

# Action Memorandum for the Non-Time-Critical Removal Action for the 212-N, -P and -R Facilities

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



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

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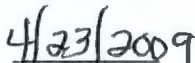
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**APPROVAL**

*DOE/RL-2008-80, Action Memorandum for the Non-Time-Critical Removal Action  
for the 212-N, -P, and -R Facilities, Rev. 0*



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M. S. McCormick, Assistant Manager  
U.S. Department of Energy,  
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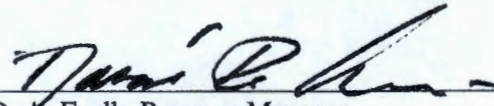
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Date

**CONCURRENCE**

*DOE/RL-2008-80, Action Memorandum for the Non-Time-Critical Removal Action  
for the 212-N, -P, and -R Facilities, Rev. 0*

  
\_\_\_\_\_  
D. A. Faulk, Program Manager  
Hanford Site Project  
U.S. Environmental Protection Agency

*19 May 09*  
\_\_\_\_\_  
Date

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**TERMS**

1		
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3	ALARA	as low as reasonably achievable
4	ARAR	applicable or relevant and appropriate requirement
5	CERCLA	<i>Comprehensive Environmental Response, Compensation and Liability Act of 1980</i>
6	CFR	<i>Code of Federal Regulations</i>
7	CWC	Central Waste Complex
8	D&D	decontamination and decommissioning
9	DOE	U.S. Department of Energy
10	EE/CA	engineering evaluation/cost analysis
11	EPA	U.S. Environmental Protection Agency
12	ERDF	Environmental Restoration Disposal Facility
13	ESD	explanation of significant difference
14	ETF	Effluent Treatment Facility
15	LLW	low-level waste
16	NCP	National Contingency Plan
17	PCB	polychlorinated biphenyl
18	RCRA	<i>Resource Conservation and Recovery Act of 1976</i>
19	ROD	Record of Decision
20	S&M	surveillance and maintenance
21	TBC	to-be-considered
22	Tri-Party	<i>Hanford Federal Facility Agreement and Consent Order</i>
23	Agreement	
24	TSCA	<i>Toxic Substances Control Act of 1976</i>
25	WAC	<i>Washington Administrative Code</i>

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## METRIC CONVERSION CHART

Into Metric Units			Out of Metric Units		
<i>If You Know</i>	<i>Multiply By</i>	<i>To Get</i>	<i>If You Know</i>	<i>Multiply By</i>	<i>To Get</i>
<b>Length</b>			<b>Length</b>		
inches	25.4	millimeters	millimeters	0.039	inches
inches	2.54	centimeters	centimeters	0.394	inches
feet	0.305	meters	meters	3.281	feet
yards	0.914	meters	meters	1.094	yards
miles	1.609	kilometers	kilometers	0.621	miles
<b>Area</b>			<b>Area</b>		
sq. inches	6.452	sq. centimeters	sq. centimeters	0.155	sq. inches
sq. feet	0.093	sq. meters	sq. meters	10.76	sq. feet
sq. yards	0.836	sq. meters	sq. meters	1.196	sq. yards
sq. miles	2.6	sq. kilometers	sq. kilometers	0.4	sq. miles
acres	0.405	hectares	hectares	2.47	acres
<b>Mass (weight)</b>			<b>Mass (weight)</b>		
ounces	28.35	grams	grams	0.035	ounces
pounds	0.454	kilograms	kilograms	2.205	pounds
ton	0.907	metric ton	metric ton	1.102	ton
<b>Volume</b>			<b>Volume</b>		
teaspoons	5	milliliters	milliliters	0.033	fluid ounces
tablespoons	15	milliliters	liters	2.1	pints
fluid ounces	30	milliliters	liters	1.057	quarts
cups	0.24	liters	liters	0.264	gallons
pints	0.47	liters	cubic meters	35.315	cubic feet
quarts	0.95	liters	cubic meters	1.308	cubic yards
gallons	3.8	liters			
cubic feet	0.028	cubic meters			
cubic yards	0.765	cubic meters			
<b>Temperature</b>			<b>Temperature</b>		
Fahrenheit	subtract 32, then multiply by 5/9	Celsius	Celsius	multiply by 9/5, then add 32	Fahrenheit
<b>Radioactivity</b>			<b>Radioactivity</b>		
picocuries	37	millibecquerels	millibecquerels	0.027	picocuries

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1     **ACTION MEMORANDUM FOR THE NON-TIME-CRITICAL REMOVAL ACTION**  
2                     **FOR THE 212-N, -P, AND -R FACILITIES**

3                             **1.0     PURPOSE**

4     This action memorandum documents the approval of the proposed *Comprehensive Environmental*  
5     *Response, Compensation, and Liability Act of 1980* (CERCLA) non-time-critical removal action  
6     described herein for the 212-N, -P, and -R structures located north of the 200 East and 200 West Areas of  
7     the Hanford Site. The 212-N, -P, and -R structures are former facilities built to provide lag storage of  
8     irradiated fuel before processing.

9     This removal action minimizes the potential for a release of hazardous substances from the 212-N, -P,  
10    and -R Facilities that could adversely impact human health and the environment, and also contributes to  
11    the efficient performance of any anticipated long-term remedial actions, such as subsurface soil  
12    remediation conducted under the *Interim Action Record of Decision for the 100-BC-1, 100-BC-2,*  
13    *100-DR-1, 100-DR-2, 100-FR-1, 100-FR-2, 100-HR-1, 100-HR-2, 100-KR-1, 100-KR-2, 100-IU-2,*  
14    *100-IU-6, and 200-CW-3 Operable Units, Hanford Site, Benton County, Washington* (hereinafter referred  
15    to as the Remaining Sites Record of Decision [ROD]) (EPA et al. 1999).

