteners shall be spaced not more than 12 inches on centers.

3.6 AUTOMATIC CONTROL SYSTEMS

3.6.1 Installation of Instruments and Wiring

3.6.1.1 Install instruments in accordance with the manufacturer's written instructions.

3.6.1.2 Install wiring in accordance with NFPA 70 (NEC).

3.6.1.3 Install low voltage wiring in conduit. Installation of the conduit is specified in Section 16400.

3.6.1.4 Instruments and controls located outside the building shall be provided with a weatherproof enclosure.

3.7 TESTING AND BALANCING HVAC SYSTEMS

3.7.1 General

3.7.1.1 After the system is completely installed and the duct has been cleaned, place exhaust and recirculating fans in operation in accordance with the manufacturer's written instructions. After the fans have been in operation for at least four hours, test and balance the heating, ventilating, and air conditioning systems in accordance with Chapter 17, SMACNA Testing, Balancing, and Adjusting Publication, and under the surveillance of the Government's Representative.

3.7.1.2 Furnish the instruments, materials, and labor required to perform the testing and balancing of the systems. Instruments shall have been calibrated by an approved testing laboratory with the date of calibration marked thereon.

3.7.1.3 Do not use instruments which are a part of the system for testing and balancing. Check the instruments of the system against the test instruments.

3.7.1.4 Check calibration of controls; recalibrate in accordance with the manufacturer's written instructions if required.

3.7.2 Data to be Recorded

3.7.2.1 After the test has been performed, submit the Test and Balance Data Report in accordance with Paragraph 1.1.3. Test data shall be tabulated and submitted with a flow sheet indicating the points of measurement. Include the characteristics of the systems that were observed during the tests. Include any failure of the system and control components to meet the operational functions required by the Drawings and this Specification.

9413294.0893

Project No. B-526

Title Non-Radioactive Hazardous Chemical Waste Facility

KAISER ENGINEERS HANFORD

VENDOR DATA LIST

("X" Indicates Required Data)

1 EPN Identification	2 Description	3 Reference Drawing	4 Specification Paragraph	5 Approval/Data: Dimensional Drawings	Equipment Weights	Specifications	Material Description	Performance Data	Circuit or Control Diagrams	Data Sheets	Illustrative Cuts	Installation Instructions	6 Certified Vendor Information (CVI): Dimensional Drawings	Equipment Weights	Specifications	Certified Test Data	Circuit or Control Diagram	Instructions: Installation	Operation	Maintenance	Spare Parts List	7 Remarks
1	Heat Pump		2.2										X	X	X			X	X	X	X	
2	Heat Recovery/ Evaporative Cooling Unit		2.3										X	X	X		X	X	X	X	X	

END OF SECTION

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SECTION 16300

HIGH VOLTAGE DISTRIBUTION
(Above 600-Volt)

PART 1 - GENERAL

1.1 SUBMITTALS: Refer to Section 01300 for submittal procedures.

1.1.1 Approval Data: Submit the information listed in Column 5 of the Vendor Data List in this Section.

1.1.2 Certified Vendor Information (CVI): Submit the information specified in Column 6 of the Vendor Data List in this Section.

PART 2 - PRODUCTS

2.1 STANDARDS FOR MATERIALS

2.1.1 The listing of particular equipment or material in this Specification shall not be construed as being all of the materials and equipment required to complete the job and place it in satisfactory operating condition.

2.1.2 Materials and equipment shall be listed for the intended service by Underwriters Laboratories, Inc. (UL) in the Electrical Appliance and Utilization Equipment Directory or Electrical Construction Materials Directory or other qualified testing laboratory and shall bear the mark of the testing laboratory. In the absence of a mark, submit a certification of applicable listing. Listing and marking by UL or other qualified electrical testing laboratory is not required for material and equipment that is specified by the manufacturer's part number on the Contract Drawings or in this Specification.

2.2 TRANSFORMERS, OUTDOOR DISTRIBUTION: Outdoor distribution transformers shall be single-phase, pole mounted, and be of the kVa ratings and voltages shown on the Drawings. Transformers shall be manufactured and tested in compliance with ANSI C57.1200 and C57.1220, with a minimum impedance of 6.5 percent and a basic impulse level (BIL) of 95. Transformers shall have manufacturer's standard high-voltage taps and bushings that will accept compression-type terminals. Mounting brackets and hardware shall be supplied. Transformers shall be certified to be PCB free.

2.3 FUSED CUTOUTS: 15 kV, 100 amp rating, ~~Joslyn Cat.~~ Westinghouse Type LVBB, No. J9254-2J, with 15E fuses. DT #39

2.4 LIGHTNING ARRESTERS

2.4.1 Lightning arresters shall be the distribution valve type rated 15 kV, 95 BIL, for use on a 13.8 kV grounded-neutral system, and meet the requirements of IEEE Std 28. The porcelain bodies shall be wet porcelain, free of defects, and have a uniform color glaze. Galvanized cap and base

hardware shall have bolted clamps for both line and ground connections. Mounting bolts shall be galvanized.

2.5 AERIAL LINE CONDUCTORS: 13.8 kV aerial line conductors shall be bare, ACSR, hard drawn, EC grade aluminum wire with standard coated steel core, aluminum/steel = 6/1, size as shown on the Drawings.

2.6 SOLDERLESS CONNECTORS AND TERMINALS: Pressure type, solderless connectors, and terminal lugs shall be rated for use with copper or aluminum conductors and listed by UL.

2.7 POWER POLES: Power poles shall be ~~40~~ 45 feet in length, Class 2, and meet the requirements of ANSI O5.1 and be western red cedar cut from live timber. Poles shall be butt-treated in accordance with AWPA C7, using preservatives meeting the requirements of AWPA C7 and P1. Each pole shall be given a single top cut at an angle of 30 degrees with the normal to the axis of the pole and at right angles to the sweep. Gains shall be cut so the roof will be at right angles to the line and so that the sweep of the pole will be in line. Roofs and gains shall be brush-treated with preservatives meeting the requirements of the AWPA P1. Each gain shall fit the crossarm tightly. Bolt holes shall not be more than 1/16-inch oversize. ADD-

2.8 ARMOR RODS: Provide armor rods at each pin insulator support on tangent poles. The armor rods shall be ~~copperweld,~~ aluminum alloy, preformed type, made by Preformed Line Products Company. The rod diameter and length shall be in accordance with the written instructions of the aerial line conductor manufacturer.

2.9 TIE WIRES: Tie wires shall be No. 4 ~~soft drawn copper,~~ EC grade annealed aluminum. The length and installation method shall be in accordance with the written instructions of the line conductor manufacturer.

PART 3 - EXECUTION

3.1 GENERAL REQUIREMENTS

3.1.1 Interpretation of Drawings and Specification: The Drawings show the general layout of the complete electrical system including the arrangement of service equipment and conductors. Verify the scale dimensions on the Drawings since actual locations, distances, and levels shall be governed by actual field conditions. Perform all work in accordance with NFPA 70 (NEC) and ANSI C2.

3.1.2 Installation Instructions: Install all equipment and materials as shown on the Drawings and as specified. The term "equipment" is defined as all components of a wiring system including conductors, poles, crossarms, etc.

3.1.3 Use the appropriate special tools when installing devices for which special installation tools are recommended by the manufacturer.

3.2 HANDLING AND UNLOADING POLE LINE MATERIALS

3.2.1 Handle poles, conductors, fittings, insulators, and miscellaneous hardware with care at all times to prevent damage to the material. Unload pole line materials carefully from truck and do not drop.

3.2.2 Do not use construction hooks, tongs, or other sharp tools on the treated portion of poles. Do not drag poles.

3.2.3 If poles are to be stored for longer than two weeks, they shall be stacked carefully upon supports at least 1 foot above ground. Strength and spacing of supports and manner of stacking shall be such that no noticeable distortion will be produced in poles so stored.

3.2.4 Locate material stored at the construction site to prevent damage from weather and adjacent construction operations.

3.3 SETTING OF POLES

3.3.1 Excavate holes large enough to admit a tamping bar all around the pole at the butt. Do not use explosives to excavate pole holes.

3.3.2 Set pole 6'-0" deep. Use backfill materials which can be solidly compacted by hand tamping in 6 inch lifts. Compact surplus earth around the pole in a cone one foot high above grade. Add additional backfill where the backfill has settled, and tamp before completion of the work.

3.3.3 Set poles plumb and in line, except that the corners and other strain points which are guyed shall have butts displaced to keep tops in line where feasible. At such locations, the rake against the strain shall be approximately 3 inches for each 10 feet of height.

3.4 CROSSARM INSTALLATION

3.4.1 Mount crossarms at right angles to the axis of the poles. Bolts shall be of sufficient length for full thread engagement of the nut, but not protrude through poles or arms in excess of 2 inches. Bolt ends shall not be cut off. Use square washers with each thru-bolt and double-arming bolt to protect the pole and crossarms.

3.5 INSTALLATION OF GUYS AND ANCHORS

3.5.1 Install anchors to bear against undisturbed earth. Tamp backfill around anchors thoroughly, the entire depth of the hole.

3.5.2 Set anchor rods in earth in line with the strand and install with top of rod at least 6 inches above grade.

3.6 INSTALLING INSULATORS: Tighten pin insulators on the pin threads and adjust the top groove so that it is parallel with the line. Secure hold nuts with locknuts.

3.7 INSTALLING AERIAL CONDUCTORS

3.7.1 String conductors from rotating reels and do not drag along the ground nor permit conductors to lie where they may be run over by vehicles. Pull conductors through stringing sheaves or stringing blocks hung on messenger cable but do not pull around sharp corners. Inspect conductors as they leave the reels and cut out any weak or damaged sections and splice the ends. Do not make splices in adjacent spans, dead end spans, or within 4 feet of a support. Install conductors to the proper stringing tensions in accordance with the manufacturer's written instructions.

3.7.2 Do not use self-gripping or automatic tension splicing sleeves. Make taps between primary wires, jumpers, etc. with mechanical connectors.

3.7.3 Install hot line stirrups on all existing conductors where new feeder taps are made.

3.7.4 Sag conductors in accordance with ANSI C2 for medium loading districts and the manufacturer's written instructions.

3.8 AERIAL EQUIPMENT GROUNDING: Ground lightning arresters in accordance with the Drawings. Bond together any pole line hardware that is separated by less than 2 inches.

3.9 TESTING

3.9.1 Test electrical equipment and wiring installed under this Specification before any attempt is made to operate the equipment. Resistance, current, and voltage measurements may be made as work progresses. Maintain a systematic record by using a schedule or chart of all tests and measurements. Provide space to record readings, dates, and witnesses. Notify the Government's Representative before start of all required tests. Correct all items found, during testing or examination by the Government's Representative, to be at variance with the Drawings and this Specification. Deliver testing reports to the Government's Representative weekly as completed.

3.9.2 Furnish all instruments, labor, and equipment required to conduct the testing.

3.9.3 Use test instruments which bear a valid calibration stamp showing the date of calibration and expiration date of the stamp. The calibration and accuracy of test instruments shall be certified by an independent testing laboratory having laboratory standards traceable to the National Bureau of Standards.

3.9.4 In addition to the testing specified to be performed by the Contractor, the installation will be subject to examination by the Government's Representative for conformance with the design and all applicable codes. Assist the Government's Representative as requested.

9413294.0898

Project No. B-526

Title: Non-Radioactive Hazardous Chemical Waste Facility

KAISER ENGINEERS HANFORD

VENDOR DATA LIST

("X" Indicates Required Data)

1 EPN Identification	2 Description	3 Reference Drawing	4 Specification Paragraph	5 Approval/Data: Dimensional Drawings	Equipment Weights	Specifications	Material Description	Performance Data	Circuit or Control Diagrams	Data Sheets	Illustrative Cuts	Installation Instructions	6 Certified Vendor Information (CVI): Dimensional Drawings	Equipment Weights	Specifications	Certified Test Data	Circuit or Control Diagram	Instructions: Installation	Operation	Maintenance	Spare Parts List	7 Remarks
1	Transformer		2.2		X	X	X					X	X		X		X					PCB Certification

END OF SECTION

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SECTION 16400

SERVICE AND DISTRIBUTION
(600-Volt and Below)

PART 1 - GENERAL

1.1 SUBMITTALS: Refer to Section 01300 for submittal procedures.

1.1.1 Approval Data: Submit the information listed in Column 5 of the Vendor Data List in this Section.

1.1.2 Certified Vendor Information (CVI): Submit the information specified in Column 6 of the Vendor Data List in this Section.

PART 2 - PRODUCTS

2.1 STANDARDS FOR MATERIALS

2.1.1 The listing of particular equipment or material in this Specification shall not be construed as being all of the materials and equipment required to complete the job and place it in satisfactory operating condition.

2.1.2 Materials and equipment shall be listed for the intended service by Underwriters Laboratories, Inc. (UL) in the Electrical Appliance and Utilization Equipment Directory or Electrical Construction Materials Directory or other qualified testing laboratory and shall bear the mark of the testing laboratory. In the absence of a mark, submit a certification of applicable listing. Listing and marking by UL or other qualified electrical testing laboratory is not required for material and equipment that is specified by the manufacturer's part number on the Contract Drawings or in this Specification.

2.1.3 Electrical equipment enclosures shall meet the requirements of NEMA ICS 6-110 and be Type 1 for indoor locations and Type 3R for outdoor locations.

2.2 METERING CABINET ASSEMBLY: The metering cabinet assembly shall consist of current transformers, potential transformers, a test switch, and a kilowatthour demand meter in a weatherproof enclosure per Sketch ES-526-FP01, at the end of this Section.

2.3 PANELBOARDS

2.3.1 Panelboards shall be rated as shown on the Drawings and meet the requirements of FS W-P-115, Type I, Class 1.

2.3.2 Panelboard door locks shall be keyed alike with two keys provided for each panelboard.

2.3.3 Incoming feeders shall terminate with approved connectors defined in Paragraph 2.6. Provide multiple lugs for multiple feeder conductors.

2.3.4 Circuit breakers shall be the bolt-on type with thermal magnetic trips. The number and rating of circuit breakers shall be as shown on the Drawings. Circuit breakers marked "Spare" on the Panelboard Schedules shall be furnished in sizes designated. Circuit breaker positions marked "Space" shall be bussed for future breakers and provided with removable single-pole fillers.

2.3.5 Permanently number circuits. Plastic or steel buttons secured by means of rivets or grommets are acceptable. Circuit number tabs shall not be attached to, or be a part of, the circuit breaker.

2.3.6 Furnish panelboards with a printed directory containing the panelboard designation and power source. Each circuit function and location shall be typewritten on the directory.

2.3.7 Panelboard enclosures shall have a nameplate (see Paragraph 2.16), engraved with the panelboard designation shown on the Drawings. Fasten the nameplate to the outside of the panel door.

2.3.8 Furnish and install locking devices on circuit breaker handles as shown on the Panelboard Schedules.

2.4 TRANSFORMERS, GENERAL PURPOSE: General purpose transformers shall be dry type, 60 Hz, of the kVA rating shown on the Drawings. Transformers shall have two 2-1/2% taps above and two 2-1/2% taps below the normal rated primary voltage. The insulation system shall be rated 185 C with a 115 C winding temperature rise above ambient. Transformers shall be outdoor floor mounting and meet the requirements of NEMA ST 20. Provide an enclosure suitable for outdoor installation.

2.5 SAFETY SWITCHES: Safety switches shall meet the requirements of NEMA KS 1 and be heavy duty type HD, horsepower rated for 600 volt ac and be fusible. Fuses where required shall be the cartridge type, be single element, UL Class K5 and meet the requirements of ANSI C97.1.

2.6 SOLDERLESS CONNECTORS AND TERMINALS - 600 VOLTS AND LESS: Pressure type, solderless connectors and terminal lugs shall be rated for use with copper or aluminum conductors, and used in installations not exceeding 600 volts between conductors. Connectors with insulating caps or covers shall be rated for the system utilization voltage. Connectors shall be of types specified below:

2.6.1 For conductors #8 AWG and smaller:

2.6.1.1 Ideal Industries, Inc. - Wire-Nuts.

2.6.1.2 Thomas and Betts Company - Sta-Kon.

2.6.1.3 3M Company - Scotchlok.

2.6.2 For conductors #6 AWG and larger:

2.6.2.1 Burndy Engineering Company - Screw Pressure Connectors or Hypress.

2.6.2.2 Thomas and Betts Company - Lock-tite.

2.7 GROUNDING EQUIPMENT

2.7.1 Rebar Ground Grid: The ground grid shall consist of lengths of the foundation rebar, exothermically welded at each lap to form an electrically continuous loop around the building perimeter.

2.7.2 Grounding Electrodes: 5/8 inch stranded galvanized steel cables.

2.7.3 Grounding Plate: Erico Products Inc. Catalog No. S-330.

2.7.4 Exothermic Welds: Cadweld by Erico Products Inc. Type of Cadweld to match application.

2.8 LIGHTING FIXTURES

2.8.1 Lighting fixtures shall have all parts and fittings necessary to install the fixtures in accordance with the manufacturer's written instructions. Fixtures shall be wired from outlet to socket with #16 AWG minimum conductors having a temperature rating of 150 C minimum.

2.8.2 Fixtures of each type described in this Specification shall be of one manufacturer and of identical finish and appearance.

2.8.3 Fluorescent fixture ballasts shall be high power factor type and operate at 120 volts. Ballasts shall be suited for fixture temperature environment and be provided with an automatic resetting thermal protector. Ballasts shall meet the requirements of ANSI C82.1.

2.8.4 The lighting fixtures shall be as follows:

2.8.4.1 Type A: One-foot by four-foot, 2-lamp, rapid start, fluorescent fixture for flush mounting in suspended T-bar ceiling. Fixture shall have acrylic prismatic lens. Benjamin "Atlas" Catalog No. AGR-2224-4. Furnish with two F40CW lamps.

2.8.4.2 Type B: Four-foot, two-lamp, rapid start, surface-mounted, protected fluorescent fixture suitable for wet or corrosive locations. Housing constructed of ABS thermoplastic baked enamel steel with gasketed latching high-impact acrylic lens. Benjamin "Stream-Flo" Catalog No. FA-2424-4R. Furnish with two F40CW lamps.

2.8.4.3 Type C: Industrial fluorescent fixture; 8-foot, 2-lamp, rapid start, with porcelain enamel steel reflector Benjamin "Lite-Line" Catalog No. FL-1021-8U. Furnish with two cool white lamps.

2.8.4.4 Type F: Four-foot, two-lamp, rapid start, surface-mounted, fluorescent fixture with acrylic prismatic, wrap-around lens. Benjamin "Calumet" Catalog No. CD-2224-4. Furnish with two F40CW lamps.

2.8.4.5 Type G: 150-watt incandescent fixture with green globe and guard for pendant mounting, Crouse-Hinds Catalog No. VDA15GP with G55 globe and 60 watt "rough service" lamp.

2.8.4.6 Type H: 18 watt, low pressure, sodium fixture for exterior wall mounting. Bronze polycarbonate enclosure with clear gasketed lens. North American Philips Lighting Corporation Catalog No. LPS-18, 120 volt with photocell.

2.8.4.7 Type K: Same as Type H except 35 watt. Philips Catalog No. LPS-35.

2.8.4.8 Type L: 100 watt incandescent with recessed-mounted enclosure and round baked-white trim with Alba-Lite glass diffuser. Thomas Catalog No. R1 enclosure, R200-W trim and 100 watt R40 lamp.

2.8.4.9 Exit Lights: 120 volt unit with 8 inch high, 3/4 inch slash, green letters on white phosphorescent background to provide 1-1/2 hours of visibility after power failure. Fixtures shall be McPhilben, No. 40W-8K1GY suitable for surface wall mounting. Fixtures shall be provided with two 25-watt A19 incandescent lamps, single circuit.

2.8.4.10 Emergency Lights: Fully automatic, solid-state, with two sealed beam lamps, high-low rate charger and 6 volt sealed lead batteries, 120 volt ac. Cabinet shall be standard bronze hammertone. Provide a metal mounting bracket for wall mounting. ~~Dual-Lite Company No. AS-1608C.~~ Chloride Technology Series TMFRE. DT #11

2.9 RECEPTACLES: Duplex receptacles shall be specification grade, rated 15 amp, 120 volt, 3 wire, grounding type, meeting the requirements of NEMA WD 1 Designation 5-15R and have screw terminals arranged for side wiring. Self-grounding receptacles may be used instead of the ground requirements specified. Receptacles located in office, corridor, and restrooms shall be ivory in color. All other receptacles shall be brown in color.

2.9.1 Explosionproof Receptacle: 20 amp, 125 volt, 3 pole, 2 wire receptacle suitable for Class 1, Division 1, Groups C, D. Crouse-Hinds Type CPS. Also furnish one Crouse-Hinds Type CPP plug with each Type CPS receptacle.

2.9.2 Clock Receptacle: 15 amp, 120 volt, 3 wire, recessed receptacle. Arrow-Hart Catalog No. 5707.

2.10 TOGGLE SWITCHES: Toggle switches shall be specification grade, rated 20 amps, 277 volts, with conventional handles and with screw terminals arranged for side wiring. Switches shall meet the requirements of FS W-S-896. Toggle switches located in office or restrooms shall be ivory in color. All other toggle switches shall be brown in color. Toggle switches shall be single-pole or three-way as indicated on the Drawing.

2.11 MANUAL MOTOR STARTING SWITCHES: Manual motor starting switches shall be 2-pole, toggle-operated, rated for a maximum of 10 hp at 480 volts, with handle lock-off and pilot light. Manual motor starting switches shall be Square D Co. Class 2510, Type KG-1A. Furnish nameplate as specified herein, engraved with legend as shown on the Drawings.

2.12 PLATES: Furnish and install plates for every wiring and control device. Finish shall be galvanized pressed steel for surface-mounted devices and ivory plastic for flush-mounted devices.

2.13 RACEWAYS, FITTINGS, AND BOXES

2.13.1 Conduit shall meet the requirements of the appropriate standard as follows:

2.13.1.1	Rigid Steel	ANSI C80.1
2.13.1.2	Intermediate Metal	UL 1242
2.13.1.3	Electrical Metallic Tubing (EMT)	UL 797
2.13.1.4	PVC (Schedule 40)	FS W-C-1094, Type II
2.13.1.5	Flexible Metal	FS WW-C-566
2.13.1.6	Rigid Aluminum and Fittings	FS WW-C-00540

2.13.2 PVC coating on rigid steel conduit shall be factory applied, and meet the requirements of NEMA RN 1, Type A-40.

2.13.3 Conduit fittings for rigid steel and EMT shall meet the requirements of NEMA FB 1. Only compression-type, threadless fittings shall be used with EMT.

2.13.4 Fittings used with flexible metal conduit shall meet the requirements of FS W-F-406 and be squeeze type only. Flexible metal conduit shall have an integral ground conductor.

2.13.5 Use "Myers" type watertight fittings or sealing lock nuts as manufactured by Midwest Electric Manufacturing Corp., for conduit entries into the sides or tops of NEMA Type 3 or NEMA Type 3R enclosures.

2.13.6 Interior lighting fixture outlet boxes shall be 4 inch octagonal pressed steel.

2.13.7 Exterior lighting fixture outlet boxes shall be cast with threaded hubs.

2.13.8 Telephone outlet boxes shall be 4 inches square x 2-1/8 inches deep with cover plate for single device.

2.14 CONDUCTORS

2.14.1 Conductors shall be copper and the type and AWG size specified or shown on the Drawings. Aluminum conductors may be substituted for copper in size #6 AWG and larger if conductors of equal or greater ampacity are used. The Contractor shall be responsible for verifying and increasing raceway sizes as required if this option is exercised.

2.14.2 Aerial Power Cable: Low voltage aerial power cable shall consist of three, 600 volt aluminum conductors with cross-link polyethylene insulation, spiraled around an ACSR messenger. Conductors shall be sized as shown on the Drawings.

2.14.3 Speaker Cable: Two-conductor, 16 gauge, stranded copper.

2.14.4 Conductors shall meet the requirements of Table E1.

TABLE E1
SINGLE CONDUCTORS

Three-Phase Circuits	Single-Phase Circuits	COLOR Notes 1 & 2	CODE TYPE	STRANDING
A Phase	Hot No. 2	Red or Marked Red	THHN, XHHW	#10 AWG and smaller may be solid unless otherwise specified. #8 AWG and larger shall be stranded.
B Phase	--	Yellow or Orange or Marked Yellow		
C Phase	Hot No. 1 (Black only)	Blue or Black		
Neutrals		White or grey only. #6 & smaller - or marked white larger than #6	THHN, XHHW	
Equipment grounding conductors		Green	THHN, XHHW	All sizes shall be stranded. Bare annealed copper wire may be used in place of insulated wire in sizes #1 to #4/0 AWG.

NOTES

1. Wire with green color insulation shall be used for equipment grounding conductor only, and it shall not be otherwise marked or used for any other purpose. Equipment grounding conductors shall be stranded (sizes 12 to 2 - 7 strands, sizes 1 to 4/0 - 19 strands).

2. Colored plastic tape may be used to mark wire. The tape marking band shall be a minimum of two inches in width. Wires shall be identified at each outlet and junction box.

2.15 CONTACTORS: Contactors for manually re-energizing lighting and receptacles in flammable storage room after loss of power shall be electrically held and suitable for ballast and resistance loads. Contactors shall be two-pole, 20 ampere rated, with NEMA 1 enclosure and 120 volt coils. "ON" and "OFF" pushbuttons shall be installed in the enclosure cover. Contactors shall be Square D Co., Class 8903, Type LG-20, Form A12.

2.16 NAMEPLATES: Nameplates shall be 1/16 inch thick, black satin finish, laminated plastic with white core and letters sized to meet legend requirements. Engraved manufacturer's standard nameplates may be used if of equal quality and legibility. Attach nameplates with screws or rivets only.

2.17 ANCHORS: Concrete anchors and masonry anchors shall be Hilti, drop-in, HDI, size 1/4 inch or 5/16 inch.

2.18 WIRE PULLING COMPOUND: Wire pulling compound shall be "Y-er Eas" as manufactured by Electro Compound Company or as specified by the cable manufacturer.

2.19 TAPE

2.19.1 Plastic insulating tape shall be Scotch No. 33+ as manufactured by 3M Company.

2.19.2 Conduit protection tape shall be Scotchrap No. 50 as manufactured by 3M Company.

2.20 INSULATING PUTTY: "Scotch-Fill" as manufactured by 3M Company; GE No. 8389 as manufactured by General Electric Co.; or "Airseal" as manufactured by the Kearney Company.

2.21 TELEPHONE BACKBOARD: 4' by 4' by 3/4" exterior-grade A-C plywood painted with one coat of primer and two coats of white semigloss enamel.

2.22 DUCT SEALING COMPOUND: Duct sealing compound shall be "Duct-seal" as manufactured by Porcelain Products Co. or "Kerite" as manufactured by the Kerite Co.

2.23 CONDUIT HANGERS: Conduit hangers for individual conduits shall be factory-made, springable wrought steel clamps or malleable iron, split and hinged rings. For suspended conduit, clamps or rings shall be bolted to, or interlocked with a threaded suspension rod.

2.24 SEALING COMPOUND: Sealing compound for conduit wall penetrations shall be polysulfide meeting the requirements of FS TT-S-00230, Type II, Class B.

2.25 CONDUIT SEALS: Crouse-Hinds, Type EYS complete with Crouse-Hinds Type X fiber and Type A sealing compound.

2.26 PUBLIC ADDRESS SYSTEM

2.26.1 The public address (PA) system shall be a complete functioning system of compatible components including the following:

2.26.1.1 PA amplifier: 60 watt, solid-state unit designed for desk mounting. Output shall contain less than 1 percent total harmonic distortion and be within 2 dB at a frequency range of 40 Hz to 15 kHz. The amplifier shall have two microphone inputs with volume controls, base, treble, and master volume controls. Amplifier shall be Rauland "Precedence" Model PR 1506.

2.26.1.2 Microphone: Dynamic, omnidirectional desk microphone with push-to-talk switch and 7 foot cable. Microphone shall be high impedance (40 kHz) and be Rauland Model 1295.

2.26.1.3 Corridor and restroom speakers: 8 inch cone speaker with 8 ohm, 10 watt peak voice coil. Speaker shall be Rauland Type 908-8 with T240, 25/70 volt line matching transformer and Type 4908-8 surface wall baffle.

