0065108

Department of Energy
Richland Operations Office
P.O. Box 550
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05-AMCP-0242

MAY 2 2005

Mr. Michael A. Wilson, Program Manager
Nuclear Waste Program
State of Washington
Department of Ecology
3100 Port of Benton Boulevard
Richland, Washington 99354

Dear Mr. Wilson:

TRANSMITTAL OF THE COMPREHENSIVE ENVIRONMENTAL RESPONSE, COMPENSATION, AND LIABILITY ACT (CERCLA) NON-TIME CRITICAL REMOVAL ACTION MEMORANDUM FOR PLUTONIUM FINISHING PLANT, ABOVE-GRADE STRUCTURES

Attached is the Non Time-Critical Removal Action Memorandum for the Plutonium Finishing Plant (PFP) Above-Grade Structures as delineated in Tri-Party Agreement Interim Milestone M-083-22 for your signature. Also attached is the Comment Responsiveness Summary and the Comment and Response Document, respectively for the Above-Grade Structures Engineering Evaluation/Cost Analysis (EE/CA), DOE/RL-2004-05, Revision 1. This Action Memo, with attachments, will be transmitted to the citizens who provided comments, in accordance with Section 1 of the Community Relations Plan for the Hanford Federal Facility Agreement and Consent Order.

If there are any questions, please contact me, or your staff may contact Matt McCormick, Assistant Manager for the Central Plateau, on (509) 373-9971.

Sincerely,

Keith A. Klein
Manager

AMCP:EMM

Attachments: 3

cc w/attachs:
J. Ayres, Ecology
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APPENDIX

TABLES

ACRONYMS

ACM	asbestos-containing material
ARAR	applicable or relevant and appropriate requirement
CCl_4	carbon tetrachloride
CERCLA	*Comprehensive Environmental Response, Compensation, and Liability Act of 1980*
CFR	Code of Federal Regulations
CWC	Central Waste Complex
D&D	decontamination and decommissioning
DBBP	dibutylbutyl phosphate
DOE	U.S. Department of Energy
DOE-RL	U.S. Department of Energy, Richland Operations Office
Ecology	Washington State Department of Ecology
EE/CA	engineering evaluation/cost analysis
EPA	U.S. Environmental Protection Agency
ERDF	Environmental Restoration Disposal Facility
ETF	200 Areas Effluent Treatment Facility
$Fe(NO_3)_3$	ferric nitrate
HEPA	high-efficiency particulate air
HFFACO	*Hanford Federal Facility Agreement and Consent Order*
HNO_3	nitric acid
LLMW	low-level mixed waste
LLW	low-level waste
$Mg(OH)_3$	magnesium hydroxide
MT	miscellaneous treatment
NaOH	sodium hydroxide
NDA	nondestructive assay
PCB	polychlorinated biphenyls
PFP	Plutonium Finishing Plant
PPSL	Plutonium Process Support Laboratory
ppm	parts per million
PRF	Plutonium Recovery Facility
RCRA	*Resource Conservation and Recovery Act of 1976*
RCW	*Revised Code of Washington*
RECUPLEX	recovery of uranium and plutonium by extraction
RMA	remote mechanical "A"
RMC	remote mechanical "C"

ACRONYMS (cont)

S&M	surveillance and maintenance
SHPO	State Historic Preservation Office
SWB	standard waste box
TBC	to-be-considered
TBD	to-be-determined
TBP	tributyl phosphate
TK	tank
TRU	transuranic
TRUM	transuranic mixed
TSCA	*Toxic Substances Control Act of 1976*
TSD	treatment, storage, and/or disposal
WAC	*Washington Administrative Code*
WIPP	Waste Isolation Pilot Plant

ACTION MEMORANDUM FOR THE PLUTONIUM FINISHING PLANT ABOVE-GRADE STRUCTURES NON-TIME CRITICAL REMOVAL ACTION

1.0 PURPOSE AND SCOPE

This Action Memorandum documents approval of the U.S. Department of Energy (DOE) proposed *Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) of 1980* removal action as described herein for the Plutonium Finishing Plant (PFP) above-grade[1] structures. The PFP above-grade structures consist of processing, support and administrative buildings located within the PFP Facility on the Hanford Site in the 200 West Area, approximately 51 kilometers (32 miles) northwest of Richland, Washington.

Each structure within the scope of this removal action, as listed in Table 1-1, is potentially contaminated.

There are a large number of facilities on the Hanford Site. Many of the facilities are administrative and/or small in nature, with little or no contamination present within. Many facilities are associated with a larger facility and may be addressed as part of that larger facility. In such cases, facility complexes are typically identified as a single facility for the purpose of implementing the decommissioning process. This approach is consistent with the overall facility decommissioning plan for Hanford. For the PFP above-grade structures removal action, if a structure listed in Table 1-1 is later determined to be uncontaminated, that structure will be deleted from the ongoing scope of the removal action (modification will be dealt with via the PFP Project Manager Meetings and be removed under existing DOE authority). Some slightly contaminated structures listed in Table 1-1 have been scheduled for demolition under existing DOE authority. These ongoing demolition activities of slightly contaminated structures are consistent with activities that will take place in support of the removal action alternatives (e.g., slab-on-grade, entombment, and collapse and cover). Under these alternatives, the ongoing demolition activities will be incorporated as appropriate into the selected alternative activities/disposal pathways (e.g., rubble from slightly contaminated demolished structures will be disposed of with other removal action rubble to an appropriate disposal site) and closed out as part of the removal action.

If other structures at PFP are identified during deactivation activities that are determined to be similar to the structures addressed by this removal action (i.e., contaminated with hazardous substances that present a threat of release), this removal action will be modified to address dispositioning for those structures.

This removal action minimizes the potential for a release of hazardous substances from the PFP above-grade structures that could adversely impact human health or the environment, is protective of site personnel, and contributes to the efficient performance of any anticipated long-term response actions.

A 30-day comment period was held from October 11, 2004 through November 10, 2004 for public review of the Engineering Evaluation/Cost Analysis (EE/CA) that provides an analysis of the alternatives considered for this removal action. The comments received on the EE/CA do not result in changes to the planned removal action and therefore do not require that DOE revise the EE/CA. The description of the

[1] In this document, when discussing the activities that are to be performed, the terms "above-grade," below-grade" and "sub-grade" are used. The term "above-grade" in this document refers to items that are above or on the elevation of the surrounding ground (e.g., a building or concrete slab). Above-grade items are within the scope of this removal action. The term "below-grade" in this document means below the elevation of the surrounding ground but not completely covered by soil. For example, the basement of a building would be "below-grade." Below-grade rooms (basements, tunnels, vaults, etc.) of above-grade structures also are within the removal action scope. The term "sub-grade" in the context of this document is used when referring to an item that is completely covered by soil or other covering that is not readily removed (ex. a floor slab). For example, piping that is buried under a building is considered sub-grade. Unless specifically noted, sub-grade items are outside the scope of the removal action and therefore will remain after the removal/demolition of the items addressed by this removal action.

removal action provided in the following sections will provide additional clarification for some of the expressed concerns.

Table 1-1. PFP Above-grade Structures in the Removal Action Scope.[1]

Structure	Name/description	Comments
216-Z-9[2]	Crib and support structures: - 216-Z-9A, Contaminated Soil Removal Building - 216-Z-9B, Operator's Cubicle - 216-Z-9C, Mining Apparatus Enclosure	Crib activities include only addition of gravel or other fill material and/or soil stabilizers inside the crib and stabilizers or structural reinforcement outside the crib if required to ensure structural integrity.
225-WC[2]	Wastewater Sampling Facility	Also known as the Instrumentation & Local Control Unit 55C-23.
234-5Z[3]	Plutonium Fabrication Facility	Includes the Plutonium Process Support Laboratory (PPSL), the hazardous waste storage area, the 267-Z Riser #9 Valve House, and basement tunnels.
234-5ZA	Change Room Addition	
236-Z[3]	Plutonium Reclamation Facility	
241-Z[3, 4]	Tank Farm Waste Disposal Building	Also known as the Waste Storage and Treatment Facility. Includes above-grade enclosure, liquid waste storage and treatment tanks in below-grade concrete vaults, and 296-Z-3 stack.
241-ZA	Sample Building	
241-ZB	Sodium Hydroxide Tank	
241-ZG	Change Facility	
241-Z-RB	Retention Basin	Also known as the 207-Z building. Includes basins, valve room, and piping.
242-Z[3]	Waste Treatment Facility	
243-Z	Low-Level Waste Treatment Facility	Includes 296-Z-15 stack.
243-ZA	Low-Level Waste Storage Facility	Includes sump pit.
243-ZB	Cooling Towers and Concrete Pad	
2503-Z	Electrical Switchyard	
252-Z-1	Electrical Substation	Electrical transformers and pad.
270-Z	Operations and Support Facility	
2701-ZA	Central Alarm Station Facility	
2701-ZD	Badge house	
2702-Z	Microwave Tower and Communications Support Building	
2704-Z	Safeguards and Security Building	
2705-Z	Operations Control Facility	
2712-Z	Stack Monitoring Station	For 291-Z-001 stack.
2721-Z	Emergency Generator Building	Does not include below-grade fuel tank.
2727-Z	Supply Storage Building	
2729-Z	Maintenance Storage Building	
2731-Z	Plutonium Drum Storage Building	
2731-ZA	Container Storage Building	Also known as the Clean Laundry Building.
2734-ZA, -ZC, -ZK, and -ZL	Gas Bottle Storage	
2734-ZB, -ZD, -ZF, and -ZG	Gas Bottle Storage	
2734-ZJ	Liquid Nitrogen Storage and Supply	
2735-Z	Bulk Chemical Storage Tanks	
2736-Z[3]	Plutonium Storage Building	Includes 296-Z-6 stack.
2736-ZA[3]	Plutonium Storage Ventilation Structure	

Table 1-1. PFP Above-grade Structures in the Removal Action Scope.[1]

Structure	Name/description	Comments
2736-ZB[3]	Plutonium Storage Support Facility	Includes 296-Z-5 stack; 296-Z-7 stack.
2736-ZC	Cargo Restraint Transport Dock	
2736-ZD	Vault-EBR II Casks	
2902-Z	Elevated Water Storage Tower and Tank	Includes below-grade valve pit.
291-Z[3]	Exhaust Air Filter Stack Building	Includes below-grade fan house, 252-Z-2 Electrical Substation, and sub-grade ductwork between 291-Z Building and 291-Z Stack.
291-Z-001[3]	Stack	Includes below-grade portion of the stack structure.
	PFP Complex Yards and Grounds[2]	Includes mobile offices buildings (e.g., MO-XXX), hazardous waste storage units and hazardous substance storage cabinets (e.g., HS-XX), interim storage vaults, and other miscellaneous items.

[1] Includes below-grade rooms such as basements, tunnels, and vaults, etc.
[2] These items are located outside of the PFP Exclusion Area or, as in the case of the PFP Complex Yards and Grounds, *may* include some items outside of the PFP Exclusion Area.
[3] Major PFP structures: Those structures that were identified as having a source term and/or containing major processing equipment or one of the confinement systems.
[4] This structure is a treatment, storage, and/or disposal (TSD) unit.

2.0 SITE CONDITIONS AND BACKGROUND

The PFP above-grade structures contain CERCLA hazardous substances, predominantly residual radionuclides and small quantities of residual hazardous chemicals. As there is no future use for the PFP Facility, the integrity of the above-grade structures and internal systems will degrade without ongoing maintenance, resulting in an increased potential for releases of these hazardous substances to the environment. The DOE, Environmental Protection Agency (EPA), and the Washington State Department of Ecology (Ecology) have determined that a CERCLA non-time critical removal action is warranted to mitigate this threat.

2.1 BACKGROUND

Past plutonium production operations at PFP have resulted in potential contamination throughout the PFP above-grade structures. The DOE has identified no further use for the PFP Facility, making the above-grade structures candidates for decontamination and decommissioning (D&D). The DOE has determined that a non-time critical removal is appropriate for the removal of the risks associated with the PFP above-grade structures. This decision is consistent with *Hanford Federal Facility Agreement and Compliance Order* (HFFACO) (Ecology et. al., 1994) Interim Milestone M-83-22, "Submit to Ecology an Engineering Evaluation/Cost Analysis(es) [EE/CA(s)] for approval and provide an Action Memorandum(s) as a primary document (s) for the decommissioning of the PFP Facility," as well as with the DOE and EPA joint guidance *Policy on Decommissioning Department of Energy Facilities Under the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA)* (DOE and EPA, 1995) (hereinafter referred to as the Policy). The Policy is based on the provisions of Executive Order 12580, which delegates from the President to the U.S. Secretary of Energy certain CERCLA response authorities for facilities under DOE jurisdiction, custody, or control. As required under the HFFACO, Ecology has been designated as the lead regulatory agency for this removal action and assigned oversight responsibility with respect to the action being taken.