16    A public comment and review period was held from December 8, 2008, through January 14, 2009, on the  
17    *212-N, -P, and -R Facilities Engineering Evaluation/Cost Analysis* (DOE/RL-2008-07), which was  
18    prepared to evaluate removal action alternatives for the 212-N, -P, and -R Facilities. All comments  
19    received generally supported implementation of this action. The comments and responses are contained  
20    in the Administrative Record.

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## 2.0 SITE CONDITIONS AND BACKGROUND

The 212-N, -P, and -R Facilities are located in the 200 North Area of the Hanford Site (Figure 2-1). Highway 240 is located to the southwest of the 200 North Area, and the Columbia River is north-northwest. Locations of the 212-N, -P, and -R Facilities and the waste sites located within this geographical area are shown in Figure 2-2.

This section describes relevant background information, including the source, nature, and extent of contamination, and also site descriptions, for the 212-N, -P, and -R Facilities.

### 2.1 BACKGROUND

The 212-N, -P, and -R facilities provided lag storage for irradiated fuel rods. As cited in *Resource Book: Decommissioning of Contaminated Facilities at Hanford* (PNL-7008), fuel operations in the 200 North Area were terminated in 1952. In the 1960s, the facilities were used as temporary storage for various contaminated wastes.

The use of these facilities for fuel storage is well documented. The extent of fuel storage operations and the specific activities performed to deactivate the 212-N, -P, and -R Facilities, however, are not well documented. Fuel storage operations in these facilities were most likely limited to short-term storage of fuel in canisters.

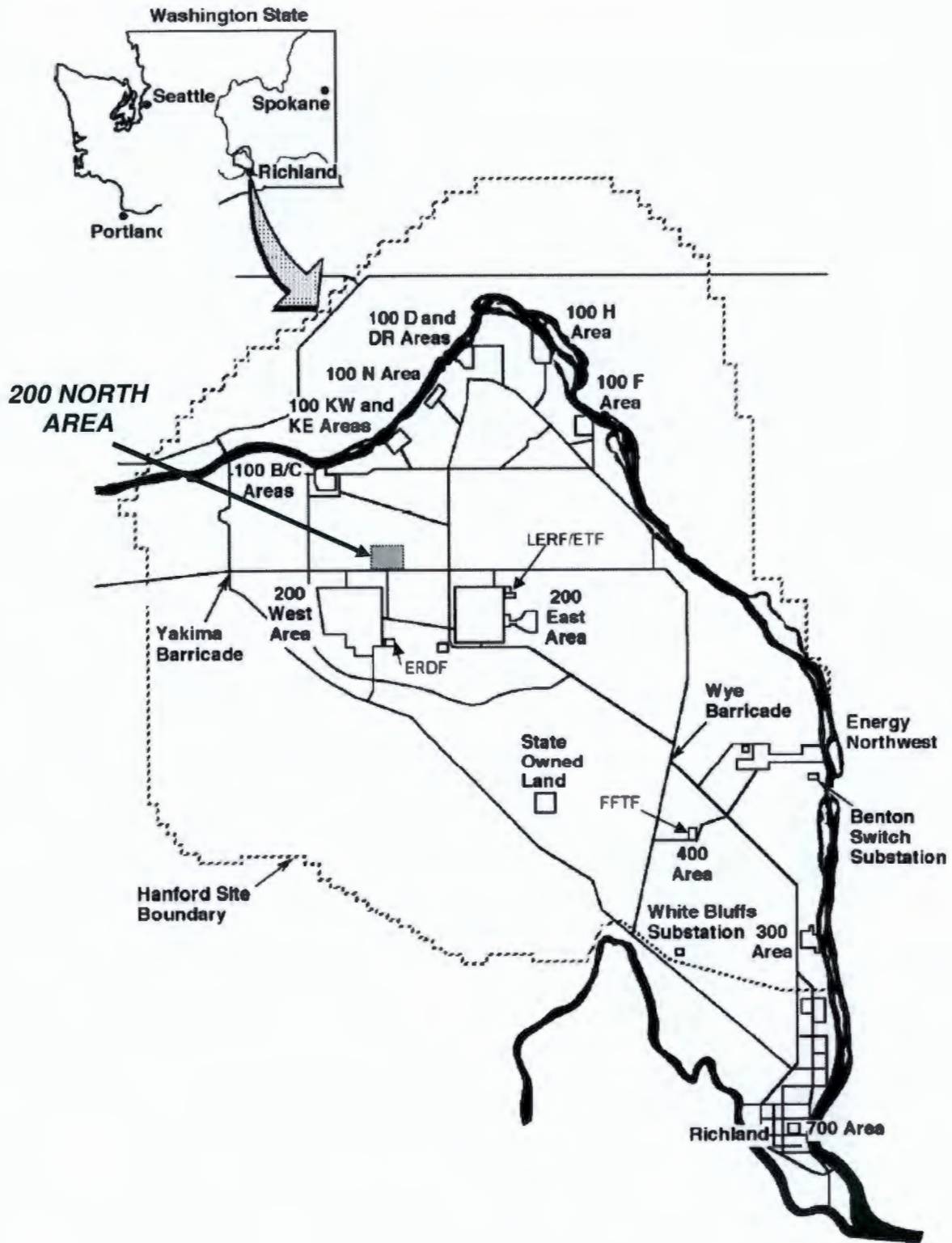
After the fuel was removed from each basin, contaminated water and sediments from each basin were pumped by aboveground piping to soil column disposal units (i.e., ponds or trenches) located near each facility. This was done prior to each facility's deactivation. Four of the waste sites that received basin cooling water were sampled in the spring of 2007. Two of the waste sites contained radiological contaminants in the soil, which were remediated in the summer of 2007.