2.26.1.4 Cell area and outdoor speakers: Wide-angle paging horn with 30 watt driver, selectable impedance and 25/70 volt line matching transformer. Horn shall be suitable for indoor or outdoor use and shall be Rauland Type 3703.

2.26.1.5 Speaker terminal box: 2-1/8" x 4" x 2" deep box with flush ivory plate and 2-pole shielded phono jack. Also provide preassembled jumper cable consisting of 5 feet of 2-conductor, 16 gauge, shielded copper cable, phono plug to match jack specified above and spade terminals to connect to amplifier.

2.27 EVACUATION ALARM SYSTEM

2.27.1 Siren: Motor driven, 120 volt, 110 decibels at 10 feet. Benjamin Catalog No. KM-8199-115.

2.27.2 Enclosure: NEMA 1 flush mounted enclosure with hinged cover. 12" x 12" x 4" deep. Provide nameplate engraved: "EVACUATION ALARM PANEL."

2.27.3 Wailing Timer: Solid-state, repeat cycle timer 120 volt, 10 amp normally open and normally closed contacts. Adjustable timing range 0.3-30 seconds. Square D Co., Class 9050, Type FSR-2.

2.27.4 Relay: 240 volt, 10 amp rated, general purpose DPDT relay Square D Co., Class 8501, Type C015 with 120 volt coil.

2.27.5 Selector Switch: Three-position, maintained-contact, Square D Co., Class 9001, Type KS-438H2. Provide Type KN-399 legend plate engraved: "STEADY-OFF-WAIL."

PART 3 - EXECUTION

3.1 GENERAL REQUIREMENTS

3.1.1 Interpretation of Drawings and Specification: The Drawings show the general layout of the complete electrical system. Verify the scale dimensions on the Drawings since actual locations, distances, and levels shall be governed by actual field conditions. Perform all work in accordance with NFPA 70 (NEC).

3.1.2 Installation Instruction: The term "equipment" is defined as all components of a wiring system. Fasten equipment securely to the structural members of the building, to metal supports attached to the structure, or to concrete surfaces. Fasten equipment to concrete or masonry with expansion anchors. Attachment to drywall shall be by screws into studs and to metal wall panels by weld studs, bolts, or self-tapping metal screws. Locate equipment, boxes, and conduit approximately where shown in relation to equipment served. Do not install conduit raceways and boxes in positions that interfere with the work of other trades. Identify safety switches and panelboards with designation or load served as shown on the Drawings. Attach the nameplates, previously specified, on the component.

3.2 INSTALLING GROUNDING SYSTEM

3.2.1 Rebar Ground Grid: Weld rebar loop per Paragraph 2.7.1. Install cable grounding electrodes where shown on the Drawings. Attach to rebar loop using exothermic welds.

3.2.2 Static Grounding: Ground the steel columns to grounding electrodes using exothermic welds.

3.2.3 Ground Plate: Install ground plate flush with floor slab directly below fire alarm panel. Attach ground plate to grounding electrode using exothermic weld.

3.2.4 Equipment Grounding Connections: Ground the equipment to the grounding electrodes using compression-type terminals.

3.2.5 System and Equipment Grounding: Solidly ground the neutral conductor of three-wire, single phase and four-wire, three phase, wye-connected distribution systems at the transformer neutral bushings only.

3.3 INSTALLING CONDUIT

3.3.1 General

3.3.1.1 Use rigid steel or intermediate metal conduit where subject to mechanical damage, where installed in concrete floors and walls, where installed exposed to the weather, or where installed 4 feet or less above

any floor. Electrical metallic tubing may be used elsewhere, when connecting electrical equipment 2 feet or less apart, and when entering the top of electrical equipment 4 feet minimum above the floor.

3.3.1.2 Install concealed conduits as directly as possible and with bend radii as long as possible. Install exposed conduit parallel with or at right angles to the building lines. Where conditions permit, maintain continuous exposed horizontal conduit runs along walls at a minimum height of 9 feet above floor level or grade.

3.3.1.3 Make elbows, offsets, and bends uniform and symmetrical. Bend conduit with approved bending devices. Install conduit without moisture traps wherever possible. Where practicable, provide drain holes in pull-boxes or fittings at low points in conduit systems and remove burrs from drilled holes. Use one-hole, conduit clamps equipped with clampbacks to secure conduits.

3.3.1.4 Use conduit hangers with 3/8 inch rods for 2 inch conduit and smaller and conduit hangers with 1/2 inch rods for 2-1/2 inch conduit and larger. If conduit is suspended on rods more than 2 feet long, brace conduit rigidly to prevent horizontal motion or swaying.

3.3.2 Hazardous Locations

3.3.2.1 Perform all electrical work in hazardous locations as indicated on the Drawings, in accordance with NEC Article 501.

3.3.2.2 Where possible avoid installing couplings, boxes, and fittings within the hazardous area and within 12 inches beyond the boundary defined on the Drawings.

3.3.2.3 Conduit seals where required shall be installed in accordance with Paragraphs 501-5(a) and (c) of the NEC.

3.3.3 Conduit Below Floor or Below Grade

3.3.3.1 For conduit installed below the grade or below the floor slab, encase conduit in concrete a minimum of 3 inches on all sides or use PVC-coated, rigid, galvanized steel. Install PVC-coated conduit in accordance with the conduit manufacturer's written instructions. Repair all PVC coating, damaged during handling or installation, using PVC paint according to the conduit manufacturer's written instructions.

3.3.3.2 Set up joints in all conduit installed in concrete, underground or exposed to weather, with a high temperature, antiseize, conductive thread lubricant and sealing compound.

3.3.3.3 Install exposed conduit stubbing up through the floor slab so that it is straight and plumb. Install conduit at sufficient depth below slab to eliminate any part of the bend above top of slab. Wrap all conduit stub-ups with conduit protection tape from a point 2 inches below top of slab to

approximately 6 inches above slab. Remove tape down to top of slab after slab has cured. Verify all conduit stub-up locations with final equipment arrangements.

3.3.4 Attachment to Equipment

3.3.4.1 Use galvanized steel lock nuts and bushings for attachment to enclosures except threaded hubs may be used where permitted by the NEC. Threadless fittings will not be permitted for rigid conduit. Use Erickson-type couplings where required. Do not use running threads.

3.3.4.2 Cut conduit square, ream and remove burrs. Conduit shall be clean, dry, and free of debris. Immediately after installation, plug or cap all exposed conduit ends with standard conduit accessories until wires are pulled.

3.3.4.3 Use flexible conduit to make connections to motors and other equipment subject to vibration. Use liquid-tight, flexible metal conduit where the conduit and fittings are to be installed outdoors or where exposed to moisture or chemical fumes indoors. Flexible conduit may be used in lengths not exceeding 4 feet for other equipment, with approval of the Government's Representative.

3.3.5 Exterior Wall Penetrations

3.3.5.1 Seal opening around conduit at exterior wall penetrations and at penetrations of walls which form boundaries between adjoining ventilation zones, using the sealing compound described herein. Make the seal waterproof and finish the sealing compound flush with the surrounding wall surface.

3.3.5.2 Seal interior of conduits by applying duct sealing compound in the conduit at the box or enclosure nearest the penetration on both sides of the wall.

3.3.6 Seal and protect conduit stubs installed for future extensions with pipe caps. Double wrap the closed end with insulating tape for the last 6 inches.

3.3.7 Install a #14 gauge galvanized iron pull wire or a 1/8 inch polyethylene rope in conduit installed and left empty for future use and all telephone conduits.

3.4 INSTALLING BOXES, ENCLOSURES, AND WIRING DEVICES

3.4.1 Install boxes firmly secured in position and plumb.

3.4.2 Install an extension ring with blank cover on all flush-mounted junction boxes where the junction box serves permanently installed equipment.

3.4.3 Flush mount junction boxes served by concealed conduit unless otherwise noted.

3.4.4 Install dust covers on boxes until wires are pulled and permanent covers or devices are installed.

3.5 INSTALLING CONDUCTORS

3.5.1 Paint or pressure-sensitive colored tape may be used for color coding conductors instead of colored insulation on #8 AWG and larger wire only. Maintain phase color coding for all branch and feeder circuits up to and including equipment connections.

3.5.2 Use lubricant recommended by the cable manufacturer's written instructions, or the wire pulling compound specified, to decrease friction when pulling wire and cable through conduit. Do not exceed maximum pulling tension according to the cable manufacturer's written instructions.

3.5.3 Do not install or handle wires with thermoplastic insulation or jacket when the ambient temperature is 15 F or below.

3.6 SPLICES, TAPS, AND CABLE TERMINATIONS

3.6.1 Make splices and taps in building wire with solderless connectors described in Paragraph 2.6. Use solderless connectors in accordance with the manufacturer's written instructions.

3.6.2 Use plastic insulating tape for all uninsulated splices and taps on circuits up to 600 volts. Apply the insulating tape to a thickness at least equal to that of conductor insulation. Where a bolted splice or connection presents an irregular surface, apply insulating putty to the joints before taping.

3.6.3 Use crimp-on type spade lugs for wire terminations of stranded conductors to binder screw or stud type terminals. Spade lugs shall have upset legs and insulation sleeves sized for the conductors.

3.7 INSTALLING LIGHTING FIXTURES

3.7.1 Mount suspended lighting fixtures securely on rods attached to building structural members or to framing channels attached to structural members. Use a fixture stud if the lighting fixture is hung from the outlet box.

3.7.2 Fixtures installed in, or surface-mounted below, the suspended "tee" ceiling shall be supported by hanger wires fastened to the building structure. Provide and install the hanger wires necessary to meet this requirement. Support 4 foot fixtures at each end with #9 gauge (minimum) galvanized hanger wires.

3.8 INSTALLING MOTOR - OPERATED EQUIPMENT: Wire motor-operated equipment in accordance with the Drawings, this Specification, and the manufacturer's written instructions. Install wiring to devices which do not appear on the Construction Drawings but which are included in the installation shown on the Manufacturer's Drawings.

3.9 TESTING

3.9.1 General

3.9.1.1 Test electrical equipment and wiring installed under this Specification before any attempt is made to operate the equipment. Resistance, current, and voltage measurements may be made as work progresses. Maintain a systematic record by using a schedule or chart of all tests and measurements. Provide space to record readings, dates, and witnesses. Notify the Government's Representative before the start of all required tests. Correct all items found, during testing or examination by the Government's Representative, to be at variance with the Drawings and this Specification. Deliver testing reports to the Government's Representative weekly as completed.

3.9.1.2 Furnish all instruments, labor, and equipment required to conduct testing.

3.9.1.3 Use test instruments which bear a valid calibration stamp showing the date of calibration and expiration date of the stamp. The calibration and accuracy of test instruments shall be certified by an independent testing laboratory having laboratory standards traceable to the National Bureau of Standards.

3.9.1.4 In addition to the testing specified to be performed by the Contractor, the installation will be subject to examination by the Government's Representative for conformance with the design and all applicable codes. Assist the Government's Representative as requested.

3.9.2 Motors

3.9.2.1 Check motors for correct rotation.

3.9.2.2 Measure and record voltage, current, and speed under normal operating loads.

3.9.3 Wiring Systems

3.9.3.1 Test all power conductors that are rated at 600 volts and are used for services, feeders, or branch circuits over 150 volts to ground phase-to-ground with a megger. The minimum acceptable value of insulation resistance shall be 200 megohms. The megger manufacturer's instruction pamphlet, furnished with the megger, shall provide instructions for conducting the tests. Temporarily disconnect all devices not capable of withstanding the voltage or current of the megger test (such as indicating instruments, relays, and lamps) before the test is made. The dc voltage output of the megger shall be 1000 (nominal).

3.9.3.2 The Contractor may elect to group and connect together all conductors within a raceway while performing the megger test. Record all readings which indicate less than the minimum acceptable value. Repeat megger test after replacement of defective wiring.

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Project No. B-526

Title: Non-Radioactive Hazardous Chemical Waste Facility

KAISER ENGINEERS HANFORD

VENDOR DATA LIST

("X" Indicates Required Data)

1 EPN Identification	2 Description	3 Reference Drawing	4 Specification Paragraph	5 Approval/Data: Dimensional Drawings	Equipment Weights	Specifications	Material Description	Performance Data	Circuit or Control Diagrams	Data Sheets	Illustrative Cuts	Installation Instructions	6 Certified Vendor Information (CVI): Dimensional Drawings	Equipment Weights	Specifications	Certified Test Data	Circuit or Control Diagram	Instructions: Installation	Operation	Maintenance	Spare Parts List	7 Remarks
1	Metering Cabinet Assembly		2.2	X			X		X						X							
2	Panelboards		2.3			X	X								X							
3	Transformer		2.4			X	X								X							
4	Safety Switches		2.5			X	X															

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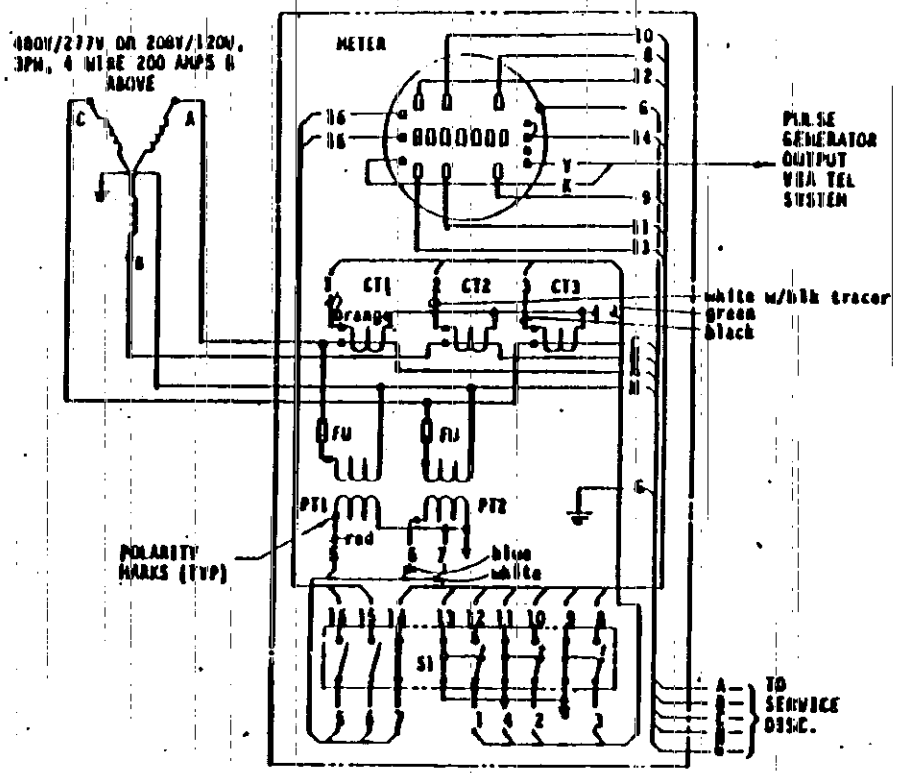
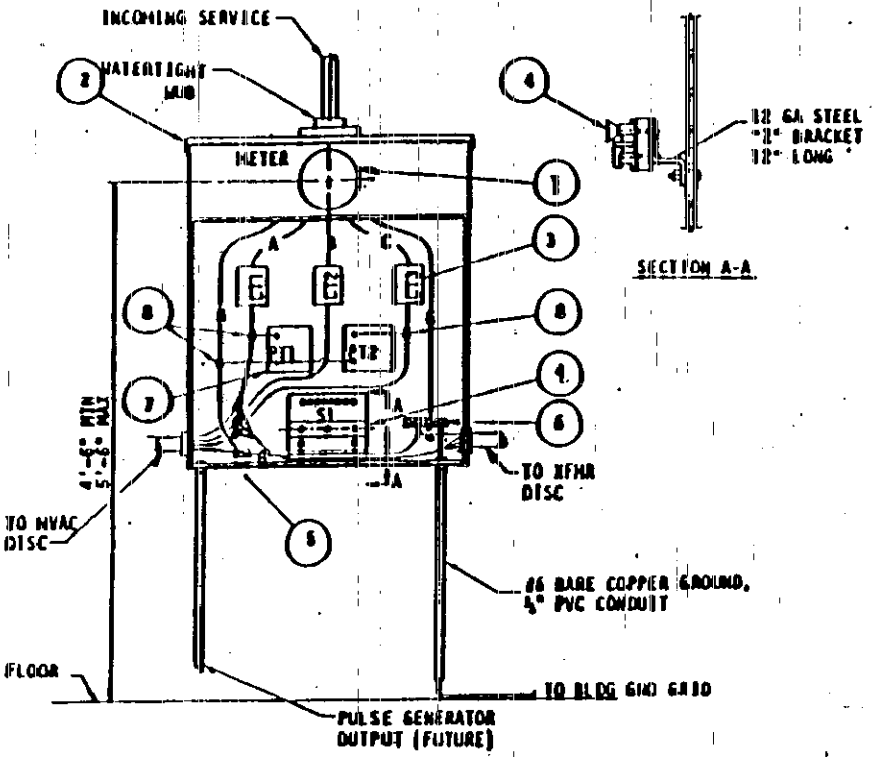


WIRING DIAGRAM



ELEVATION

MATERIAL LIST

QTY	PART NO.	DESCRIPTION	REFERENCE*
1	1	METER, WATTHOUR, DEMAND TYPE, 2 STATOR, CLASS 10, 120VAC, FOR USE WITH 3 CTS AND 2-208/120V PTS, 480Y/277V 3PH, 4 WIRE SERVICE, COMPLETE WITH PULSE GENERATOR, R/P = 625/864, KWH/PULSE = 0.25 AND REGISTER TYPE H-30 WITH 30 MINUTE DEMAND INTERVAL, PRIMARY RATED.	GE VAQ-165-S WITH D-52 PULSE GEN**
1	2	COMBINATION METER AND CURRENT TRANSFORMER CABINET, 400A MAX, 3PH, 4 WIRE WYE, NEMA TYPE 3R, WITH AUTOMATIC CIRCUIT CLOSING DEVICES	CIRCLE AW 12201 OR EQUIVALENT
3	3	CURRENT TRANSFORMER	GE JCW-0** (400A)
	4	TEST SWITCH, 9 POLES	SUPERTOR 1041-F
1	5	BUSHING, INSULATED GROUNDING TYPE	OZ/GEDNEY CO. TYPE BLG
1	6	GROUNDING LUG, TYPE 020	BURNDY CORP.
2	7	POTENTIAL (VOLTAGE) TRANSFORMER, 208/120V, WITH TWO (2) PRIMARY FUSES	GE JVP-1**
3	8	SPLIT BOLT CONNECTORS & TAPE FOR 600V	

*MAY BE THE EQUIVALENT PRODUCT OF DUNCAN, SANGAMO, OR WESTINGHOUSE

NOTES

1. POTENTIAL TRANSFORMER WIRING AND CURRENT TRANSFORMER SECONDARY WIRING SHALL BE NO. 12 AWG STRANDED COPPER, TYPE XHHW WITH 600 V INSULATION.

END OF SECTION

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SECTION 16720

ALARM AND DETECTION SYSTEMS

PART 1 - GENERAL

1.1 SUBMITTALS: Refer to Section 01300 for submittal procedures.

1.1.1 Approval Data: Submit the information listed in Column 5 of the Vendor Data List in this Section.

1.1.2 Certified Vendor Information (CVI): Submit the information specified in Column 6 of the Vendor Data List in this Section.

PART 2 - PRODUCTS

2.1 STANDARDS FOR MATERIALS

2.1.1 The listing of particular equipment or material in this Specification shall not be construed as being all of the materials and equipment required to complete the job and place it in satisfactory operating condition.

2.1.2 Materials and equipment shall be listed for the intended service by Underwriters Laboratories, Inc. (UL) in the Electrical Appliance and Utilization Equipment Directory or Electrical Construction Materials Directory or other qualified testing laboratory and shall bear the mark of the testing laboratory. In the absence of a mark, submit a certification of applicable listing. Listing and marking by UL or other qualified electrical testing laboratory is not required for material and equipment that is specified by manufacturer's part number on the Contract Drawings or in this Specification.

2.1.3 Use fire alarm equipment listed in the UL Fire Protection Equipment Directory or the FM Approval Guide bearing the mark of the listing organization.

2.1.4 The fire alarm system design, components, and installation shall meet the requirements of NFPA 70, 72B, and 1221.

2.2 FIRE ALARM CONTROL PANEL

2.2.1 Furnish a panel of NEMA 1 construction designed for surface mounting, with a key lockable hinged door. Panel door shall have a cylinder lock with key matched to Corbin Cat. 60 and be finished outside in "Signal Red," FED STD 595, Color 11105.

2.2.2 Provide four fire detection zones, minimum, each with end-of-line supervision to detect all open circuits or unintentional grounds, in accordance with NFPA 72B.

2.2.3 Label all indicating lights and switches with their function. Identify each zone with laminated plastic nameplates approximately 5/8 inch by 2 inches and engraved with the zone number and function. Unused zones shall be engraved "SPARE". Engrave laminated plastic nameplates with 1/8 inch high characters. Manufacturer's standard nameplates are acceptable if of equal quality and legibility.

2.2.4 Supply the following equipment mounted on or in the fire alarm control panel:

2.2.4.1 Indicating lights (LEDS):

a. AC Power On (green)
b. AC Power Off (amber)
c. System Common Alarm (red)
d. System Common Trouble (amber)
e. City Disconnect (amber)
f. System Ground Fault (amber)
g. Battery Trouble (amber)
h. Battery High Rate (amber)
i. Zone Alarm for each zone (red)
j. Zone Trouble for each zone (amber)
k. Bell Supv. (amber)

2.2.4.2 Switches

a. Drill - To sound all audible alarm devices. Operation shall not transmit signal to the fire station unless an alarm occurs during the drill.

b. Alarm Off - To silence all audible alarm devices. Operation shall energize trouble circuit.

c. Trouble Off - To silence system trouble tone, with resound capability in the event a subsequent trouble condition occurs.

d. Reset - Ringback shall occur if operated when any other switch is not in normal position.

e. City Off - Operation shall energize trouble circuit.

f. Lamp Test - Operation shall energize trouble circuit.

2.2.4.3 Trouble alarm buzzer (tone alert).

2.2.4.4 Gong ringing circuit. The gong ringing circuit shall pulse the alarm gongs at a rate of 2 strokes per second.

2.2.4.5 Terminal blocks for wiring.

2.2.4.6 Automatic power transfer switch. Failure of the primary power supply shall cause automatic transfer to secondary supply. Return to

primary power shall occur automatically upon restoration of primary power supply. Transfer from primary to secondary power shall cause an audible trouble signal to be initiated and the supervisory code transmitter shall be actuated. No false alarms or interruption of fire alarm service shall occur due to loss or restoration of primary power.

2.2.4.7 Secondary power supply. Primary power will be from the facility power panel in accordance with the Drawings. Secondary power supply shall be a rechargeable battery in accordance with NFPA 72B to operate the fire alarm system and trouble signals in the event of failure of the primary power. Battery shall be heavy duty, sealed, maintenance-free type designed for fire alarm usage. The battery assembly shall be sized to operate the system for a minimum of 60 hours after loss of charging current at an ambient temperature of +40 F, and be capable of transmitting a fire alarm signal for not less than 5 minutes at the end of this period. Calculations similar to Appendix A shall be made to verify the size of the batteries required.

2.2.4.8 Battery charger. The battery charger shall be a compatible, automatic, solid state, constant voltage device with ac voltage compensation, dc voltage regulation and current limiting. The battery charger shall provide continuous taper charging, have a manual high rate switch to provide equalizing charge, and be capable of charging batteries from 75% of full charge to 100% of full charge in not more than 24 hours. The battery charger shall have a dc ammeter, a voltmeter, and an undervoltage relay with normally closed contacts that open when battery voltage drops to 75% of its rated normal voltage, and be enclosed in the fire alarm control panel.

2.2.4.9 Zone Modules. Each zone module shall have an alarm operated output.

2.2.5 Alarm signals shall latch and require manual reset devices.

2.2.6 Control Panel Operation:

2.2.6.1 On incoming fire alarm signal the fire alarm control panel shall:

a. Transmit the coded alarm signal.

b. Light the system common alarm indicating lamp.

c. Light the incoming signal zone alarm indicating lamp.

d. Operate the building alarm gongs.

2.2.6.2 On incoming trouble (supervisory) signal the fire alarm control panel shall:

a. Transmit the coded trouble signal.

b. Light the system common trouble indicating lamp.

c. Light the incoming signal zone trouble indicating lamp.

d. Sound an audible alarm at the panel.

2.2.6.3 A fire alarm signal shall be initiated by:

a. Operating any manual pull box in system.

b. Operation of the flow alarm pressure switch.

2.2.6.4 A trouble signal shall be initiated by:

a. Disconnecting any device or wire in the system.

b. Loss of primary (ac) circuit.

c. Loss of, or low secondary (battery) voltage.

d. Any open circuit.

e. Any ground short not part of system design,

f. Silencing alarm gong system.

g. Operation of the post indicator valve tamper switch.

2.3 FIRE ALARM MUNICIPAL TRANSMITTER: The municipal transmitter shall meet the requirements of NFPA 1221 and be mounted in the fire alarm control panel. The transmitter shall be the positive noninterfering, local energy, successive type, capable of transmitting four rounds of Code Number 1614 to the fire station.

OPTIONAL FIRE ALARM MASTER BOX: The Contractor may elect to provide a separately mounted master box for transmitting fire alarm signals. If this option is chosen, the master box shall conform to the above requirements and be manually wound. The master box enclosure shall be "Signal Red," suitable for outdoor surface mounting and be the non-break, glass type. The master box shall be Gamewell Model No. M34-56. Vendor submittals shall show required conduit and conductor changes to the Drawings if this option is used.

2.4 SUPERVISORY CODE TRANSMITTER: The supervisory code transmitter shall be mounted in the fire alarm control panel. It shall be of the positive, noninterfering, local energy, successive type. The transmitter shall be capable of transmitting one round of the code number 71614 to the fire station. The transmitter shall be fully compatible with the existing area loop.

OPTIONAL SUPERVISORY CODE TRANSMITTER: The Contractor may elect to provide a separately mounted supervisory code transmitter. If this option is chosen, the transmitter shall conform to the above requirements and be manually wound. The enclosure shall be lockable, shall be finished in royal blue, and be suitable for outdoor surface mounting. The

transmitter shall be Gamewell Model No. M34-72. Vendor submittals shall show required conduit and conductor changes to the Drawings if this option is used.

2.5 MANUAL FIRE ALARM STATIONS: Manual fire alarm stations shall be noncoded, nonself-restoring type with double-pole, double-throw positive action contacts. The fire alarm manual stations shall meet the requirements of UL 38, be for indoor surface mounting, and be finished "Signal Red."

2.6 END-OF-LINE DEVICE: The end-of-line resistor, capacitor, or diode shall be sized and provided by the fire alarm equipment supplier.

2.7 FIRE ALARM GONG: The fire alarm gong shall be a single-stroke, 6 inch diameter bell with universal mounting plate. The fire alarm gong shall operate on 24 volt dc and be finished "Signal Red."

2.8 SOLDERLESS CONNECTORS AND TERMINALS--600 VOLTS AND LESS: Refer to Section 16400, Paragraph 2.6.

2.9 RACEWAYS AND FITTINGS: Refer to Section 16400, Article 2.13.

2.10 CONDUCTORS

2.10.1 General

2.10.1.1 Conductors shall be No. 14 AWG, minimum, stranded copper type THHN or XHHW and be of the AWG size shown on the Drawings.

2.10.1.2 Conductors shall be readily identified by a continuous permanent marking on the insulation to indicate the type, voltage, gauge, and manufacturer.

2.10.2 Aerial Fire Alarm Cable: Aerial cable shall be two-conductor, No. 14 AWG, self-supporting, 30 percent conductivity copper-covered steel with single extrusion high-density polyethylene insulation and red color PVC jacket. Triangle/PWC No. KN644253.

2.11 LAMINATED PLASTIC NAMEPLATES: Nameplates shall be 1/16 inch thick, black satin finish with white core. Front four edges shall have a 1/32 inch by 45 degree bevel.

2.12 WIRE PULLING COMPOUND: Wire pulling compound shall be "Y-er Eas" manufactured by Electro Compound Company or as specified by the cable manufacturer.

PART 3 - EXECUTION

3.1 GENERAL REQUIREMENTS

3.1.1 Interpretation of Drawings and Specification: The Drawings show the general layout of the complete fire alarm system including the arrangement of circuits, control panels, manual stations, alarms, and other equipment. Verify the scale dimensions on the Drawings since actual locations,

distances, and levels shall be governed by actual field conditions. Perform all work in accordance with NFPA 70, 72B, and 1221.