The PFP Facility was used to conduct plutonium processing, storage, and support operations for national defense, including the following:

- Special nuclear material handling and storage
- Plutonium recovery
- Plutonium conversion
- Laboratory support
- Waste handling
- Shutdown and operational facility surveillances.

In October 1996, the DOE issued a shutdown order that stated the operation of the PFP Facility as a production processing plant was no longer required and directed the U.S. Department of Energy, Richland Operations Office (DOE-RL) to "initiate deactivation and the transition of the PFP in preparation for decommissioning" (Ahlgrimm 1996).

Eleven buildings (i.e., 232-Z [not in removal action scope], 234-5Z, 234-5ZA, 236-Z, 242-Z, 2701-ZA, 2704-Z, 2736-Z, 2736-ZA, 2736-ZB, and 291-Z) are eligible for listing in the National Register of Historic Places as contributing properties within the Manhattan Project and Cold War Era Historic District. Of these 11 buildings, four buildings (i.e., 232-Z , 234-5Z, 2736-Z , and 291-Z) were recommended for preservation for public education and interpretation through heritage tourism. In January 2003, the State Historic Preservation Office (SHPO) agreed that because of public health and safety concerns posed by high radiological contamination levels, public access to these four buildings would be highly unlikely; therefore, deactivation activities could proceed. On September 29, 2003, further correspondence was received from the SHPO which allowed deactivation activities to extend approximately 1000 feet beyond the PFP fence line and included excavations to a depth of 20 feet (Whitlam 2003).

Walkthroughs of PFP historic buildings have been conducted to assess contents and to locate any artifacts that might have interpretive or educational value as potential exhibits within local, state, or national museums. Artifacts within PFP have been identified and tagged. PFP artifacts that are not contaminated will be retained; contaminated artifacts will be disposed after the objects are thoroughly documented.

Further details on the background of the PFP above-grade structures are available in *Engineering Evaluation/Cost Analysis for the Plutonium Finishing Plant Above-Grade Structures* (DOE/RL-2004-05, Rev. 1, Re-Issue).

2.2 FACILITY DESCRIPTION

Building descriptions for each of the PFP above-grade structures within the removal action scope are provided in Appendix A. Appendix A describes materials of construction, building floor plans, and functions of each structure and to the extent practicable, includes the type and quantity of contaminated process equipment and major components of engineered systems that could be generated as demolition waste under this removal action.

2.3 RELEASES OR THREATENED RELEASES INTO THE ENVIRONMENT OF A HAZARDOUS SUBSTANCE OR POLLUTANT OR CONTAMINANT

PFP plutonium processing buildings contain plutonium chemical process equipment or process waste handling equipment contaminated with radiological and chemical substances used or generated during plutonium processing and process waste management operations. The 216-Z-9 facilities (216-Z-9A, 216-Z-9B, and 216-Z-9C) were internally contaminated during 'mining' of the 216-Z-9 crib (waste site) to remove plutonium-contaminated soil. Remaining buildings within the scope of this removal action are non-process support structures. Potential radiological and chemical substances in these buildings have been identified from characterization data, historical operating data, process knowledge, and knowledge of hazardous substances in construction materials (e.g., asbestos, polychlorinated biphenyls [PCBs]).

The primary hazardous substances of concern are radioactive materials. Key radionuclide contaminants are transuranics including various plutonium isotopes (Pu-238 through Pu-240) and their decay products (americium-241, uranium isotopes U-234 through U-238, and neptunium-237) and lesser amounts of mixed fission products (cobalt-60, strontium-90, and cesium-137). Contaminants are found in the form of adherent films and residues in deactivated process vessels, piping, equipment, and ventilation system ductwork. These contaminants also might exist because of releases throughout the decades of PFP operations that could have affected the immediate release area (e.g., spills of liquid or 'heavy' materials) or also could have affected a wider area and rooms or areas connected to the downstream ventilation system (e.g., releases of plutonium oxide or fluoride powders). Thus, mobile forms of plutonium could be found in any process area of the primary plutonium processing areas or the ventilation system for such areas. In most instances, the powders will be fixed (painted over) but loose powder contamination could exist in areas not generally accessed (e.g., panels, electric junction boxes, lighting fixtures, false ceilings, ventilation ductwork). For the purpose of this removal action, approximately 100 kilograms (220 pounds) of pure and/or impure plutonium powders, alloys, or sludges could exist within the contaminated buildings.

Table 2-1 lists radiological and chemical contaminants identified as having been used in PFP plutonium processes or otherwise found or used at PFP. These constituents have a potential to exist in removal action plutonium process system waste or structure demolition waste.

Table 2-1. Potential Radiological and Hazardous Substances in Removal Action Waste[1]

1-Naphthyamine sulfuric acid
1-naphtylamine-7 sulfamic acid
Aluminum nitrate nona-hydrate [2](ANN)
Aluminum (oxide)
Americium (nitrate, fluoride)
Argon
Asbestos [3][piping and duct insulation, floor/ceiling tiles, transite wallboard, cove mastic, door actuators, electrical wiring, gaskets)
Barium (oxide)
Benzene
Beryllium (oxide)
Boron (oxide)
Bromobenzene
Butanol
Cadmium [batteries, paint]
Calcium (metal, fluoride, iodide, nitrate, oxide)
Carbon (activated bone char)
Carbon tetrachloride
Cerium (nitrate, oxide)
Chlorine

Table 2-1. Potential Radiological and Hazardous Substances in Removal Action Waste[1]

Chromium (oxide)
Citric acid
Cobalt
Copper (metal, oxide)
Dibutyl phosphate (DBP)
Dibutyl butyl phosphonate (DBBP)
Dysprosium
Ethanol
Ethylene glycol
Europium
Ferrous ammonium sulfate
Fluorine
Freon
Gadolinium
Gallium (oxide)
Hydrazine
Hydrochloric acid
Hydrofluoric acid
Hydrogen fluoride
Hydrogen fluoride gas
Hydrogen peroxide
Hydroxylamine nitrate
Hydroxylamine sulfate
Iodine (crystals)
Iron (oxide, nitrate)
Isopropanol
Lanthanum nitrate
Lead [paint, batteries, floor drains, shielding bricks, sprinkler heads/fusible links]
Lithium (oxide)
Magnesium (hydroxide, oxide)
Manganese (oxide)
Mercury [thermometers, instruments, switches, paint]
Methyl Isobutyl ketone [paint]
Molybdenum (oxide)
Monobromobenzene
Monobutyl Phosphate
Neodymium (nitrate, oxide)
Neptunium
Nickel [batteries] (carbonyl, oxide)
Nitric acid
Nitrogen
Oxalic acid
Polychlorinated Biphenyls (PCBs) [paint, capacitors, electrical wiring, fluorescent light ballasts, hydraulic fluids transformers]
Perchloroethylene
Phosphoric acid
Phosphoric (oxide)
Potassium (hydroxide, oxide, permanganate, sulfate)
Propane
Propylene glycol
Plutonium (metal, dioxide, fluoride, nitrate, oxalate, oxide, silicate)
Samarium
Silicon (oxide)

Table 2-1. Potential Radiological and Hazardous Substances in Removal Action Waste[1]

Silver (persulfate)
Sodium (bicarbonate, carbonate, hydroxide, nitrate, nitrite, sulfate)
Sulfamic acid
Sulfur
Sulfuric acid
Tantalum (oxide)
Thorium (oxide)
Tin (monoxide)
Titanium (oxide)
Toluene [from paint]
Tributyl phosphate (TBP)
Triethylalamine
Tritium
Tungsten (oxide)
Uranyl nitrate
Uranium (oxide)
Vanadium
Xylene (from paint)
Zinc (oxide)
Zirconium (oxide)

[1] List derived from *Review of Constituents That May Impact Air Permitting During Legacy Holdup Removal and Facility Cleanout of the Plutonium Finishing Plant* (Hoyt and Teal, 2003) and *The Plutonium Finishing Plant Residual Chemical Hazards Assessment Data* (HNF-13940).
[2] ( ) = Known chemical formulation(s), or, acronym
[3] [ ] = Potential constituent source.

Table 2-2 identifies quantities of waste, by waste type, that could be generated by demolition of the above-grade structures within the scope of the 'slab on grade' alternative. Because not all structures have been fully characterized, waste estimates for some structures remain to be determined.

Table 2-2. Projected Quantity of Waste from Structure Demolition (in cubic meters)[1]

Building number	Low-level waste[2] (LLW)	Low-level mixed waste[3] (LLMW)	Transuranic (TRU) waste[4]	Transuranic mixed (TRUM) waste[5]	Demolition waste[6]
216-Z-9[12]	0	0	6	>1	149
225-WC[13]	To Be Determined (TBD)	0	0	0	118
234-5Z[7]	2,540	42	1,674	167	35,162
236-Z	471	10	1,352	135	4,465
241-Z[8]	227	2	81	8	74
242-Z	612	12	85	9	464
243-Z[9]	84	0	0	0	0
2503-Z	0	2,700	0	0	0
252-Z-1	TBD	0	0	0	6
270-Z	TBD	0	0	0	788
2701-ZA[14]	TBD	0	0	0	473
2702-Z	TBD	0	0	0	89
2704-Z	TBD	0	0	0	24
2705-Z	TBD	0	0	0	89
2721-Z	TBD	0	0	0	16
2727-Z	TBD	0	0	0	89
2729-Z	TBD	0	0	0	106

Table 2-2. Projected Quantity of Waste from Structure Demolition (in cubic meters)[1]

Building number	Low-level waste[2] (LLW)	Low-level mixed waste[3] (LLMW)	Transuranic (TRU) waste[4]	Transuranic mixed (TRUM) waste[5]	Demolition waste[6]
2731-Z[15]	345	0	0	0	0
2734-ZA[16]	TBD	0	0	0	63
2734-ZB[17]	TBD	0	0	0	99
2734-ZJ	TBD	0	0	0	3
2735-Z[13]	15	93	0	0	0
2736-Z[10]	0	0	53	5	1,769
2902-Z	42	4	0	0	0
291-Z[11]	12	0	23	2	432
PFP Yards & Grounds	TBD	0	0	0	3172

[1] Waste volumes derived from *Waste Volume Estimates to Support Preparation of the PFP Above-Grade Engineering Evaluation/Cost Analysis (EE/CA)* (Killoy 2004).
[2] LLW volume includes LLW drums and LLW Boxes.
[3] LLMW includes LLMW drums only.
[4] TRU waste includes TRU drums and TRU standard waste boxes (SWBs).
[5] TRUM waste volume includes TRUM waste drums and TRUM waste SWBs.
[6] Demolition debris transported to the Environmental Restoration Disposal Facility (ERDF) in rolloff boxes [15 cubic meters (20 cubic yards) each].
[7] 234-5Z also includes 234-5ZA.
[8] 241-Z also includes 241-ZA, 241-ZB, 241-ZG and 241-Z-RB.
[9] 243-Z also includes 243-ZA and 243-ZB.
[10] 2736-Z also includes 2736-ZA, 2736-ZB, 2736-ZC, and 2736-ZD.
[11] 291-Z also includes 291-Z-001 stack and 2712-Z.
[12] 216-Z-9 also includes 216-Z-9A, 216-Z-9B, 216-Z-9C.
[13] These structures are potentially contaminated. Contamination and potential quantity of non-demolition waste is currently unknown.
[14] 2701-ZA also includes 2701-ZD.
[15] 2731-Z also includes 2731-ZA.
[16] 2734-ZA also includes 2734-ZC, -2734-ZK, and 2734- ZL.
[17] 2734-ZB also includes 2734-ZD, 2734-ZF, and 2734-ZG.

To the extent practicable, known quantities of containerized hazardous chemicals will have been removed from PFP above-grade structures in preparation for this removal action. Nonradiological substances identified in Table 2-1 as having a potential to be present in removal action waste originate from construction materials, plutonium product chemical impurities, process chemicals, Hanford and Rocky Flats ash processed at PFP, and decontamination solutions. Nonradiological constituents generally considered to provide the most significant personnel health risks through ingestion, contact, and/or inhalation are PCBs, asbestos, beryllium, heavy metals, acids/caustics, and hazardous process chemicals (e.g., carbon tetrachloride, TBP, DBBP). Residual quantities of hazardous chemicals could remain as hold up or heels in process piping, tanks, and vessels, or as residue on contaminated process equipment or structures. Although most tanks and vessels have been drained, there is little documentation indicating that many have been flushed and therefore residues are anticipated to exist. Because PFP processes were radioactive, chemical contamination likely will exist only in the presence of radionuclides.

3.0 THREAT TO PUBLIC HEALTH, WELFARE, OR ENVIRONMENT

The primary risk associated with the PFP above-grade structures in the current configuration is due to the radiological inventory. Radionuclides are classified as Group A (known human) carcinogens. Any inventory released to the environment due to structural failure brought on by earthquake, wind, storms, age, etc. could result in a potential dose to site personnel and the public (via aerial dispersion of radionuclides that reaches receptors beyond the PFP fence line), and although a remote possibility, a release to soils potentially could provide a pathway for migration to groundwater. Any release to soils would require remediation to prevent future environmental exposure.