Later missions of the buildings included storage of contaminated components. Records indicate that in the late 1960s, 25 crates of radiologically contaminated equipment removed from service in the Hanford Site 300 Area were shipped to the 212-N and -R Facilities. In 1972, a project consolidated these waste containers, resulting in 15 waste crates stored in the transfer area of the 212-N Facility. The majority of crates from the 212-R Facility were removed and disposed as industrial waste. Insulating overfill was placed over and around the crates in the 212-N Facility to mitigate the potential for hazards, and the transfer area doors and openings were secured with steel plates. The 212-N Facility's waste crates remained in storage until 2007, when all were removed and shipped to the Central Waste Complex for storage and future disposal.

The 212-P Facility was used by electrical utilities for storage of liquid polychlorinated biphenyl (PCB) waste in a tank inside the facility and an electrical transformer outside the facility (Figure 2-3). The PCB liquid waste and transformers have been removed.

The 212-N, -P, and -R Facilities addressed by this action memorandum are considered non-key facilities, as defined in the *Hanford Federal Facility Agreement and Consent Order* (Tri-Party Agreement) Action Plan, Section 8.0, "Facility Decommissioning Process" (Ecology et al. 2003). The Tri-Party Agreement Action Plan, Section 8.3, "Decommissioning Process Planning," provides for decommissioning of non-key facilities in accordance with U.S. Department of Energy (DOE) guidelines and applicable regulations. These facilities contain CERCLA hazardous substances. The integrity of the inactive structures and internal systems has degraded, resulting in an increased potential for release of hazardous substances to the environment.

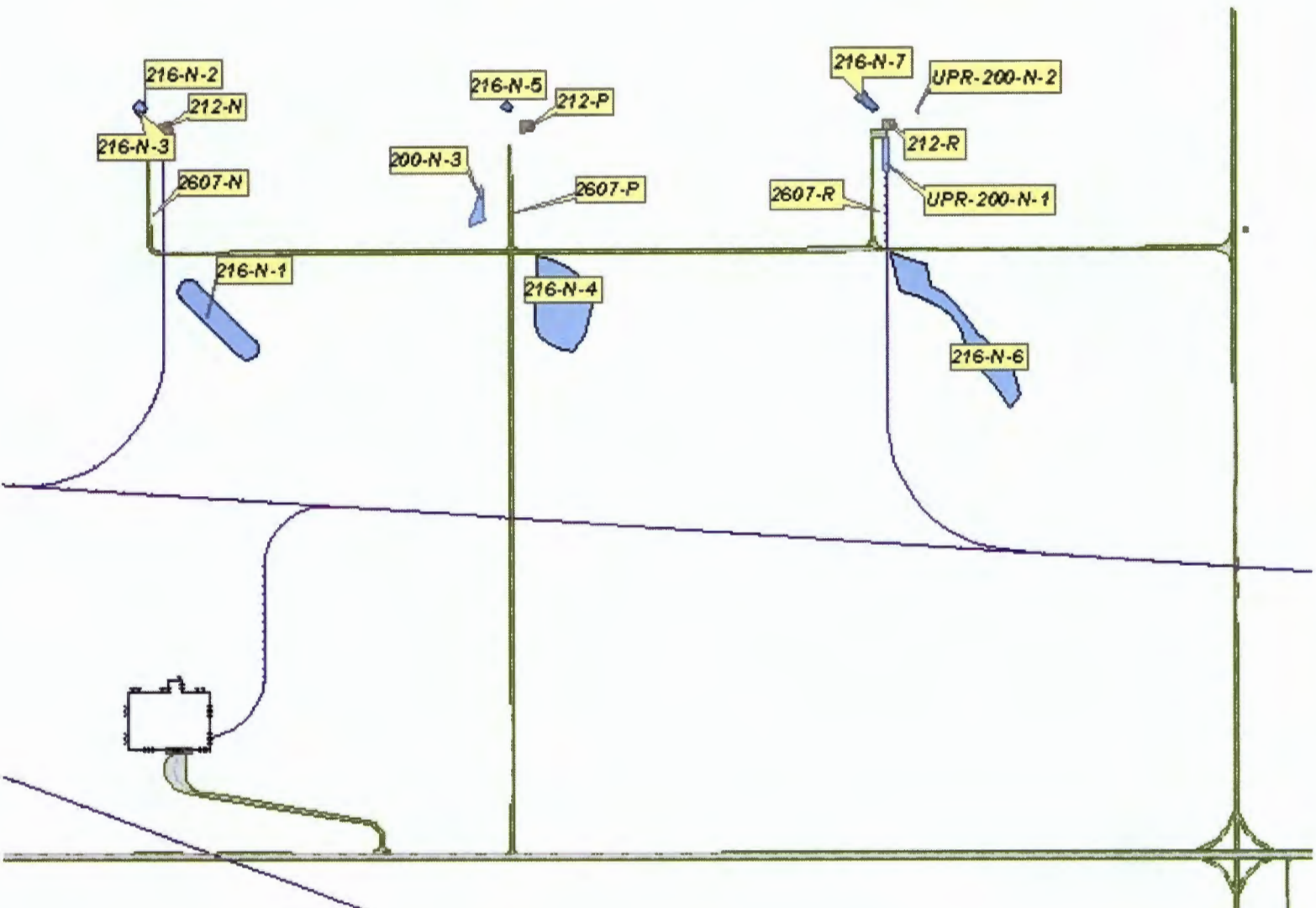
Figure 2-1. Hanford Site and 200 North Area.



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Figure 2-2. 200 North Buildings and Waste Site Locations.



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Figure 2-3. 212-P Facility with Outdoor Transformer Storage.