3.1.2 Installation Instruction: The term "equipment" is defined as all components of a wiring system including conduit, raceways, control panels, cabinets, outlet boxes, lighting fixtures, etc. Fasten equipment securely to the structural members of the building, to metal supports attached to the structure, or to concrete surfaces. Use clamping devices for attaching to structural steel, or, when clamping is impracticable, obtain written authority from the Government's Representative to weld to, drill, or cut structural members to provide attachment. Fasten equipment to concrete or masonry with expansion anchors. Attachment to drywall shall be by screws into studs and to metal wall panels by weld studs, bolts, or self-tapping metal screws. Locate equipment, boxes, and conduit approximately where shown in relation to equipment served. Do not install conduit raceways and boxes in positions that interfere with the work of other trades.

3.1.3 Use the appropriate special tools when installing devices for which special installation tools are recommended by the manufacturer.

3.2 INSTALLING CONDUIT: Refer to Section 16400, Article 3.3.

3.3 INSTALLING CONDUCTORS

3.3.1 Do not bend cables installed in wireways to less than the cable manufacturer's recommended minimum bending radius.

3.3.2 Use the following color code for fire alarm system conductors:

Circuit	Color of Wire Insulation
Area Fire Alarm Loop--from Fire Station or from Area Fire Alarm Control Cabinet to the Fire Alarm Control Panel	Red
Alarm Initiating Devices--detectors, manual stations, etc.	Red
Supervisory Devices--limit switches, pressure supervisory switches, etc.	Yellow
Other Wiring	Different from preceding colors but not Green, Orange, Blue, or Brown
AC Power	Black and White

3.3.3 Use lubricant recommended by the cable manufacturer's written instructions, or the wire pulling compound specified, to decrease friction when pulling wire and cable through conduit.

3.3.4 Do not install or handle wires with thermoplastic insulation or jacket when the ambient temperature is 15 F or below.

3.4 INSTALLING DEVICES

3.4.1 Wiring and equipment within the fire alarm control panel shall be arranged so that individual sub-panels or components are readily accessible for adjustment or maintenance without disconnecting conductors.

3.4.2 If a separately mounted fire alarm master box and supervisory code transmitter are chosen in lieu of modules in the fire alarm control panel, the units shall be located as close as possible to the control panel on the exterior of the building. The Contractor shall modify conduit and conductor routings to comply with this option.

3.5 SPLICES, TAPS, AND CABLE TERMINATIONS: Refer to Section 16400 for cable terminations. Splices in fire alarm wiring are not acceptable.

3.6 TESTING

3.6.1 General

3.6.1.1 Test electrical equipment and wiring installed under this Specification before any attempt is made to operate the equipment. Resistance, current, and voltage measurements may be made as work progresses. Maintain a systematic record by using a schedule or chart of all tests and measurements. Provide space to record readings, dates, and witnesses. Notify the Government's Representative before the start of all required tests. Correct all items found, during testing or examination by the Government's Representative, to be at variance with the Drawings and this Specification. Deliver testing reports to the Government's Representative weekly as completed.

3.6.1.2 Furnish all instruments, labor, and equipment required to conduct testing.

3.6.1.3 Use test instruments which bear a valid calibration stamp showing the date of calibration and expiration date of the stamp. The calibration and accuracy of test instruments shall be certified by an independent testing laboratory having laboratory standards traceable to the National Bureau of Standards.

3.6.1.4 In addition to the testing specified to be performed by the Contractor, the installation will be subject to examination by the Government's Representative for conformance with the design and all applicable codes. Assist the Government's Representative as requested.

3.6.2 Wiring Systems

3.6.2.1 Test all fire alarm circuits for continuity.

3.7 The operability of the fire alarm system shall be verified by ATP No. 4536. This ATP is provided with the design package.

Project No. B-526

Title: Non-Radioactive Hazardous Chemical Waste Facility

KAISER ENGINEERS HANFORD

VENDOR DATA LIST

("X" Indicates Required Data)

1 EPN Identification	2 Description	3 Reference Drawing	4 Specification Paragraph	5 Approval/Data: Dimensional Drawings	Equipment Weights	Specifications	Material Description	Performance Data	Circuit or Control Diagrams	Data Sheets	Illustrative Cuts	Installation Instructions	6 Certified Vendor Information (CVI): Dimensional Drawings	Equipment Weights	Specifications	Certified Test Data	Circuit or Control Diagram	Instructions: Installation	Operation	Maintenance	Spare Parts List	7 Remarks
1	Fire Alarm Control Panel including all modules		2.2			X		X	X	X	X				X		X		X	X		
2	Battery		2.2.4.7			X		X							X				X	X		
3	Battery calculations		2.2.4.7					X														
4	Fire alarm gong		2.7			X		X			X											
5	Manual station		2.5			X					X											

Richland, WA

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APPENDIX A

SAMPLE BATTERY CALCULATION

ALARM MANUFACTURER: Fireco

ALARM PANEL TYPE: Model FACP-7

REFERENCE DRAWINGS: M123 Control Panel Wiring Diagram
M374 Zone Alarm Module
M339 Alarm Trouble Module, etc

CURRENT DEMAND

SYSTEM COMPONENTS	NORMAL SUPERVISORY	ALARM CONDITION
Zone Alarm Module	0.005A	0.065A
Trouble Module	0.003A	0.020A or 0.0
Fire Alarm Module	0.005A	0.050A
Ionization Detectors	0.003A	0.035A
Ultraviolet Detectors	0.005A	0.045A
Indicator Lamp	-	0.030A
Auxiliary Relay Coil	-	0.025A
Masterbox Coil	-	0.045A

SYSTEM COMPONENTS	NORMAL SYSTEM DEMAND
(6) Zone Alarm Modules	0.030
(1) Trouble Module	0.003
(1) Fire Alarm Module	0.005
(3) Ionization Detectors	0.009
(1) Ultraviolet Detector	0.005
	0.052A @ 60 hr = 3.120AH

SYSTEM COMPONENTS	FIRE ALARM DEMAND
(5)Zone Module (Supervisory)	0.025
(1)Zone Module (Alarm)	0.065
Fire Alarm Module	0.050
(2)Ionization Detectors	0.070
Indicator Lamp	0.030
Aux Relay Coil	0.025
Masterbox Coil	0.045
	0.310A @ 1 hr = 0.310AH

CONTINGENCY - 20% of normal Supr Demand 3.12 AH 0.624AH

TOTAL TIME ADJUSTED CURRENT DRAW: 4.054AH

END OF APPENDIX A

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APPENDIX 4B

DESIGN DRAWINGS

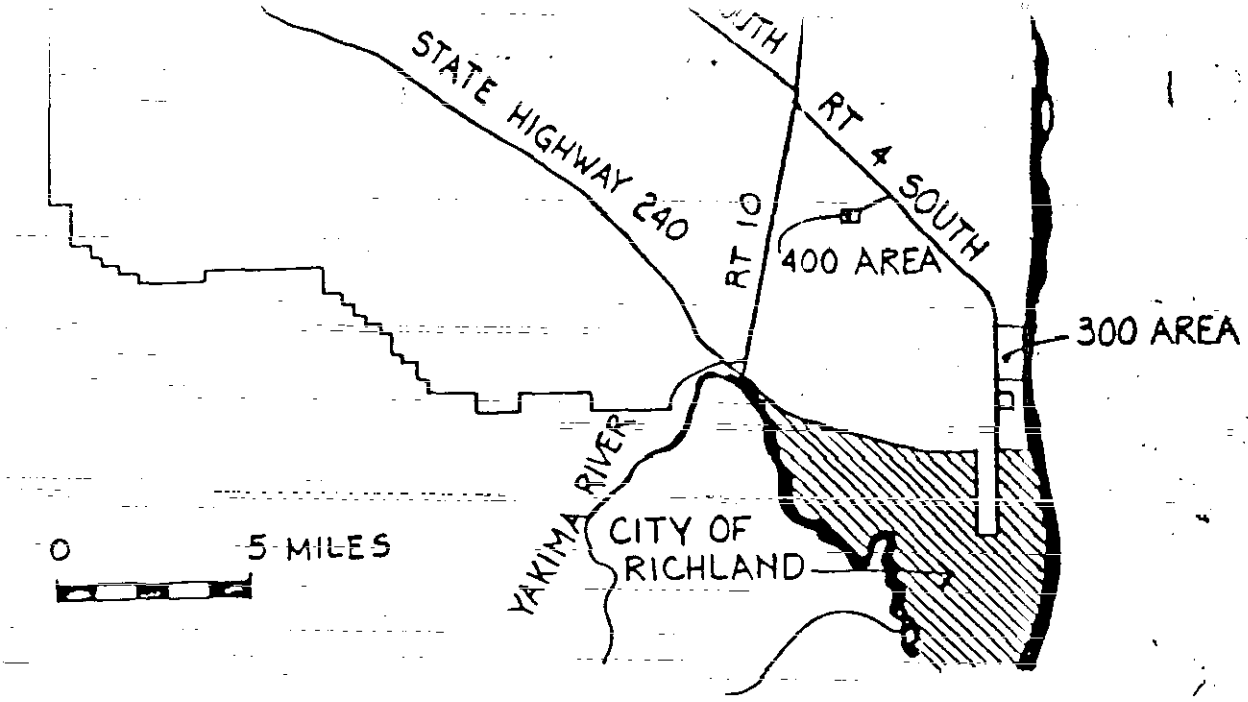
This appendix contains the following design drawings:

H-6-1552	CIVIL/DWG LIST SITE PLAN, SECTIONS & DETAILS	REV. 3
H-6-1553	ARCHITECTURAL PLAN, ELEVATIONS & SECTIONS	REV. 3
H-6-1554	ARCHITECTURAL PLAN, ELEVATIONS AND DETAILS	REV. 1
H-6-1555	ARCH PLAN, SCHED, DETAILS & SECTIONS	REV. 2
H-6-1556	STRUCTURAL PLAN & SECTIONS	REV. 2
H-6-1557	STRUCTURAL ELEVATION, DETAILS & SECTIONS	REV. 1
H-6-1558	STRUCTURAL PLAN, SECTIONS, EL & DETAILS	REV. 1
H-6-1559	HVAC/PIPING PLANS, ELEVATION & SECTIONS (SHEET 1 OF 2)	REV. 2
H-6-1559	HVAC/PIPING PLANS, ELEVATION & SECTIONS (SHEET 2 OF 2)	REV. 0
H-6-1560	ELEC/PIPING EL, SECT, DIAG, SCHED & DET	REV. 2
H-6-1561	ELECTRICAL PLANS, EL, DIAG & DET	REV. 2
H-6-1608	ELECTRICAL RADIO FIRE ALARM PLAN AND DIAGRAM	REV. 1

Note: Revised design drawings currently are being prepared to address the 616 NRDWSF changes. These changes include the following:

- Installation of a blind flange on the sink in the packaging and sampling room
- Installation of locking mechanisms on the drain plugs in the trenches of the loading areas
- Revision of the floor plan to reflect the switching of the acid cell and combustible cell
- General revision of the drawings to address current operation.

On completion, the revised drawings will be included in the permit application.



B

ESSENTIAL DRAWING

APPROVAL	DATE	U. S. DEPARTMENT OF ENERGY Richland Operations Office KAISER ENGINEERS HANFORD COMPANY
J ENGR	7/24/85	CIVIL / DWG LIST SITE PLAN, SECTIONS & DETAILS
ROVED	6/14/85	
ETY	7/21/85	
ROVED	6/14	PROJECT TITLE NON-RADIOACTIVE HAZARDOUS CHEMICAL WASTE FACILITY
CKED SAVARD / RAINE	6/14/85 / 6/3/85	PROJ B-526 · WO X52602 · JOB RG88A2
WN C. MCGOUGH	4/15/85	SCALE SHOWN · BLDG 616 · INDEX 0000, [illegible]
IGNED MA HAQ	4/12/85	
SSIFICATION: IONE · BY: NOT REQD		DRAWING NUMBER H-6-1552 · SHEET 1 · OF 1 · REV 3

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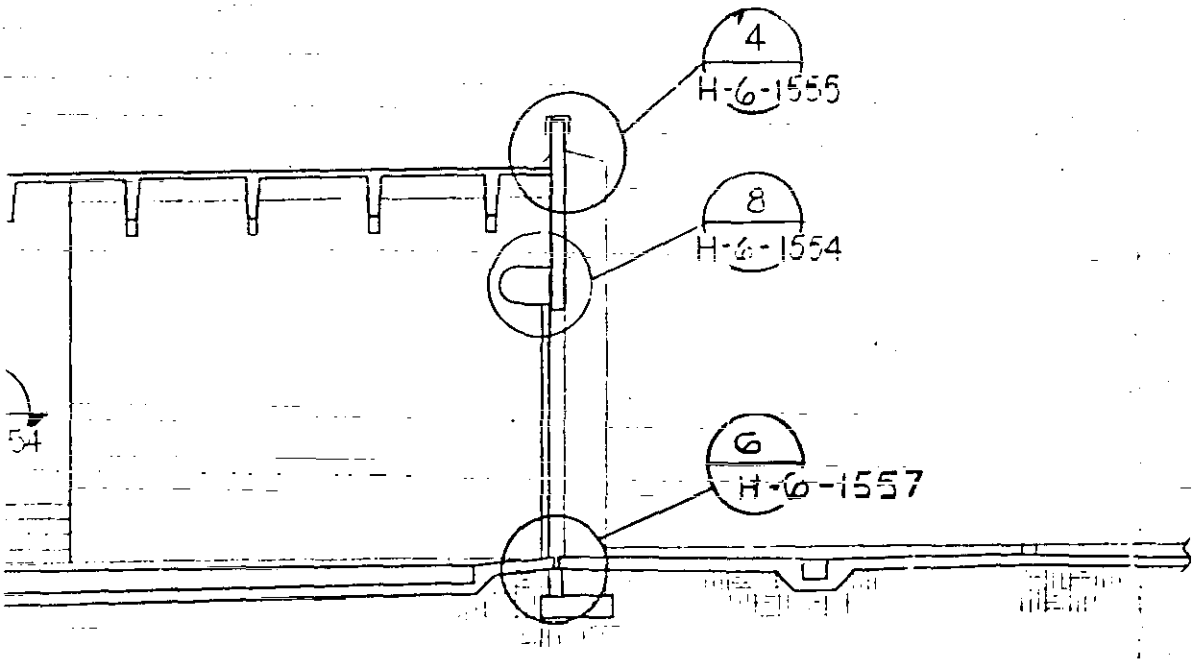

ESSENTIAL DRAWING

ICE LEVEL A: CRITICAL DIMENSIONS ARE VERIFIED WITHIN SPECIFIED DRAWING
CES. CONCEALED PIPING OR WIRING IS VERIFIED AS TO FLOW PATH, BUT
ROUTING IS NOT VERIFIED.

HO APPROVAL	J. J. Noble	DATE 7/24/85
J ENGR	Hamada	11-4/85
		2/25
ROVED		6/14/85
TY		6/21/85
ROVED		6/ /85
CKED	P.C. SPILMAN	6/18/85
WN	A.L. EDWARDS	2/26/85
IGNED	S.Y. INES	2/21/85

U. S. DEPARTMENT OF ENERGY
Richland Operations Office
KAISER ENGINEERS HANFORD COMPANY

ARCHITECTURAL
PLAN, ELEVATIONS
& SECTIONS

PROJECT TITLE NON-RADIOACTIVE HAZARDOUS CHEMICAL WASTE FACILITY

PROJ	WO	JOB
B-526	X52602	R688A2
SCALE	BLDG	INDEX
SHOWN	616	0800, 0801

SSIFICATION	BY	DRAWING NUMBER	SHEET	OF	REV
ONE	NOT REQD	H-6-1553	1	1	3

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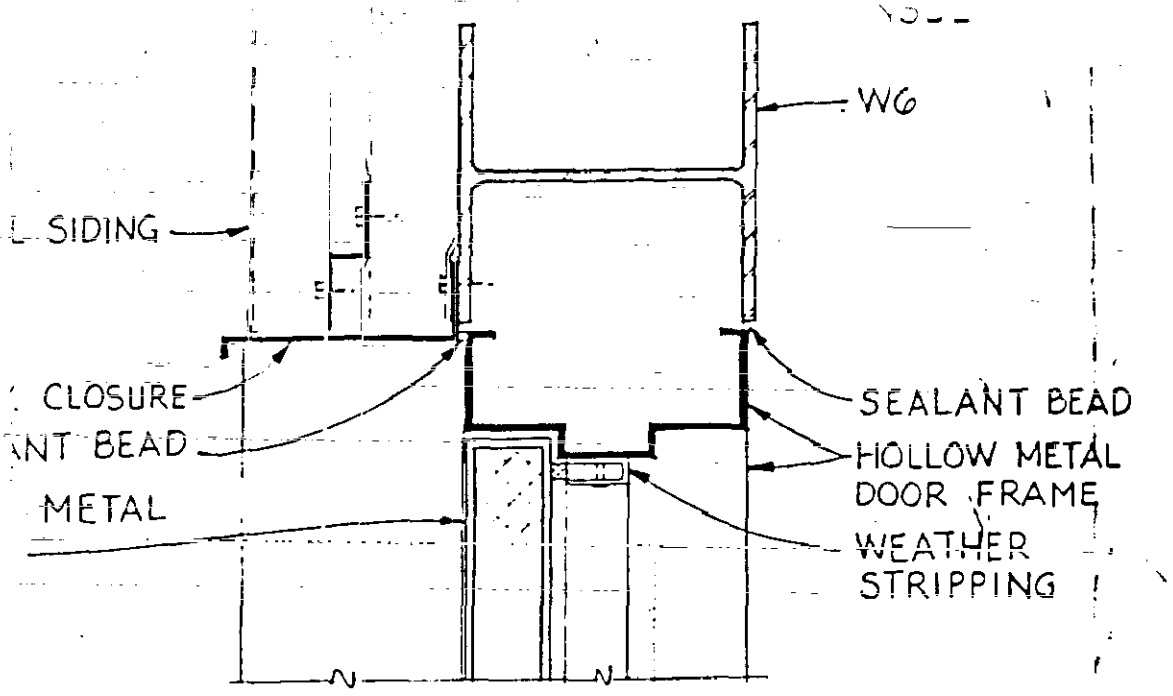

B

DOOR HEAD

16

SCALE: 3" = 1' - 0"

H-6-1553

APPROVAL	DATE
[illegible]	7/24/85
NGA [illegible]	7/24/85
[illegible]	[illegible]
VED [illegible]	6/14/85
[illegible]	4/21/85
VED [illegible]	6/14
ED P.C. SPILMAN	6/18/85
SNES	4/15/85
ED SNES	3/21/85
FICATION	BY
NE	NOT REQD

U. S. DEPARTMENT OF ENERGY
Richland Operations Office
KAISER ENGINEERS HANFORD COMPANY

ARCHITECTURAL
PLAN, ELEVATIONS & DETAILS

A

PROJECT TITLE: NON-RADIOACTIVE HAZARDOUS CHEMICAL WASTE FACILITY

PROJ	WO	JOB
B-526	X52602	R688A2
SCALE	BLDG	INDEX
SHOWN	616	0801

DRAWING NUMBER	SHEET	OF	REV
H-6-1554	1	1	1

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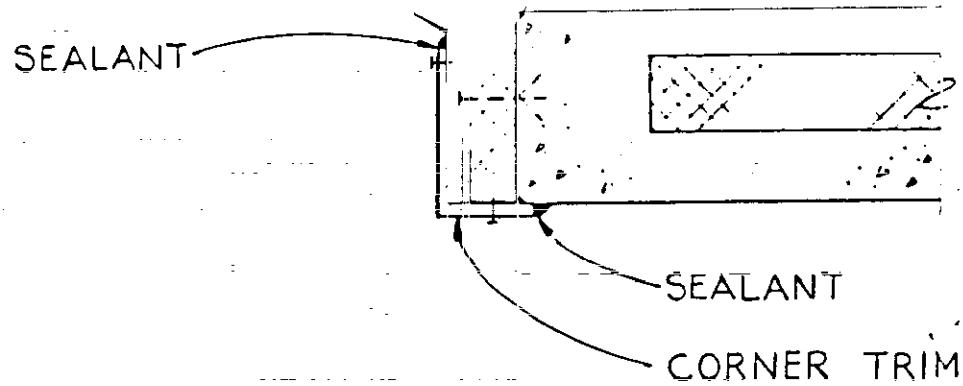

WALL CORNER DETAIL (10)

SCALE: 1 1/2" = 1'-0" H-6-1553

B

A

O APPROVAL		DATE
J. J. Noble		7/24/85
ENGR		7/24/85
[illegible]		7/
OVED		6/14/85
[illegible]		6/21/85
OVED		6/14
KED	P. C. SPILMAN	6/18/85
N	A. L. EDWARDS	4/15/85
NED	INES	4/8/85
IFICATION	BY	
ONE	NOT REQD	

U. S. DEPARTMENT OF ENERGY
Richland Operations Office

KAISER ENGINEERS HANFORD COMPANY

ARCH
PLAN, SCHED,
DETAILS & SECTIONS

PROJECT TITLE: NON - RADIOACTIVE HAZARDOUS CHEMICAL WASTE FACILITY

PROJ	WO	JOB
B-526	X52602	R688A2

SCALE	BLDG	INDEX
SHOWN	616	0800, 0801, 0802

DRAWING NUMBER	SHEET	OF	REV
H-6-1555	1	1	2

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ALL BOLTS FOR STRUCTURAL STEEL CONNECTIONS ARE 5/8" DIAMETER (ASTM A 325).

THE EXPANSION BOLTS HAVE THE FOLLOWING MINIMUM EMBEDMENT LENGTHS UNLESS NOTED OTHERWISE:

2-1/2" LONG FOR 3/8" DIAMETER BOLTS

3-1/2" LONG FOR 1/2" DIAMETER BOLTS

MINIMUM CONCRETE COVER FOR REINFORCEMENT SHALL BE AS FOLLOWS:

CONCRETE CAST AGAINST EARTH = 3"

CONCRETE EXPOSED TO EARTH OR WEATHER = 1-1/2"

THE CONSTRUCTION OF SEPTIC TANK AND PERFORATED PIPES IN DRAIN FIELD SHALL BE IN ACCORDANCE WITH SPECIFICATION AND REQUIREMENTS CONFORMING TO EPA MANUAL NO. EPA 625/1-80-012.

ALL CONCRETE SLABS WITH EXTERIOR VERTICAL SURFACES SHALL HAVE EXPANSION JOINTS. (SEE DRAWING H-6-1556, DETAIL 1 FOR EXPANSION JOINT DETAIL.)

SEE SPECIFICATION B-526-CI FOR MATERIAL DESCRIPTION AND INSTALLATION INSTRUCTIONS.

METAL RAMP INSTALLED. PAINTED W/ PITTSBURG "AQUAPON", TWO-PART EPOXY, 97-3 COMPONENT 1; AND 97-98 COMPONENT 2. NON-SKID COMPONENT IS TEX SHELL.

B

A

APPROVAL	DATE
[illegible]	7/24/85
NGR [illegible]	7/24/85
[illegible]	6/21/85
VED [illegible]	6/14/85
[illegible]	6/21/85
VED [illegible]	6/14
ED EAING	6/18/85
C. MCGOUGH	3-22-85
ED M. HAQ	3-20-85

IFICATION	BY
ONE	NOT REQD

U. S. DEPARTMENT OF ENERGY
Richland Operations Office
KAISER ENGINEERS HANFORD COMPANY

STRUCTURAL PLAN & SECTIONS

PROJECT TITLE: NON-RADIOACTIVE HAZARDOUS CHEMICAL WASTE FACILITY

PROJ	WO	JOB
B-526	X52602	R688A2
SCALE	BLDG	INDEX
SHOWN	616	0900, 1000

DRAWING NUMBER	SHEET	OF	REV
H-6-1556	1	1	2

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NOTE:
REINFORCEMENT
IN FDN & FL. SLAB
NOT SHOWN

N SECTION AT DOOR SILL
(FOR OVERHEAD DOORS # 1 & 6)

DETAIL 6
SCALE: 3/4" = 1'-0" H-6-1553

B

TE: FOR GENERAL NOTES SEE DWG H-6-1556.

APPROVAL	DATE
J. Noble	7/24/85
IGR [illegible]	7/4/85
[illegible]	6/21/85
ED [illegible]	6/14/85
[illegible] Minister	6/21/85
ED [illegible]	6/14
D PLAING	6/13/85
C. MCGOUGH	4/4/85
ED M. HAQ	4/1/85

ICATION	BY
ONE	NOT REQD

U. S. DEPARTMENT OF ENERGY
Richland Operations Office
KAISER ENGINEERS HANFORD COMPANY

STRUCTURAL
ELEVATION, DETAILS
& SECTIONS

A

PROJECT TITLE NON-RADIOACTIVE HAZARDOUS CHEMICAL WASTE FACILITY

PROJ	WO	JOB
B-526	X52602	R688A2

SCALE	BLDG	INDEX
SHOWN	616	1000

DRAWING NUMBER	SHEET	OF	REV
H-6-1557	1	1	1

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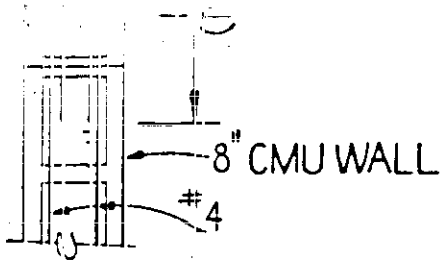
R $\frac{1}{4}$"x$1\frac{1}{4}$"x2'-2" LG
LE BENDS ON



BEAM REINF (1)

B

TE: FOR GENERAL NOTES SEE DWG H-6-1556

A

APPROVAL	DATE
J. Noble	7/24/85
[illegible]	7/24/85
[illegible]	11/11/85
[illegible]	6/14/85
[illegible]	6/24/85
[illegible]	6/14
PLAING	6/13/85
McGOUGH	5/1/85
M. HAQ	4/1/85

CATION	BY
NE	NOT REQD

U. S. DEPARTMENT OF ENERGY
Richland Operations Office
KAISER ENGINEERS HANFORD COMPANY

STRUCTURAL
PLAN, SECTIONS, EL
& DETAILS

PROJECT TITLE NON-RADIOACTIVE HAZARDOUS CHEMICAL WASTE FACILITY

PROJ	WO	JOB
B-526	X52602	R688A2
SCALE SHOWN	BLDG 616	INDEX 1000

DRAWING NUMBER	SHEET	OF	REV
H-6-1558	1	1	1

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IN EXHAUST AIR INTAKE TEMPERATURE ABOVE SEQUENCE
L STAGES OF ELECTRIC HEAT ARE OFF. UPON A FURTHER
TEMPERATURE THE FACE AND BYPASS DAMPERS SHALL
ODE, THEREBY BYPASSING OUTSIDE AIR AROUND THE HEAT
S ARE IN A FULL BYPASS POSITION.

RATURE REACHES 65° THE WINTER/SUMMER THERMOSTAT
MODE UPON WHICH THE EXHAUST FAN WILL GO TO HIGH
ILL GO TO HIGH SPEED. THE UNIT WILL MAINTAIN A
OT GREATER THAN 75°/66°. THE FACE AND BYPASS
PASS POSITION. UPON A DROP IN SUPPLY AIR DISCHARGE
ALL MODULATE TO CLOSE THE BYPASS DAMPERS. UPON A
GE TEMPERATURE THE FACE AND BYPASS DAMPERS SHALL
S POSITION. WHEN THE DISCHARGE TEMPERATURE GOES
COOLING SOLENOID VALVES SHALL BE OPENED AND IN-
SHALL BE INITIATED. UPON A DROP IN SUPPLY AIR
CYCLE SHALL BE REVERSED.

CORDANCE WITH THE MANUFACTURER'S WRITTEN

B

HVAC SUPPLY AND EXHAUST FAN INDICATOR LIGHTS
A. COORDINATE LOCATION W/ THE BLDG. MANAGER.

AND EXHAUST FAN INDICATOR LIGHTS SHALL HAVE A
W/ "SUPPLY FAN" AND "EXHAUST FAN". CHARACTERS
NAMEPLATE SHALL BE 1/16 IN THK LAMINATED
TIN FINISH AND WHITE CORE.