A potential for a release of hazardous substances associated with the structures contamination resulting in an increase of radiation, inhalation, and ingestion risks justify a CERCLA non-time-critical removal action.

4.0 ENDANGERMENT DETERMINATION

The response action proposed is necessary to protect the public health or welfare and the environment from actual or threatened releases of hazardous substances, including radioactive substances from the PFP above-grade structures. Such a release or threat of release may present an imminent and substantial endangerment to the public health or welfare, and the environment.

5.0 PROPOSED ACTIONS AND ESTIMATED COSTS

Proposed actions and estimated costs are presented in the following sections.

5.1 PROPOSED ACTIONS

The DOE prepared an EE/CA to evaluate alternatives considered for the disposition of the PFP above-grade structures. These alternatives are described below.

- Alternative One: No Action
- Alternative Two: Surveillance and Maintenance
- Alternative Three: Deactivation/Stabilization
- Alternative Four: Slab-on-Grade
- Alternative Five: Entombment
- Alternative Six: Collapse and Cover.

Table 5-1 identifies alternatives considered for each of the PFP above-grade structures within the scope of this removal action. As noted in the table, for particular structures, one or several of the alternatives (i.e., entombment, collapse and cover) were not applicable because of the nature of the structure (i.e., design, level of contamination) and therefore were not evaluated.

Table 5-1. Removal Action Alternatives Considered for Each PFP Above-Grade Structure

Structure	#1. No Action	#2. Cont'd Surveillance & Maintenance	#3. Deactivation/ Stabilization	#4. Slab On Grade	#5. Entombment[5]	#6. Collapse & Cover[5]
216-Z-9 Crib and support structures[1]	X	X	X	X	X	
225-WC	X	X	X	X		X
234-5Z	X	X	X	X	X	X
234-5ZA	X	X	X	X		X
236-Z	X	X	X	X	X	X
241-Z	X	X	X	X	X[2]	
241-ZA	X	X	X	X		
241-ZB	X	X	X	X	X	
241-ZG	X	X	X	X		
241-Z-RB	X	X	X	X	X	
242-Z	X	X	X	X	X	X
243-Z	X	X	X	X		X
243-ZA	X	X	X	X	X[3]	X
243-ZB	X	X	X	X		
2503-Z	X	X	X	X		
252-Z-1	X	X	X	X		
270-Z	X	X	X	X		
2701-ZA	X	X	X	X		
2701-ZD	X	X	X	X		
2702-Z	X	X	X	X		
2704-Z	X	X	X	X		
2705-Z	X	X	X	X		
2712 –Z	X	X	X	X		X
2721-Z	X	X	X	X		
2727-Z	X	X	X	X		
2729-Z	X	X	X	X		
2731-Z	X	X	X	X		
2731-ZA	X	X	X	X		
2734-ZA, -ZC, -ZK, & –ZL	X	X	X	X		
2734-ZB, -ZD, -ZF, &-ZG	X	X	X	X		
2734-ZJ	X	X	X	X		
2735-Z	X	X	X	X		X
2736-Z	X	X	X	X	X	X
2736-ZA	X	X	X	X	X	X
2736-ZB	X	X	X	X	X	X
2736-ZC	X	X	X	X		
2736-ZD	X	X	X	X		
2902-Z	X	X	X	X		
291-Z	X	X	X	X	X[4]	X
291-Z-001 stack	X	X	X	X		X
PFP Complex	X	X	X	X		

Table 5-1. Removal Action Alternatives Considered for Each PFP Above-Grade Structure

Structure	#1. No Action	#2. Cont'd Surveillance & Maintenance	#3. Deactivation/ Stabilization	#4. Slab On Grade	#5. Entombment[5]	#6. Collapse & Cover[5]
Yards and Grounds						

[1] The only activity associated with this removal action for 216- Z-9 crib would be to stabilize the surface area and structurally reinforce, the crib (such as adding a layer of pea gravel) and/or to install a cover. Under this removal action, no sub-grade activities would be conducted for 216-Z-9. Remediation of 216-Z-9 would be evaluated in follow-on CERCLA documentation (prepared for Central Plateau Remediation).
[2] 241-Z entombment alternative includes metal enclosure removal.
[3] The 243-ZA building can be entombed with the above-grade tank removed.
[4] 291-Z entombment alternative includes stack removal
[5] For the above-grade structures that are not undergoing entombment or collapse and cover, the removal action will be 'slab-on-grade'.

5.1.1 Alternative One: No Action

Under the No Action alternative, access to PFP above-grade structures would not be restricted. Plutonium holdup disposition activities will be completed prior to this removal action with approximately 20 to 50 kg of residual contamination remaining. No additional facility stabilization would be performed. The No Action alternative would not address the hazards posed by the above-grade structures. The structures would continue to deteriorate. Initial risks of the No Action alternative would be minimal to the environment. Barring an unusual event, contaminants are assumed to remain confined within the structures. Industrial and radiological hazards would exist under a No Action alternative assumption because controls to prevent access would not be maintained. Risks over time can be expected to increase as deterioration of the structures progresses and the structural integrity of the above-grade structures and their systems are compromised. Eventually, the PFP above-grade structures decay would be expected to result in radiological releases to the environment and potential exposure to personnel and the public. Physical hazards associated with partial structural collapse also would be anticipated.

5.1.2 Alternative Two: Surveillance and Maintenance

Alternative Two would ensure that PFP above-grade structures are maintained in a safe condition until final disposition. Approximately 20 to 50 kg of residual contamination may remain after completion of plutonium holdup disposition activities prior to the removal action. For this alternative, the surveillance and maintenance (S&M) of each above-grade structure is estimated to continue until 2030. This date was chosen to assume a basis for determining long-term S&M for the purpose of evaluating EE/CA alternatives. Current PFP decommissioning dates are much earlier. Under this alternative, the structures would remain in the S&M program until final PFP Facility decommissioning occurs. These S&M measures would include periodic radiological and industrial hazard monitoring (both inside and outside of a structure), cold weather protection, preventive maintenance, annual roof inspections, identification and minor repair of friable asbestos, and general visual inspections. Critical safety, fire prevention, and environmental systems would remain operating. Major maintenance operations, such as roof maintenance, would be performed to ensure the maintenance of safe conditions and the control of the ongoing deterioration process. Additionally, limited decontamination and fixative application would occur to control the spread of radiological contamination.

The primary elements of Alternative Two are as follows:

- Limited decontamination and fixative application
- Leave structures in place with critical safety and environmental systems operating
- Dispose of the various waste forms generated in these operations
- Conduct periodic S&M.

The prime goal of this alternative is to prevent radiological environmental releases and to avoid industrial accidents. Adoption of Alternative Two extends the life obligation of the PFP above-grade structures for approximately the next 30 years, during which time deterioration progresses and unusual events might occur. Severe weather conditions could create structure conditions amenable to radiological releases, and long-term aging of confinement structures could lead to eventual failure. These conditions, accompanied by minimum surveillance efforts, could result in an unplanned radiological release.

Because minimal surveillance would not readily detect structure decay (e.g., system corrosion or structural breakdown), preventive maintenance might not occur in time, and response actions could be required. This approach could result in the spread of contamination. An ongoing S&M program would have to become increasingly more labor intensive and expensive requiring periodic characterization efforts to counter these conditions. Such conditions ultimately would lead to increased personnel exposure to radioactive material and contamination. While the magnitude of an ongoing S&M program should be controlled to conserve funding and be responsive only to safety issues, the program financial growth should be planned to account for progressive structure deterioration. Data evaluation, inspection/observations, and future structure plans should be factored into the S&M planning and implementation.

5.1.3 Alternative Three: Deactivation/Stabilization

Alternative Three would ensure that PFP above-grade structures are maintained in a safe condition until final disposition. Approximately 5 to 30 kg of residual contamination may remain after completion of plutonium holdup disposition activities. Plutonium holdup disposition activities would be completed prior to the removal action. For this alternative, the PFP above-grade structures would be deactivated, consisting of residual waste material removal including tank flushing, and the process equipment and other items stabilized. The structures would be transitioned to long-term S&M as described in Section 8.0 of the HFFACO Action Plan. Like Alternative Two, this long-term S&M is expected to continue until 2030. As in Alternative Two, S&M measures would include minimal long-term radiological and industrial hazard monitoring (both inside and outside of a structure), cold weather protection, preventive maintenance, annual roof inspections, identification and minor repair of friable asbestos, and general visual inspections. Major maintenance operations, such as roof maintenance, would be performed to ensure the maintenance of safe conditions and the control of the ongoing deterioration process. Additionally, limited decontamination and fixative application would occur to control the spread of radiological contamination.

The primary elements of Alternative Three are as follows:

- Remove the substantial nonradiological and radiological hazardous substances from within the above-grade structures including associated below-grade basements, tunnels, vaults, etc.
- Decontaminate, fix contamination, and isolate systems as needed
- Leave structures in place with critical safety and environmental systems operating
- Dispose of the various waste forms generated in these operations
- Conduct periodic S&M.

5.1.4 Alternative Four: Slab-on-Grade

Alternative Four would ensure that PFP above-grade structures are dispositioned in a safe condition. This alternative would consist of the following primary elements:

- Remove the nonradiological and radiological hazardous substances from within the above-grade structures including associated below-grade basements, tunnels, vaults, etc.
- Decontaminate, fix contamination, and isolate systems, as needed
- Remove above-grade and, as needed, basement, tunnel, vault, etc., equipment
- Demolish above-grade structures to grade
- Cut off equipment penetrating the structures slab, as needed, and seal penetrations to prevent intrusion or leakage
- Dispose of the various waste forms generated during these operations
- Stabilize the area
- Install a cover, as needed
- Conduct periodic S&M.

Plutonium holdup disposition activities would be completed. Significantly less than 1 kg of residual contamination may remain after completion of the slab-on-grade activities. The remaining residual contamination would be trapped in the building foundation slabs and sub-grade structures (including buried piping and ductwork).

Nonradiological hazardous substances would be removed. These would include asbestos-containing material (ACM), chemical feed tanks and piping, equipment oils, mercury, control panels, and potentially materials/liquids in the floor drains. Radiological hazardous substances removal would include removal of process hoods and piping. Equipment, vessels, and piping systems might need to be isolated and severed to facilitate removal and/or disposal. Remote handling equipment might be used to facilitate removal of equipment and piping. While concerns for operational methods and technology used would be

encountered and resolved during removal actions, no major issues exist that might compromise this alternative. No sub-grade (e.g., buried structures, buried pipelines, soil, groundwater, or unplanned releases) source terms would be removed or treated.

In general, piping and vessels would be removed from a structure, either before or as part of that structure demolition. Piping entering or exiting a structure below-grade would be plugged or grouted to prevent potential pathways to the environment.

Demolition would use heavy equipment (e.g., excavator with various attachments) to demolish the structures. Other industry standard practices for demolition also could be used (e.g., mechanical saws, cutting torches). Each PFP above-grade structure would be demolished until only the slab and foundation remained. In addition, miscellaneous debris in the surrounding area, like fencing, telephone poles, etc., will be removed and disposed of during demolition. For structures with basements, tunnels, vaults, etc., the below-grade walls would be left standing as well as the below-grade slab and foundation. These remaining surface portions of a structure are referred to in this document collectively as the structure's 'slab'.

Exposed areas such as the 234-5Z tunnels or 241-Z vaults that exist below-grade would be filled and covered with a suitable material to grade level to prevent water accumulation but not preclude any future remedial activity. Each PFP above-grade structure footprint would be stabilized to prevent migration of any residual contamination to the environment, if needed. This migration prevention could include adding a cover (of compacted fill, gravel, asphalt or other appropriate material with an engineered slope), if needed, to the slab to prevent run-on/run-off.

Over time contaminants could still pose a risk through a potential groundwater transport exposure pathway. Further soil or waste site remediation would be conducted in coordination with future remedial actions as described in Section 2.4.

The major risk associated with this alternative is personnel safety during the hazardous substance removal and decontamination and the industrial aspects of a structures D&D. These risks are related to the potential release of contamination, and the hazards associated with the demolition activities.

5.1.5 Alternative Five: Entombment

Alternative Five would allow for applicable PFP above-grade structures (for structures identified for this alternative, see Table 5-1) to be cleaned out sufficiently for individual structures to be designated as low-level waste (LLW) units. The structures would be entombed in concrete or other appropriate material. Partial entombment would result in filling select above-grade structures and removing others. Total entombment would fill and encase applicable above-grade structures. In each instance, applicable basement, tunnel, vault, etc., structures would be filled. Applicable buried radioactive pipes and ducts would be plugged or grouted to prevent potential pathways to the environment.