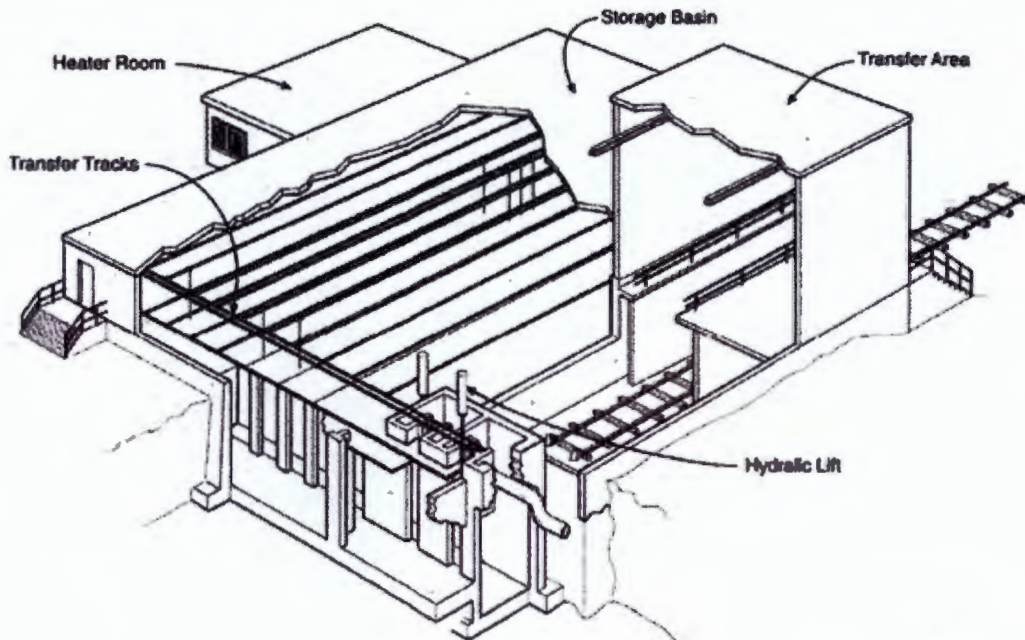
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## 4 2.2 FACILITY DESCRIPTIONS

5 The 212-N, -P, and -R Facilities are essentially one-story; steel-frame structures with 20.3-cm (8-in.)  
6 concrete block walls and pre-cast concrete roofs. The buildings were designed in three parts: the  
7 transfer area, the storage basin, and the heater room. The layout of the 212-N, -P, and -R Facilities is  
8 shown in Figure 2-4. Facility construction images and a more recent image are provided in Figures 2-5  
9 through 2-7.

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Figure 2-4. Typical Facility Layout.



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Figure 2-5. 212 Building Under Construction.



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Figure 2-6. 212 Building Under Construction.



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10 **2.2.1 Transfer Area**

11 The transfer area is a high bay area at the western end of the building. The exterior dimensions are  
12 22.6 m by 8.2 m by 8.9 m high (74.2 ft by 26.9 ft by 29.2 ft high). Two transfer pits are located at the  
13 north end of the transfer room (Figure 2-4). The transfer pits were originally coated with a fixative  
14 material to minimize surface contamination and aid in decontaminating the surfaces. Transfer pits were  
15 equipped with hydraulic systems that were designed to handle storage buckets containing fuel canisters.  
16 The hydraulic fluids have been removed.

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Figure 2-7. 212-P Building.

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5 Accommodations for one cask and rail transfer car were provided. The top of the rail track is  
6 approximately 2.1 m (6.9 ft) below the floor of the transfer area. A crane was used to unload the fresh  
7 fuel casks into the fuel transfer pit. The cranes were deactivated in place and no further usage planned.  
8 For cooling, fuel casks were moved underwater and placed in the fuel storage basin within the storage  
9 room. Once cooled, the fuel casks were moved from the fuel storage basin to the transfer area, where  
10 they were loaded into a transport cask to be moved to the 200 East and West Areas for subsequent  
11 processing. A unit heater was located in the transfer room. For the 212-N Facility, doors and other  
12 penetrations were covered with 0.3-cm (0.12-in.) thick steel plates. The 212-P and -R Facilities are  
13 closed with typical wooden doors that do not contain additional steel plates.

#### 14 2.2.2 Storage Basin

15 The eastern portion of each facility houses a subgrade, reinforced-concrete fuel storage basin. A 5.1-cm  
16 (2-in.)-thick wooden deck that covers the fuel basin is level with the walkways. Supported by concrete  
17 piers and steel members, the floor is approximately 6.1 m (20 ft) above the floor of the storage basin and  
18 2.4 m (7.9 ft) from the bottom of the concrete-paneled ceiling.

#### 19 2.2.3 Heater Room

20 The heater room is attached to the east wall of the storage room and contains a fan room. Access to the  
21 fan room is from an exterior door in the southeast corner of the room. Preheated air was filtered and  
22 directed into the storage room through louvered openings.

### 23 2.3 RELEASES OR THREATENED RELEASE INTO THE ENVIRONMENT 24 OF A HAZARDOUS SUBSTANCE OR POLLUTANT OR CONTAMINANT

25 The 212-N, -P, and -R Facilities are contaminated with CERCLA hazardous substances, including  
26 radiological contaminants, lead, PCBs, and asbestos used or generated during the previously described  
27 period of lag storage operations, PCB storage activities (in the case of 212-P Facility), and waste  
28 management activities.