LL BE #12 AWG. ALL WIRING SHALL BE INSTALLED

FOR CONTINUATION OF NOTES SEE SHEET 2

ESSENTIAL DRAWING

A

APPROVAL	DATE
[illegible]	7/24/85
[illegible]	7/24/85
[illegible]	7/24/85
[illegible]	7/24/85
[illegible]	6/21/85
[illegible]	6/17
ROUTH	5/31/85
MCGOUGH	5/29/85
K.HAMADA	3/20/85

TION	BY
E	NOT REQD

U. S. DEPARTMENT OF ENERGY
Richland Operations Office
KAISER ENGINEERS HANFORD COMPANY

HVAC/PIPING
PLANS, ELEVATION
& SECTIONS

PROJECT TITLE: NON-RADIOACTIVE HAZARDOUS CHEMICAL WASTE FACILITY

PROJ	WO	JOB
B-526	X52602	R688A2
SCALE	**BLDG**	**INDEX**
SHOWN	616	7901, 8901

DRAWING NUMBER	SHEET	OF	REV
H-6-1559	1	2	2

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L BE HEAVY DUTY, BACKWARDLY-INCLINED, DWDI,
OUBLE INLET) CENTRIFUGAL TYPE WITH PILLOW BLOCK,
LL BEARINGS, MOUNTED ON A SPRING ISOLATED WELDED
L BASE. THE 2-SPEED MOTOR SHALL BE MOUNTED ON
STEEL BASE BY MEANS OF AN ADJUSTABLE CAST STEEL
MOUNTING. THE DRIVE SHALL BE ADJUSTABLE PITCH
0% OF THE MOTOR HORSEPOWER.

LL BE NON-SPARKING, HEAVY-DUTY, BACKWARDLY-
(SINGLE WIDTH SINGLE INLET) CENTRIFUGAL TYPE
CK REGREASEABLE BALL BEARINGS, MOUNTED ON A
WELDED STRUCTURAL STEEL BASE. THE 2-SPEED MOTOR
D ON THE STRUCTURAL STEEL BASE BY MEANS OF AN
STEEL MOTOR RAIL-TYPE MOUNTING. THE DRIVE SHALL
ITCH AND RATED AT 150% OF THE MOTOR HORSEPOWER.

PERTAINING TO SPECIFIC FANS REFER TO CVI #19157.

REV 0 | SHT 2 OF 2 | DWG NO H-6-1559

ECN 129471

	DATE
	2/6/91
White	3-13-91
	3-14-91
	3-14-91

U.S. DEPARTMENT OF ENERGY
Richland Operations Office
Westinghouse Hanford Company

A

HVAC/PIPING PLANS, ELEVATION & SECTIONS

SIZE	BLDG NO	INDEX NO	DWG	REV
F	616	7901 8901	H-6-1559	0

SCALE SHOWN | SHEET 2 OF 2

ENTATION

DATE

CHK PRINT ☐ DATE | COMMENT PRINT ☐ DATE

GPO: 1988-691-371

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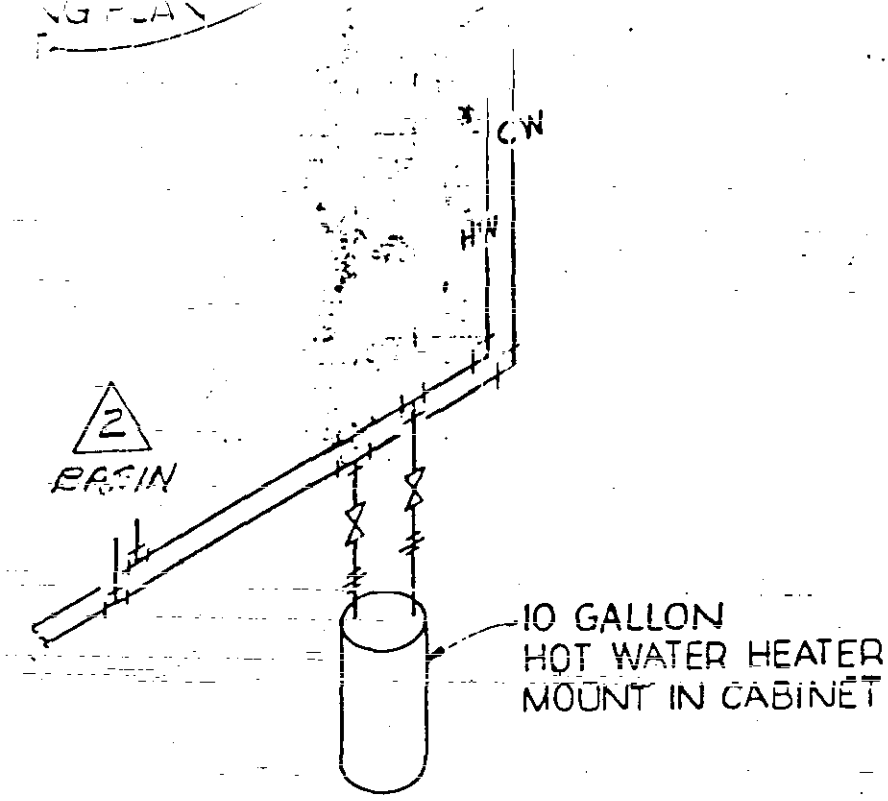

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...ING & SAMPLING SW ISOMETRIC 7
...ONE H-6-1559

2 ESSENTIAL DRAWING

...HO APPROVAL J. J. Noble	DATE 7/24/85	U. S. DEPARTMENT OF ENERGY Richland Operations Office KAISER ENGINEERS HANFORD COMPANY
...J ENGR F. Hamada	7/24/85	ELEC / PIPING EL, SECT, DIAG, SCHED & DET
[illegible]	6/21/85	
...ROVED [illegible]	6/14/85	
...ENY [illegible]	6/21/85	
...ROVED [illegible]	6/14	PROJECT TITLE NON-RADIOACTIVE HAZARDOUS CHEMICAL WASTE FACILITY
...ECKED R C SAVARD R ROUTH	7/[illegible]	PROJ B-526 / WO X52602 / JOB R688A2
...AWN C.R. MCGOUGH A.L. EDWARDS	5/9/85	SCALE NONE / BLDG 616 / INDEX 7304, 7404 7702, 8003, 8510, 8900
...SIGNED F. HAMADA R. HAZELBAKER	5/1/85	
...ASSIFICATION NONE	BY NOT REQD	DRAWING NUMBER H-6-1560 / SHEET 1 / OF 1 / REV 2

A

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8'-0".

⊠h	CONTACTOR, MOUNT AT 4'-6". LOWER CASE LETTER INDICATES CONTROLLED EQUIPMENT.
	FIRE ALARM MANUAL STATION, MOUNT AT 5'-0".
FO	FIRE ALARM GONG, MOUNT AT 8'-0".
	LIGHTING/POWER PANELBOARD.
T	TRANSFORMER.
Ⓣ	THERMOSTAT BACKBOX, FLUSH MOUNT AT 5'-0" (THERMOSTAT BY MECHANICAL).
WP	DENOTES WEATHERPROOF.
CO	DENOTES CONDUIT ONLY.
EXP	DENOTES EXPLOSION PROOF.
WH	WATER HEATER.
	PAGING SPEAKER, MOUNT AT 8'-0" TO TOP.
E	EVACUATION ALARM PANEL. FLUSH MOUNT AT 5'-0".
	TELEPHONE OUTLET, FLUSH MOUNT AT 2'-0".
	SAFETY SWITCH, MOUNT AT 5'-0".

B

△ ESSENTIAL DRAWING

RHO APPROVAL BY	DATE 7/24/85	U. S. DEPARTMENT OF ENERGY Richland Operations Office
		KAISER ENGINEERS HANFORD COMPANY
PROJ ENGR		ELECTRICAL PLANS, EL, DIAG & DET
QA		
APPROVED BY	6/14/85	
SAFETY	6/21/85	
APPROVED BY	6/14	PROJECT TITLE NON-RADIOACTIVE HAZARDOUS CHEMICAL WASTE FACILITY
CHECKED BY R.C. SAVARD	6/14/85	PROJ B-526 / WO X52602 / JOB R688A2
DRAWN BY A. L. EDWARDS	3/25/85	
DESIGNED BY R.R. HAZELBAKER	3/18/85	SCALE SHOWN / BLDG 616 / INDEX 7701 7201, 7301, 7401
CLASSIFICATION: NONE	BY: NOT REQD	DRAWING NUMBER H-6-1561 / SHEET 1 / OF 1 / REV 2

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GROUND LEVEL

LEVATION A-A

NOT TO SCALE

SEE NOTES 1 THRU 11

EASED FOR CONSTRUCTION

DATE

DOE

PROJECT B-392, HANFORD SITE FIRE ALARM SYSTEM UPGRADE.

APPROVALS	DATE
ALITY ASSURANCE	
Oliver	
ROBERTELL Wood	10/1/86
ENGINEER RLOW	8/11/86
PO	
RLOW	8/11/86
RRY TATE	8/11/86
ON	BY

U. S. Department of Energy
Richland Operations Office

Warren Oliver Company
Lake Oswego, Oregon 97034

ELECTRICAL RADIO FIRE ALARM PLAN AND DIAGRAM

SCALE	BLDG NO.	INDEX NO.
NONE	616	7701/7702

DRAWING NO.	SHEET NO.	SHEETS
H-6-1608	1	1

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APPENDIX 4C

CONTAINMENT CALCULATIONS

9413294.0938

910910.1650

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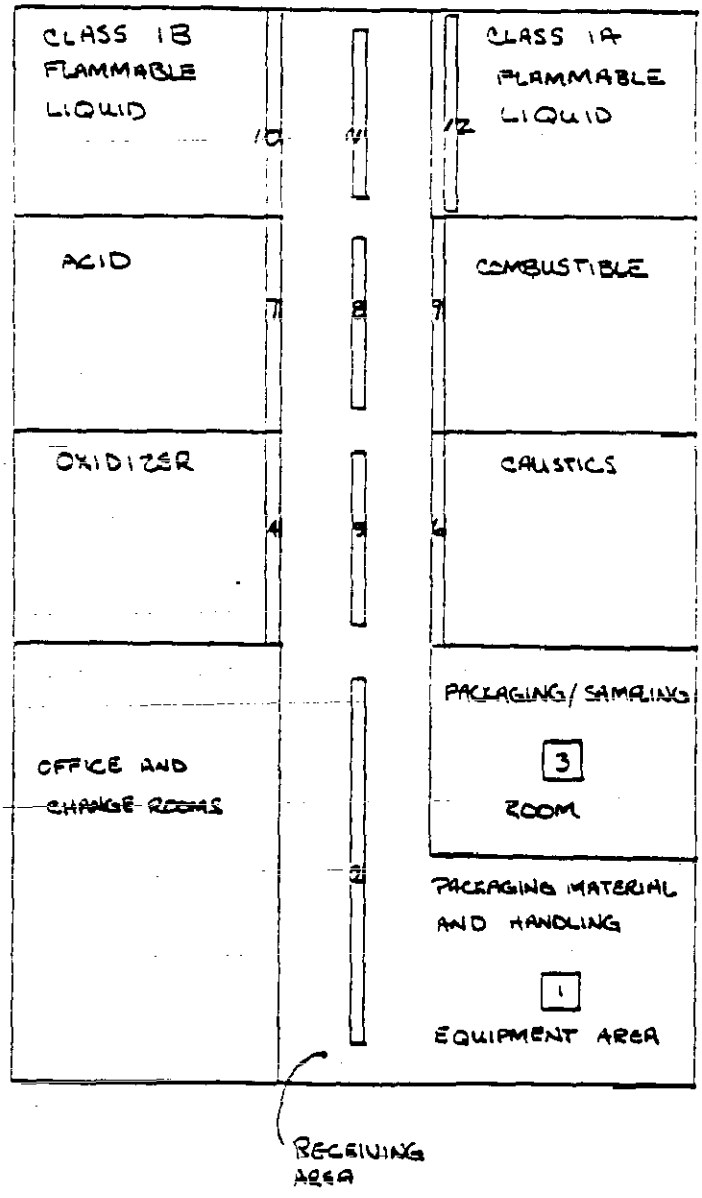
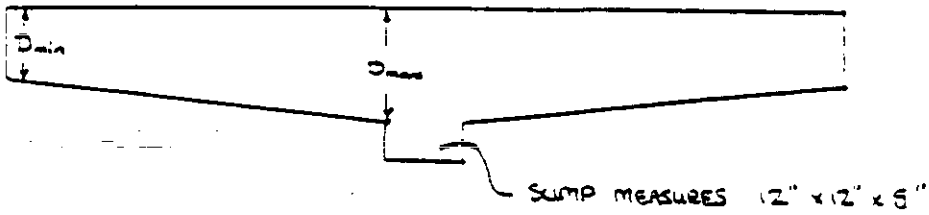
9413294.0939

NRDWSF TRENCHES AND SUMPS

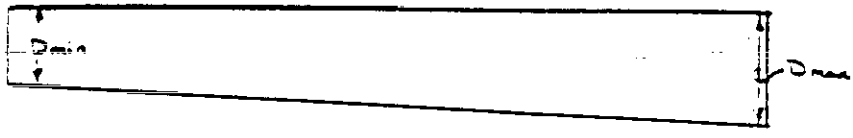


TRENCHES 4, 6, 7, 9, 10 AND 12 :



TRENCH	L	W	Dmin	Dmax
4	20'	12"	16"	18
6	20'	12"	16"	18
7	22'-4"	12"	16"	18½
9	22'-4"	12"	16"	18
10	19'-4"	12"	15½"	17
12	15'-10"	12"	16"	17

TRENCHES 2, 5, 8, AND 11



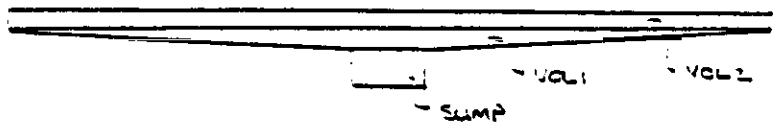
TRENCH	L	W	Dmin	Dmax
2	35'-2"	12"	8"	15"
5	14-2	12	12	14
8	16-3	12	13	15
11	11-3	12	13	14

TRENCHES 1 AND 3

THESE TRENCHES ARE CUBES 3' ON A SIDE

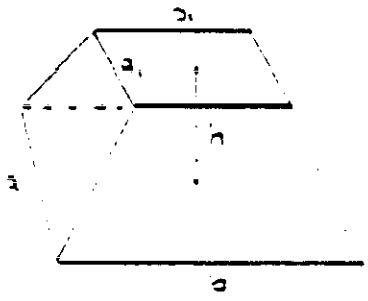
VOLUME = 27 ft³ OR 202 gal (7.48 gal/ft³)

TRENCH VOLUME CALCULATIONS FOR 4, 6, 7, 9, 10 AND 12.



THESE TRENCHES ARE BROKEN INTO 3 VOLUME ELEMENTS VOL1, VOL2 AND SUMP. THE SUMP ON ALL TRENCHES IS IDENTICAL.

VOL1 WILL BE CALCULATED USING THE FORMULA FOR AN OBELISK:



VOLUME: $\frac{1}{6} h \left[ab + (a+a_1)(b+b_1) + a_1 b_1 \right]$

$h = D_{max} - D_{min}$

VOL2 IS A SOLID RECTANGLE $D_{min} \times L \times W$

THE SUMP VOLUME IS $1' \times 1' \times \frac{5'}{12} = 0.42\ ft^3$

VOL1

TRENCH	a	a_1	b	b_1	h	VOL1
4	1 ft	1 ft	20 ft	1 ft	0.17 ft	1.79
6	1	1	20	1	0.17	1.79
7	1	1	22.33	1	0.21	2.45
9	1	1	22.33	1	0.17	1.98
10	1	1	17.33	1	0.13	1.19
12	1	1	15.83	1	0.08	0.67

VOL2

TRENCH	D_{min}	L	W	VOL2
4	1.33 ft	20 ft	1 ft	26.6 ft^3
6	1.33	20	1	26.6
7	1.33	22.33	1	29.7
9	1.33	22.33	1	29.7
10	1.29	17.33	1	22.4
12	1.33	15.83	1	21.0

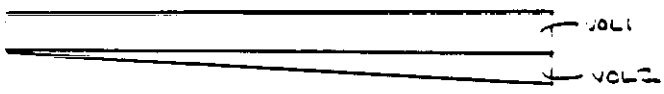
9413294.0942

900611.1414

TRENCH	VOL1	VOL2	SUMP	TOTAL
4	1.79 ft³	26.6 ft³	0.42 ft³	28.8 ft³
6	1.79	26.6	0.42	28.8
7	2.45	29.7	0.42	32.6
9	1.98	29.7	0.42	32.1
10	1.19	22.4	0.42	24.0
12	0.67	21.0	0.42	22.1

TRENCH CALCULATIONS FOR 2, 5, 8 AND 11

THESE TRENCHES ARE BROKEN INTO 2 VOLUME ELEMENTS VOL1 AND VOL2.

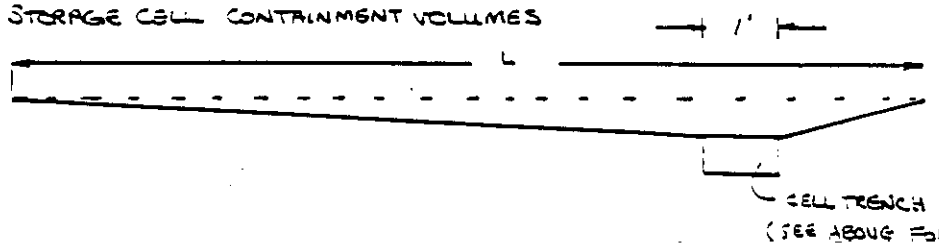


VOL1 = L x W x Dmin

VOL2 = ½ L x W x (Dmax - Dmin)

TRENCH	L (ft)	W (ft)	Dmin	Dmax-Dmin	VOL1	VOL2	TOTAL
2	35.17	1	0.67 ft	0.58 ft	23.56 ft	10.20 ft	33.76 ft³
5	14.17	1	1	0.17	14.17	1.20	15.37
8	16.25	1	1.08	0.17	17.55	1.38	18.93
11	11.25	1	1.08	0.08	12.15	0.45	12.60

STORAGE CELL CONTAINMENT VOLUMES



THE CELL CONTAINMENT VOLUME WILL BE CALCULATED USING THE FORMULA FOR AN OBELISK AGAIN

CELL	a	a₁	b	b₁	h	VOLUME
Packaging/Lamp.	21.9 ft	3 ft	25.9 ft	3 ft	0.08	17.3 ft³
OXIDIZER	21.33	21.3	29.6	1	0.25	81.5
CAUSTIC	21.3	21.3	29.6	1	0.25	81.5
ACID	23.5	23.5	29.6	1	0.25	89.8
COMBUSTIBLE	23.5	23.5	29.6	1	0.25	89.8
CLASS 1B	17.4	17.4	32.2	1	0.25	72.2
CLASS 1A	17.2	17.2	28.4	1	0.25	63.1

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TOTAL CELL CONTAINMENT VOLUME IS THE SUM OF THE CELL TRENCH VOLUME AND CELL-CONTAINMENT VOLUME

CELL	TRENCH	CONTAINMENT	TOTAL CONTAINMENT VOLUME	
Packaging/Saws	27 ft³	17.3 ft³	44.3 ft³ OR	331 gal
OXIDIZER	28.8	81.5	110.3	825
CAUSTIC	28.8	81.5	110.3	825
ACID	32.6	89.8	122.4	915
COMBUSTIBLE	32.1	89.8	121.9	912
CLASS 1B	24.0	72.2	96.2	719
CLASS 1A	22.1	63.1	85.2	637

MAXIMUM STORED CAPACITY OF EACH CELL

CELL	TIER 1	TIER 2*	TOTAL VOLUME
OXIDIZER	50 · 55 gal	40·55/10·30	5250 gal
CAUSTIC	50 · 55	40·55/10·30	5250
ACID	60 · 55	40·55/20·30	6100
COMBUSTIBLE	58·55	40·55/13·30	5930
CLASS 1B	40·55	40·30	3400
CLASS 1A	32·55	32·20	2535†

* TIER 2 SINGLE ROWS: CONTAINERS MAY BE NO LARGER THAN 30 GALLONS

† INCLUDING A 135 GALLON STORAGE CABINET

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APPENDIX 4D

CONCRETE SEALANT PROPERTIES AND PERFORMANCE DATA

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MATERIAL SAFETY DATA SHEET
COATINGS AND RESINS GROUP

SECTION I - PRODUCT INFORMATION

MANUFACTURER'S NAME: PPG INDUSTRIES, INC.
PRODUCT CODE/IDENTITY: 97-57 (112586E)
CUSTOMER PART#/NAME:
PRODUCT TRADE NAME: CLEAR EPOXY FLOOR SEALER
CHEMICAL FAMILY: POLYAMIDE

* *

SHIPPING INFORMATION

US-DOT: SHIPPING NAME: PAINT, FLAMMABLE LIQUID
HAZARD CLASS:
UN NUMBER: UN1263

ICAO: NAME: UNAVAILABLE
HAZARD LABEL: UNAVAILABLE

INTERNATIONAL: SHIPPING NAME: UNAVAILABLE
HAZARD CLASS: UNAVAILABLE

* *

SARA 311/312 CATEGORIES FOR THIS PRODUCT

ACUTE=Y CHRONIC=Y FLAM=Y PRESS=N REAC=N

* *

ALL CHEMICAL SUBSTANCES IN THIS PRODUCT COMPLY WITH ALL APPLICABLE RULES OR ORDERS UNDER THE ENVIRONMENTAL PROTECTION AGENCY'S TOXIC SUBSTANCES CONTROL ACT.

* *

PRODUCT SAFETY INFO: 260 KAPPA DRIVE
PITTSBURGH, PA 15238
(412) 963-5822

EMERGENCY MEDICAL INFO: (304) 843-1300
EMERGENCY SPILL INFO: (304) 843-1300
DATE OF MSDS PREPARATION: 6/09/89

* *

THIS MATERIAL SAFETY DATA SHEET HAS BEEN PREPARED IN ACCORDANCE WITH THE OSHA HAZARD COMMUNICATION STANDARD (29 CFR 1910.1200), CANADA'S WORKPLACE HAZARDOUS MATERIALS INFORMATION SYSTEM, THE SUPPLIER NOTIFICATION REQUIREMENTS OF SARA TITLE III, SECTION 313, AND OTHER APPLICABLE RIGHT-TO-KNOW REGULATIONS. ABBREVIATIONS AND OTHER DESIGNATIONS USED ON THIS MATERIAL SAFETY DATA SHEET INCLUDE THE FOLLOWING:

U/I = UNKNOWN INFORMATION; N/A = NOT APPLICABLE; NOT ESTAB. = NOT ESTABLISHED; CERT. LTR. = CHEMICAL O.K. ON TSCA INVENTORY; CAS NO. NOT AVAILABLE

BAJ0608891 (CUSTOMER NO.) LOCATION : 9809 8997/57//////609

CONTINUATION OF MANUFACTURER'S CODE: 97-57 DATE OF PREP: 6/09/89 PAGE 2

SECTION II - INGREDIENTS

INGREDIENTS	% WEIGHT	OCCUPATIONAL EXPOSURE LIMITS: ACGIH TLV-TWA	ACGIH TLV-STEL	OSHA PEL-TWA	OSHA PEL-STEL	IPPG IPEL-TWA	IPPG IPEL-STEL	SARA TITLE III & CERCLA RATING: NS (102)	EHS (302)	TC* (313)	RQ (LBS)	TPQ (LBS)	SARA 311/312 HC	CH	FL	PR	RE
ENE [1330-20-7]... ACUTE: SKIN IRRITANT	25-30	100 ppm	150 ppm ORAL= 4.30	100 ppm DERM=U/I	NOT ESTAB INHL=	100 ppm 21.71	150 ppm CHRONIC: NO LONG-TERM EFFECTS IDENTIFIED	Y	N	Y	1000	N/A	Y	N	Y	N	N
TOLUENE ...[108-88-3]... ACUTE: SKIN IRRITANT	10-15	100 ppm	150 ppm ORAL= 5.00	200 ppm DERM= 14.00	300 ppm INHL=U/I	100 ppm	150 ppm CHRONIC: NO LONG-TERM EFFECTS IDENTIFIED	Y	N	Y	1000	N/A	Y	N	Y	N	N
ISOPROPYL ALCOHOL, ANHYDROUS ...[67-63-0]... ACUTE: EYE IRRITANT	10-15	400 ppm	500 ppm ORAL= 5.84	400 ppm DERM= 16.00	NOT ESTAB INHL=U/I	400 ppm	500 ppm CHRONIC: NO LONG-TERM EFFECTS IDENTIFIED	N	N	Y	N/A	N/A	Y	N	Y	N	N
ETHYLENE GLYCOL MONOPROPYL ETHER [2807-30-9]... ACUTE: EYE IRRITANT	10-15	NOT ESTAB.	NOT ESTAB. ORAL= .50	NOT ESTAB. DERM= .87	NOT ESTAB. INHL= 6.52	NOT ESTAB.	NOT ESTAB. CHRONIC: LIVER/KIDNEY/BLOOD/BONE MARROW/ TOXIN	N	N	Y	N/A	N/A	Y	Y	Y	N	N
FILM FORMERS, RESINS, AND ADDITIVES ...[NOT ESTAB.]... ACUTE: SKIN IRRITANT	30-35	NOT ESTAB.	NOT ESTAB. ORAL=U/I	NOT ESTAB. DERM=U/I	NOT ESTAB. INHL=U/I	NOT ESTAB.	NOT ESTAB. CHRONIC: NO LONG-TERM EFFECTS IDENTIFIED	N	N	N	N/A	N/A	Y	N	N	N	N

ORAL= LD50 ORAL (RAT), (g/kg) DERM= LD50 DERMAL (RABBIT), (g/kg) INHL= LC50 INHALATION (RAT), (mg/L)
* INGREDIENTS IN THE TC COLUMN ARE SUBJECT TO THE REPORTING REQUIREMENTS OF SARA TITLE III. SEE 40 CFR PART 372.

SECTION III - PHYSICAL/CHEMICAL CHARACTERISTICS

[FORMULA VALUES, NOT SALES SPECIFICATIONS]

BOILING RANGE: 82 - 153 DEG. C
VAPOR PRESSURE: 13.9mmHg
VAPOR DENSITY: HEAVIER THAN AIR
% VOL/VOLUME: 70.80
EVAP RATE(BuOAc=100): 123
SOLUBILITY IN WATER: 24.2%
WT/GAL (LBS): 7.55 (U.S.)
pH: U/I
% SOLID BY WEIGHT: 32.67
SPECIFIC GRAVITY: .91
ODOR/APPEARANCE: VISCOUS LIQUID WITH AN ODOR CHARACTERISTIC OF THE SOLVENTS LISTED IN SECTION II.

SECTION IV - FIRE AND EXPLOSION HAZARD DATA

US-DOT CATEGORY: FLAMMABLE
FLASHPOINT: 59 DEG. F PMCC FLAMMABLE LIMITS: LEL 1.4 UEL U/I

EXTINGUISHING MEDIA:

USE NATIONAL FIRE PROTECTION ASSOCIATION (NFPA) CLASS B EXTINGUISHERS (CARBON DIOXIDE, DRY CHEMICAL, OR UNIVERSAL AQUEOUS FILM FORMING FOAM) DESIGNED TO EXTINGUISH NFPA CLASS IB FLAMMABLE LIQUID FIRES.

UNUSUAL FIRE AND EXPLOSION HAZARDS:

KEEP CONTAINERS TIGHTLY CLOSED. ISOLATE FROM HEAT, ELECTRICAL EQUIPMENT, SPARKS, AND OPEN FLAMES. CLOSED CONTAINERS MAY EXPLODE WHEN EXPOSED TO EXTREME HEAT. DO NOT APPLY ON HOT SURFACES. TOXIC GASES MAY FORM WHEN PRODUCT IS CONTACTED BY FLAME OR HOT SURFACES.

SPECIAL FIRE FIGHTING PROCEDURES:

WATER SPRAY MAY BE INEFFECTIVE. WATER SPRAY MAY BE USED TO COOL CLOSED CONTAINERS TO PREVENT PRESSURE BUILD-UP AND POSSIBLE AUTOIGNITION OR EXPLOSION WHEN EXPOSED TO EXTREME HEAT. IF WATER IS USED, FOG NOZZLES ARE PREFERABLE. FIRE-FIGHTERS SHOULD WEAR SELF CONTAINED BREATHING APPARATUS.