Alternative Five would consist of the following primary elements:

- Remove the substantial nonradiological and radiological hazardous substances from within the above-grade structures including associated below-grade basements, tunnels, vaults, etc.
- Decontaminate, fix contamination, and isolate systems as needed
- Remove selected gloveboxes and equipment as needed

- Dispose of the various waste forms generated during operations
- Fill applicable basement, tunnel, vaults, etc. portions of the structures with appropriate material not to preclude any future remedial activity.
- Fill and encase applicable above-grade structures or fill select above-grade structures and remove remaining applicable above-grade structures that are not entombed
- Install a cover if needed
- Conduct periodic S&M.

Plutonium holdup disposition activities would be completed before entombment activities are initiated and may leave up to approximately 4 kg of residual contamination in any one building with an estimated total of approximately 6 kg of holdup remaining in the entire PFP Facility.

Disposition would be via entombment in concrete or other appropriate material not to preclude any future remedial activity. In general, this would involve pouring a concrete retaining wall around a structure. This wall would act as the concrete form. Concrete would be pumped into and around the structure. Before starting the pouring of concrete into the structure, gloveboxes, ducts, and voids would be filled with an appropriate material. For areas of known or suspected sub-grade soil contamination, the top of the entombment could be sloped to direct run off away from contaminated areas. No sub-grade (e.g., buried structures, buried pipelines, soil, groundwater, or unplanned releases) source terms would be removed or treated.

The end product would be a tall block of concrete or other appropriate material, up to 70 feet in some cases, entombing a structure. A sealant would be applied to the concrete. Miscellaneous debris in the surrounding area, like fencing, telephone poles, fire risers, etc., will be removed and disposed of during entombment. The top would be sloped to promote run-off. An additional cover could be added to increase the integrity of the concrete surface from weathering. Partial entombment also could result in some applicable above-grade structures being removed. For the above-grade structures that are not being entombed, the removal action for this alternative will be 'slab-on-grade' (as described for Alternative Four).

5.1.6 Alternative Six: Collapse and Cover

The goal of this alternative is to minimize the quantity of waste and construction debris that would be removed from the PFP Facility. This alternative would result in the applicable PFP above-grade structures (for structures identified for this alternative, see Table 5-1) having been cleaned up to meet LLW standards, and structurally collapsed in-place to reduce the height of the final skyline. Parts of the structures and debris that meet LLW or free-release standards would remain within the engineered cover that would be built over each collapsed structure. A void fill would be introduced to prevent subsidence, but necessarily would not be relied on as a fixative to hold residual contamination in place. The engineered covers would be designed to prevent water infiltration and dispersion of surface contamination by wind. No sub-grade source terms would be removed or treated. Again, miscellaneous debris in the surrounding area, like fencing, telephone poles, fire risers, etc., will be removed and disposed of during cover placement. Applicable buried radioactive pipes and ducts would be plugged or grouted to prevent potential pathways to the environment.

Alternative Six consists of the following primary elements:

- Remove the substantial nonradiological and radiological hazardous substances from within the above-grade structures including associated below-grade basements, tunnels, vaults, etc.
- Decontaminate, fix contamination, and isolate systems as needed
- Remove gloveboxes and equipment as needed
- Dispose of waste generated during these operations
- Fill basement, tunnel, vaults, etc. portions of the structures with appropriate material not to preclude any future remedial activity.
- Collapse structures in place to rubble
- Fill void with appropriate material
- Conduct periodic S&M
- Install a cover (to provide protection due to the potential migration of contamination) that could include one of the following types:
    - Asphalt cover
    - Contamination control cover (i.e., a highly weather resistant contamination barrier ensuring confinement of residual contamination and serving as an interim protective measure; not intended for final site closure nor to meet requirements of a RCRA cap)
    - RCRA-equivalent cover.

Plutonium holdup disposition activities would be completed. After deactivation is complete and before collapse and cover activities are initiated, up to approximately 3 kg of residual contamination may remain in any one building with an estimated total of approximately 4 kg of residual contamination in the entire PFP Facility. For the above-grade structures that are not undergoing collapse and cover, the removal action for this alternative will be 'slab-on-grade' (as described for Alternative Four).

5.2 COMMON ELEMENTS

With the exception of the No Action alternative, each of the alternatives would result in generation of waste requiring disposal at an appropriate disposal facility. Waste management would be a common element among these alternatives. Contaminated debris likely would be designated as LLW; however, quantities of mixed waste, dangerous waste, and/or TRU waste could be generated. Waste management applicable or relevant and appropriate requirements (ARARs) are discussed in Section 5.3.

Most waste generated during the selected CERCLA removal action for the PFP aboveground structures likely would fall within the definition of waste eligible for disposal at ERDF. Waste might require treatment to meet ERDF waste acceptance criteria. The type of treatment and the location of treatment would be determined on a case-by-case basis. Solidification, encapsulation, neutralization, and size reduction/compaction might be employed to treat various waste types. For waste requiring treatment, the techniques would be documented in a waste treatment plan for ERDF.

The ERDF, located in the 200 West Area, is an engineered structure designed with a double liner, a leachate collection system, leak detection, and final cover and eligible for disposal of any LLW, mixed waste, and hazardous/dangerous waste generated as a result of CERCLA provided that the waste meets ERDF waste acceptance criteria and that appropriate CERCLA decision documents are in place.

Some waste generated during the removal action might not meet or might not be able to be treated to meet ERDF acceptance criteria. Specifically, this would include low-level radioactive and nonradioactive liquid waste and TRU waste that might be encountered or generated during the removal action. Liquid waste containing levels of radioactive and/or nonradioactive hazardous substances meeting the 200 Areas Effluent Treatment Facility (ETF) waste acceptance criteria would be sent to the ETF and treated to meet ETF waste discharge standards. Liquids that do not meet ETF waste acceptance criteria would be either sent to another permitted TSD unit that accepts liquid waste or solidified and disposed at ERDF (if ERDF waste acceptance criteria are met).

TRU waste would be placed in interim storage at PFP or at the Central Waste Complex (CWC) waiting shipment to the Waste Isolation Pilot Plant (WIPP), using the Waste Receiving and Processing Facility, if necessary, in accordance with the schedule established for completing remedial actions on the Hanford Site.

The ERDF is considered to be onsite for the purposes of CERCLA for management and/or disposal of waste from removal actions proposed in this document[2]. There is no requirement to obtain a permit to manage or dispose of CERCLA waste at this facility.

For waste that must be sent offsite (i.e., ETF, CWC, etc.), EPA would make a determination in accordance with Title 40, *Code of Federal Regulations* (CFR), Section 300.440 as to the acceptability of the proposed disposal site for receiving this CERCLA removal action waste if necessary.

5.3 APPLICABLE OR RELEVANT AND APPROPRIATE REQUIREMENTS AND OTHER GUIDANCE TO BE CONSIDERED

ARARs are defined to mean only substantive requirements. ARARs do not include administrative requirements. Furthermore, onsite CERCLA actions are exempt from obtaining federal, state, and local permits [40 CFR 300.400(e)].

To Be Considered (TBC) information consists of advisories or guidance issued by federal or state governments that are not binding legally and do not have the status of ARARs. As appropriate, TBCs should be considered in determining the removal action necessary for protection of human health and the environment. Requirements drawn from TBCs may be included in the selected alternative. Because the alternatives would result primarily in waste generation and potential for air emissions, the key ARARs identified for the alternatives considered include waste management standards and standards controlling

[2] CERCLA Section 104(d)(4) states that, where two or more noncontiguous facilities are reasonably related on the basis of geography, or on the basis of the threat or potential threat to the public health or welfare or the environment, the President may, at his discretion, treat these facilities as one for the purpose of this section. The preamble to the "National Oil and Hazardous Substances Pollution Contingency Plan" (40 CFR 300) clarifies the stated EPA interpretation that when noncontiguous facilities are reasonably close to one another, and wastes at these sites are compatible for a selected treatment or disposal approach, CERCLA Section 104(d)(4) allows the lead agency to treat these related facilities as one site for response purposes and, therefore, allows the lead agency to manage waste transferred between such noncontiguous facilities without having to obtain a permit. Therefore, ERDF and ETF are considered to be onsite for the purposes of CERCLA under this removal action. It should be noted that the scope of work covered in this removal action is for those above-grade structures and waste contaminated with hazardous substances. Materials encountered during implementation of the selected removal action that are not contaminated with hazardous substances will be dispositioned by DOE.

emissions to the environment. The ARARs are discussed generally in the following sections and are documented in detail in Table 5-2.

5.3.1 Waste Management Standards

A variety of waste streams would be generated under the proposed removal action alternatives. It is anticipated that most of the waste would be designated as LLW. Small quantities of TRU waste, dangerous or mixed waste, PCB-contaminated waste, and asbestos and ACM also might be generated. Waste likely would be in a solid form. However, some aqueous solutions might be generated.

The identification, storage, treatment, and disposal of hazardous waste and the hazardous component of mixed waste are governed by RCRA. Authority to implement most of the RCRA was delegated to the State of Washington, which implements RCRA requirements under *Washington Administrative Code* (WAC) 173-303. The dangerous waste standards for generation and storage would apply to the management of any dangerous or mixed waste generated at PFP above-grade structures. Treatment standards for dangerous or mixed waste subject to RCRA land disposal restrictions are specified in WAC 173-303-140, which incorporates 40 CFR 268 by reference.

The management and disposal of PCB waste are governed by the *Toxic Substances Control Act* (TSCA) *of 1976*, which is implemented by 40 CFR 761. The TSCA regulations contain specific provisions for PCB waste, including PCB waste that contains a radioactive component. PCBs also are considered underlying hazardous constituents under RCRA and thus might be subject to WAC 173-303-140 requirements for waste regulated by both RCRA and TSCA.

Removal and disposal of asbestos and ACM are regulated under the *Clean Air Act* (40 CFR 61, Subpart M). These regulations provide for special precautions to prevent environmental release or exposure to personnel of airborne emissions of asbestos fibers during removal actions. 40 CFR 61.150 identifies packaging requirements.

It is anticipated that alternatives would be performed in compliance with waste management ARARs. Waste streams would be evaluated, designated, and managed in compliance with the appropriate requirements. Before disposal, waste would be managed in a protective manner to prevent release to the environment or unnecessary exposure to personnel. Waste that is designated as LLW would be disposed at ERDF, which is engineered to meet relevant and appropriate performance standards under 10 CFR 61.

Waste that is designated as either contact-handled or remote-handled TRU waste or TRUM waste would be stored at PFP or CWC until eventual disposal. TRU waste is defined by DOE Orders as waste containing more than 100 nanocuries per gram of waste of alpha-emitting transuranic isotopes with half-lives greater than 20 years, with few exceptions.

Waste designated as dangerous or mixed waste would be treated as appropriate to meet land disposal restrictions, and disposed at ERDF. ERDF is engineered to meet landfill design standards under WAC 173-303-665. Applicable packaging and pre-transportation requirements for dangerous or mixed waste generated at PFP above-grade structures would be identified and implemented prior to movement of any waste. Some of the aqueous waste designated as LLW, dangerous, or mixed waste would be transported to ETF for disposal. ETF is authorized to treat aqueous waste streams generated on the Hanford Site and dispose of these streams at a designated state approved land disposal facility.

Waste designated as PCB remediation waste likely would be disposed at ERDF or WIPP, depending on whether the waste is a LLW or a TRU waste respectively. ERDF is authorized to accept non-liquid PCB waste containing PCB concentration up to 500 parts per million (ppm) for disposal. TRU waste suspected

to contain PCBs would be evaluated to determine whether the waste meets ERDF or WIPP waste acceptance criteria. Any PCB waste that does not meet ERDF or WIPP waste acceptance criteria would be retained at an onsite PCB storage area meeting the substantive requirements for TSCA storage. The waste would be transported to an appropriate disposal facility for future disposal.

Asbestos and ACM would be removed, packaged as appropriate, and disposed of at ERDF.

As stated in Section 5.2, the ERDF is considered the on-site waste disposal facility. All other disposal facilities mentioned in this section (i.e., ETF, CWC) are considered off-site and require prior approval by the EPA as an acceptable facility for receiving this CERCLA waste.

5.3.2 Standards Controlling Emissions to the Environment

The proposed removal action has the potential to generate airborne emissions of both radioactive and nonradioactive emissions.

The federal *Clean Air Act* and the "Washington Clean Air Act" [*Revised Code of Washington* (RCW) Chapter 70.94] regulate airborne emissions. Table 5-2 provides detailed discussion of the potential ARARs under these regulations.

WAC 173-400 and 173-460 establish requirements for emissions of criteria/toxic air pollutants. The primary source of emissions would be particulate matter and/or other toxic constituents. Particulate emissions would be controlled through standard industrial practices (i.e., best available control technology) including, but not limited to, application of water spray, fixatives and/or temporary confinement enclosures/glovebag containments.