### 1 2.3.1 Radiological Hazards

2 The primary hazardous substances of concern are radioactive materials. Key radionuclide contaminants  
3 are uranium-234, uranium-235, uranium-238, plutonium-239/240, americium-241, and mixed fission  
4 products such as strontium-90, cesium-137, cobalt-60, europium-152, europium-154, and europium-155.  
5 Tritium may also be found as a sealed source within building exit signs. The majority of contaminants  
6 are found in the form of adherent films and residues encrusted in the deactivated basins, piping, and  
7 ventilation system ductwork.

### 8 2.3.2 Chemical Hazards

9 The facilities may also contain some friable and/or nonfriable asbestos in the form of insulation and  
10 ductwork, which will be confirmed through sampling and analysis. In addition, the facilities are  
11 anticipated to contain one or more of the following materials found in most Hanford facilities that contain  
12 hazardous substances, which will be confirmed prior to demolition:

- 13 • PCB light ballasts and possible structural contamination (in the case of 212-P Facility)
- 14 • Lead paint
- 15 • Mercury switches, gauges, and thermometers
- 16 • Mercury or sodium vapor lights
- 17 • Used oil from motors and pumps
- 18 • Unspecified chemical or waste containers
- 19 • Lead batteries
- 20 • Asbestos.

21 Additional characterization will be conducted as part of the removal action activities in accordance with  
22 an approved sampling and analysis plan, and a quality assurance/quality control plan. The additional  
23 sampling and characterization will be used to support waste designation and determine if the removal  
24 action objectives have been met.

## 25 2.4 DISCUSSION OF RELEASE THREAT

26 The 212-N, -P, and -R Facilities are contaminated with CERCLA hazardous substances including  
27 radiological contaminants, lead, PCBs, and asbestos, with the majority of risk of release being from  
28 undiscovered transferrable contamination which is considered unlikely.

29 The risks to the environment associated with routine surveillance and maintenance (S&M) activities at the  
30 212-N, -P, and -R Facilities have not been quantified; however, radiological conditions require special  
31 precautions for entry. In addition, visual inspection of the facilities performed in 1998 and 2000 found  
32 that some wall blocks were cracked and structural deterioration is becoming evident. Since 1986, wooden  
33 features (e.g., doors and trim) have been in relatively poor condition and, in some cases, beyond repair.  
34 There is also significant deterioration of roofing.

35 For the 212-N, -P, and -R Facilities, the inhalation and ingestion pathways for contamination are also of  
36 concern if the material within the basin, ducting, and/or piping is disturbed. Decontamination and  
37 decommissioning (D&D) activities include equipment dismantling (cutting process piping, ducting, and  
38 other activities such as crane removal), as well as other hazardous substance removal. During initial  
39 D&D activities, the potential for an airborne radionuclide release will increase. As the inventory is  
40 stabilized and disposed appropriately, the source term (hence, the risk) will decrease.

1 In general, the risk of an accidental radiological release (e.g., from a structural failure resulting from  
2 weather, fire, or a seismic event) increases the longer the facilities remain in the S&M program awaiting  
3 disposition. The risk from the 212-N, -P, and -R Facilities will increase over time because of the potential  
4 for inventory releases from structure degradation. Under a continued S&M scenario, the residual  
5 contamination presents sufficient threat of release to the environment to justify a removal action.

6

1                   **3.0    THREATS TO HUMAN HEALTH OR THE ENVIRONMENT**

2    Conditions persist wherein threats to the public health or the environment exist. The “National Oil and  
3    Hazardous Substances Pollution Contingency Plan” (hereinafter referred to as the National Contingency  
4    Plan [NCP]), 40 *Code of Federal Regulations* (CFR) 300.415(b)(2), establishes factors to be considered  
5    in determining the appropriateness of a removal action. One factor identifies seismic events and severe  
6    weather conditions that may cause hazardous substances, pollutants, or contaminants to migrate or be  
7    released. Hazardous substances are present as fixed contamination within the walls, equipment, and  
8    additional structures. These substances pose a threat of release as fixed contamination becomes exposed  
9    and as structural integrity is compromised, resulting in a potential direct exposure of nearby personnel and  
10   the environment, and exposure to the public through airborne radioactive contaminants.

11   A potential for the spread of hazardous substances from the 212-N, -P, and -R Facilities that could result  
12   in an increased radiation, inhalation, and ingestion risk justify this CERCLA removal action.

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#### 4.0 ENDANGERMENT DETERMINATION

2 Security controls, including administrative and physical access controls, are currently in place to limit  
3 unauthorized entrance. Only authorized personnel are allowed entry into areas where hazards exist. As  
4 long as DOE-RL retains control of these areas, these institutional controls would prevent direct contact  
5 with and exposure to the hazardous substances. Institutional controls, however, will not prevent  
6 deterioration of the facilities or eliminate the threat of release of radiological and hazardous substances to  
7 the environment. Radiological and hazardous substances could be released directly or indirectly to the  
8 environment via a breach in a containment wall, roof, or other physical control as the facilities age and  
9 deteriorate. Radiological and hazardous substances could also be released to the environment through  
10 animal intrusion into contaminated structures and systems.

11 As the facilities continue to age, the threat of substantial release of hazardous substances increases with  
12 time, and containing these materials and preventing them from being released to the environment  
13 becomes more difficult. S&M activities required to confine the hazardous substances may increase the  
14 risk of potential exposure to personnel.

15 The potential exposure to workers and wildlife, the potential threat of future releases, and the risks  
16 associated with the hazardous substances at the facilities addressed by this Action Memorandum, justify  
17 use of CERCLA removal action authority in accordance with Section 300.415(b)(2) of the "National Oil  
18 and Hazardous Substances Pollution Contingency Plan." Therefore, actual and/or threatened releases of  
19 hazardous substances from these facilities have the potential to present a threat to public health and/or the  
20 environment.