SECTION V - REACTIVITY DATA

STABILITY: STABLE HAZARDOUS POLYMERIZATION: NOT EXPECTED TO OCCUR

INCOMPATIBILITY (MATERIALS AND CONDITIONS TO AVOID):

AVOID CONTACT WITH STRONG ALKALIES, STRONG MINERAL ACIDS, OR STRONG OXIDIZING AGENTS.

HAZARDOUS DECOMPOSITION PRODUCTS:

MAY PRODUCE HAZARDOUS DECOMPOSITION PRODUCTS WHEN HEATED. WELDING, BRAZING, OR FLAME-CUTTING ON SURFACES COATED WITH THIS PRODUCT MAY PRODUCE FUMES INCLUDING:
Carbon Monoxide, Oxides of Nitrogen

SECTION VI - SPILL OR LEAK PROCEDURES

STEPS TO BE TAKEN IN CASE MATERIAL IS RELEASED OR SPILLED:

PROVIDE MAXIMUM VENTILATION. ONLY PERSONNEL EQUIPPED WITH PROPER RESPIRATORY AND SKIN AND EYE PROTECTION SHOULD BE PERMITTED IN THE AREA. REMOVE ALL SOURCES OF IGNITION. TAKE UP SPILLED MATERIAL WITH SAWDUST, VERMICULITE, OR OTHER ABSORBENT MATERIAL AND PLACE INTO CONTAINERS FOR DISPOSAL.

WASTE DISPOSAL METHOD:

WASTE MATERIAL MUST BE DISPOSED OF IN ACCORDANCE WITH FEDERAL, STATE, PROVINCIAL, AND LOCAL ENVIRONMENTAL CONTROL REGULATIONS. EMPTY CONTAINERS SHOULD BE RECYCLED OR DISPOSED OF THROUGH AN APPROVED WASTE MANAGEMENT FACILITY.

SECTION VII - HEALTH HAZARD DATA

EFFECTS OF OVEREXPOSURE FROM:

INGESTION:
- HARMFUL OR FATAL IF SWALLOWED.

EYE CONTACT:
- CAUSES SEVERE EYE IRRITATION.

SKIN CONTACT:
- MAY CAUSE MODERATE SKIN IRRITATION.
- MAY BE ABSORBED THROUGH THE SKIN.

INHALATION:
- VAPOR AND SPRAY MIST HARMFUL IF INHALED.
- VAPOR IRRITATES EYES, NOSE, AND THROAT.
- REPEATED EXPOSURE TO HIGH VAPOR CONCENTRATIONS MAY CAUSE IRRITATION OF THE RESPIRATORY SYSTEM AND PERMANENT BRAIN AND NERVOUS SYSTEM DAMAGE.
- INTENTIONAL MISUSE BY DELIBERATELY CONCENTRATING AND INHALING THE CONTENTS CAN BE HARMFUL OR FATAL.

CHRONIC OVEREXPOSURE:

AVOID LONG TERM AND REPEATED CONTACT.
- THIS PRODUCT CONTAINS AN ETHYLENE-SERIES GLYCOL ETHER AND/OR ACETATE WHICH HAS BEEN SHOWN TO CAUSE DAMAGE TO THE KIDNEYS, LIVER, BLOOD AND/OR BLOOD-FORMING TISSUES. THE ETHYL AND METHYL DERIVATIVES HAVE CAUSED BIRTH DEFECTS AND REPRODUCTIVE ORGAN DAMAGE IN LABORATORY ANIMALS. THERE IS NO EVIDENCE OF THESE EFFECT

SIGNS AND SYMPTOMS OF OVEREXPOSURE:

CONTINUED ON PAGE 4

·EYE WATERING, HEADACHES, NAUSEA, DIZZINESS, AND LOSS OF COORDINATION ARE INDICATIONS THAT SOLVENT LEVELS ARE TOO HIGH.
·REDNESS, ITCHING, BURNING SENSATION AND VISUAL DISTURBANCES MAY INDICATE EXCESSIVE EYE CONTACT.
·DRYNESS, ITCHING, CRACKING, BURNING, REDNESS, AND SWELLING ARE CONDITIONS ASSOCIATED WITH EXCESSIVE SKIN CONTACT.

MEDICAL CONDITIONS AGGRAVATED BY EXPOSURE: NOT APPLICABLE

SECTION VIII - FIRST AID PROCEDURES

INGESTION:
IF SWALLOWED, DO NOT INDUCE VOMITING.

EYE CONTACT:
IN CASE OF EYE CONTACT, FLUSH EYES IMMEDIATELY WITH PLENTY OF WATER FOR AT LEAST 15 MINUTES.

SKIN CONTACT:
IN CASE OF SKIN CONTACT, REMOVE PROMPTLY BY WIPING, FOLLOWED BY WATERLESS HAND CLEANER AND SOAP AND WATER.

INHALATION:
IF AFFECTED BY INHALATION OF VAPOR OR SPRAY MIST, REMOVE TO FRESH AIR. APPLY ARTIFICIAL RESPIRATION AND OTHER SUPPORTIVE MEASURES AS REQUIRED.

OTHER:
IF ANY OF THE FOLLOWING OCCUR DURING OR FOLLOWING USE OF THIS PRODUCT, CONTACT A POISON CONTROL CENTER, EMERGENCY ROOM OR PHYSICIAN IMMEDIATELY; HAVE MATERIAL SAFETY DATA SHEET INFORMATION AVAILABLE. *INGESTION *EXCESSIVE EXPOSURE TO A CORROSIVE MATERIAL.
* PERSISTENT SKIN/EYE IRRITATION OR BREATHING DIFFICULTIES.

SECTION IX - PROTECTION INFORMATION

PERSONAL PROTECTIVE EQUIPMENT FOR:

EYE PROTECTION:
WEAR CHEMICAL-TYPE SPLASH GOGGLES OR FULL FACE SHIELD.

SKIN PROTECTION:
WEAR PROTECTIVE CLOTHING, INCLUDING IMPERMEABLE APRON AND GLOVES CONSTRUCTED OF:
NITRILE RUBBER, NEOPRENE RUBBER OR POLYVINYL ALCOHOL

RESPIRATORY PROTECTION:
OVEREXPOSURE TO VAPORS MAY BE PREVENTED BY ENSURING VENTILATION CONTROLS, VAPOR EXHAUST OR FRESH AIR ENTRY. NIOSH/MSHA-APPROVED (TC-23C-) PAINT SPRAY OR AIR SUPPLIED (TC-19C-) RESPIRATORS MAY ALSO REDUCE EXPOSURE. READ RESPIRATOR MANUFACTURER'S INSTRUCTIONS AND LITERATURE CAREFULLY TO DETERMINE THE TYPE OF AIRBORNE CONTAMINANTS AGAINST WHICH THE RESPIRATOR IS EFFECTIVE AND HOW IT IS TO BE PROPERLY FITTED.

OTHER EQUIPMENT:
CLEAN OR DISCARD CONTAMINATED CLOTHING AND SHOES.

VENTILATION REQUIREMENTS:
PROVIDE GENERAL DILUTION OR LOCAL EXHAUST VENTILATION IN VOLUME AND PATTERN TO KEEP THE CONCENTRATION OF INGREDIENTS LISTED IN SECTION II BELOW THE LOWEST SUGGESTED EXPOSURE LIMITS, THE LEL IN SECTION IV BELOW THE STATED LIMIT, AND TO REMOVE DECOMPOSITION PRODUCTS DURING WELDING OR FLAME CUTTING ON SURFACES COATED WITH THIS PRODUCT.

SECTION X - SPECIAL PRECAUTIONS

HANDLING AND STORAGE PRECAUTIONS:
DO NOT STORE ABOVE 120 DEGREES F. STORE LARGE QUANTITIES IN BUILDINGS DESIGNED AND PROTECTED FOR STORAGE OF NFPA CLASS IB FLAMMABLE LIQUIDS.

OTHER PRECAUTIONS:
IF THIS MATERIAL IS PART OF A MULTIPLE COMPONENT COATING SYSTEM, READ THE MATERIAL SAFETY DATA SHEET(S) FOR THE OTHER COMPONENT OR COMPONENTS BEFORE BLENDING AS THE RESULTING MIXTURE MAY HAVE THE HAZARDS OF ALL OF ITS PARTS.
CONTAINERS SHOULD BE GROUNDED WHEN POURING. AVOID FREE FALL OF LIQUIDS IN EXCESS OF A FEW INCHES.

MATERIAL SAFETY DATA SHEET
COATINGS AND RESINS GROUP

SECTION I - PRODUCT INFORMATION

MANUFACTURER'S NAME: PPG INDUSTRIES, INC.
PRODUCT CODE/IDENTITY: 97-98 (080388E)
CUSTOMER PART#/NAME:
PRODUCT TRADE NAME: AQUAPON CLEAR - COMP. B
CHEMICAL FAMILY: EPOXY

* *

SHIPPING INFORMATION

US-DOT: SHIPPING NAME: PAINT, FLAMMABLE LIQUID
HAZARD CLASS:
UN NUMBER: UN1263

ICAO: NAME: UNAVAILABLE
HAZARD LABEL: UNAVAILABLE

INTERNATIONAL: SHIPPING NAME: UNAVAILABLE
HAZARD CLASS: UNAVAILABLE

* *

SARA 311/312 CATEGORIES FOR THIS PRODUCT

ACUTE=Y CHRONIC=Y FLAM=Y PRESS=N REAC=N

* *

ALL CHEMICAL SUBSTANCES IN THIS PRODUCT COMPLY WITH ALL APPLICABLE RULES OR ORDERS UNDER THE ENVIRONMENTAL PROTECTION AGENCY'S TOXIC SUBSTANCES CONTROL ACT.

* *

PRODUCT SAFETY INFO: 260 KAPPA DRIVE
PITTSBURGH, PA 15238
(412) 963-5822

EMERGENCY MEDICAL INFO: (304) 843-1300
EMERGENCY SPILL INFO: (304) 843-1300
DATE OF MSDS PREPARATION: 6/09/89

* *

THIS MATERIAL SAFETY DATA SHEET HAS BEEN PREPARED IN ACCORDANCE WITH THE OSHA HAZARD COMMUNICATION STANDARD (29 CFR 1910.1200), CANADA'S WORKPLACE HAZARDOUS MATERIALS INFORMATION SYSTEM, THE SUPPLIER NOTIFICATION REQUIREMENTS OF SARA TITLE III, SECTION 313, AND OTHER APPLICABLE RIGHT-TO-KNOW REGULATIONS. ABBREVIATIONS AND OTHER DESIGNATIONS USED ON THIS MATERIAL SAFETY DATA SHEET INCLUDE THE FOLLOWING:

U/I = UNKNOWN INFORMATION; N/A = NOT APPLICABLE;
NOT ESTAB. = NOT ESTABLISHED; CERT. LTR. = CHEMICAL
O.K. ON TSCA INVENTORY; CAS NO. NOT AVAILABLE

BAJ0608891 (CUSTOMER NO.) LOCATION : 9809 8997/98//////609

CONTINUATION OF MANUFACTURER'S CODE: 97-98 DATE OF PREP: 6/09/89 PAGE 2

SECTION II - INGREDIENTS

INGREDIENTS	% WEIGHT	ACGIH TLV TWA	ACGIH TLV STEL	OSHA PEL TWA	OSHA PEL STEL	OSHA IPEL TWA	OSHA IPEL STEL	PPG IPEL	NS (102)	EHS (302)	TC* (313)	RQ (LBS)	TPQ (LBS)	SARA 311/312 AC	CH	FL	PR	RE
XYLENE ...[1330-20-7]... ACUTE: SKIN IRRITANT	25-30	100 ppm	150 ppm ORAL= 4.30 DERM=U/I	100 ppm	NOT ESTAB INHL= 21./I	100 ppm CHRONIC: NO LONG TERM EFFECTS IDENTIFIED	150 ppm		Y	N	Y	1000	N/A	Y	N	Y	N	N
ETHYLENE GLYCOL MONOPROPYL ETHER ...[2807-30-9]... ACUTE: EYE IRRITANT	5-10	NOT ESTAB.	NOT ESTAB. ORAL= .50 DERM= .87	NOT ESTAB.	NOT ESTAB. INHL= 8.52	NOT ESTAB. CHRONIC: LIVER/KIDNEY/BLOOD/BONE MARROW/ TOXIN	NOT ESTAB.		N	N	Y	N/A	N/A	Y	Y	Y	N	N
TOLUENE ...[108-88-3]... ACUTE: SKIN IRRITANT	5-10	100 ppm	150 ppm ORAL= 5.00 DERM= 14.00	200 ppm	300 ppm INHL=U/I	100 ppm CHRONIC: NO LONG TERM EFFECTS IDENTIFIED	150 ppm		Y	N	Y	1000	N/A	Y	N	Y	N	N
1-METHOXY-2-PROPANOL ...[107-98-2]... ACUTE: NO SEVERE HAZARDS IDENTIFIED	10-15	100 ppm	150 ppm ORAL= 5.20 DERM= 13.00	NOT ESTAB	NOT ESTAB INHL= 55.28	100 ppm CHRONIC: NO LONG TERM EFFECTS IDENTIFIED	150 ppm		N	N	N	N/A	N/A	Y	N	Y	N	N
FILM FORMERS, RESINS, AND ADDITIVES ...[NOT ESTAB.]... ACUTE: SKIN SENSITIZER	45-50	NOT ESTAB.	NOT ESTAB. ORAL=U/I	NOT ESTAB.	NOT ESTAB. INHL=U/I	NOT ESTAB CHRONIC: NO LONG TERM EFFECTS IDENTIFIED	NOT ESTAB		N	N	N	N/A	N/A	Y	N	N	N	N

ORAL= LD50 ORAL (RAT), (g/kg) DERM= LD50 DERMAL (RABBIT), (g/kg) INHL= LC50 INHALATION (RAT), (Mg/L)
* INGREDIENTS IN THE TC COLUMN ARE SUBJECT TO THE REPORTING REQUIREMENTS OF SARA TITLE III. SEE 40 CFR PART 372.

SECTION III - PHYSICAL/CHEMICAL CHARACTERISTICS

(FORMULA VALUES, NOT SALES SPECIFICATIONS)

BOILING RANGE: 110 - 153 DEG. C
VAPOR PRESSURE: 8.3mmHg
VAPOR DENSITY: HEAVIER THAN AIR
% VOL/VOLUME: 59.60
EVAP RATE(BuOAc=100): 89
SOLUBILITY IN WATER: 18.0%
WT/GAL (LBS): 8.43 (U.S.)
pH: U/I
% SOLID BY WEIGHT: 47.95
SPECIFIC GRAVITY: 1.01
ODOR/APPEARANCE: VISCOUS LIQUID WITH AN ODOR CHARACTERISTIC OF THE SOLVENTS LISTED IN SECTION II.

SECTION IV - FIRE AND EXPLOSION HAZARD DATA

US-DOT CATEGORY: FLAMMABLE
FLASHPOINT: 57 DEG. F PMCC FLAMMABLE LIMITS: LEL 1.3 UEL U/I

EXTINGUISHING MEDIA:

USE NATIONAL FIRE PROTECTION ASSOCIATION (NFPA) CLASS B EXTINGUISHERS (CARBON DIOXIDE, DRY CHEMICAL, OR UNIVERSAL AQUEOUS FILM FORMING FOAM) DESIGNED TO EXTINGUISH NFPA CLASS IB FLAMMABLE LIQUID FIRES.

UNUSUAL FIRE AND EXPLOSION HAZARDS:

KEEP CONTAINERS TIGHTLY CLOSED. ISOLATE FROM HEAT, ELECTRICAL EQUIPMENT, SPARKS, AND OPEN FLAMES. CLOSED CONTAINERS MAY EXPLODE WHEN EXPOSED TO EXTREME HEAT. DO NOT APPLY ON HOT SURFACES. TOXIC GASES MAY FORM WHEN PRODUCT IS CONTACTED BY FLAME OR HOT SURFACES.

SPECIAL FIRE FIGHTING PROCEDURES:

WATER SPRAY MAY BE INEFFECTIVE. WATER SPRAY MAY BE USED TO COOL CLOSED CONTAINERS TO PREVENT PRESSURE BUILD-UP AND POSSIBLE AUTOIGNITION OR EXPLOSION WHEN EXPOSED TO EXTREME HEAT. IF WATER IS USED, FOG NOZZLES ARE PREFERABLE. FIRE-FIGHTERS SHOULD WEAR SELF CONTAINED BREATHING APPARATUS.

SECTION V - REACTIVITY DATA

STABILITY: STABLE HAZARDOUS POLYMERIZATION: NOT EXPECTED TO OCCUR

INCOMPATIBILITY (MATERIALS AND CONDITIONS TO AVOID):

AVOID CONTACT WITH STRONG ALKALIES, STRONG MINERAL ACIDS, OR STRONG OXIDIZING AGENTS.

HAZARDOUS DECOMPOSITION PRODUCTS:

MAY PRODUCE HAZARDOUS DECOMPOSITION PRODUCTS WHEN HEATED. WELDING, BRAZING, OR FLAME-CUTTING ON SURFACES COATED WITH THIS PRODUCT MAY PRODUCE FUMES INCLUDING:
Carbon Monoxide,

SECTION VI - SPILL OR LEAK PROCEDURES

STEPS TO BE TAKEN IN CASE MATERIAL IS RELEASED OR SPILLED:

PROVIDE MAXIMUM VENTILATION. ONLY PERSONNEL EQUIPPED WITH PROPER RESPIRATORY AND SKIN AND EYE PROTECTION SHOULD BE PERMITTED IN THE AREA. REMOVE ALL SOURCES OF IGNITION. TAKE UP SPILLED MATERIAL WITH SAWDUST, VERMICULITE, OR OTHER ABSORBENT MATERIAL AND PLACE INTO CONTAINERS FOR DISPOSAL.

WASTE DISPOSAL METHOD:

WASTE MATERIAL MUST BE DISPOSED OF IN ACCORDANCE WITH FEDERAL, STATE, PROVINCIAL, AND LOCAL ENVIRONMENTAL CONTROL REGULATIONS. EMPTY CONTAINERS SHOULD BE RECYCLED OR DISPOSED OF THROUGH AN APPROVED WASTE MANAGEMENT FACILITY.

SECTION VII - HEALTH HAZARD DATA

EFFECTS OF OVEREXPOSURE FROM:

INGESTION:
- HARMFUL OR FATAL IF SWALLOWED.

EYE CONTACT:
- CAUSES SEVERE EYE IRRITATION.

SKIN CONTACT:
- MAY CAUSE MODERATE SKIN IRRITATION.
- MAY BE ABSORBED THROUGH THE SKIN.
- PROLONGED OR REPEATED CONTACT MAY CAUSE AN ALLERGIC SKIN REACTION.

INHALATION:
- VAPOR AND SPRAY MIST HARMFUL IF INHALED.
- VAPOR IRRITATES EYES, NOSE, AND THROAT.
- REPEATED EXPOSURE TO HIGH VAPOR CONCENTRATIONS MAY CAUSE IRRITATION OF THE RESPIRATORY SYSTEM AND PERMANENT BRAIN AND NERVOUS SYSTEM DAMAGE.
- INTENTIONAL MISUSE BY DELIBERATELY CONCENTRATING AND INHALING THE CONTENTS CAN BE HARMFUL OR FATAL.

CHRONIC OVEREXPOSURE:

AVOID LONG TERM AND REPEATED CONTACT.

- THIS PRODUCT CONTAINS AN ETHYLENE-SERIES GLYCOL ETHER AND/OR ACETATE WHICH HAS BEEN SHOWN TO CAUSE DAMAGE TO THE KIDNEYS, LIVER, BLOOD AND/OR BLOOD-FORMING TISSUES. THE ETHYL AND METHYL DERIVATIVES HAVE CAUSED BIRTH DEFECTS AND REPRODUCTIVE ORGAN DAMAGE IN LABORATORY

CONTINUED ON PAGE 4

ANIMALS. THERE IS NO EVIDENCE OF THESE EFFECTS IN HUMANS.

SIGNS AND SYMPTOMS OF OVEREXPOSURE:

-EYE WATERING, HEADACHES, NAUSEA, DIZZINESS, AND LOSS OF COORDINATION ARE INDICATIONS THAT SOLVENT LEVELS ARE TOO HIGH.

-REDNESS, ITCHING, BURNING SENSATION AND VISUAL DISTURBANCES MAY INDICATE EXCESSIVE EYE CONTACT.

-DRYNESS, ITCHING, CRACKING, BURNING, REDNESS, AND SWELLING ARE CONDITIONS ASSOCIATED WITH EXCESSIVE SKIN CONTACT.

MEDICAL CONDITIONS AGGRAVATED BY EXPOSURE: NOT APPLICABLE

SECTION VIII - FIRST AID PROCEDURES

INGESTION:

IF SWALLOWED, DO NOT INDUCE VOMITING.

EYE CONTACT:

IN CASE OF EYE CONTACT, FLUSH EYES IMMEDIATELY WITH PLENTY OF WATER FOR AT LEAST 15 MINUTES.

SKIN CONTACT:

IN CASE OF SKIN CONTACT, REMOVE PROMPTLY BY WIPING, FOLLOWED BY WATERLESS HAND CLEANER AND SOAP AND WATER.

INHALATION:

IF AFFECTED BY INHALATION OF VAPOR OR SPRAY MIST, REMOVE TO FRESH AIR. APPLY ARTIFICIAL RESPIRATION AND OTHER SUPPORTIVE MEASURES AS REQUIRED.

OTHER:

IF ANY OF THE FOLLOWING OCCUR DURING OR FOLLOWING USE OF THIS PRODUCT, CONTACT A POISON CONTROL CENTER, EMERGENCY ROOM OR PHYSICIAN IMMEDIATELY; HAVE MATERIAL SAFETY DATA SHEET INFORMATION AVAILABLE. *INGESTION *EXCESSIVE EXPOSURE TO A CORROSIVE MATERIAL. * PERSISTENT SKIN/EYE IRRITATION OR BREATHING DIFFICULTIES.

SECTION IX - PROTECTION INFORMATION

PERSONAL PROTECTIVE EQUIPMENT FOR:

EYE PROTECTION:

WEAR CHEMICAL-TYPE SPLASH GOGGLES OR FULL FACE SHIELD.

SKIN PROTECTION:

WEAR PROTECTIVE CLOTHING, INCLUDING IMPERMEABLE APRON AND GLOVES CONSTRUCTED OF: POLYVINYL ALCOHOL, NEOPRENE RUBBER, NITRILE RUBBERBUTYL RUBBER OR LATEX RUBBER

RESPIRATORY PROTECTION:

OVEREXPOSURE TO VAPORS MAY BE PREVENTED BY ENSURING VENTILATION CONTROLS, VAPOR EXHAUST OR FRESH AIR ENTRY. NIOSH/MSHA-APPROVED (TC-23C-) PAINT SPRAY OR AIR SUPPLIED (TC-19C-) RESPIRATORS MAY ALSO REDUCE EXPOSURE. READ RESPIRATOR MANUFACTURER'S INSTRUCTIONS AND LITERATURE CAREFULLY TO DETERMINE THE TYPE OF AIRBORNE CONTAMINANTS AGAINST WHICH THE RESPIRATOR IS EFFECTIVE AND HOW IT IS TO BE PROPERLY FITTED.

OTHER EQUIPMENT:

CLEAN OR DISCARD CONTAMINATED CLOTHING AND SHOES.

VENTILATION REQUIREMENTS:

PROVIDE GENERAL DILUTION OR LOCAL EXHAUST VENTILATION IN VOLUME AND PATTERN TO KEEP THE CONCENTRATION OF INGREDIENTS LISTED IN SECTION II BELOW THE LOWEST SUGGESTED EXPOSURE LIMITS, THE LEL IN SECTION IV BELOW THE STATED LIMIT, AND TO REMOVE DECOMPOSITION PRODUCTS DURING WELDING OR FLAME CUTTING ON SURFACES COATED WITH THIS PRODUCT.

SECTION X - SPECIAL PRECAUTIONS

HANDLING AND STORAGE PRECAUTIONS:

DO NOT STORE ABOVE 120 DEGREES F. STORE LARGE QUANTITIES IN BUILDINGS DESIGNED AND PROTECTED FOR STORAGE OF NFPA CLASS IB FLAMMABLE LIQUIDS.

OTHER PRECAUTIONS:

IF THIS MATERIAL IS PART OF A MULTIPLE COMPONENT COATING SYSTEM, READ THE MATERIAL SAFETY DATA SHEET(S) FOR THE OTHER COMPONENT OR COMPONENTS BEFORE BLENDING AS THE RESULTING MIXTURE MAY HAVE THE HAZARDS OF ALL OF ITS PARTS.

CONTAINERS SHOULD BE GROUNDED WHEN POURING. AVOID FREE FALL OF LIQUIDS IN EXCESS OF A FEW INCHES.

AQUAPON PERFORMANCE DATA

PPG Industries Manufacturer's Data

24-HOUR CHEMICAL SPOT TESTS ON AQUAPON EPOXY COATINGS

Chemical name	Formula	Results[a]
Ferric nitrate	$Fe(NO_3)_3$	Dis
Sodium hypocarbonate	$NaHCO_3$	-
Sodium carbonate	Na_2CO_3	-
10% trisodiumphosphate		-
50% hydrogen peroxide	H_2O_2	Complete
Calcium hypochlorate(?)	$Ca(OCl)_2$	-
Butyl alcohol(?)	BUOH	Soft
Methyl isobutyl ketone	MIBK	SL, Soft
Trichloroethylene	C_2HCl_3	-
Xylene	$C_6H_4(CH_3)_2$	-
Gasoline		-
Cellosolve acetate[b]		-
Iodine		Dis
5% phenol acetate		SL, Soft
Skydrol 500B*		Soft, SW, LG
Machine oil		-

[a] - No effect
Complete Complete failure
Dis Discoloration
LG Loss of gloss
SL Soft
Soft Softening
SW Swelling

[b] Ethylene glycol monoethyl ether acetate

* Skydrol 500B is a trademark of Monsanto Company.

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APPENDIX 7A

BUILDING EMERGENCY PLAN - 616 BUILDING

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1.0 INTRODUCTION

The 616 Building Emergency Plan has been designed to provide a system of planned responses that will minimize risks to personnel, equipment, buildings, public health, and the environment in the event of an emergency. This plan is applicable to the building, employees, and visitors, identified in Section 1.1.

This plan, in conjunction with the WHC Emergency Plan (WHC-CM-4-1) and the DOE-RL Emergency Plan and Procedures Manuals, is intended to meet all applicable requirements for building emergency plans, and the Washington State requirements for Hazardous/Dangerous Waste Contingency Plans. The Building Emergency Director (BED), as mentioned throughout this plan, has the duties described in WAC 173-303 of the "Emergency Coordinator."

Emergency situations considered for this building requiring emergency response plans are identified in Section 3.0," Potential Emergency Conditions." The six categories of emergencies considered are identified as follows:

1. Operational Emergencies, including security events
2. Natural Hazards
3. Nonradioactive Hazardous Material Hazards (including sudden or nonsudden releases of dangerous wastes)
4. Radioactive Material Hazards (including sudden or nonsudden release of mixed waste)
5. Criticality
6. Explosive Materials/Munitions.

Planned responses are those activities which are intended to provide direction to control a fire, minimize the immediate effects of an explosion, contain a spill or release, and minimize the effects of a criticality incident. These responses include, notification of personnel, emergency organizations, and the BED. The Plan also provides guidance for notifying personnel to take cover, evacuate, or take other actions, which are determined by the particular circumstances. The planned responses also provide for formal notification and reporting, investigation of the incident, cleanup, and restoration.

The 616 Building is located on the 570 mi^2, U.S. Department of Energy (DOE) Hanford Site in southeastern Washington State. The 616 Building is located in the center portion of the 600 Area near the center of the Hanford Site.

A discussion of the 616 Building is contained in Section 1.4.