Table 5-2. Identification of Applicable or Relevant and Appropriate Requirements and To Be Considered for the PFP Above-Grade Structures.

ARAR Citation	ARAR or TBC	Requirement	Rationale for Use
WASTE MANAGEMENT STANDARDS			
Regulations pursuant to the *Resource Conservation and Recovery Act of 1976*, 42 USC 6901, et seq. – Implemented through the *Hazardous Waste Management Act*, RCW 70.105			
Dangerous Waste Regulations, (WAC 173-303):			
Solid Waste Identification Specific subsections: WAC 173-303-016 WAC 173-303-017	ARAR	These regulations define how to identify when materials are and are not solid waste.	Substantive requirements of these regulations are potentially applicable because these define how to determine which materials are subject to the designation regulations. Specifically, materials that are generated for removal from the CERCLA site during the removal action would be subject to the procedures for identification of solid waste to ensure proper management.

Table 5-2. Identification of Applicable or Relevant and Appropriate Requirements and To Be Considered for the PFP Above-Grade Structures.

ARAR Citation	ARAR or TBC	Requirement	Rationale for Use
Dangerous/Mixed Waste Designation WAC 173-303-070(3)	ARAR	This regulation establishes the procedures to be used to determine if solid waste requires management as dangerous waste. These procedures are used to identify which waste codes are appropriate for application to the waste.	Substantive requirements of these regulations are potentially applicable to materials encountered during the removal action. Specifically, solid waste that is generated for removal from the CERCLA site during this removal action would be subject to the dangerous waste designation procedures to ensure proper management.
Dangerous/Mixed Waste Management Specific subsections: WAC 173-303-073 WAC 173-303-077 WAC 173-303-170(3)	ARAR	These regulations establish the management standards for solid waste designated as dangerous or mixed waste. Special waste is addressed in WAC 173-303-073. Universal waste is addressed in WAC 173-303-077. Generator standards are identified through WAC 173-303-170(3).	Substantive requirements of these regulations are potentially applicable to materials encountered during the removal action. Specifically, the substantive standards for management of special waste and universal waste and the substantive standards for management of dangerous/mixed waste are applicable to the interim management of certain waste that will be generated during the removal action. For purposes of this removal action, WAC 173-303-170(3) includes the substantive provisions of WAC 173-303-200 by reference. WAC 173-303-200 further includes certain substantive standards from WAC 173-303-630 and -640 by reference.
Dangerous/Mixed Waste Disposal Specific subsection: WAC 173-303-140(4)	ARAR	This regulation establishes state standards for land disposal of dangerous waste and incorporates by reference, federal land disposal restrictions of 40 CFR 268, that are applicable to solid waste that designates as dangerous or mixed waste in accordance with WAC 173-303-070(3).	The substantive requirements of this regulation are potentially applicable to materials encountered during the removal action. Specifically, dangerous/mixed waste that is generated and removed from the CERCLA site during the removal action for offsite (as defined by CERCLA) land disposal would be subject to the identification of applicable land disposal restrictions at the point of generation of the waste. The actual offsite treatment of such waste would not be ARAR to this removal action, but would instead be subject to applicable laws and regulations.

Table 5-2. Identification of Applicable or Relevant and Appropriate Requirements and To Be Considered for the PFP Above-Grade Structures.

ARAR Citation	ARAR or TBC	Requirement	Rationale for Use
Recycling Requirements Specific subsections: WAC 173-303-120(3) WAC 173-303-120(5)	ARAR	These regulations define the requirements for the recycling of materials that are solid and dangerous waste. Specifically, WAC 173-303-120(3) provides for management of certain recyclable materials, including spent refrigerants, antifreeze, and lead-acid batteries. WAC 173-303-120(5) provides for the recycling of used oil.	Substantive requirements of these regulations are potentially applicable to certain materials that might be encountered during the removal action. Recyclable materials that are exempt from regulation as dangerous waste and that are not otherwise subject to CERCLA as hazardous substances can be recycled and/or conditionally excluded from certain dangerous waste requirements.
Final TSD Unit Requirements Specific subsection: WAC 173-303-610(2)	ARAR	This regulation establishes requirements applicable to final status TSD units undergoing closure.	Substantive requirements of this regulation would be relevant and appropriate to any interim status TSD unit undergoing closure in conjunction with the removal action.
Regulations pursuant to the *Toxic Substances Control Act (TSCA)*, 15 USC 2601 et seq.			
Polychlorinated Biphenyls Manufacturing, Processing, Distribution in Commerce, and Use Provisions (40 CFR 761)			
PCB Waste Management and Disposal Specific subsections: 40 CFR 761.50(b)(1) 40 CFR 761.50(b)(2) 40 CFR 761.50(b)(3) 40 CFR 761.50(b)(4) 40 CFR 761.50(b)(7) 40 CFR 761.50(c)	ARAR	These regulations establish standards for storage and disposal of PCB wastes.	Substantive requirements of these regulations are potentially applicable to the storage and disposal of PCB liquids, items, remediation waste, and bulk product waste at ≥50 ppm. The specific identified subsections from 40 CFR 761.50(b) reference the specific sections for management of each PCB waste type. Radioactive PCB waste can be disposed in accordance with 40 CFR 761.50(b)(7).
Regulations pursuant to the *Solid Waste Management, Recovery and Recycling Act*, RCW 70.95			
"Minimum Functional Standards for Solid Waste Handling," (WAC 173-304)			
Nondangerous, Nonradioactive Solid Waste Management Specific subsection: WAC 173-304-200(2)	ARAR	This regulation establishes requirements for the on-site storage of solid waste that is not dangerous or radioactive waste.	Substantive requirements of these regulations are potentially applicable to materials encountered during the removal action. Specifically, nondangerous, nonradioactive solid wastes (i.e., hazardous substances that are only regulated as solid waste) that will be containerized for removal from the CERCLA site would be managed onsite according to the substantive requirements of this standard.

Table 5-2. Identification of Applicable or Relevant and Appropriate Requirements and To Be Considered for the PFP Above-Grade Structures.

ARAR Citation	ARAR or TBC	Requirement	Rationale for Use
To-Be-Considered pursuant to relevant facility acceptance criteria			
Environmental Restoration Disposal Facility Waste Acceptance Criteria (BHI-00139)	TBC	This document establishes waste acceptance criteria for the Environmental Restoration Disposal Facility.	Waste destined for management at ERDF must meet acceptance criteria to ensure proper disposal.
STANDARDS CONTROLLING RELEASES TO THE ENVIRONMENT			
Regulations pursuant to the *Clean Air Act of 1977*, 42 USC 7401, et seq.			
"National Emission Standards for Hazardous Air Pollutants (NESHAP)," (40 CFR 61)			
40 CFR 61.92	ARAR	Emissions of radionuclides to the ambient air shall not exceed amounts that would cause any member of the public to receive in any year an effective dose equivalent of 10 mrem/yr.	Substantive requirements of this standard are potentially applicable because this removal action may include activities such as open-air demolition of contaminated structures, excavation of contaminated soils, and operation of exhausters and vacuums, each of which may provide airborne emissions of radioactive particulates to unrestricted areas. As a result, requirements limiting emissions potentially apply. This is a risk-based standard for the purposes of protecting human health and the environment.
40 CFR 61.93	ARAR	Emissions from point sources of airborne radioactive material shall be measured. Measurement techniques may include, but are not limited to, sampling, calculation, smears, or other reasonable methods for identifying emissions as determined by the lead agency.	Substantive requirements of this standard are potentially applicable because point source emissions of radionuclides to the ambient air may result from activities performed during the removal action such as open-air demolition of contaminated structures, excavation of contaminated soils, and operation of exhauster and vacuums. This standard exists to assure compliance with emission standards.
40 CFR 61.145(a) 40 CFR 61.145(c) 40 CFR 61.150	ARAR	Regulated asbestos-containing materials shall be removed in accordance with specific handling, packaging, and disposal requirements where the potential to emit asbestos exists.	Substantive requirements of this standard are potentially applicable because this removal action includes abatement of asbestos and asbestos-containing materials in the form of pipe and tank insulation, transite siding, and ductwork. As a result, there is potential to emit asbestos to unrestricted areas and the requirements for the removal, handling, and packaging of asbestos potentially apply.

Table 5-2. Identification of Applicable or Relevant and Appropriate Requirements and To Be Considered for the PFP Above-Grade Structures.

ARAR Citation	ARAR or TBC	Requirement	Rationale for Use
Regulations pursuant to the *Washington Clean Air Act*, RCW 70.94 / *Department of Ecology*, RCW 43.21A			
"Radiation Protection - Air Emissions," (WAC 246-247)			
WAC 246-247-040(3) WAC 246-247-040(4)	ARAR	Emissions shall be controlled to assure emission standards are not exceeded.	Substantive requirements of this standard are potentially applicable because fugitive, diffuse, and point source emissions of radionuclides to the ambient air may result from activities performed during the removal action, such as open-air demolition of contaminated structures, excavation of contaminated soils, and operation of exhauster and vacuums. This standard exists to assure compliance with emission standards.
WAC 246-247-075	ARAR	Emissions from non-point and fugitive sources of airborne radioactive material shall be measured. Measurement techniques may include, but are not limited to sampling, calculation, smears, or other reasonable method for identifying emissions as determined by the lead agency.	Substantive requirements of this standard are potentially applicable because fugitive and non-point source emissions of radionuclides to the ambient air may result from activities performed during the removal action such as open-air demolition of contaminated structures and excavation of contaminated soils. This standard exists to assure compliance with emission standards.
"General Regulations for Air Pollution," (WAC 173-400)			
Air Contaminant Emission Standards Specific subsections: WAC 173-400-040 WAC 173-400--113	ARAR	Methods of control shall be employed to minimize the release of air contaminants associated with fugitive emissions resulting from materials handling, construction, demolition, or other operations. Emissions are to be minimized through application of best available control technology.	Substantive requirements of these standards are potentially relevant and appropriate to this removal action because there may be visible, particulate, fugitive, and hazardous air emissions and odors resulting from decontamination, demolition, and excavation activities. As a result, standards established for the control and prevention of air pollution may be relevant and appropriate.
"Controls for New Sources of Air Pollution," (WAC 173-460)			
WAC 173-460-030 WAC 173-460-060 WAC 173-460-070	ARAR	Emissions of toxic air contaminants shall be quantified and ambient impacts evaluated. Best available control technology for toxics shall be used as determined by the lead agency to protect human health and the environment.	Substantive requirements of these standards are potentially relevant and appropriate to this removal action because there is the potential for toxic air pollutants to become airborne as a result of decontamination, demolition, and excavation activities. As a result, standards established for the control of toxic air contaminants may be relevant and appropriate.

5.4 ESTIMATED COSTS

The estimated costs for each removal action alternative were evaluated in the EE/CA and are summarized here. The near-term costs for implementing the No Action alternative are negligible as no funds are expended to surveillance, maintenance, or mitigate the hazardous conditions posed by the PFP above-grade structures; therefore, estimated costs for the No action alternative are not included.

The summarized estimates for Alternatives Two and Three includes a projection of costs over their S&M periods for roof replacement and maintenance. The identified costs do not account for increased efforts required if the PFP above-grade structures deterioration is accelerated or if an unusual deleterious event occurred that required emergency response and cleanup. These costs also do not include structure disposition.

The summarized estimates for Alternatives Five and Six exclude any associated waste disposal costs should future disposition of the entombed or collapsed structures occur.

Total nondiscounted costs or constant dollars are used for evaluation of alternatives of this removal action. Since funding will not be set aside initially, no present-worth analysis is warranted.

Summarized cost estimates for Alternatives Two through Six are provided in Table 5-3.

Table 5-3. Cost Estimates for PFP Above-Grade Structure Removal Action Alternatives.

Alternative	Total Cost ($1000)
Alternative Two - Surveillance and Maintenance	$1,599,132
Alternative Three - Deactivation/Stabilization	$1,767,528
Alternative Four - Slab-on-Grade	$605,702
Alternative Five - Entombment	$518,601
Alternative Six - Collapse and Cover	$575,790

5.5 PROJECT SCHEDULE

Removal actions for specific structures within the Action Memorandum will be initiated upon approval by DOE-RL and Ecology of removal action work plan(s). Completion of removal action activities will be commensurate with HFFACO Major Milestone M-083-00A, "Complete Transition and Selected Disposition Activities". This major milestone is to be completed on or before September 30, 2016. There are interim milestones supporting this major milestone. The individual scope and schedule for each milestone is recorded in the HFFACO. The interim milestones and their completion roll up to the major milestone so that when the final interim milestone is completed, then the major milestone is completed. See the HHFACO for the complete schedule of milestones.

6.0 EXPECTED CHANGE IN THE SITUATION SHOULD ACTION BE DELAYED OR NOT TAKEN

Severe weather can create facility conditions amenable to radiological releases, and long-term aging of engineered controls can lead to eventual failure. These conditions could result in an unplanned release. This may cause a threat to human health and the environment by direct exposure to nearby personnel and the environment, and exposure to the public through airborne radioactive contaminants.