21 The DOE will use CERCLA response authority whenever a hazardous substance is released, or when  
22 there is a substantial threat of release into the environment, and response is necessary to protect public  
23 health, welfare, or the environment. DOE Order 5400.4 (*Comprehensive Environmental Response,  
24 Compensation, and Liability Act Requirements*) requires DOE to respond to any release or substantial  
25 threat of a release of a hazardous substance into the environment in a manner consistent with CERCLA  
26 and the NCP (40 CFR 300), regardless of whether the release or threatened release is from a site listed on  
27 the National Priorities List.

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## 5.0 PROPOSED ACTIONS AND ESTIMATED COSTS

### 5.1 PROPOSED ACTION

An engineering evaluation/cost analysis (EE/CA) (DOE/RL-2008-07) was prepared to analyze removal action alternatives to address the risks at the 212-N, -P, and -R Facilities for protection of human health and the environment and to determine the most appropriate removal action. The removal action objectives were developed based on the remediation objectives for the 200-CW-3 Operable Unit and for the contaminants of concern, applicable or relevant and appropriate requirements (ARARs), and potential exposure pathways identified in the Remaining Sites ROD (EPA et al. 1999).

The following removal action objectives were developed for this removal action:

- Reduce/eliminate the inventory of hazardous/radioactive substances within the facilities
- Reduce or eliminate the potential for a release to the environment
- Safely manage (treat and/or dispose) of waste streams generated through the removal action
- Be consistent with future remediation plans for the 200 North Area
- Prevent adverse impacts to cultural and natural resources
- Reduce or eliminate the need for future S&M activities.

Based on these considerations, the following four removal action alternatives were identified:

- Alternative One: No Action
- Alternative Two: Continued S&M
- Alternative Three: D&D (Building Structures Down to Basin, Not Including Basin or Underlying Soils/Structures)
- Alternative Four: Expanded D&D (Building Structures, Including Building Basin and Underlying Soils up to 1 m [3.3 ft] Below Each Basin).

The following subsections summarize the alternatives evaluated in the EE/CA (DOE/RL-2008-07).

#### 5.1.1 Alternative One: No Action

Under the "No Action" alternative, access to the 212-N, -P, and -R Facilities is assumed to be unrestricted. Industrial and radiological hazards continue to exist because controls to prevent access are not maintained. Initial risks of the "No Action" alternative are minimal to the environment, provided there is no significant seismic, weather, or fire events. Risks over time are expected to increase as deterioration of the 212-N, -P, and -R Facilities progresses and structural integrity is compromised. The "No Action" alternative does not mitigate address the hazards posed by the 212-N, -P, and -R Facilities as they continue to deteriorate. Eventually, deterioration is expected to result in releases of radiological or other hazardous substances to the environment, as well as potential exposure to personnel and the public. Physical hazards associated with partial structural collapses would also be anticipated. Biologic intrusions with subsequent uptake and spread of contaminants would be expected.

1 **5.1.2 Alternative Two: Continued Surveillance and Maintenance**

2 Alternative Two would ensure that the 212-N, -P, and -R Facilities are sustained in a safe condition until  
3 final disposition. If continued S&M is selected as the removal action alternative for the 212-N, -P, and  
4 -R Facilities, it is assumed that D&D may not occur for an undetermined number of years. For the  
5 purposes of calculating costs for this alternative, it is assumed that S&M of the 212-N, -P, and  
6 -R Facilities would continue until 2035.

7 The primary elements of Alternative Two are as follows:

- 8 • Limited decontamination and fixative application
- 9 • Structures left in place with safety and environmental systems operating
- 10 • Various waste forms generated in these operations disposed
- 11 • Periodic S&M conducted.

12 The prime goal of this alternative is to prevent radiological environmental releases and to avoid industrial  
13 accidents.

14 **5.1.3 Alternative Three: Decontamination and Decommissioning (Building Structure**  
15 **Down to Basins, Not Including Basin or Underlying Soils/Structures)**

16 Alternative Three consists of removing the nonradiological and radiological hazardous substances from  
17 the 212-N, -P, and -R Facilities by removing equipment and associated piping, decontaminating the  
18 structures and/or stabilizing the contamination, demolishing the structures to the top of each basin,  
19 disposing the waste generated, and stabilizing the basins and surrounding area.

20 Alternative Three would ensure that the structures are dispositioned in a safe condition. This alternative  
21 would consist of the following primary elements:

- 22 • Remove the nonradiological and radiological hazardous substances from within the structures  
23 over the basins
- 24 • Decontaminate, fix contamination, and isolate systems as needed
- 25 • Remove equipment
- 26 • Demolish each structure, excluding each basin
- 27 • Cut off equipment penetrating each structure's basin as needed, and seal penetrations to prevent  
28 intrusion or leakage
- 29 • Dispose of the various waste forms generated during these operations
- 30 • Stabilize the area
- 31 • Install a cover as needed
- 32 • Conduct periodic S&M.

1 **5.1.4 Alternative Four: Expanded Decontamination and Decommissioning (Building Structures,**  
 2 **Including Building Basin and Underlying Soils up to 1 m [3.3 ft] Below Each Basin)**

3 This alternative consists of D&D, as described in Alternative Three (Section 5.1.3), plus removal of the  
 4 building basin. Following the removal activities, the resulting excavated area will undergo a waste site  
 5 evaluation process, which will be described in the removal action work plan, to determine if the  
 6 underlying soil requires remediation. Screening levels for this evaluation will be based on the Remaining  
 7 Sites ROD (EPA et al. 1999).

8 Alternative Four would ensure that the structures and soil are dispositioned in a safe condition. This  
 9 alternative would consist of the following primary elements:

- 10 • Remove the nonradiological and radiological hazardous substances from within the structures and  
 11 the basins
- 12 • Decontaminate, fix contamination, and isolate systems as needed
- 13 • Remove equipment
- 14 • Demolish each structure, including each basin
- 15 • Dispose of the various waste forms generated during these operations
- 16 • Evaluate underlying soil for contaminants
- 17 • Stabilize the area
- 18 • Conduct periodic S&M.