1.1 FACILITY NAME: U.S. Department of Energy Hanford Site
616 Building

1.2 FACILITY LOCATION: Benton County, Washington; within the 600 Area.

Buildings/Facilities covered by this plan are: the 616 Building

1.3 OWNER/OPERATOR: U.S. Department of Energy
Richland Operations Federal Building
825 Jadwin Avenue
Richland, Washington

CO-OPERATOR: Westinghouse Hanford Company
P.O. Box 1970
Richland, Washington

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1.4 DESCRIPTION OF THE FACILITY AND OPERATIONS

The 616 Building is designed and used for storing nonradioactive dangerous waste. To support safe response to potential spills it has numerous features, such as independent collection trenches, sloped floors, and curbing. Nonradioactive dangerous wastes generated on the Hanford site are received, stored, and prepared here for shipment to permitted offsite treatment, storage, or disposal facilities. The 616 Building occupies approximately 7,700 square feet of space. It consists of the following.

- Office and change rooms--Building records, a radio base station, and the source of the building PA system are located in the office.
- Receiving Area--Area used for handling incoming/outgoing shipments.
- Loading/Unloading Areas--Shipments are usually made or received via the main entrance area. The backup area is intended for use if shipments in and out of the building occur simultaneously.
- Packaging Material and Handling Equipment Storage Areas--Storage of supplies, etc.
- Packaging and Sampling Room--Work area where wastes are occasionally repackaged/overpacked. No closed waste containers are opened in this process. No sampling is performed in this room, although it could be modified to support sampling activities.
- Oxidizer Cell--Storage of waste oxidizers.
- Caustic Cell--Storage of waste caustics.

- Acid Cell--Storage of waste acids.
- Combustible Cell--Storage of waste combustibles.
- Flammable Cells 1A and 1B--Storage of waste flammables. Cell 1A is equipped with hinged walls and a special ceiling to "blow out" and therefore minimize damage in the event of an explosion. Explosion-proof pumps, outlets, and lights are located in Cell 1A as well.

Wastes that are shipped to the 616 Building are characterized, designated, and packaged according to Washington Department of Ecology and U.S. Department of Transportation (DOT) regulations. All waste packages are pre-inspected and arrive by truck. The 616 Building staff, upon acceptance, transfer the waste packages to appropriate storage cells. The 616 Building is operated during the day shift, five days per week. Packages received at the 616 Building are accompanied by onsite hazardous waste manifests. The packages are remanifested and reinspected for compliance with DOT regulations prior to offsite shipment. Incoming shipments occur about twice per week. Offsite shipments are made about once every three weeks. The building routinely houses 150-250 drums of waste.

Explosives, munitions, reactive wastes defined under WAC 173-303-090 (7)(a)(vi), (vii), and (viii), or greater than 10 pounds of class IV oxidizers are not accepted at the 616 Building.

The 616 Building has two ventilation systems; one serving the office area, and the other serving the rest of the building. The office is always kept at a higher air pressure than the storage cells to prevent inadvertent chemical exposure.

Packages are moved in the 616 Building with a drum dolly, hand truck, or electric fork lift (the electric fork lift cannot be used in Flammable Cell 1A). Drums are stacked no more than two high.

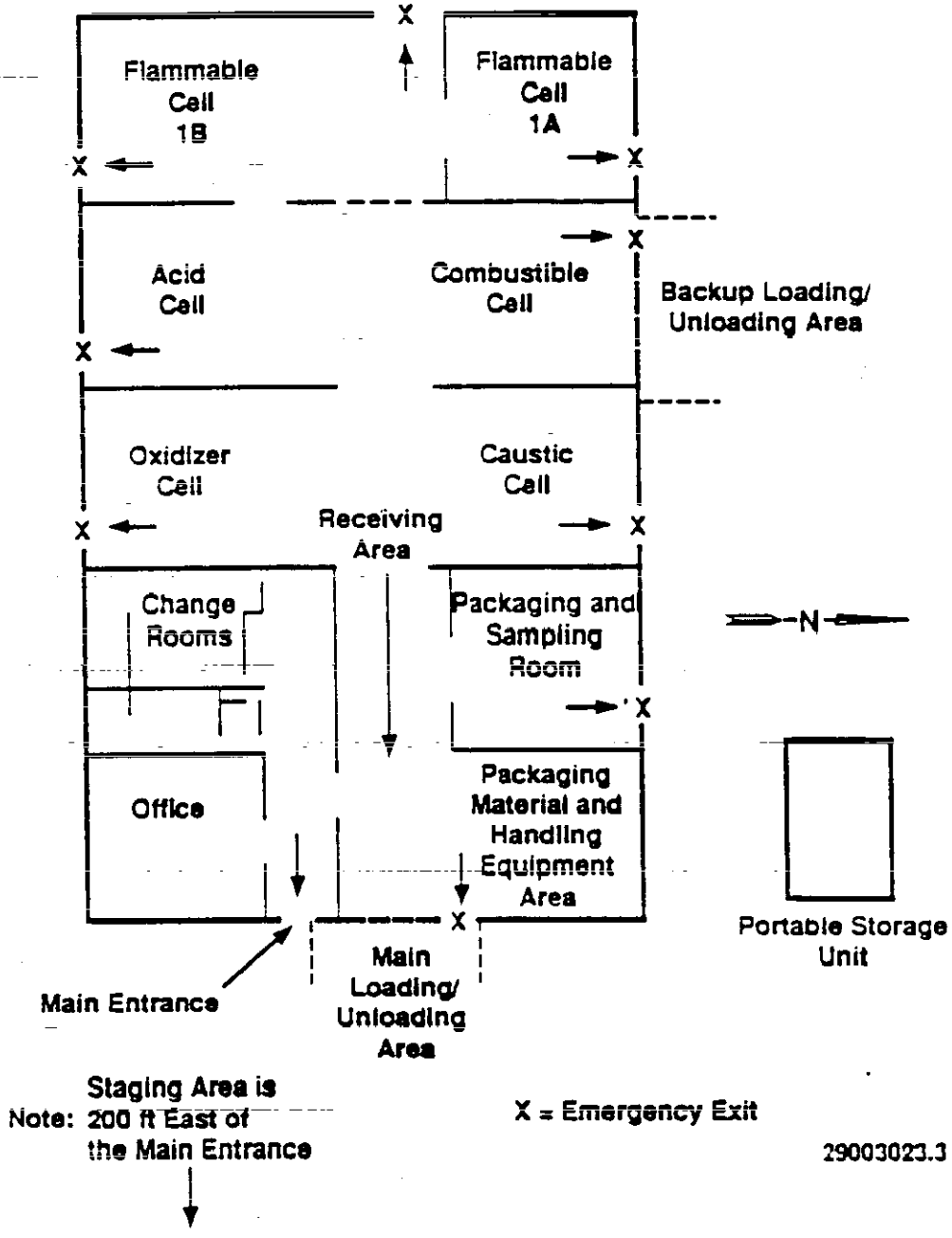
1.5 BUILDING EVACUATION ROUTING (BUILDING LAYOUT)

Figure 1 provides identification of emergency evacuation routes from the building to the staging area, and if necessary, evacuation routes within the building.

1.5.1 Building Evacuation Route (Building Layout, Exits, and Staging Area)

Figure 1 shows the layout, exits, and staging area for the 616 Building. Evacuation of the building is made by using any of the emergency exits and proceeding directly to the staging area, 200 ft east of the main entrance. Evacuation alarms are described in Section 5.4, and response to alarms are given in Section 6.1.

Figure 1. The 616 Building Layout, Exits, and Staging Area.



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1.5.2 Secondary Evacuation Routes

If it becomes necessary to evacuate the primary staging area, the staging area manager or the building emergency director instructs personnel to proceed to an alternate staging area or destination, depending on the type of emergency. Personnel are informed of the routes to be used and are instructed to use private vehicles, government vehicles, or evacuation buses as appropriate. Numerous routes can be taken to evacuate the 600 Area. Figure 2 shows evacuation and alternate evacuation routes for further evacuation from the primary staging area.

2.0 PURPOSE

2.1 PURPOSE OF PLAN

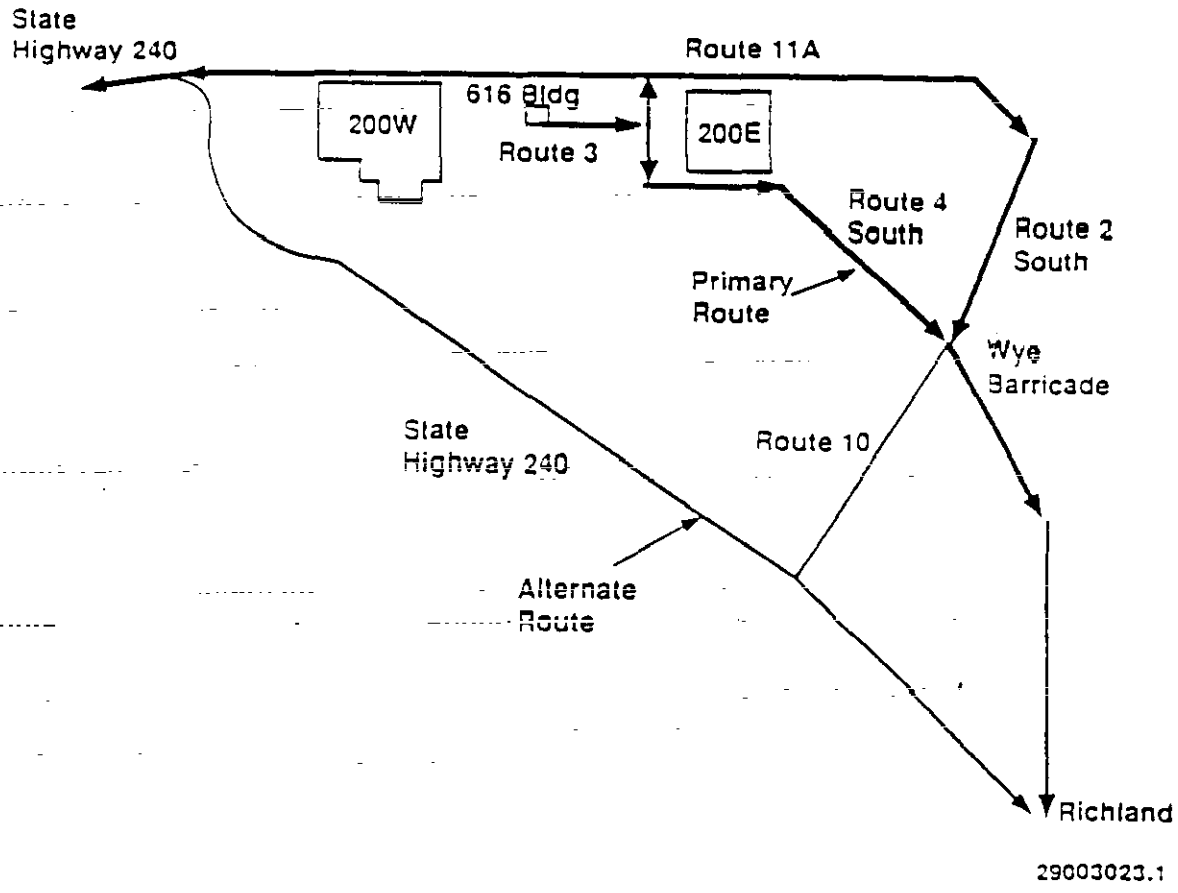
The purpose of the 616 Building Emergency Plan is to provide employees and visitors with information necessary for emergency situations in order to accomplish the following:

- Maximize employee safety, minimize the risk to life, and provide prompt and efficient treatment for injured persons.
- Ensure continuity of leadership at all times and in all emergency situations.
- Minimize the effects of an accident on the health and safety of the general public and the environment.
- Minimize property damage.
- Ensure prompt internal and external communications with responsible authority.
- Meet the requirements of DOE Orders 5500 Series.
- Comply with the requirements of WHC-CM-4-1, *Emergency Plan*. The emergency plan for this building consists of this plan, the WHC Emergency Plan, the DOE-RL Emergency Plan, and the DOE-RL Emergency Procedures Manual.

2.2 EMPLOYEE REQUIREMENTS

Each WHC employee assigned to the 616 Building is required to annually review this plan and document that review using the "Building Emergency Plan Review Checklist" (form number 54-6000-369) as defined in WHC-CM-4-1.

Figure 2. The 616 Building Secondary Evacuation Routes.



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3.0 POTENTIAL EMERGENCY CONDITIONS

The following provides a generalized idea of the types and amounts of hazardous materials and wastes stored or used in the 616 Building. These materials and wastes could be involved in a number of the potential emergencies described in the subsections that follow. Job Safety Analysis and Material Safety Data Sheets provide the basis for safe use of the materials in the workplace. Each employee shall know the appropriate actions to take in case of a spill or unwanted release.

The 616 Nonradioactive Dangerous Waste Storage Building handles a wide variety of chemical wastes. These include corrosive (acidic and/or caustic), flammable, combustible, carcinogenic, and oxidizer type dangerous wastes. The following wastes are not accepted for storage at the 616 building:

- Reactive waste defined in WAC 173-303-090(7)(a)(vi), (vii), or (viii)
- Explosives
- Greater than 10 pounds of class IV oxidizer.

Waste packages range in size from very small to 110 gallon containers and pallet mounted boxes. A specific inventory list of wastes stored in the building is kept by the BED, including Material Safety Data sheets.

Radioactive wastes are not stored in the 616 Building.

3.0.1 Assessment

After identifying the source and nature of the incident, the BED will assess any potential hazards to human health or the environment using the following criteria (when available):

- Origin of the leak, fire, or explosion, if known
- Conditions of the source, e.g., controllable leak or fire, uncontrollable leak or fire, easily moved, immovable
- Materials involved
- Physical state of the material, e.g., solid, liquid, or gas
- Evidence of reaction(s), e.g., fuming, flaming, gas evolution
- Odor
- Color of material.

This information, in conjunction with the detailed information acquired in determining the material involved, will provide the BED or person assessing the event with enough data to assess potential hazards and to determine the appropriate response necessary.

The assessment will consider the potential for:

- Spread of fire
- Explosion or further chemical reaction
- Increase in spill volume
- Generation of new compounds and their hazards
- Generation or spread of toxic, irritating, or asphyxiating gases
- Identification of exposure and release pathways
- Effect of exposure and appropriate safety precautions
- Contaminated run-off from spilled chemicals, response chemicals and fire, explosion, or reaction residues
- Injury to personnel
- Impacts beyond the immediate area involved.

3.0.2 Sampling

In cases involving soil contamination, sampling must be performed to determine the lateral and vertical extent of contamination. The BED is responsible for coordinating onsite characterization activities to be performed by Hanford Site organizations that are qualified to conduct the work.

3.1 EVACUATION AND TAKE COVER

Evacuation alarms at this building may be activated for the following reasons:

1. Release of hazardous material (radioactive or nonradioactive) at this or another building impacting this building
2. Loss of utilities
3. Protective response to emergencies affecting ability to inhabit the building.

Take cover alarms at this building may be activated for the following reasons:

1. Release of hazardous material outside of a building

2. Attack by hostile factions

3. Emergencies affecting the building or personnel.

3.2 OPERATIONAL EMERGENCIES

The following emergency situations are those considered credible for this building, unless determined to be NA (not applicable). Described in this section are the types and extent of credible emergency events. Response plans for each type are listed in Section 6.0 of this plan.

The following sections contain a description of the "Worst Case" anticipated accident in each category and the event classifications associated with the identified credible event. This information is typically derived from the Safety Analysis Report, Hazards Evaluation, or Risk Assessment for the building.

3.2.1 Bomb Threat

Bomb threats involve the possibility that an explosive device has been located in or around the building. Hazards include flying objects and exposure to dangerous waste.

3.2.2 Industrial Accidents

Hazards associated with industrial accidents include the potential for injuries resulting from accidents with moving equipment (such as the electric fork lift), from falls, or from exposure to spilled chemical wastes.

3.2.3 Loss of Electricity

Hazards associated with a loss of electricity include potential exposure to toxic chemical vapors due to shutdown of the ventilation system.

3.2.4 Loss of Water

Loss of waster could disable the wet pipe sprinkler system, resulting in increased hazard in the event of a fire.

3.2.5 Loss of Ventilation

Loss of ventilation could result in exposure to toxic chemical vapors/particulates. The only vapors expected in the 616 Building would arise from spills as there is no usual discharge of vapors/particulates.

3.2.6 Loss of Steam

NA. The 616 Building does not receive steam.

3.2.7 Loss of Air

NA. The 616 Building does not receive instrument or process air.

3.2.8 Fire

Fire hazards include exposure to toxic chemicals, smoke inhalation, burns, and damage to equipment. Sealed containers may also become pressure hazards.

3.2.9 Major Process Upset

NA. The 616 Building does not contain a chemical process as it is a storage building.

3.2.10 Pressure Hazards

In the event of a chemical reaction or a fire, sealed containers could suddenly rupture, producing flying objects and releasing dangerous wastes.

3.2.11 Security Event

A security event may involve numerous hazards; including injury, fire, explosion, or environmental damage.

3.3 NATURAL HAZARDS EMERGENCIES

The following emergencies are those applicable to facilities on the Hanford Site. Response plans for each are contained in Section 6.0.

3.3.1 Seismic Event

A seismic event may involve hazards caused by falling objects or failure of electrical systems.

3.3.2 Volcanic Eruption and Ashfall

Hazards associated with a volcanic eruption and ashfall include interference with the building ventilation system.

3.3.3 High Winds or Tornado

Hazards associated with high winds or tornado include loss of electricity and damage caused by flying objects.

3.3.4 Flood

NA. The 616 Building is situated at least 175 ft above the highest elevation of the probable maximum flood postulated by the U.S. Army Corps of Engineers.

3.3.5 Range Fire

Hazards associated with a range fire include burns and smoke innalation from outside the building, as well as the hazards described in Section 3.2.11.

3.4 HAZARDOUS MATERIALS AND MIXED WASTE SPILLS AND RELEASES

This section addresses the spill and release of non-radioactive hazardous materials. Mixed wastes are not stored in the 616 Building.

The primary storage areas are: Flammables, Combustible, Acid, Caustic, and Oxidizer Storage Cells.

The use, storage, and control of hazardous material is controlled by Plant Operating Procedures and Material Safety Data Sheets which are located in the 616 Building Office. Spills or releases may result in the following conditions:

3.4.1 Spill of Hazardous Material

Hazards associated with a spill include potential exposure to corrosive and toxic materials or fumes, and potential environmental damage.

3.4.2 Fires or Explosions Involving Hazardous Material

A fire or explosion in the 616 Building could produce flying objects and the release of hazardous waste to the air or ground.

3.4.3 Toxic Fumes Hazards

Hazards associated with toxic fumes include potential chemical exposure to personnel and the environment (Section 3.4.1).

3.4.4 Reactive Chemical and Corrosive Material Hazards

Improper segregation of incompatible materials could cause an explosive reaction. Hazards associated with corrosive materials include chemical burns and exposure to toxic material. These hazards are the same as for spills (Section 3.4.1).

3.4.5 Thermal Reactions and Hazards

Thermal reactions could result in burns, chemical burns, toxic fumes, and pressure hazards in sealed containers.

3.4.6 Flammable Material and Liquids Hazards

Hazards associated with flammable materials and liquids include fire, explosion, and spills of hazardous wastes.

3.4.7 Asbestos Release

The 616 Building is new and its structure does not contain asbestos. Dangerous wastes containing asbestos, however, could be stored there. Release of asbestos waste could result in an inhalation hazard.

3.5 RADIOACTIVE MATERIALS

Radioactive materials are not used and stored in the 616 Building. Therefore, the following types of radiation emergencies are not applicable. Response plans for each type of radiation emergency are also not applicable.

3.5.1 Gaseous Effluent Discharges (Stack Releases)

NA.

3.5.2 Liquid Effluent Discharges

NA.

3.5.3 Significant Contamination Spread or Releases

NA.

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3.6 CRITICALITY

NA.

3.7 EXPLOSIVE MATERIALS AND MUNITIONS HAZARDS

Explosives, including munitions (as defined by the U.S. Department of Transportation regulations), are not stored in the 616 Building. Explosions, however, might occur in flammable materials (Sections 3.4.2 and 3.4.6).

4.0 IMPLEMENTATION OF BUILDING EMERGENCY PLAN

4.1 IMPLEMENTATION

The provisions of this emergency plan will be implemented when the BED makes a determination that the severity of an incident presents a potential to endanger human health or the environment. The plan will be implemented when there is an imminent threat of, or an actual incident as listed in Section 3.0.

Emergency circumstances include fire, explosion, or unplanned release of dangerous waste or dangerous waste constituents to the air, soil, surface water, or groundwater. Emergency notifications shall be made as identified in Section 5.3.

The BED has the responsibility to assess building emergency incidents, and to determine the level of action necessary to protect the personnel, building, or environment. If the incident requires assistance from patrol, fire, or ambulance units, notification to the Patrol Operations Center requesting assistance is made by calling the Hanford Emergency Response Number 911. When additional resources or assistance from outside the building other than from patrol, fire, or ambulance units is required, notification is given to the Emergency Duty Officer at the Patrol Operations Center business number (373-3800). For a relatively minor incident, the situation will be handled by building personnel under the direction of the BED or line management.

4.2 IDENTIFICATION OF HAZARDOUS MATERIALS

The BED should be aware of the location, types and general amounts of all hazardous or dangerous materials and wastes in the building. If there

is an emergency incident and the materials or wastes involved are unknown, they will be identified by using the following methods:

1. Questioning witnesses or individuals familiar with the operations or area where the incident occurred or is occurring.

2. Checking the label or placard on the container or tank, if it is visible from a safe distance.

3. Noting the location of a container, if in a waste storage or accumulation area and checking that location against the building's waste inventory log, chemical waste disposal analysis letter file, waste transfer manifest file, or the accumulation area record file.

4. If the wastes cannot be identified by these methods the Hazardous Materials Response (HAZMAT) Team and the Chemical Spill Response Team (CSRT) will be called (811). The HAZMAT Team will control and stabilize the incident and the CSRT will sample the waste in accordance with sampling and testing methods specified in WAC 173-303-110 and SW-846. Following proper chain-of-custody procedures, the samples will be packaged and transported to an analytical laboratory for analysis and identification.

4.3 EMERGENCY DOSE LIMITS

NOTE: The 616 building is not used to store radioactive waste or material.

These limits only apply in an emergency, including receipt of misrepresented radioactive waste at the 616 Building. Every effort will be made to maintain doses as low as reasonably achievable (ALARA).

Circumstances of Exposure	Maximum Single Dose (Whole Body)
Recovery of Hanford Criticality Radiation Dosimeters (see WHC-CM-4-1, Section 9.3.3, for guidelines).	3 rem
Recovery of deceased victim, Prevent property loss/reduce hazard.	10 rem
Reduce hazard or prevent substantial property loss in special circumstances.	25 rem
Save a life or prevent severe effects on health or safety of public.	100 rem

5.0 EMERGENCY RESOURCES

5.1 BUILDING EMERGENCY ORGANIZATION

For the 616 Nonradioactive Dangerous Waste Storage Building, the personnel listed in Appendix A are the minimum recommended emergency staff of the building emergency response organization. In an emergency which requires implementation of the provisions of this plan, the person acting as the BED has the authority to commit the resources required to carry out this plan, including, money, manpower, and equipment.

Definitions of roles and responsibilities of emergency personnel are contained in the WHC-CM-4-1.

Appendix A contains the list of the Building Emergency Response Organization.

5.2 IDENTIFICATION AND DESCRIPTION OF EMERGENCY EQUIPMENT

The 616 Building has a variety of fixed and portable emergency equipment. The locations, physical descriptions, and capabilities of all emergency equipment, including fire extinguishing systems, spill control equipment, communications and alarm systems, and decontamination equipment are given in Table 1. Figure 3 shows locations of equipment.

5.3 EMERGENCY NOTIFICATIONS

5.3.1 Notification to Personnel within the Building

Notification of building personnel will be given immediately upon discovering any conditions which affect building occupants, or operations.

Any person discovering such an incident should leave the immediate area if there is any danger of harm. If the incident is a fire, the nearest fire alarm should be activated. After doing this, and for any other emergency incident, the person should go to the nearest phone in a safe area, dial 911 or 373-3800 and provide the following information slowly and clearly:

- Name
- Nature of the emergency
- Exact location of the emergency.

After requesting necessary outside assistance, the employee shall notify their supervisor.

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Table 1. Identification and Description of Emergency Equipment. (sheet 1 of 3)

Item	Location	Physical Description	Capabilities
		Fixed Emergency Equipment	
Fixed Fire Control System	Throughout the 616 Building.	Wet pipe overhead sprinkler system.	Assist in fire control. Activated by heat. The system for the storage cells is designed to meet Extra Hazard, Group 2, National Fire Protection Association requirements (NFPA 1988).
Fire Hydrant	Exterior of the southeast corner of the 616 Building.	Yellow hydrant enclosed in four posts.	Supply water for fighting fires.
Eye Wash/Shower Stations	2 units: one is located in the Combustible Cell, the other is in the Packaging and Sampling Room.	Fixed combination eyewash/safety shower.	Immediate decontamination of building personnel who have been inadvertently exposed to hazardous materials.
		Portable Emergency Equipment	
Portable Fire Extinguishers	1 unit located in the office.	10-ABC Type.	Fighting fires in wood, cloth, paper, flammable liquids, gasses, greases, and energized electrical equipment.
Portable Fire Extinguishers	4 units: hallway outside of the office, Receiving Room, Combustible Cell, Flammable Cell 1B.	4-ABC Type.	Fighting fires in wood, cloth, paper, flammable liquids, gasses, greases, and energized electrical equipment.
		Protective Equipment	
Chemical Resistant Coveralls	Outside Men's Change Room.	10 pair minimum; nonperforated coated cloth, Saranex® type, or equivalent.	Provide protection when overpacking containers.
Response Gloves*	PMMI area.	20 pair minimum; Norfoil®, Silver Shield®, or equivalent.	Provide protection for hands when exposed to an undetermined chemical or a wide variety of toxic/hazardous materials. Maybe worn over other chemical resistant gloves for additional protection.

®Norfoil and Silver Shield are registered trademarks of Stella North, Inc., Charleston, South Carolina.
®Saranex is a registered trademark of Dow Chemical Company, Midland, Michigan.
*Glove breakthrough times for specific chemical exposures must be reviewed and evaluated prior to use.

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Table 1. Identification and Description of Emergency Equipment. (sheet 2 of 3)

Item	Location	Physical Description	Capabilities
		Protective Equipment	
Corrosive Material Gloves*	PNNE area.	10 pair minimum; neoprene, nitrile, polyvinyl chloride, or equivalent.	Provide protection for hands when exposed to corrosive materials.
Solvent Resistant Gloves*	PNNE area.	10 pair minimum; Viton®, butyl, nitrile, neoprene, or equivalent.	Provide protection for hands when exposed to solvents, alcohols and water based solutions.
Abrasion Resistant Gloves*	PNNE area.	Four pair minimum, leather or equivalent.	Provide abrasion/cut/puncture protection for hands when handling containers and tools.
		Spill Control Equipment	
Drum Dolly	PNNE area.	Minimum of two, capable of handling assorted sizes and types of drums.	Moving drums.
Absorbent Material	PNNE area and portable storage unit north of 616 Building.	10 bags minimum; cat litter, diatomaceous earth.	Absorbing spills.
Overpack Drums	PNNE and portable storage unit north of 616 Building.	Minimum of three each; 30, 55, and 85-gallon "salvage" drums.	Overpack damaged containers.
Chemical Transfer Pumps	1 in PNNE area.	Hand pump.	Transfer liquids to secure containers.
	1 in 616 Building packaging and sampling room.	Electric pumps.	
	1 in 616 Building flammable cell 1A	Explosion proof pumps.	
Nonsparking Tools	PNNE area.	Minimum of one each; adjustable wrench, bung wrench, and shovel.	Used when managing containers of flammable material.
Tools	PNNE area.	Minimum of one each; cross-slotted screwdriver, slotted screwdriver, crowbar, and hammer.	Used when managing wooden containers.