7.0 OUTSTANDING POLICY ISSUES

There are no outstanding policy issues for this removal action.

8.0 SELECTED ALTERNATIVE

DOE and Ecology selected Alternative Four - Slab-on-Grade for the removal of the PFP above-grade structures. This alternative provides the best balance of protecting human health and the environment associated with the hazardous substance inventory within the structures, meeting the removal action objectives, and providing a cost-effective option. Alternative Four has significantly smaller quantities of material remaining, i.e., the slab, as a result of the end state of this removal action compared with the other alternatives. Alternative Four provides an end-state that does not preclude future actions beneath the above-grade structures (e.g., Operable Units 200-CW-5, 200-LW-2, 200-MW-1, 200-PW-1, and 200-PW-6); and compared with the other alternatives minimizes future costs if any remedial actions are required. The cost to remove the buildings to a slab-on-grade condition is somewhat higher than the costs for Alternatives Five and Six, but these estimated amounts are close enough to be considered similar as CERCLA removal actions allow an estimation tolerance of +50/-30% of the estimate for the actual removal action cost.

Investigation activities for the 216-Z-9 crib are addressed as part of the 200-PW-1 operable unit. Removal of the three support structures (216-Z-9A, -9B, and -9C) associated with the 216-Z-9 crib will be completed under this removal action. If determined necessary as part of this removal action, some stabilization of the crib may be required until remedial activities for the crib can occur. Coordination with EPA regarding planning and work plan development for activities associated with the 216-Z-9 crib and structures is required. EPA will approve, in addition to RL and Ecology, activities that will have significant potential to impact the condition of the 216-Z-9 crib.

The ERDF is considered to be onsite for the purposes of CERCLA for management and/or disposal of waste from this removal action. There is no requirement to obtain a permit to manage or dispose of CERCLA waste at this facility.

For waste that must be sent offsite (i.e., ETF, CWC, etc.), EPA will make a determination in accordance with Title 40, Code of Federal Regulations (CFR), Section 300.440 as to the acceptability of the proposed disposal site.

In the event that transuranic waste is generated during this removal action, it will be placed into interim storage at PFP or CWC and shipped to WIPP in accordance with the schedule established for completing remedial actions, no later than September 20, 2024.

The DOE will prepare a removal action work plan(s) and any necessary supporting documentation prior to commencing this removal action and they will be forwarded to Ecology for approval.

9.0 REFERENCES

10 CFR 61, "Licensing Requirements for Land Disposal of Radioactive Waste," *Code of Federal Regulations*, as amended.

40 CFR 61, "National Emissions Standards for Hazardous Air Pollutants," *Code of Federal Regulations*, as amended.

40 CFR 268, "Land Disposal Restrictions," *Code of Federal Regulations*, as amended.

40 CFR 300, "National Oil and Hazardous Substances Pollution Contingency Plan," *Code of Federal Regulations*, as amended.

40 CFR 761, "Polychlorinated Biphenyls (PCBs) Manufacturing, Processing, Distribution in Commerce, and Use Prohibitions," *Code of Federal Regulations*, as amended.

Ahlgrimm, 1996, Letter, J. Ahlgrimm to J. D. Wagoner, RL, "Approval to Initiate Deactivation and Transition of the Plutonium Finishing Plant", October 7, 1996.

BHI-00139, *Environmental Restoration Disposal Facility Waste Acceptance Criteria*, Rev. 4, July 2002, Bechtel Hanford, Inc., Richland, Washington.

Clean Air Act of 1977, 42 U.S.C. 7401, et seq.

Comprehensive Environmental Response, Compensation, and Liability Act of 1980, 42 U.S.C. 9601, et seq.

DOE and EPA, 1995, *Policy on Decommissioning of Department of Energy Facilities Under the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA)*, May 22, 1995, U.S. Department of Energy and U.S. Environmental Protection Agency, Washington, D.C.

Ecology, EPA, and DOE, 1994, *Hanford Federal Facility Agreement and Consent Order*, 2 vols., as amended, Washington State Department of Ecology, U.S. Environmental Protection Agency, and U.S. Department of Energy, Richland, Washington.

Executive Order 12580, *Superfund Implementation*, January 23, 1987, Washington D.C.

HNF-3172, *Liquid Waste Processing Facilities Waste Acceptance Criteria*, Rev. 1, March 2001, Fluor Hanford, Richland, Washington.

HNF-13940, *The Plutonium Finishing Plant Residual Chemical Hazards Assessment Data*, Rev. 0, December 2002, Fluor Hanford, Richland, Washington.

Hoyt and Teal, 2003, *Review of Constituents That May Impact Air Permitting During Legacy Holdup Removal and Facility Cleanout of the Plutonium Finishing Plant*, Rev. 1, December 16, 2003,

Richard C. Hoyt, Fluor Hanford, and Joseph A. Teal, Science Applications International Corp., Richland, Washington.

Killoy, 2004, Memo from C. J. Simiele to file, FH, "Waste Volume Estimates to Support Preparation of the PFP Above-Grade Engineering Evaluation/Cost Analysis (EE/CA)," M2100-04-010, July 21, 2004.

RCW 70.94, "Washington Clean Air Act," *Revised Code of Washington*, as amended.

Resource Conservation and Recovery Act of 1976, 42 U.S.C 6901, et seq.

Toxic Substances Control Act of 1976, 15 U.S.C. 2601, et seq.

WAC 173-303, "Dangerous Waste Regulations," *Washington Administrative Code*, as amended.

WAC 173-304, "Minimum Functional Standards for Solid Waste Handling," *Washington Administrative Code*, as amended.

WAC 173-400, "General Regulations for Air Pollution Sources," *Washington Administrative Code*, as amended.

WAC 173-460, "Controls for New Sources of Toxic Air Pollutants," *Washington Administrative Code*, as amended.

WAC 246-247, "Radiation Protection - Air Emissions," *Washington Administrative Code*, as amended.

Whitlam, 2003, Letter to J. Hebdon, RL, "Re: D&D of the Plutonium Finishing Plant Complex HCRC #2003-200-039," September 29, 2003, Office of Archaeology and Historic Preservation, Olympia, Washington.

DOE APPROVAL SIGNATURE

The following signature pages (Approval-1 of 2) provide documented agreement between the DOE and Ecology for the *Action Memorandum for the Plutonium Finishing Plant Above-Grade Structures Non-Time Critical Removal Action*. Conditions at the site meet the NCP Section 300.415(b)(2) criteria for a removal action. The total estimated cost for this removal action is $605,702,000.

Keith A. Klein, Manager
Richland Operations Office
United States Department of Energy

5/2/05
Date

DOE APPROVAL SIGNATURE

The following signature pages (Approval-1 of 2) provide documented agreement between the DOE and Ecology for the *Action Memorandum for the Plutonium Finishing Plant Above-Grade Structures Non-Time Critical Removal Action*. Conditions at the site meet the NCP Section 300.415(b)(2) criteria for a removal action. The total estimated cost for this removal action is $605,702,000.

Keith A. Klein, Manager
Richland Operations Office
United States Department of Energy

5/2/05
Date

ECOLOGY CONCURRENCE SIGNATURE

The following signature pages (Approval-2 of 2) provide documented agreement between the DOE and Ecology for the *Action Memorandum for the Plutonium Finishing Plant Above-Grade Structures Non-Time Critical Removal Action*. Conditions at the site meet the NCP Section 300.415(b)(2) criteria for a removal action. The total estimated cost for this removal action is $605,702,000.

Mike Wilson
Program Manager, Nuclear Waste Program
Washington State Department of Ecology

5/1/05
Date

APPENDIX A

BUILDING DESCRIPTIONS

This appendix describes the PFP Facility above-grade structures within the scope of this removal action and summarizes the processes that occurred at these locations.

216-Z-9 CRIB AND SUPPORT STRUCTURES DESCRIPTION

The 216-Z-9 Facility is located just southeast of the 234-5Z Building outside of the double fences. This facility is comprised of the 216-Z-9 'crib' and three support structures (216-Z-9A, -9B, and -9C), which are installed, all or in part, on a concrete slab covering the crib. The structures are the 'contaminated-soil removal building', the 'operator's cubicle', and the 'mining apparatus enclosure'.

The 216-Z-9 crib was built in 1954 as an underground soil disposal area with an enclosed 'cavern' (a wooden void space) at the head end. The crib walls are sloped toward the center of the floor. The top of the crib at ground level was covered by a concrete slab upon which sits facility structures. The 216-Z-9 crib is not a major process facility or support area of the PFP Facility and is the only waste site associated with this EE/CA. The crib operated from 1955 to 1962 serving the recovery of uranium and plutonium by solvent extraction (RECUPLEX) facility and receiving and disposing of streams of plutonium-bearing aqueous and liquid organic waste. A soil mining and leaching plan was developed in 1966 to remove the top layer of soil and leach out the plutonium. Cold test of mining equipment consisting of a clamshell assembly attached to a boom was conducted in 1972. Power was supplied by hydraulic cylinders. Equipment was mounted on 1.07 m (42-inch) risers placed across the face of the concrete cover slab. In 1973, a 10 percent cadmium nitrate solution was added to the soils as a poison before beginning mining. From 1976 to 1978, the trench floor was mined for plutonium using remotely operated equipment to reduce the risk of environmental contamination and the potential for criticality. Approximately, 58 kilograms (128 pounds) of plutonium were recovered.

The 'contaminated soil removal' building (216-Z-9A) was constructed in 1976 and is the largest 216-Z-9 facility structures. This building is located adjacent to and partially on the crib cover slab. The building, having an irregular footprint, is constructed of corrugated steel and is approximately 25.6 m (84 feet) long (east to west), 7.3 m (24 feet) wide (north to south), and approximately 3.7 m (12 feet) high corrugated steel. The building housed the glovebox that received excavated soil from crib mining operations via a conveyor and also contained support equipment for the glovebox and waste loadout. Equipment outside the glovebox has been removed except for supply cabinets and a portable air compressor and its captive air tank.

The 'operator cubicle' (216-Z-9B) was the control room to view and operate mining apparatus. This cubicle was constructed in 1976 and is located both above and below the crib concrete slab. The cubicle above-grade portion is a prefabricated steel shed that was used as an entry for the below-grade control room area. The below-grade portion is of similar size and is constructed and located to allow operator viewing of below-grade mining activities.

The 'mining apparatus enclosure' (216-Z-9C), constructed in 1976, is located on the concrete slab covering the crib. The building is a prefabricated corrugated steel building. This building was used as weather protection for the mobile clamshell assembly that 'mined' the crib via one of two openings in the crib cover.

225-WC WASTEWATER SAMPLING FACILITY DESCRIPTION

The 225-WC Building was constructed in 1995 and is located southeast of 234-5Z outside the PFP fence line. The building is a corrugated steel structure placed on a concrete slab.

225-WC houses the sampling and monitoring equipment for the wastewater discharge to the 200 Area Treated Effluent Disposal Facility.

234-5Z PLUTONIUM FABRICATION FACILITY DESCRIPTION

Within the 234-5Z building, floor levels are designated as the basement, first floor, duct level, second floor, and roof level. The frame is of structural steel with an outer sheathing of aluminum panels over rock wool insulation and 16-gauge sheet steel. The basement is poured concrete. The first floor is a concrete slab. The duct level is sheet metal roof decking. The second floor is a concrete slab. The roof is insulated metal decking. Interior walls are reinforced concrete with metal studs, metal lath, and plaster. The reinforced concrete walls stop at the second floor. The vault and process area doors are constructed of steel. The building has two box-type reinforced concrete stairwells that extend to the roof.

The basement primarily consists of pipe tunnels containing drain piping to building sumps.

The first floor housed primary plutonium processing operations occurring in gloveboxes and/or hoods. The first floor also houses support areas such as instrument maintenance shops, building maintenance shops, locker rooms with change facilities and restrooms, and office spaces. The process operations included manual plutonium-bearing material stabilization and conversion initially in the 'rubber glove' line and later remote operations in Remote Mechanical "A" (RMA) ('oxide line') and Remote Mechanical "C" (RMC) line ('metal line') gloveboxes. By May 1976, some of the gloveboxes used for plutonium processing operations and most of the plutonium processing equipment were removed from the RMA and RMC lines and placed in 61 containers in retrievable TRU waste burial grounds in the 200 West Area. 234-5Z housed plutonium process improvement laboratory functions in the PPSL, standards laboratory, and PFP Analytical Laboratory (AL). 234-5Z housed the RECUPLEX facility. In 1978, the Radioactive Acid Digestion Test Unit was emplaced to upgrade waste disposal practices where combustible material were shredded, fed into a digester where the material was mixed with nitric and sulfuric acids, residual solids were separated, the solution dried, and packaged for disposal. At this writing, primary plutonium process equipment remaining at 234-5Z that would require removal under this action includes approximately 84 gloveboxes and 59 hoods.