19 **5.2 COMMON ELEMENTS**

20 With the exception of the "No Action" alternative, each of the alternatives would result in the generation  
 21 of waste. The majority of the contaminated debris would likely be designated as low-level waste (LLW);  
 22 however, quantities of mixed waste, dangerous waste, and solid waste that are not contaminated with  
 23 hazardous substances may be generated. The ARARs for waste management are discussed in Section 5.3.

24 Waste generated under removal action Alternatives Two, Three, and Four would be disposed at an  
 25 appropriate disposal site. Waste management would be a common element among these alternatives.  
 26 For each alternative, recycling and/or reuse options would be evaluated and implemented where possible  
 27 to reduce the volume of material disposed.

28 Contaminated waste for which no reuse, recycle, or decontamination option is identified would be  
 29 assigned an appropriate waste designation (e.g., solid, asbestos, PCB, radioactive, dangerous, or mixed)  
 30 and disposed at an approved disposal location. For the purposes of the cost analysis performed in this  
 31 document, most of the contaminated waste generated during implementation of these alternatives is  
 32 assumed to be disposed onsite at the Environmental Restoration Disposal Facility (ERDF) near the  
 33 200 West Area. Alternate disposal locations may be considered when the removal action is performed if  
 34 suitable and cost-effective locations are identified. Alternate disposal locations will be evaluated using  
 35 appropriate performance standards to ensure that they are adequately protective of human health and the  
 36 environment, and contribute to efficient performance of possible remedial actions.

1 The ERDF is an engineered facility that provides a high degree of protection to human health and the  
2 environment and meets *Resource Conservation and Recovery Act of 1976* (RCRA) minimum technical  
3 requirements for landfills, including standards for a double liner, a leachate collection system, leak  
4 detection, monitoring, and final cover. Construction and operation of ERDF was authorized in  
5 a CERCLA ROD (EPA et al. 1995). The *Explanation of Significant Difference for the Environmental*  
6 *Restoration Disposal Facility, Hanford Site, Benton County, Washington* (EPA et al. 1996) modified  
7 the *Record of Decision for the Environmental Restoration Disposal Facility, Hanford Site, Benton*  
8 *County, Washington* (EPA et al. 1995, and 2002 amendment) to clarify the eligibility of waste generated  
9 during cleanup of the Hanford Site. In accordance with the explanation of significant difference (ESD)  
10 (EPA et al. 1996), the ERDF is eligible for disposal of any LLW, mixed waste, and hazardous/dangerous  
11 waste generated as a result of cleanup actions (e.g., D&D waste and investigation-derived waste),  
12 provided that the waste meets ERDF waste acceptance criteria and that appropriate CERCLA decision  
13 documents are in place.

14 If other suitable locations for disposal of wastes are identified before the selected alternative is completely  
15 implemented (e.g., rubble from the demolished structures used for fill as part of nearby remedial actions),  
16 the alternate waste disposal location would be evaluated in accordance with the removal action objectives  
17 and the selected ARARs, and the waste management plan would be modified, as appropriate.

18 Most waste that would be generated during the proposed removal action alternatives likely would meet  
19 the requirements of *Environmental Restoration Facility Waste Acceptance Criteria* (WCH-191).  
20 However, some waste might not meet, or might not be able to be treated to meet, ERDF acceptance  
21 criteria. Specifically, this would include low-level radioactive and nonradioactive liquid waste that might  
22 be encountered or generated.

23 Liquid waste containing levels of radioactive and/or nonradioactive hazardous substances meeting the  
24 200 Areas Effluent Treatment Facility (ETF) waste acceptance criteria would be transferred to the ETF in  
25 accordance with the "NCP offsite rule" (40 CFR 300.440) and treated to meet ETF waste discharge  
26 criteria with an approved offsite determination. Liquids that do not meet ETF waste acceptance criteria  
27 would be solidified and either disposed at ERDF (if ERDF waste acceptance criteria are met) or stored at  
28 the Central Waste Complex (CWC) subject to final disposition under CERCLA. The type and location of  
29 treatment would be documented in treatment plans developed as needed for each waste stream requiring  
30 treatment. Solidification, encapsulation, neutralization, and size-reduction/compaction could be  
31 employed to treat various waste types. Clean water (e.g., nonradioactive and nonhazardous) could be  
32 used for dust suppression.

33 The ERDF is considered to be onsite for management and/or disposal of waste from removal actions  
34 proposed in this document (see the Waste Management Standards section of this document for further  
35 discussion on this topic). There is no requirement to obtain a permit to manage or dispose CERCLA  
36 waste at the ERDF. It is expected that the majority of the waste generated during the removal action  
37 proposed in this document can be disposed onsite at ERDF. In accordance with the ERDF ROD  
38 (EPA et al. 1995, and 2002 amendment), this action memorandum constitutes CERCLA authority to  
39 dispose waste at ERDF. Waste that must be sent offsite can only be shipped to permitted treatment,  
40 storage, and/or disposal facilities that have qualified for approval from the relevant U.S. Environmental  
41 Protection Agency (EPA) regional office under the "offsite rule" to receive CERCLA response action  
42 waste.