®Viton is a registered trademark of E.I. Dupont de Nemours and Company, Wilmington, Delaware.
*Glove breakthrough times for specific chemical exposures must be reviewed and evaluated prior to use

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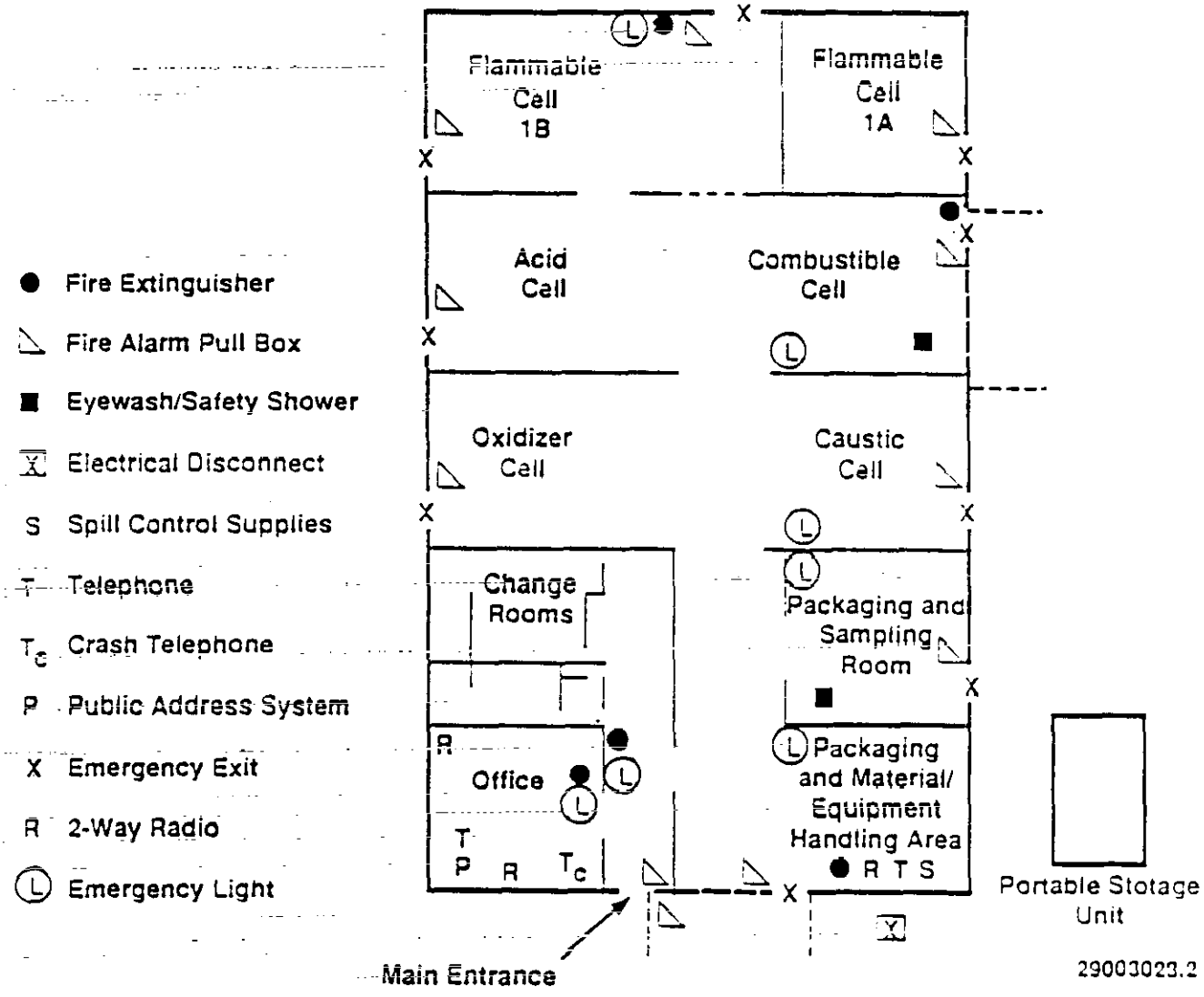
Table 1. Identification and Description of Emergency Equipment. (Sheet 3 of 3)

Item	Location	Physical Description	Capabilities
		Communications Systems	
Radios	2 units, 1 base station in 616 office, 1 portable in PHME area.	Standard equipment.	Provide communications.
Public Address System	616 Building office, storage cells, and exterior.	Standard source is from the 616 office.	Provide communications within and outside the building.
Telephones	616 Building office (2), Receiving Room (1), on the telephone pole on the east side exterior of the building (1).	Standard.	Provide communications.
Crash Phones	616 Building office (1).	Standard telephone with yellow label on handle.	Emergency communications.
		Alarms	
Fire Alarm Pull Boxes (10 units)	Flammable Cell 1A (1), Flammable Cell 1B (2), Acid Cell (1), Combustible Cell (1), Caustic Cell (1), Oxidizer Cell (1), Packaging and Sampling Room (1), Receiving Room (1), and Inside Main Entrance (1).	Standard pull boxes.	Alerts 616 Building, fire station of fire.
Fire Alarm Button	Outside main entrance	Push button.	Alerts 616 Building and Fire Station of fire.
Loss of Ventilation Indicator Lights	616 Building office (2)	Two small red lights.	Indicates when office, cell ventilation systems are operating.
Evacuation/Safe Cover Alarm	616 Building office	Gray panel.	Operated manually to initiate building evacuation.

Figure 3. The 616 Building Safety Equipment.



Have the person answering the call repeat the message back. The Building Supervisor will assess the situation and determine if the BED must be notified.

Notification of emergency incidents will be given to building, area, or site personnel, depending on the severity of the incident, via one or more of the following emergency warning systems:

- Building PAX public address (PA) System--used for localized incidents which affect only a limited area in immediate proximity to the incident

- Hanford Site standard emergency signals--summarized in Section 5.4.1 and more fully described in WHC-CM-4-1, Section 6, Subsection 6.1.1

- Crash Alarm telephone system--a telephone system activated by dialing one number and accessing a predefined number of telephones, used for the purposes of disseminating emergency messages.

ADDITIONAL INFORMATION. Crash Phones are identified with a white label on the handle. The following rooms have a telephone on the crash alarm system: 616 Building office.

Contact the BED, who is identified in Appendix A, upon receipt of a Crash Alarm Message. This is to ensure that the message gets to all personnel.

Priority message system (Management Bulletin). A network of telefax machines used to communicate written information rapidly across the Hanford site. The 616 Building receives priority messages from Building 272-WA.

The DOE-RL radio system. This links Management, Patrol, Fire, Safety, and Engineering representatives through a network of base stations and mobile and portable radio units.

5.3.2 Notification to Personnel and Organizations Outside of the Building

The DOE-RL is responsible for all notifications to organizations or agencies outside of the DOE and WHC organizations. All releases of hazardous or dangerous waste or materials are reported by DOE-RL to the Washington State Department of Ecology. The DOE-RL reports any release of hazardous or dangerous waste materials in quantities greater than the reportable quantities identified in federal regulations to the National Response Center.

In the event of a fire or explosion, the BED or line management must immediately notify the Patrol Operations Center by telephone at 811. In the event of unplanned release of hazardous or dangerous wastes or materials, the BED will immediately notify WHC Environmental Protection at 373-1716,

who will notify DOE-RL. (Notification of Environmental Protection may also be made, if needed, using its 24-hour Emergency Preparedness Point of Contact list.)

After identification of an emergency, the facility manager or representative must make oral notification to the Occurrence Notification Center (ONC) Duty Officer on 6-2900 as required by WHC-CM-1-3, Section MRP 5.14, Occurrence Reporting and Processing of Operations Information. The ONC must notify the DOE-RL Facility Representative within 15 minutes of categorization as an emergency occurrence. Written notification must be completed as required by MRP 5.14 and submitted within 24 hours of the occurrence categorization.

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5.4 ACTIVATION OF EMERGENCY ALARMS

5.4.1 Standard Emergency Alarms

SIGNAL	MEANING	ACTIONS
Steady tone or siren (3 to 5 min), building PA System, or at manager's request	Area evacuation radioactive material release, hazardous material release bomb threat	Get car keys, if time permits, and go to evacuation staging area.
Wavering tone or siren (3 to 5 min)	Take cover--hazardous materials release, or security event where evacuation can not be completed in a timely manner	Take cover in nearest building, close doors and windows and turn off ventilation.
Howler (AH-OO-GAH)	Criticality, nuclear excursion	Run away from alarm sound and go directly to a designated staging area as identified in the building emergency plan.
Gong	Fire	Evacuate unless directed not to do so by the BED.
Continuous ringing bell and flashing red light	Potential airborne radiological contamination	Hold your breath and place one barrier between you and alarm.
Crash alarm (200, 300 400 areas)--steadily ringing telephone	Emergency communications	Pick up phone and listen. Relay message to BED.
	The all clear signal for any of these alarms or signals will be passed by voice. The building public address system or crash alarm phones may be used for this purpose.	

5.4.2 Building Specific Emergency Alarms

The 616 Building has an evacuation alarm and a take cover alarm which sound throughout the building. The alarms are initiated manually from the office.

Building fire alarms are activated by pull boxes near each building exit. The locations of the fire alarm pull boxes are shown in Figure 3.

6.0 EMERGENCY RESPONSE PLANS

This section contains emergency response guides that pertain to the 616 Nonradioactive Dangerous Waste Storage Building.

6.1 RESPONSE TO BUILDING EVACUATION AND TAKE COVER ALARMS

This section identifies the proper response to Evacuation and Take Cover alarms within this building.

6.1.1 Evacuation--Steady Siren Response

When an evacuation siren sounds (STEADY SIREN) employees shall proceed to the primary or alternate staging area as identified below. The BED will announce via the Public Address system which staging area to evacuate to.

Area	Location
Primary Staging Area	200 feet east of the 616 Building Main Entrance.
Alternate Staging Area	NA. Secondary evacuation will be made as directed.

6.1.2 Take Cover--Wailing Siren Response

When the take cover alarm is activated, personnel should take cover in the building. The following actions should be taken or considered: 1) close all exterior doors and windows, 2) report your location to your manager or the BED, 3) if possible, secure (turn off) unnecessary electronic or electrical equipment, 4) turn off cell and office area ventilation systems.

6.1.3 Attack by Hostile factions--Take Cover

The 616 Building will be alerted of an impending attack via the Area Crash Alarm System telephone located in the 616 Building office.

6.2 BOMB THREAT RESPONSE GUIDES

A bomb search kit containing some or all of the following items is located at the 272-WA Building:

- Flashlights
- Bump hats, and gloves
- Set of maps
- Marking pens (for marking up search plans on maps)
- Mirrors and extension handles
- Crescent wrenches (for mirror adjustments)
- Thread or string (for marking paths to objects for investigation)
- Green tape (for repairs, holding string, etc.)
- Masking tape (for taping off areas searched).

6.2.1 Receivers of Telephoned Threats

An employee receiving a direct telephone threat should respond as follows.

1. Using a copy of the bomb threat checklist (Figure 4), obtain as much information as possible about the threat, caller, background sound, and language.
2. Initiate evacuation of the building.
3. Notify BED.
4. Notify Patrol Operations Center at termination of call.

6.2.2 Receivers of Written Threats

Receivers of written threats should respond as described below.

1. Handle the letter as little as possible to preserve fingerprints and avoid smudging.
2. Immediately notify the Patrol Operations Center (811) and the BED.
3. Record all details of the receipt (i.e., where found, how delivered, and when found).

Figure 4. Bomb Threat Checklist.

Westinghouse Hanford Company

PLACE THIS CARD ON BACK OF YOUR TELEPHONE

QUESTIONS TO ASK

1. When is bomb going to explode?
2. Where is it right now?
3. What does it look like?
4. What kind of bomb is it?
5. What will cause it to explode?
6. Did you place the bomb?
7. Why?
8. What is your address?
9. What is your name?

FOLD

EXACT WORDING OF THE THREAT

Sex of Caller _____ Race _____

Age _____ Length of Call _____

Number at which call is received

Time _____ Date ___/___/___

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FOLD

BOMB THREAT

CALLER'S VOICE

- ☐ Calm
- ☐ Angry
- ☐ Excited
- ☐ Slow
- ☐ Rapid
- ☐ Soft
- ☐ Loud
- ☐ Laughter
- ☐ Crying
- ☐ Normal
- ☐ Distinct
- ☐ Slurred
- ☐ Nasal
- ☐ Stutter
- ☐ Lisp
- ☐ Raspy
- ☐ Deep
- ☐ Ragged
- ☐ Clearing throat
- ☐ Deep breathing
- ☐ Cracking Voice
- ☐ Disguised
- ☐ Accent
- ☐ Familiar

If voice is familiar, who did it sound like?

BACKGROUND SOUNDS

- ☐ Street Noises
- ☐ Crockery
- ☐ Voices
- ☐ PA System
- ☐ Music
- ☐ House noises
- ☐ Motor
- ☐ Office machinery
- ☐ Factory machinery
- ☐ Animal noises
- ☐ Clear
- ☐ Static
- ☐ Local
- ☐ Long distance
- ☐ Booth
- ☐ Other

THREAT LANGUAGE

- ☐ Well spoken (Educated
- ☐ Foul
- ☐ Irrational
- ☐ Incoherent
- ☐ Taped
- ☐ Message read by threat maker

REMARKS _____

Report call immediately to

Call 811

Call Bldg. Emergency Director

Date _____

Name _____

Position _____

Phone No _____

CARD PLACEMENT

1. Fold card on lines indicated
2. Attach to back of telephone with paper clips, bold "Bomb Threat" lettering toward front

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4. Tell no one else about threat.

5. Release the letter only to WHC Security personnel or to a person authorized by WHC Security.

6.2.3 Discoverer of a Bomb or Suspicious Object

Discoverers of a bomb or suspicious object should respond as described below.

1. Clear the immediate area of personnel. Do not transmit on a radio near the suspected object.

2. Immediately notify the Patrol Operations Center (811) and the BED.

3. Stand guard in a sheltered location and at maximum possible distance to assure that no one enters the area.

6.3 OPERATIONAL EMERGENCY RESPONSE PLAN

The following sections contain response plans for each type of emergency condition or hazard identified in Section 3.0. The BED shall be notified of all emergency conditions.

6.3.1 Utility Disconnect Plan

The purpose of this plan is to provide the steps necessary to place the utilities in a safe and secure condition when an emergency has been declared, or at the direction of the BED.

6.3.1.1 Heating, Ventilation, and Air Conditioning

1. Inspect all waste storage cells. If any containers are leaking or ruptured, notify supervision.

2. After inspecting containers, close all cell doors inside the building.

3. Open all exterior doors.

4. Evacuate storage area.

5. If ventilation loss will be longer than one hour, evacuate the building (unless shutdown is part of a take cover alarm).

6. Maintain surveillance of the building to prevent unauthorized personnel entry.

7. Proceed to roof or main panel marked "Heat Pump" near men's room.

8. Locate ON/OFF switch.

9. Put switch in OFF position.

10. Do not reenter the building until the ventilation system has been reestablished and operating for at least 30 minutes.

6.3.1.2 Electrical

NOTE: This building should be shut down in extreme emergency only.

1. Follow Section 6.3.1.1 instructions for shutdown of the ventilation system.

2. Contact Electrical Dispatch on 373-2123.

3. Proceed to outside the northeast corner wall or to the hallway near the men's room.

4. Locate the main electrical distribution panel labeled "Main Switch Transformer."

5. Locate the ON/OFF switch labeled "2 of 2."

6. Put switch in OFF position.

7. Do not re-enter the building until power or ventilation has been restored for at least 30 minutes.

6.3.1.3 Fire Sprinkler System

NOTE: This building should be shut down in extreme emergency only.

1. Proceed to the outside of the south wall of the 616 Building.

2. Locate the red valve (inside of 4 red posts).

3. Break the seal with the attached wrench.

4. Turn the valve to the SHUT position.

6.3.1.4 Sanitary Water/Sewer

1. Proceed to women's change room.

2. Locate main valve on south wall labeled "Sanitary Water Shutoff."

3. Turn valve until closed.

6.3.1.5 **Process Water**

NA.

6.3.1.6 **Steam**

NA.

6.3.1.7 **Telephone Service**

1. Only GTE can disconnect this service.

2. Call 376-6322 or 376-1611 (GTE) and state your request.

6.3.2 Industrial

1. Contact the Patrol Operations Center at 911 or 373-3800 and provide as much information as possible. Request additional assistance as required.

2. Inform the BED.

3. Take other action as directed.

6.3.3 Loss of Electricity

1. Loss of Electricity will result in loss of operation of the building ventilation system.

2. Notify the BED.

3. The BED will notify the Patrol Operations Center (3-3800).

4. If instructed by supervision, close all cell doors inside the building and open all exterior doors.

5. Evacuate the building.

6. Maintain surveillance of the building to prevent unauthorized personnel entry.

7. Do not reenter the building until the electrical/ventilation systems have been reestablished and have been operating for at least 30 minutes.

6.3.4 Loss of Water

1. Notify the BED.

2. Notify appropriate maintenance personnel for repair.

6.3.5 Loss of Ventilation

Follow the Section 6.3.3 instructions for Loss of Electricity.

6.3.6 Loss of Steam

NA.

6.3.7 Loss of Air

NA.

6.3.8 Fire

Fire fighting in the 616 Building is complicated by the presence of dangerous wastes which may cause chemical contamination.

Follow Section 6.5.2 for response to fires because any fires in the 616 Building may involve hazardous materials.

6.3.9 Major Process Disruption

NA. The 616 Building does not house chemical processing activities.

6.3.10 Pressure Hazards Emergency Response

1. Notify the BED.
2. Follow Section 6.5.2 instructions for fire, if needed.
3. Evacuate the area of the hazard.

6.4 NATURAL HAZARDS RESPONSE PLAN

6.4.1 Volcanic Eruption and Ash Fall

Volcanic eruptions and ash fallout from several Cascade mountains are a possibility. Notification to the building in the event that ash fallout is imminent would be through the crash alarm system. The following actions should be taken upon notification that an ash plume is headed for the Hanford Reservation.

1. The BED should contact the Emergency Control Center (ECC) to obtain meteorology data and to determine estimated time of arrival for the ash plume.
2. Decide whether to evacuate or initiate take cover emergency response. If the decision is made to evacuate, follow the "Evacuation" response in Section 6.1.

3. If the take cover response is required, follow the "Take Cover" response in Section 6.2.

4. Protect air supply inlets and reduce ventilation flows as appropriate.

5. Determine the need for shutting down some or all of the building activities. Notify appropriate personnel to begin shutdown activities.

6. Maintain communication with the emergency duty officer or the ECC to discuss building condition and changing fallout conditions.

6.4.2 Seismic Event Response

The WHC Emergency Organization's primary role in a seismic event is to coordinate the initial response to injuries, fires or fire hazards, and to take measures to contain or control radioactive and toxic material releases that may have an adverse impact.

6.4.2.1 Response During the Seismic Event

Each building emergency organization must be ready to respond following a seismic event that affects the Hanford Site and WHC Facilities, personnel, and property. The following guidelines identify the responses necessary to respond to a seismic event at this building.

1. Promptly assess post-earthquake emergency needs.

2. Take necessary actions to protect building personnel and onsite and offsite personnel.

3. Report needs to 811 or ECC.

4. Search for injured or trapped employees.

5. Conduct accountability.

6. Render first aid.

7. Search for fires and other hazards.

8. Fight fires.

9. Turn off water, gas, and electricity.

10. Perform building inspection.

11. Consider shutdown of operating systems.

12. Arrange for rescue of personnel.

13. Form a recovery plan.

14. Perform cleanup.

6.4.2.2 Employee Response During the Seismic Event

During the earthquake, building personnel should perform the following actions.

1. Remain calm.

2. Respond to all emergency signals.

3. Seek shelter away from windows.

4. If outside, avoid objects which could fall or release hazardous material.

6.4.2.3 Seismic Event Response Following the Event

After the earthquake, building personnel should perform the following actions:

1. Follow instructions of the BED.

2. Check fellow workers for injuries and administer first aid.

3. Call 811 for emergency assistance and notify Plant management.

4. Do not use matches or lighters.

5. Do not touch downed power lines or objects touched by downed wires.

6. Do not use the telephone or PAX except for emergency communications.

7. Establish damage assessment teams for the local area and areas beyond the building background.

8. Determine if release of dangerous waste is occurring or likely to occur.

9. Determine current local meteorology.

10. Warn adjacent facilities of event using: crash alarm, radios, telephone, runners, and Hanford Patrol rover vehicles.

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11. Initiate road closures (Highway 240, and onsite roadways) to reduce potential exposures.

12. Provide resources and personnel assistance to other affected personnel and facilities.

6.4.3 High Winds or Tornado

1. Take cover as directed until the event subsides.

2. Assess and identify damage to the 616 Building.

3. Contact the Patrol Operations Center at 811 or the Emergency Duty Officer at 373-3800, as appropriate.

6.4.4 Flood

NA.

6.4.5 Range Fire

1. Notify the BED.

2. Close exterior doors to the building, as directed, to prevent sparks from being blown inside.

3. Follow response procedures described in Section 6.3.8, "Fire."

6.5 HAZARDOUS MATERIALS AND MIXED WASTE RESPONSE PLAN

Discovery of a nonradioactive hazardous material or mixed waste spill may be made by anyone (mixed wastes are not handled or stored at this building). Emergency equipment may be used by individuals discovering a spill providing, however, that the individual has been properly trained in the use of the spill equipment and uses proper respiratory and personnel protective equipment.

6.5.1 Spill Response Plan

The following responses should be taken when a spill of hazardous material occurs. The BED has overall responsibility to ensure proper response to emergency situations.

1. Assess the severity of the situation.

2. If the release can be controlled safely and promptly, do so; notify the BED as soon as possible.

3. The BED will assess the situation and determine the type and quantity of materials released and the hazards involved.

4. Activate the appropriate emergency alarms, if necessary, and notify personnel in the immediate area of the incident via the PAX PA system.

5. Respond to the emergency alarm and stand by for further instructions over the PAX PA system.

6. If response is within the capabilities of the emergency response organization, actions appropriate for the waste or material involved shall be initiated to contain and control the release.

7. If beyond the capabilities of the building emergency response organization, the BED will notify the Patrol Operations Center at 311 to request additional assistance.

8. Direct building personnel to take those actions which can be safely performed to control or contain the release before arrival of requested assistance.

9. Direct an individual to meet the emergency responders from outside the building and direct them to the event scene.

10. The Hanford Fire Department will proceed immediately to the scene of the incident and, coordinating with the BED, initiate actions to control the incident.

11. Establish an incident command post in a safe location and request additional assistance as necessary.

12. Rescue personnel will provide immediate first aid and prepare for transport to a full service medical building.

13. Establish roadblocks or other traffic control measures to prevent unauthorized personnel from entering the area.

14. After the release has been contained and there is no longer an imminent threat to human health, announce an "all clear" signal.

15. Isolate and stabilize residual hazardous materials by covering or other appropriate means until they can be removed in a nonemergency mode and properly treated or disposed.

16. Emergency equipment used in the response to the incident will be cleaned and returned to a condition fit for reuse after the cleanup is completed. All expendable supplies used will be replaced.

6.5.2 Fire and Explosion Associated with Hazardous Materials

Explosions may be the cause or result of a fire or may be totally disassociated. For this plan, fire and explosion are treated simultaneously. Special chemical hazards are addressed in the "Pre-Fire Plans" of the Hanford Fire Department which are located on the wall near the entrance in the 616 Building receiving area.

6.5.2.1 Discoverer of Fire

1. Avoid inhaling smoke, fumes, or vapors even if no hazardous waste is involved.

2. Pull the nearest fire alarm pull box and call 811.

3. Notify the BED or Operations Shift Office. Provide as much information as possible without personal risk.

4. Move and keep people away from fire scene.

5. The BED will identify the character, exact source, amount and extent of any released materials. Request support from Solid Waste Engineering for this effort.

6. If the emergency involves a hazardous waste storage area, contact the BED to identify the materials involved.

7. Contact the Patrol Operations Center at 811 and provide as much information as possible. Request additional assistance as required.

6.5.2.2 Building Emergency Director Actions

1. Evacuate part or all of the building. Ensure that the staging area remains safe.

2. Assign a person to meet the Fire Department and provide directions to the location of the alarm or fire.

3. Consider requesting Patrol to evacuate personnel along adjacent streets and roadways.

4. Ensure that the Fire Department HAZMAT Team has been notified.

5. Relay pertinent information, including telephone number and proposed location of the Technical Support Center.

6. Establish a command post in a safe location and request additional assistance as necessary.

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7. Remove injured personnel to a safe area, provide immediate first aid, and prepare them for transport to a full service medical building.

8. Establish roadblocks to prevent unauthorized personnel from entering as necessary.

9. After the fire has been extinguished, or the cause of the explosion has been eliminated, and there is no longer an imminent threat to human health, the BED will announce an "all clear" signal.

10. Isolate any hazardous materials and stabilize them until they can be removed in a nonemergency mode and properly treated or disposed.

11. Clean and repair emergency equipment and return to a condition fit for reuse.

12. Replace all expendable supplies.

6.5.3 Toxic Fume Release

Discovery of a nonradioactive hazardous material toxic fume release may be made by anyone. Rapid communication is a vital part of warning personnel and notifying appropriate response personnel.

6.5.3.1 Discoverer

The person discovering the toxic fumes shall take the following immediate actions.

1. ASSUME A FUME RELEASE IS TOXIC UNLESS IT IS ABSOLUTELY KNOWN TO BE HARMLESS.

2. Avoid inhaling smoke, fumes, or vapors even if no hazardous waste is involved.

3. Do not assume that gasses or vapors are harmless because of lack of smell.

4. Contact the Building Supervisor or BED immediately. Provide as much information as possible without personal risk.

5. Keep people away from the area of the release.

6.5.3.2 Building Emergency Director

The BED must immediately take the following actions.

1. Identify the exact source, amount, extent and character of any released materials.

2. Refer to the Material Safety Data Sheets for information on what type of respiratory and personnel protective equipment should be used to isolate the spill area or stop the leak.

3. If the emergency involves a dangerous waste storage area, refer to the building inventory (located in the office) to identify the materials involved.

4. If assistance is required, notify the Patrol Operations Center at 811, or 373-3800, and request that the Fire Department HAZMAT Team be dispatched. Providing as much information as possible.

5. Assign a representative to meet and direct the HAZMAT Team to the area of the spill.

6. Assess possible hazards to human health and the environment (considering direct, indirect, immediate and long-term effects) that may result from the spill.

7. Contact Pacific Northwest Laboratory (PNL) Meteorology Weather Station on 373-2716 to determine the wind speed, direction, and plume stability.

8. Take all reasonable measures necessary to ensure that fires, explosions, and releases do not occur, recur, or spread to other dangerous waste at the building.

9. Where applicable, stop operations, collect and contain released waste, and remove or isolate containers.

10. Evaluate the need to evacuate part or all of the building. Take into account the location of the spill and ensure the safety of the evacuation staging area.

11. Consider shutdown of the intake air supply systems and retain personnel inside the building.

6.5.4 Reactive Chemical or Corrosive Material Hazard

Spills of corrosive wastes should be handled according to Section 6.5.1, "Spill Response Plan." Spills of reactive materials should be handled according to Section 6.5.1, Spill Response Plan, taking into account the specific incompatibilities of the material.

6.5.5 Thermal Reaction and Hazard

1. Leave the area of the hazard.

2. Notify the BED.

3. Notify the Patrol Operations Center (811) as needed.

6.5.6 Flammable Liquids and Materials

Spills of flammable liquids and materials should be handled according to Section 6.5.1, "Spill Response Plan."

6.5.7 Asbestos Release

Asbestos containing materials are normally well encapsulated so that the asbestos fibers do not become airborne. An asbestos hazard emergency condition arises when a large portion of the encapsulation is damaged and the asbestos containing material is physically dispersed in the area. An example at the 616 Building would be damage to a drum containing asbestos waste. The following actions should be taken:

1. Evacuate all personnel from the affected area

2. Isolate and post the area

3. Contact Industrial Safety and Fire Protection to determine remedial action

4. Contact BED and provide information

5. Identify a recovery/cleanup plan at the direction of Industrial Safety and Fire Protection and a trained asbestos worker supervisor.

NOTE: Spills of asbestos-containing waste should be handled according to Section 6.5.1, "Spill Response Plan."

6.6 RADIOACTIVE MATERIALS RESPONSE PLAN

The 616 Building does not store radioactive materials or wastes.

6.6.1 Radioactive Gaseous Effluent Discharge--Stack Alarm

NA.

6.6.2 Radioactive Liquid Effluent Discharge

NA.

6.6.3 Significant Contamination Spread

NA.

6.7 CRITICALITY RESPONSE PLAN

NA.

6.8 EXPLOSIVE MATERIALS AND MUNITIONS HAZARDS RESPONSE PLAN

NA. The 616 Building does not receive explosives or munitions. Follow Section 6.5.2 steps for response to fire or explosion in the event that improperly handled incompatible wastes generate an explosive reaction.