Building processes also included stabilization of non-organic plutonium-bearing solutions using the magnesium hydroxide [$Mg(OH)_2$] and oxalic precipitation process in the RMC line area; packaging of plutonium metals and oxides in the Bagless Transfer System glovebox; plutonium nitrate feed load-in/load-out; interim storage operations.

The duct level contains most of the service piping, ventilation ducts, and some filter boxes.

The second floor contains the lunchroom, a plastics shop, conference room, materials storage room, chemical feed preparation and aqueous makeup rooms, locker rooms with change facilities and restrooms, and office spaces. The second floor also contains exhaust-air ductwork including filter boxes, filter rooms, and the fan room. The fan room houses the ventilation supply fans, the steam inlet and distribution system, air dryers, the distilled water still, air chilling units, process vacuum pumps, and the vent and balance control room.

The roof level contains air supply ducts and exhaust outlets. The primary exhaust duct is the 1.4-m (54-inch) diameter supply to the 236-Z Building.

The 267-Z fire riser valve house is a sheet steel and structural steel structure located immediately north of, and attached to the northeast corner of the 234-5Z Building. It was not part of the original 234-5Z construction. The building houses the control valves for the 234-5Z fire water supply.

234-5ZA CHANGE ROOM ADDITION DESCRIPTION

The 234-5ZA Building was built in 1993 and is located at the east end of the 234-5Z Building. The building operated as a change room and control station and contained equipment for the accountability control station.

236-Z PLUTONIUM RECLAMATION FACILITY DESCRIPTION

The 236-Z Plutonium Reclamation Facility (PRF) was constructed in 1963 and is located at the southeastern corner of the 234-5Z Building. The PRF is connected to 234-5Z Facility by the 242-Z Building. The building is essentially a four-story structure constructed of reinforced concrete and concrete block.

The PRF was built to replace the RECUPLEX facility and was completed in December of 1963, with hot feed operations beginning in the PRF on May 6, 1964. The 236-Z Building received process liquids from 234-5 Z as well as scrap from plutonium facilities in the DOE Complex. The PRF houses plutonium recovery process equipment that was used to convert various plutonium-bearing materials and aqueous feeds to a purified plutonium nitrate product suitable for conversion to plutonium metal or plutonium oxide. PRF processes included plutonium material and scrap stabilization [miscellaneous treatment (MT)] (hydrolysis, clarification, and calcinations); plutonium purification (feed preparation, solvent extraction, stripping, and organic cleanup); and concentration and clarification of the aqueous product and waste streams. Except for residue stabilization/cleanout type operations, the PRF did not operate after 1989. The principal 236-Z internal feature is a single process equipment cell ('PRF canyon'). The cell is a three-story room in the center of the 236-Z Building. The 236-Z housed the majority of the plutonium recovery process equipment that was used to convert various plutonium-bearing acid-digested ('scrap') materials and aqueous feeds to a purified plutonium nitrate product. The equipment in the process cell includes many long, narrow, upright metal tanks or columns that vary in length. At this writing, primary process equipment remaining at 236-Z that would require removal under this action includes approximately 16 gloveboxes, 81 process cell tanks, and 8 pieces of contaminated equipment.

An equipment transfer area is located against the large double door at the south end of the building.

The east side of the building was primarily the service side. The ground floor housed the maintenance shop areas. The second floor housed the maintenance glovebox and ventilation exhaust filter. The third floor housed building service equipment and electrical switch gear. The fourth floor housed the chemical preparation, MT, operating control room, slag and crucible dissolver equipment, and a column room. The first through the fourth floors are serviced by a service elevator on the east side of the building.

241-Z TANK FARM WASTE DISPOSAL BUILDING DESCRIPTION

The 241-Z Building, also known as the Waste Storage and Treatment Facility, is located south of the 234-5Z Building. The 241-Z consists of a corrugated metal enclosure located above a below-grade concrete vault structure containing tanks (TK) D-4, D-5, D-6, D-7, and D-8. The vault structure was constructed as a portion of the PFP Facility between 1948 and 1951 and entered operations in 1949. The metal enclosure was built in 1979.

The 241-Z Building sits atop the concrete vault roof and has a corrugated metal roof, exterior walls, and interior walls. The building is a weather cover for ventilation and electrical systems. The building houses a 680 kg (1,500-pound) capacity monorail crane, steam jet piping, chemical addition TK D-10 (out-of-service) and TK D-11, and instrument racks.

The below-grade vault structure is constructed of reinforced concrete, and the approximate dimensions are 6 m (20 feet) wide, 28 m (92 feet) long, and 7 m (22 feet) deep. The vault roof (that also serves as the building floor) is at approximately grade level and consists of a concrete slab and concrete cover blocks. The vault structure consists of five separate cells each with its own sump and each containing a tank. There are approximately 25 drains from the multiple-branched pipe system that are routed to the pipe drain header to which the 241-Z Building transfer pipe is connected.

The 241-Z vault houses the RCRA permitted tank system for treatment and storage of PFP liquid mixed from plutonium processing operations in 234-5Z and 236-Z waste before transfer to the Double-Shell Tank System via Tank Farm 244-TX. TK D-4, D-5, D-7, and D-8 were part of the RCRA unit and were used to accumulate and treat the radioactive liquid waste generated in the PFP before transfer to the tank farms. Before plutonium stabilization processing ended in 2004, TK-D-8 received PFP aqueous waste from the PPSL, PFP AL, and periodic flushes from the vacuum seal water. Waste transferred to TK D-8 included filtrate solutions from plutonium solution treatment operations with the $Mg(OH)_3$ and oxalate precipitation process. The stored waste was treated by the addition of chemicals, such as ferric nitrate [$Fe(NO_3)_3$] from TK D-11 and sodium hydroxide (NaOH) or potassium hydroxide before transfer to the 244-TX receiving facility as required to meet waste acceptance criteria. Sodium nitrite and $Fe(NO_3)_3$ were added to inhibit corrosion and stabilize the waste. TK D-6 is approximately the same size as TKs D-4 and D-5. It served the same function as the RCRA waste storage tanks but leaked and was removed from service before RCRA operations. Therefore, TK D-6 was not a portion of the RCRA unit. Soil contamination potentially exists under the TK D-6 vault cell. At this writing, the above mentioned tanks and any equipment (e.g., waste storage tank agitators, waste transfer pumps, sample pumps) not addressed or removed during RCRA closure activities will be addressed under this action.

The 296-Z-3 stack is on a concrete pad located just outside of the southwest corner of the building. The associated fans, filters, and controls are located in the 241-Z Building. The stack is 7.6 m (25 feet) high, 36 cm (14 inches) in diameter.

241-ZA SAMPLE BUILDING DESCRIPTION

The 241-ZA Sample Building was constructed in 1972 and is located directly east of the 241-Z. The 241-ZA Building was used to collect and package samples taken from the 241-Z tanks and houses an annunciator panel, data chart recorder, and a sample processing glovebox (GB-2-241-ZA).

241-ZB SODIUM HYDROXIDE TANK DESCRIPTION

The 241-ZB structure was constructed in 1972 and is located to the east of the 241-Z Building. The structure originally was built as a uranium load-out facility. Feed was from 236-Z via buried piping. The uranium nitrate line remains. The pad houses the 15,400 liter (4,068-gallon) D-9 tank that contained NaOH used in buffering waste in the 241-Z below-grade tanks. There is steel grating above the tank. There are two sumps located within the spill barrier. One sump is located in a concrete pad adjacent to the D-9 Tank.

The 241-ZB (TK D-9) was added to the 241-Z Facility to collect PRF 'uranium containing' effluent after the PRF uranium partitioning process was added in the early 1970s. The intent was to return the collected liquid to the Uranium Trioxide Plant for conversion to oxide for recycle of the uranium. However, the partitioned uranium solution was found to be too high in plutonium concentration for the Uranium

Trioxide Plant to accept the solution. The PRF-partitioned uranium solution was ultimately disposed to the Tank Farms. Subsequent to the PRF uranium partitioning process, TK D-9 was switched to NaOH storage for use in the 241-Z waste solution buffering process. The process line that connected the PRF and TK D-9 remains in place and is believed to be contaminated with uranium and plutonium.

241-ZG CHANGE FACILITY DESCRIPTION

The 241-ZG Facility was built in 1981 and is located at the southeast corner of the 241-Z Building. 241-ZG houses the change room for personnel who are to enter the 241-Z Building and the 241-ZA Sampling Building.

241-Z-RB RETENTION BASIN DESCRIPTION

The 241-Z-RB retention basin, also called the 207-Z Facility, was built in 1949 and is located to the east of the 241-Z Building. This structure is comprised of two side-by-side concrete waste water retention basins.

The structure was used to hold liquid waste from the 241-Z complex. Liquid waste having low levels of radioactivity was discharged to the Z-19 trench or the U-10 pond, whereas waste with higher levels of radioactivity was discharged into the PFP crib system. The basins contain no major equipment. Covered valve pits exist at the west end of the basins that contain some small components. This basin has been isolated from PFP discharges.

242-Z WASTE TREATMENT FACILITY DESCRIPTION

The 242-Z Building was constructed in 1963 and is connected to the southeast corner of the 234-5Z Building. The 242-Z also is connected to the 236-Z Building. The 242-Z Building is constructed in part of reinforced concrete with portions of the building having a structural steel frame covered with metal lath and plaster internally, and insulating material wall panels externally. The slightly peaked roof is constructed of metal decking, covered by insulation and built-up asphalt and gravel.

A corridor along the east side interconnects the 234-5Z, 242-Z, and 236-Z Buildings. The south portion of 242-Z houses large, empty process vessels, cation and solvent exchange columns, with pipe connecting to the process gloveboxes in the control room. The north portion, designated the control room, has a mezzanine over its west half for chemical addition tanks. The 242-Z Building shares its ventilation system with the main ventilation system in the 234-5Z Building.

The 242-Z Building was used to treat 234-5Z and PRF waste and extract americium from the liquid using special ion exchange resins. 242-Z originally provided chemical additions to 241-Z and the chemical addition lines remain. An americium recovery system was placed in a glovebox in 242-Z in 1964 and became operational in May of 1965. The system received acidic aqueous waste from the 242-Z solvent extraction column, neutralized the solution with NaOH, and co-extracted plutonium and americium-241. The process was modified in 1970 with addition of a second cation exchange column. In 1976, an accident caused high levels of contamination [americium, plutonium, resin, and nitric acid (HNO_3)] to be deposited in the rooms of the process area, necessitating the isolation of the building, installation of a HEPA filter to the building exhaust system, and application of a strippable organic coating to contaminated surfaces.

243-Z LOW-LEVEL WASTE TREATMENT FACILITY DESCRIPTION

The 243-Z Building, known as the Low-Level Waste Treatment Facility, was constructed in 1994 and is located east of the 291-Z Building. The building is constructed of corrugated steel and sits on a concrete slab.

This building consists of five rooms with a vestibule (Room 401) providing direct access to the change room (Room 402) and to the process area for waste water filtration (Room 405). The process area contains two media trains consisting of tanks, pumps, filters, and the associated piping and instrumentation necessary for operation and monitoring the equipment and incoming waste streams and treatment of the PFP effluents to remove low-level radioactive and chemical contamination before transfer to maintenance cover Z7. Room 403 is a drum washing room and Room 404 is a drum turning room.

Immediately to the north side of the building is the 296-Z-15 stack. The 296-Z-15 stack is 12.8 m (42 feet) high and 31 cm (12 inches) in diameter and is constructed of stainless steel.

243-ZA LOW-LEVEL WASTE STORAGE FACILITY DESCRIPTION

The 243-ZA structure was constructed in 1994 and is located east of the 243-Z Building. The structure is a sump that is divided into an upper and lower sump. The lower sump is a concrete pit and the upper sump is a tank basin at grade level that is surrounded by a retaining wall.

The lower sump contains the 3,785 liter (1,000 gallon) influent sump tank and two 5-horsepower turbine pumps. The influent sump tank is 2.1 m (7 feet) tall with no overflow. The upper sump contains the 18,927 liter (5,000 gallon) influent surge tank that is 5.5 m (18 feet) tall with overflow.

243-ZB COOLING TOWERS AND CONCRETE PAD DESCRIPTION

The 243-ZB was constructed in 1993 and is located north of 234-ZA. This structure is a concrete slab. The 243-ZB houses the closed-loop cooling water system and two fluid cooling units for 243-Z Building operations.

2503-Z ELECTRICAL SWITCHYARD DESCRIPTION

The switchyard, located north of the 234-5Z Building is constructed of electric disconnect switches, electric cable, and insulators mounted on wooden poles. The entire unit is surrounded with a chain link fence. There are no interior or exterior walls.