6.9 PREVENTION OF RECURRENCE OR SPREAD OF FIRES, EXPLOSIONS, OR RELEASES

To try to ensure that fires, explosions, or releases do not occur, recur, or spread, plant and building operations have been reviewed to identify potential hazards and Plant Operating Procedures have been developed to minimize the occurrence of unplanned incidents. Safety systems such as automatic fire sprinklers and spill containment structures, have been installed to assure that if an emergency event occurs the affected areas will be kept to a minimum.

Upon completion of an emergency response to an incident, the BED is responsible for analyzing the events that lead to the incident and for conducting a critique; including causes, impacts, and lessons learned from the incident. The requirements of DOE Order 5484.1 must be followed to ensure that all appropriate parties are aware of and participate in decisions on the best courses of action to take to prevent or minimize the possibility of future occurrences.

Specific steps that may be taken for a particular incident could include the following:

1. Isolating the site of the initial incident by shutting off power, closing off ventilation systems to minimize the spread of a release or the potential for a fire or explosion

2. Inspecting containment structures for cracks or leaks

3. Removing released material and waste remaining inside of containment structures as soon as possible

4. Containing and isolate residual waste material using dikes and absorbents

5. Covering or otherwise stabilizing areas where residual released materials remain to prevent migration or spread from wind or precipitation runoff

6. Installing new facilities, systems, or equipment to enable better management of hazardous or dangerous wastes or materials.

7.0 TERMINATION OF EMERGENCY

Normally, it is a function of the BED to declare the termination of an emergency. However, once the WHC Emergency Organization is activated, only the Area Emergency Director or the WHC Emergency Director shall declare that an emergency has ended. If the DOE-RL EACT is activated, only the DOE-RL Director shall officially terminate the emergency. In all cases, however, the BED must be consulted before reentry is initiated.

8.0 ACCIDENT RECOVERY

The recovery phase of the accident is not handled under emergency criteria, but rather according to a recovery plan developed for the specific event. The building manager will create an emergency organization encompassing all required aspects of engineering, operations, maintenance, and functional support, with the direction of the Hazardous Waste Unit and the Industrial Hygiene and Safety Department. This will include making proper notifications to official agencies (i.e., DOE, U.S. Environmental Protection Agency or Washington State Department of Ecology). Any material, that is released will be recaptured (where possible), stored, and disposed of. Contaminated soil, surface water, or any other material that results from a spill, toxic fume generation, fire or explosion, will be stored and disposed of.

No waste that may be incompatible with the released material will be treated, stored, or disposed of until cleanup is completed.

All emergency equipment will be cleaned and made fit for its intended use immediately following an emergency.

9.0 POSTEVENT ANALYSIS AND REPORTING REQUIREMENTS

Damage assessments should be made at the conclusion of the emergency phase and the results of these assessments must be communicated to the ECCs. The BED should designate a recovery manager who will determine necessary

steps to return the building to an operational status. The following items should be considered.

1. Building structures (walls, ceilings, systems, etc.)
2. Utilities
   - Electricity
   - Water
   - Telephone
3. Hazardous materials/processes
   - Chemical system
   - Toxic
   - Reactive
   - Corrosive
   - Explosive
   - Pressure systems
   - Compressed gas lines
   - Pressure vessels
4. Waste systems
   - Sanitary water line
   - Fire sprinklers
5. Heating ventilation and air conditioning
6. Safety eyewash/safety shower
7. Alarms
   - Fire alarm
   - Crash alarms
   - Sirens and alarms

APPENDIX A
BUILDING EMERGENCY RESPONSE ORGANIZATION LISTING

Building Emergency Director*

	Name	Location	Phone
Primary:	Solid Waste Operations Supervisor	(616 NRDWSF)	
Alternate:	Solid Waste Operations Supervisor		
Alternate:	Solid Waste Operations Supervisor		

Staging Area Managers

	Name	Location	Phone
Primary:			
Alternate:			
Alternate:			

Volunteer Bomb Search Team Members

	Name	Location	Phone
Primary:			
Alternate:			

Evacuation Bus Drivers

	Name	Location	Phone
Primary:			

*Note: Identification of personnel appointed to the listed emergency response positions will be addressed as part of the Hanford Facility Dangerous Waste Permit Application (DOE-RL 1991).

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APPENDIX B
RESOURCE CONSERVATION AND RECOVERY ACT REGULATED UNIT CONTINGENCY PLAN

B.1 INTRODUCTION

This is a supplement to the 616 Building Emergency Plan (BEP) and provides specific information and response plans for the 616 Nonradioactive Dangerous Waste Storage Building Resource Conservation and Recovery Act (RCRA) Regulated Unit. Due to the nature of this regulated unit, special plans identified here are required for response to emergencies at this location.

B.1.1 Facility Covered by this Plan

The 616 Storage Building is covered by this plan.

B.1.2 Location of the Facility

The 616 Building is located as described in Section 1.2 of this plan.

B.1.3 Description of Facility and Operations

A description of this building and its operations is given in Section 1.4.

B.2 PURPOSE OF THE PLAN

The purpose of this emergency or contingency plan is to lessen the potential impact on the public health and the environment in the event of an emergency circumstance. Emergencies include a fire, explosion, or unplanned sudden or nonsudden release of dangerous waste or constituents to air, soil, surface water, or groundwater at the 616 Building.

B.3 POTENTIAL EMERGENCIES

Potential emergencies involving the 616 Building are described in Section 3 of this BEP. Specifically, fire is addressed in Section 3.2.8 and explosion in Section 3.7. Unplanned sudden or nonsudden releases of dangerous waste or constituents are addressed in Section 3.4.

B.4 PLAN IMPLEMENTATION

The emergency plan will be implemented as described in Section 4.

B.5 EMERGENCY RESPONSE PLAN

B.5.1 Building Emergency Response Organization (Specific)

The Building Emergency Response Organization is given in Appendix A. The Building Emergency Director (BED) has the duties described in WAC 173-303 of the "Emergency Coordinator." Appendix A identifies the primary and alternates in the order they will assume responsibility.

B.5.2 Identification and Description of Specialized Emergency Equipment

Table 1 is a listing of all emergency equipment at the 616 Building including locations, physical descriptions, and capabilities.

B.5.3 Emergency Plan

Plans for responding to emergencies are located in Section 6 of this BEP. Fire and explosion are addressed in Section 6.5.2. Unplanned sudden or nonsudden releases of dangerous waste or constituents are addressed in Section 6.5.1. Section 6.5.3 addresses releases of toxic fumes. Additional elements of the emergency plan that apply to units regulated by RCRA/Ecology and to dangerous waste are listed below.

Wastes are transported to the 616 Building, accompanied by an onsite manifest. If a waste shipment arrives at the building that cannot be accepted (as described in Washington Administrative Code 173-303-370(5)) because it cannot be managed at the 616 Building, or there is a significant discrepancy between the shipment and the wastes listed on the manifest, or the shipment is in a hazardous condition, and if the shipment cannot be returned to the generator, the following actions are taken:

1. The BED is notified
2. Hazards associated with the shipment are assessed
3. Depending on the nature of the hazards, an appropriate response is initiated
4. Responses may include:
   - Summoning the generator to repackage the waste
   - Overpacking of the waste by 616 Building personnel
   - Sampling the waste
   - Evacuation of the 616 Building
   - Summoning the site Hazardous Materials (HAZMAT) Team or other emergency organizations.

A description of the arrangements agreed to by hospitals, state and local agencies and governments, is located in Appendix A of the Emergency Plan of the U.S. Department of Energy-Richland Operations Office (DOE-RL).

The evacuation plan for the 616 Building is located in Sections 1.5 and 6.1 of this BEP.

Copies of this BEP are maintained at the 616 Building and by onsite emergency organizations. Additional locations include the 609-A Fire Station, the 200 East Area Emergency Control Center (2750-E Building), the Westinghouse Hanford Company (WHC) Emergency Management Center (1170 Building) and its alternate center in building 6652L (near the base of Rattlesnake Mountain), and the DOE-RL/Emergency Action and Coordination Team (EACT) room in the Federal Building. The DOE is responsible for distribution to all local police departments, fire departments, hospitals, and state and local emergency response teams that may be called upon to provide emergency services.

Amendments to this BEP will be made annually or in one of the following situations, if needed:

- Whenever applicable regulations or the building permit are revised
- The plan fails in an emergency
- The building changes (in its design, construction, operation, maintenance, or other circumstances) in a way that materially increases the potential for fires, explosions, or releases of dangerous waste or dangerous waste constituents
- The building changes in a way that changes the response necessary in an emergency
- The list of emergency equipment changes.

The responsibilities and authority of the BED are established in Section 5.1 of the WHC *Emergency Plan*, WHC-CM-4-1.

A BED will at all times be either on the building premises or on call with the responsibility for coordinating all emergency response measures. The BED will be thoroughly familiar with all aspects of this BEP and the WHC and DOE emergency plans. The BED will also be thoroughly familiar with all operations and activities at the building, the location and properties of all wastes handled, the location of all records within the building, and the building layout. In addition, this person has the authority to commit the resources needed to carry out this BEP.

Whenever there is an imminent or actual emergency situation involving RCRA/Ecology facilities, the BED (or designee when the BED is on call) will immediately perform the following:

- Activate internal building alarms or communication systems, where applicable, to notify all building personnel

- Initiate notifications of appropriate state or local agencies with designated response roles if their help is needed (via the site emergency organization and the DOE as shown in Figure 6-3 of WHC-CM-4-1.

Whenever there is a release, fire, or explosion involving RCRA/Ecology facilities, the BED will immediately identify the character, exact source, amount, and extent of any released materials.

Concurrently, the BED will assess possible hazards to human health and the environment (considering direct, indirect, immediate, and long-term effects) that may result from a release, fire, or explosion.

If the BED determines that the building has had a release, fire, or explosion that could threaten human health or the environment outside the building, he must report the findings as follows.

- If the assessment indicates that evacuation of local areas may be advisable, he must immediately notify local authorities via the site emergency organization. He must be available to help appropriate officials decide whether local areas should be evacuated.

- The BED must immediately initiate notifications to (via the site emergency organization on 811 and WHC Environmental Protection at 373-1716) Ecology and either the government official designated as the on-scene coordinator or the National Response Center, using their 24-hour toll free number (800) 424-8802.

The BED assessment report (to be fowarded to offsite agencies) will include the following:

- Name and telephone number of the reporter

- Name and address of the building

- Time and type of incident (e.g., release, fire)

- Name and quantity of materials involved, to the extent known

- Extent of injuries, if any

- Possible hazards to human health or the environment outside the building.

During an emergency, the BED will take all reasonable measures necessary to ensure that fires, explosions, and releases do not occur, recur, or spread to other dangerous waste at the building. These measures will include, where applicable, stopping operations, collecting and containing released waste, and removing or isolating containers.

If the building stops operations in response to a fire, explosion, or release, the BED will monitor for leaks, pressure buildup, gas generation, or ruptures in valves, pipes, or other equipment, wherever this is appropriate.

Immediately after an emergency, the BED will provide for the treatment, storage, or disposal of recovered waste, contaminated soil or surface water, or any other material that results from a release, fire, or explosion at the building.

The BED will ensure that in the affected areas of the building the following is performed:

- No waste that may be incompatible with the released material is treated, stored, or disposed of until cleanup procedures are completed
- All emergency equipment listed in Table 1 is cleaned and fit for use before operations are resumed.

The BED will initiate notification to Ecology and local authorities (via the site organization and the DOE) that the building is in compliance with the incompatible waste and emergency equipment requirements noted above before operations are resumed in the affected area(s) of the building. Notification of Ecology and local authorities will be verified as completed prior to restart.

The BED will verify that the time, date, and details are recorded in the operating log for any incident that requires implementing this portion of the BEP.

The BED will cooperate in preparing a written report on the incident for DOE to submit (within 15 days after the incident) to Ecology. This report will include the following information:

- Name, address, and telephone number of the owner or operator
- Name, address and telephone number of the building
- Date, time, and type of incident (e.g., fire, explosion)
- Name and quantity of material(s) involved
- Extent of injuries

- An assessment of actual or potential hazards to human health or the environment
- Estimated quantity and disposition of recovered material that resulted from the incident
- Cause of the incident
- Description of the corrective action taken to prevent recurrence of the incident.

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APPENDIX 8A

TRAINING COURSE DESCRIPTIONS

APPENDIX 8A

CONTENT

8A.1 GENERAL COURSES . . . . . APP 8A-1

8A.2 UNIT-SPECIFIC COURSES . . . . . APP 8A-3

8A.3 JOB-SPECIFIC COURSES . . . . . APP 8A-4

8A.4 ENVIRONMENTAL AND HAZARDOUS MATERIAL SAFETY TRAINING . . . APP 8A-9

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1	**8A.1 GENERAL COURSES**	
2	Title:	Hanford General Employee Training
3	Description:	Course covers U.S. Department of Energy and applicable regulations pertaining to employer and employee rights and responsibilities, general radiation training, hazardous communications and hazardous waste, fire prevention, personal protective equipment, safety regulations, accident reporting, and avenues for addressing safety concerns.
4	Target Audience:	All new employees
5	Delivery:	Computer-based training/interactive video
6	Evaluation:	Computer generated questions
7	Length:	4-6 hours
8	Frequency:	12 months
9		
10	Title:	On-the-Job Training Instructor Training
11	Description:	Course provides instructional approach to the planning, implementation, and evaluation of on-the-job training. Includes role-model demonstration exercise and practice with critique.
12	Target Audience:	Identified bargaining unit, exempt personnel
13	Delivery:	Classroom
14	Evaluation:	Practical exercise
15	Length:	12 hours
16	Frequency:	Not applicable
17		
18	Title:	New Employee Safety Orientation
19	Description:	Course covers U.S. Department of Energy and applicable regulations pertaining to employer and employee rights and responsibilities, general radiation training, hazardous communications and hazardous waste, fire prevention, personal protective equipment, safety regulations, accident reporting, and avenues for addressing safety concerns.
20	Target Audience:	All new employees
21	Delivery:	Classroom
22	Evaluation:	Not applicable
23	Length:	3 hours
24	Frequency:	Not applicable
25		

1	Title:	Building Emergency Director Training
2	Description:	Course provides an overview of building emergency director responsibilities, identifies the building emergency organizations, review building emergency plan, and discusses drill and exercise requirements.
3	Target Audience:	Primary and alternate building emergency directors and members of a building emergency organization
4	Delivery:	Classroom
5	Evaluation:	Written test
6	Length:	2 hours
7	Frequency:	12 months
8		
9	Title:	Basic Crane and Rigging Training
10	Description:	Course familiarizes those who operate any type of lifting device who are not professional crane operators. The content includes principles of rigging and lifting as well as safety checks and practices.
11	Target Audience:	Anyone who operates a lifting device
12	Delivery:	Classroom
13	Evaluation:	Written test
14	Length:	8 hours
15	Frequency:	24 months
16		
17	Title:	Fork Truck Operation Training
18	Description:	Course is designed to make personnel more knowledgeable of fork truck and component.
19	Target Audience:	Nuclear operators or anyone who operates a fork truck as part of work assignment
20	Delivery:	Classroom, self-study, demonstration training
21	Evaluation:	Written test and driving test
22	Length:	6 hours
23	Frequency:	36 months
24		
25	Title:	Light-Duty Hoist Training
26	Description:	Course covers the proper use of electric and manual hoists as well as the pre-use inspection of rigging hardware.
27	Target Audience:	Operations and maintenance personnel
28	Delivery:	Classroom, videocassette, and mockup rigging accessories
29	Evaluation:	Written test
30	Length:	8 hours
31	Frequency:	36 months

1	Title:	Orientation to U.S. Department of Energy Order 5000.3A Occurrence Reporting
2	Description:	Course is designed to familiarize personnel with the U.S. Department of Energy Order 5000.3A, *Occurrence Reporting and Processing of Operations Information*. Course provides information on Order requirements and the changes made to occurrence reporting and processing of operational information.
3	Target Audience:	Personnel involved in occurrence reporting
4	Delivery:	Classroom
5	Evaluation:	Not applicable
6	Length:	1.5 hours
7	Frequency:	Not applicable
8		
9	Title:	First Line Managers Conduct of Operations
10	Description:	In depth discussion of U.S. Department of Energy Order 5480.19, *Conduct of Operations Requirements for U.S. Department of Energy Facilities*, and application of facilities plus practical unit walkthrough.
11	Target audience:	Management
12	Delivery:	Classroom and unit walkthrough
13	Evaluation:	Not applicable
14	Length:	24 hours
15	Frequency:	Not applicable
16		
17	Title:	Managers Conduct of Operations
18	Description:	In depth discussion of U.S. Department of Energy Order 5480.19, *Conduct of Operations Requirements U.S. Department of Energy Facilities*, and application of facilities.
19	Target audience:	Management
20	Delivery:	Classroom
21	Evaluation:	Not applicable
22	Length:	16 hours
23	Frequency:	Not applicable
24		

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1	Title:	Fork Truck Operation Requalification
2	Description:	Course consists of Site-wide safety training requalifying operators of fork trucks and similar material-moving vehicles.
3	Target Audience:	Nuclear operators or anyone occasionally or regularly operating a fork truck
4	Delivery:	Demonstration training
5	Evaluation:	Written test and driving test
6	Length:	3 hours
7	Frequency:	36 months
8		
9	**8A.2 UNIT-SPECIFIC COURSES**	
10	Title:	Solid Waste Operations Orientation
11	Description:	Course consists of a classroom presentation using structured notes and/or a videocassette. Topics to be presented in compliance with federal and state requirements include: entry and exit requirements; location of organizational charts, administrative, and operating procedures; the person in charge of communications; potential hazards; restricted areas; potential emergencies, alarms, communications, responses and staging areas; location and use of personal protective and emergency equipment; identification of buildings; overview of the process; and training requirements.
12	Target Audience:	All personnel assigned to or performing work in Solid Waste Operations
13	Delivery:	Classroom or videocassette/self-study
14	Evaluation:	Not applicable
15	Length:	1 hour
16	Frequency:	12 months

Title:	Building Emergency Plan Checklist (Appendix 7A)
Description:	Course provides the information managers are required to discuss with employees. The checklist is contained in the building emergency plan. The building emergency plan covers designated Solid Waste Operations buildings.
Target Audience:	All Solid Waste Operations employees, including contractor personnel
Delivery:	Classroom
Evaluation:	Not applicable
Length:	2 hours
Frequency:	12 months

8A.3 JOB-SPECIFIC COURSES

Title:	General Radio-Chemical Operator Training
Description:	Course consists of self-study, using a manual that covers in general terms the following topics for the 200 Areas TSD units: • Introduction • Mathematics • Chemistry • Security • Industrial safety • Emergency preparedness • Radiation safety • Environmental protection • Criticality prevention • Nuclear materials management • Instrumentation • Process and equipment.
Target Audience:	Nuclear operators (i.e., operator trainee, 18-month nuclear operator, 30-month nuclear operator, 42-month nuclear operator, and nuclear process operator) process crane operators, dispatchers, and Tank Farm shift operations managers
Delivery:	Classroom or self-study
Evaluation:	Written test
Length:	Average = 80 hours
Frequency:	12 months for operator trainee through nuclear operator 42-month levels; 24 months for nuclear process operator level; not applicable for Tank Farm shift operations managers.

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1	Title:	Solid Waste Unit-Specific Training
2	Description:	Course is designed to establish a general understanding and comprehension of Solid Waste Operations.
3	Target Audience:	Nuclear operators, assigned to Solid Waste Operations (i.e., operator trainee, 18-month nuclear operator, 30-month nuclear operator, 42-month nuclear operator, and nuclear process operator)
4	Delivery:	Self-study
5	Evaluation:	Written test
6	Length:	Average = 80 hours
7	Frequency:	12 months for operator trainee through 42-month nuclear operator level; 24 months for nuclear process operator level.
8		
9	Title:	Solid Waste Operations Nuclear Operator Certifications
10	Description:	Course is designed to prepare and certify Solid Waste Operations nuclear operators. Solid Waste Operations managers and supervisors can complete courses designated by management. Courses will be designed, developed, implemented, and documented based on job and training analyses.
11	Target Audience:	Nuclear operators assigned to Solid Waste Operations, and Solid Waste Operations managers and supervisors when required
12	Delivery:	Classroom, self-study, and on-the-job training
13	Evaluation:	Written test and on-the-job training checklist
14	Length:	Average = 80 hours
15	Frequency:	24 months
16		
17	Title:	616 Nonradioactive Dangerous Waste Storage Facility
18	Description:	Course is designed to prepare nuclear operators to perform duties for acceptance and transfer of nonradioactive dangerous waste.
19	Target Audience:	Nuclear operators, and Solid Waste Facility Operations manager and supervisors when applicable
20	Delivery:	Self-study and on-the-job training
21	Evaluation:	Written test
22	Length:	Average = 40 hours
23	Frequency:	24 months
24		

1	Title:	Solid Waste Operations Nuclear Process Operator Emergency Procedures and Abnormal Unit Conditions Training
2	Description:	Course consist of a review of abnormal and emergency conditions that could occur in Solid Waste Operations (616 NRDWSF), associated alarms and communications, and proper responses.
3	Target Audience:	Nuclear process operators, beginning 12 months after completion of general radio-chemical operator and unit-specific training
4	Delivery:	Self-study and on-the-job training
5	Evaluation:	Written test
6	Length:	Average = 20 hours
7	Frequency:	12 months
8		**SPECIAL NOTE:** To comply with the U.S. Department of Energy training requirement for nonreactor nuclear facility operations personnel, nuclear process operators must complete emergency training at least annually. This course must be completed by nuclear operators at the nuclear process operator level in conjunction with the general radio-chemical operator and unit-specific requalification courses. To achieve this, the requalification courses will be completed one year, the emergency procedures and abnormal unit conditions training the next year, then the requalification courses, then the emergency procedures and abnormal unit conditions training, etc. In this way, nuclear process operators complete annual emergency training.
9		

1	Title:	Solid Waste Operations Supervisor Certification
2	Description:	Course consists of the following topics: • Administrative information • Technical information • Environmental/hazardous materials requirements • Operations safety requirements • Acceptance, storage, and transfer of nonradioactive dangerous waste • Jobs conducted in the area of assigned responsibility • Processes and services • Equipment.
3	Target Audience:	Operations supervisors
4	Delivery:	Self-study and on-the-job training
5	Evaluation:	Written test and on-the-job training checklist
6	Length:	Average = 36 hours
7	Frequency:	24 months
8		
9	Title:	Solid Waste Operations Supervisor Emergency Procedures and Abnormal Unit Conditions Training
10	Description:	Course is designed to be a review of abnormal and emergency conditions that could occur in Solid Waste Operations, associated alarms and communications, and proper responses.
11	Target Audience:	Operations manager and supervisors
12	Delivery:	Self-study and on-the-job training
13	Evaluation:	Written test
14	Length:	Average = 16 hours
15	Frequency:	12 months
16		
17	Title:	Phase II Process Engineering Certification (Unit-Specific) Training
18	Description:	Course covers generic information for a specific operating TSD unit including process and utilities.
19	Delivery:	Self-study
20	Evaluation:	Written test and oral walkthrough
21	Length:	Average = 40 hours
22	Frequency:	24 months
23		

1	Title:	Hazardous Material-Carrier/Driver Course
2	Description:	Course familiarizes truck drivers and train crews in procedures for accepting and transporting hazardous material in compliance with 49 CFR 173 and applicable requirements.
3	Delivery:	Classroom
4	Evaluation:	Written test
5	Length:	8 hours
6	Frequency:	24 months
7		
8		

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8A.4 ENVIRONMENTAL AND HAZARDOUS MATERIAL SAFETY TRAINING[1]

	Course name	Description
1.	Hazard Communication and Waste Orientation	Course provides an overview of federal and applicable hazard communication programs and hazardous waste disposal programs.
2.	Generator Hazards Safety Training	Course provides the hazardous material/waste worker with the fundamentals for use and disposal of hazardous materials.
3.	Hazardous Materials/Waste Job-Specific Training	Course provides specific information on hazardous chemicals and waste management at the employees' TSD unit.
4.	Initial Radiation Worker Training	Course provides radiation workers with the fundamentals of radiation protection and the proper procedures for maintaining exposures ALARA.
5.	Waste Site-Basics	Course provides required information for the safe operation of dangerous waste TSD units regulated under 40 CFR 264 and 265 pursuant to RCRA.
6.	Scott 'SKA-PAK'[2] Training-SKA	Course instructs employees in the proper use of the Scott 'SKA-PAK' for entry, exit, or work in conditions immediately dangerous to life and health and instructs employees to recognize and handle emergencies.
7.	Cardiopulmonary Resuscitation	Course of the American Heart Association course that provides certification in cardiopulmonary resuscitation for the single rescuer (Heartsaver Course).
8.	Fire Extinguisher Safety	Course provides videocassette presentation that covers types of portable fire extinguishers and the proper usage for each.

[1]Chapter 8.0, Tables 8-4 and 8-5 present a compilation of training requirements.

[2]Scott SKA-PAK is a trademark of Figgie International, Incorporated.

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9.	Waste Site-Advanced	Course provides environmental safety information for RCRA and/or CERCLA operations and sites. Topics include regulations and acronyms, occupational health and safety, chemical hazard information, toxicology, personal protective equipment and respirators, site safety, decontamination, and chemical monitoring instrumentation.
10.	Waste Site Field Experience	Course is a 3-day field experience under the direct supervision of a trained, experienced supervisor.
11.	Hazardous Waste Shipment Certification	Course provides an indepth look at federal, state, and onsite requirements for nonradioactive hazardous waste management and transportation.
12.	Certification of Hazardous Material Shipments	Course provides training in hazardous material regulations of the U.S. Department of Transportation, as required by law, to those who certify the compliance of Hanford Facility hazardous material shipments. The main focus is on the proper preparation and release of radioactive material shipments.
13.	Hazardous Waste Site Supervisor/Manager	Course provides specialized training to operations and management in the following programs: safety and health, employee training, personal protective equipment, spill containment, and health hazard monitoring procedures and techniques.

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APPENDIX 11A

RANDOM NUMBERS TABLE

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Table APP 11A-1. Random Numbers Table.* *(sheet 1 of 2)

Location	X (1,13)	Y (1,11)
East loading pad	5	2
	4	8
	1	4
	3	5
	8	10
	5	6
	13	4
	7	3
	10	1

Location	X (1,9)	Y (1,13)
North loading pad	4	8
	2	12
	7	1
	1	11
	5	5
	3	5
	1	10
	8	7
	5	13

*Random numbers generated on Lotus 123. Lotus 123 is a Registered Trademark of the Lotus Development Corporation.

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Table APP 11A-1. Random Numbers Table.* (sheet 2 of 2)

Location	X	Y
<u>Packaging, sampling, and receiving area sumps and trenches</u>		
Packaging materials handling equipment area sump	2	2
Packaging/sampling room sump	3	2
Receiving area trench	1	18
<u>Cell trenches</u>		
Caustic cell	1	2
Oxidizer cell	1	13
Combustible cell	1	16
Acid cell	1	3
Flammable 1A cell	1	14
Flammable 1B Cell	1	9
<u>Walkway trenches</u>		
Caustic/oxidizer	1	5
Combustible/acid	1	15
Flammable 1B/1A	1	9
<u>Loading pad trenches</u>		
East pad trench	1	25
North pad trench	1	16

*Random numbers generated on Lotus 123. Lotus 123 is a Registered Trademark of the Lotus Development Corporation.

APPENDIX 11B

DESCRIPTION OF PROCEDURES*

11B-1 PROCEDURE FOR PREPARING HEALTH AND SAFETY PLAN

11B-2 PROCEDURE FOR DECONTAMINATING SAMPLING EQUIPMENT

11B-3 PROCEDURE FOR EVALUATING DATA

11B-4 PROCEDURE FOR PACKAGING SAMPLES

11B-5 PROCEDURE FOR SOIL AND SEDIMENT SAMPLE CONTAINERS

11B-6 PROCEDURE FOR ENSURING QUALITY CONTROL OF RECORDS AND DOCUMENTATION

11B-7 PROCEDURE FOR MAINTAINING A FIELD LOGBOOK

11B-8 PROCEDURE FOR CHAIN-OF-CUSTODY

11B-9 PROCEDURE FOR CONTROLLING UNKNOWN SUSPECTED WASTE

11B-10 PROCEDURE FOR DEVIATING FROM PROCEDURES USED DURING CLOSURE

*Procedure descriptions will be provided by November 29, 1991.

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