252-Z-1 ELECTRICAL SUBSTATION DESCRIPTION

This substation abuts the north wall of the 234-5Z Building and contains electrical transformers mounted on concrete slabs. The substation does not contain walls or a roof.

270-Z OPERATIONS AND SUPPORT FACILITY DESCRIPTION

The 270-Z is a single story office building of standard stick and mortar construction. The exterior walls are covered with stucco, while the interior walls are drywall and paint. The floor is concrete covered by carpeting and/or tile. The building is located north of the 234-5Z Building. The roof is comprised of steel decking covered by felt roofing, tar, and gravel (built up roof).

2701-ZA CENTRAL ALARM STATION FACILITY DESCRIPTION

This building is located in the northeast corner of PFP. The interior walls are concrete block covered with painted gypsum board.

2701-ZD BADGE HOUSE DESCRIPTION

The badge house is constructed of concrete block on a concrete slab, with a built up roof and is located in the northeast corner of PFP. The interior walls are either studs and drywall, or bullet proof steel and glass construction.

2702-Z MICROWAVE TOWER AND COMMUNICATIONS SUPPORT BUILDING DESCRIPTION

The 2702-Z Support Building is a pre-engineered, self-framed metal building with a standing-seam metal deck roof and is located interior to the PFP security fence. The microwave tower is constructed entirely of steel mounted on a concrete slab.

2704-Z SAFEGUARDS AND SECURITY BUILDING DESCRIPTION

The 2704-Z Building was part of the original PFP construction. It is a wooden structure with transite shingles on both the roof and exterior walls and is located in the northeast corner of PFP. The interior walls are of painted lathe and plaster construction. The floors are wood covered with tile and/or carpeting.

2705-Z OPERATIONS CONTROL FACILITY DESCRIPTION

The Operations Control Facility provides the first screening of personnel entering the PFP complex. It also includes the personnel monitors for logging in/out PFP personnel for accountability purposes required during emergencies. The building is located outside of the PFP security fence.

2712-Z STACK MONITORING STATION DESCRIPTION

The 2712-Z Building was constructed in 1956 and is located on an elevated platform on the north side of the 291-Z-1 stack, approximately 15.2 m (50 feet) above-grade. The roof, sides, and door of the building are constructed of steel.

The building operated as a 291-Z-001 stack sampler and monitoring room and contains stack sampling and monitoring equipment. Prior to use at PFP, this structure was used in the 300 Area.

2721-Z EMERGENCY GENERATOR BUILDING DESCRIPTION

The 2721-Z Building was constructed in 1979 to house backup/emergency diesel electric generators. 2721-Z is located immediately southwest of the 234-5Z Building and west of the 2736-ZB Building. 2721-Z is constructed of concrete walls and floor. The 2721-Z houses three diesel-driven generators used as backup power for the PFP facilities. A switchgear room is situated on the north end of the building.

2727-Z SUPPLY STORAGE BUILDING DESCRIPTION

The 2727-Z Building is a steel structure erected on a concrete slab located immediately east of the 236-Z Building. It is used for equipment and material storage for the PFP laboratory and operations personnel.

2729-Z MAINTENANCE STORAGE BUILDING DESCRIPTION

The 2729-Z Building located southeast of the 236-Z Building, is used for storage of maintenance materials and equipment. It is erected on a concrete slab.

2731-Z PLUTONIUM DRUM STORAGE BUILDING DESCRIPTION

The plutonium drum storage building is located south of the 234-5Z Building.

2731-ZA CONTAINER STORAGE BUILDING DESCRIPTION

The 2731-ZA Building, also known as the Clean Laundry Building is located south of the 2736-ZB Building.

2734-ZA, -ZC, -ZK, AND –ZL GAS BOTTLE STORAGE DESCRIPTION

These four facilities are/were used to store and "manifold" various gases for production and laboratory operations/support in the 234-5Z Building. Gas bottles may still be found in some of these structures, though some are out of service.

2734-ZB, -ZD, -ZF, AND -ZG GAS BOTTLE STORAGE DESCRIPTION

These structures provide the same functions as those described above, but are constructed entirely of metal. They are very similar dimensionally structures described above and also are located adjacent to the 234-5Z Building.

2734-ZJ LIQUID NITROGEN STORAGE AND SUPPLY DESCRIPTION

The 2734-ZJ Building is located to the west of the 234-5Z Building. The liquid nitrogen tank (vendor-owned) and nitrogen supply is comprised of a large liquid nitrogen tank (vertical orientation) mounted adjacent to an aluminum nitrogen gas generator. The gas generator transforms the liquid nitrogen to a gaseous state for use in the 234-5Z Building.

2735-Z BULK CHEMICAL STORAGE TANKS DESCRIPTION

The 2735-Z Building impoundment was built in 1954 and is located at the east end of the 234-5Z. The 2735-Z is a concrete pad with a retaining wall that houses bulk chemical storage tanks.

Aluminum nitrate nonahydrate and HNO_3 were stored in separate 26,298 liter (7,000 gallon) bulk storage tanks. CCl_4 was stored in a 9,464 liter (2,500 gallon) tank. A chemical drain catch tank is approximately 1,325 liters (350 gallons) and is contaminated with plutonium.

2736-Z PLUTONIUM STORAGE BUILDING DESCRIPTION

The 2736-Z Building operated as the primary PFP plutonium storage building and is located on the south side of the 234-5Z Building. The 2736-Z also abuts the 2736-ZB Building. The 2736-Z was constructed in 1971 and is a one story building.

The building consists of several vaults, divided by a corridor running the width of the building. The storage vaults held forms of plutonium product and scrap handled by PFP. Ventilation supply and exhaust ducts are mounted near the ceiling on the east and west walls respectively.

2736-ZA PLUTONIUM STORAGE VENTILATION STRUCTURE DESCRIPTION

The 2736-ZA Building, constructed in 1971, houses the ventilation equipment for the 2736-Z Building and is located west of the 2736-Z Building. The 2736-ZA is a one story building.

The 2736-ZA Building consists of two rooms. One of which formerly housed a diesel generator. The other room houses the exhaust fans and HEPA filters, stack continuous air monitors and sampler, and equipment and instrumentation related to operation of the 2736-Z Building. The ventilation system exhausts through HEPA filters and exits the 296-Z-6 stack.

The 296-Z-6 stack is located in the northwest corner of the 2736-Z Building. The stack is constructed of carbon steel and projects 76 cm (30 inches) above the roof.

2736-ZB PLUTONIUM STORAGE SUPPORT FACILITY DESCRIPTION

The 2736-ZB Building was constructed in 1982 to support 2736-Z Building storage vault operations. The 2736-ZB Building is connected to the south side of the 2736-Z Building and is a one story building.

2736-ZB activities included plutonium material shipping, receiving, sorting, and repackaging. The primary operational and support areas within the 2736-ZB Building were the stabilization and packaging equipment room, outer can weld room, interim storage room, nondestructive assay (NDA) laboratory, control room, HEPA filter room, and decontamination room. Other areas within the building include the International Atomic Energy Agency room, and the mechanical room that houses the control unit, communication lines, air compressors, and heating, ventilation and air conditioning supply fans and pumps. Three container shipping and receiving/storage areas are physically separated by walls. A storage area has a steel security cage surrounding the metal storage shelves. A decontamination room is equipped with a shower and sink.

The 2736-ZB Building contains a ventilation system that exhausts stabilization and packaging operations through the 296-Z-7 stack and the remainder of the building areas exhaust through the 296-Z-5 stack. The 296-Z-7 stack is located on a concrete pad just outside of the east wall of the building. The 296-Z-5 stack is located on the northwest corner of the 2736-ZB Building.

A liquid nitrogen system is located immediately west of the 2736-ZB and provides nitrogen gas to the 2736-ZB Building for cooling. In addition to the liquid nitrogen tank and aluminum gas generator, it includes a pad for the nitrogen cooling system.

2736-ZC CARGO RESTRAINT TRANSPORT DOCK DESCRIPTION

The 2736-ZC was constructed in the late 1970's and is an enclosed loading/unloading dock and corridor to shipping and receiving areas of the 2736-ZB Building. The loading dock is located outside the southeast corner of the 2736-ZB Building. The dock is a concrete pad enclosed in a metal building approximately with electric roll-up doors. 2736-ZC provides approximately 158 m^2 (1,700 ft^2) of enclosed storage for cargo-restraint transporters used for offsite receiving and shipping. The enclosure contains a jib crane, chain hoist, and drum handler. The dock primarily processed containers of waste but also processed containers of plutonium oxide powder, plutonium metal, and miscellaneous scrap materials from various onsite and offsite sources. Containers of plutonium material were not opened in 2736-ZC but were moved into 2736-ZB before being opened.

2736-ZD VAULT – EBR II CASKS DESCRIPTION

The 2736-ZD storage facility, located south of 2736-ZC, is an aboveground concrete vault. This facility is used for storage of experimental breeder reactor II casks. This facility has no support equipment nor does it receive any Hanford Site utilities.

2902-Z ELEVATED WATER STORAGE TOWER AND TANK DESCRIPTION

The 2902-Z water tower is located north of the 234-5Z Building. Construction for the 2902-Z water tower began in 1948. The 189,000 liter (50,000 gallon) elevated water tank (drained and currently out of service) formerly served as backup water supply to the PFP facilities. An associated below-grade valve pit has been disconnected.

291-Z EXHAUST AIR FILTER STACK BUILDING DESCRIPTION

The 291-Z Exhaust Air Stack Building is located south of the 234-5Z Building. The 291-Z was constructed in 1949 as part of the PFP Facility and is a reinforced-concrete structure.

This building houses the exhaust fans and plenums that provide ventilation exhaust for the 234-5Z, 242-Z, 236-Z, and 291-Z Buildings and formerly for the 232-Z Building (not in EE/CA scope). Although the ductwork from 232-Z Building remains physically connected to the 291-Z ventilation system, it was isolated from the 291-Z system in 1990 and replaced by a dedicated stack for the 232-Z Building solely. 291-Z also houses an electrical switchgear room called the 252-Z-2 Electrical Substation that is located on the east side of the 291-Z Building. South of the switchgear room is a mechanical room containing two 40 kg (90-pound) air compressors, and two 43 cm (17-inch) mercury air sample vacuum pumps. There is a plutonium-contaminated sump located in the mechanical equipment room that has three electrical pumps, and one backup steam jet that discharge to a header going to the 234-Z Building. The contamination in the sumps originates from the process vacuum pumps (previously removed). Contaminated process vacuum piping remains.

The ventilation fans and the inlet and exhaust plenums are the primary contents of the 291-Z Building. The building has two fan rooms. The fan rooms contain seven electric motor-driven fans. Each fan room contains one turbine driven fan. The fan rooms are on each side of the inlet plenum and each fan room has a discharge plenum below. The two exhaust plenums discharge to a common discharge plenum to the 291-Z-001 stack. The building also has a compressor and pumps room, two cross passageways, and an air supply room.

Although sub-grade, the ductwork from the 291-Z Building to the 291-Z-001 Stack is within the scope of this EE/CA.

291-Z-001 STACK DESCRIPTION

The 291-Z-001 stack, also constructed in 1949, is adjacent to the 291-Z Building and provides the outlet for exhaust gases of the 234-5Z, 236-Z, 242-Z, and 291-Z Buildings. Until 1990, this stack also vented the exhaust from the 232-Z Building. This stack is 61 m (200 feet) tall and is constructed of reinforced concrete.

PFP COMPLEX YARDS AND GROUNDS DESCRIPTION

The following items are identified as "PFP Complex Yards and Grounds". The items identified are examples, but are not considered as inclusive of items that will be found and dispositioned from the PFP yards and grounds.

Mobile offices (MO-XXX) are trailer structures constructed of metal and wood framing. These structures vary in size from single-wide to multiple-wide. Mobile offices may contain office furniture, kitchen and bathroom facilities, and storage areas. Potential hazardous materials associated with mobile offices include lead-based paints, fluorescent light tubes, incandescent light bulbs, PCBs containing light ballasts, asbestos insulation and mastic, mercury switches, emergency light batteries, oils from door actuators and electrical transformers, and radioactive sources in smoke detectors and exit signs. Mobile offices may be removed from PFP yards and grounds and reused.

Hazardous waste storage units and hazardous substance storage cabinets range from small fireproof cabinets to large multi compartment skids (HS-XX) that have historically been used for hazardous chemical storage and waste management. Larger units are equipped with automatic fire suppression and alarm signal capability. Potential hazardous materials associated with the cabinets are associated with the chemicals or waste stored/accumulated in them.

Interim storage vaults are aboveground, concrete and steel shielded, top-loading fuel storage vaults to be used to provide safe interim dry storage at PFP of Core Component Containers with Fast Flux Test Facility unirradiated fuel assemblies.

Other miscellaneous items could included telephone poles, power poles, lighting poles, steel barrier posts, fencing, razor wire, electrical transformers (both pole and pad mounted), conex boxes, and ground level cement/concrete structures.