1 **5.3 APPLICABLE OR RELEVANT AND APPROPRIATE REQUIREMENTS AND**  
 2 **OTHER CRITERIA, ADVISORIES, OR GUIDANCE TO BE CONSIDERED**

3 The removal action implementation of the selected alternative was designed to comply with the ARARs  
 4 cited in this section to the extent practicable. The ARARs are selected from promulgated environmental  
 5 regulations that have been evaluated to determine whether they may be pertinent to the removal action.  
 6 The purpose of this section is to identify the key ARARs for the selected alternative addressed in this  
 7 action memorandum. The ARARs are discussed in the following subsections and are documented in  
 8 detail in Tables 5-1 and 5-2. In addition, to-be-considered (TBC) information consisting of  
 9 nonpromulgated advisories or guidance issued by Federal or state governments that are not binding  
 10 legally and do not have the status of ARARs are also included in the tables.

11 Response actions are required to comply with the substantive aspects of ARARs, not with corresponding  
 12 administrative requirements. That is, permit applications and other administrative procedures  
 13 (e.g., administrative reviews, and reporting and recordkeeping requirements) are considered  
 14 "administrative" for actions conducted entirely onsite (40 CFR 300.400[e]) and, therefore, are not  
 15 required.

16 **5.3.1 Waste Management Standards**

17 The following discussion identifies the primary substantive environmental regulations that are the source  
 18 of the substantive ARAR standards governing waste management in CERCLA actions at the Hanford.

19  
 Table 5-1. Identification of Federal Applicable or Relevant and Appropriate Requirements and To Be Considered for the Removal Action.

	ARAR or TBC	Requirement	Rationale for Use
<i>National Archaeological and Historic Preservation Act of 1976,</i> 16 U.S.C. 469aa-mm	ARAR	Requires that removal actions at the 200 North Area do not cause the loss of any archaeological or historic data. This act mandates preservation of the data and does not require protection of the actual site.	Archeological and historic sites have been identified within the 100 and 200 Areas; therefore, the substantive requirements of this act are applicable to actions that might disturb these sites. This requirement is location-specific.
<i>National Historic Preservation Act of 1966,</i> 16 U.S.C. 470, Section 106	ARAR	Requires Federal agencies to consider the impacts of their undertaking on cultural properties through identification, evaluation and mitigation processes, and consultation with interested parties.	Cultural and historic sites have been identified within the 100 and 200 Areas; therefore, the substantive requirements of this act are applicable to actions that might disturb these types of sites. This requirement is location-specific.
<i>Native American Graves Protection and Repatriation Act,</i> 25 U.S.C. 3001, et seq.	ARAR	Establishes Federal agency responsibility for discovery of human remains, associated and unassociated funerary objects, sacred objects, and items of cultural patrimony.	Substantive requirements of this act are applicable if remains and sacred objects are found during removal action and will require Native American Tribal consultation in the event of discovery. This requirement is location-specific.

Table 5-1. Identification of Federal Applicable or Relevant and Appropriate Requirements and To Be Considered for the Removal Action.

	ARAR or TBC	Requirement	Rationale for Use
<i>Endangered Species Act of 1973</i> , 16 U.S.C. 1531 et seq, subsection 16 U.S.C. 1536(c)	ARAR	Prohibits actions by Federal agencies that are likely to jeopardize the continued existence of listed species or result in the destruction or adverse modification or critical habitat. If the removal action is within critical habitat or buffer zones surrounding threatened or endangered species, mitigation measures must be taken to protect the resource.	Substantive requirements of this act are applicable if threatened or endangered species are identified in areas where removal actions will occur. This requirement is location-specific.
<b>40 CFR 82, "Protection of Stratospheric Ozone"</b>			
40 CFR 82.156, "Required Practices" 40 CFR 82.158, "Standards for Recycling and Recovery Equipment" 40 CFR 82.161, "Technician Certification"	ARAR	Specifies the procedures and processes that will be followed for recycling and recovery of ODSs. Establishes the required performance standards for ODS recycling and recovery equipment; and requires appropriate certification for workers who recover or recycle ODSs.	Selected alternative may include the recycling or recovery of ODSs that must be conducted in accordance with the applicable requirements and work practices. These requirements are action-specific.

40 CFR 82, "Protection of Stratospheric Ozone"

ARAR = applicable or relevant and appropriate requirement

CFR = Code of Federal Regulations

ODS = ozone-depleting substance

TBC = to-be-considered

Table 5-2. Identification of State Applicable or Relevant and Appropriate Requirements and to Be Considered for the Removal Action. (4 sheets)

ARAR Citation	ARAR or TBC	Requirement	Rationale for Use
<b>Regulations pursuant to the Resource Conservation and Recovery Act of 1976 and implemented through WAC 173-303, "Dangerous Waste Regulations"</b>			
"Identifying Solid Waste," WAC 173-303-016	ARAR	Identifies those materials that are and are not solid waste.	Substantive requirements of these regulations are applicable because they 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 identifying solid waste to ensure proper management. This requirement is action-specific.
"Designation of Dangerous Waste," WAC 173-303-070(3)	ARAR	Establishes the method for determining whether a solid waste is or is not a dangerous waste or an extremely hazardous waste.	Substantive requirements of these regulations are applicable to materials encountered during the removal action. Specifically, solid waste generated for removal from the CERCLA site during this removal action would be subject to the dangerous waste designation procedures to ensure proper management. This requirement is action-specific.
"Excluded Categories of Waste," WAC 173-303-071	ARAR	Describes those waste categories that are excluded from the requirements of WAC 173-303 (excluding WAC 173-303-050).	The conditions of this requirement are applicable to removal actions identified in WAC 173-303-071 be encountered. This requirement is action-specific.
"Conditional Exclusion of Special Wastes," WAC 173-303-073	ARAR	Establishes the conditional exclusion and the management requirements of special waste, as defined in WAC 173-303-040.	Substantive requirements of these regulations are applicable to materials encountered during the removal action. Specifically, the substantive standards for management of special waste are applicable to the interim management of certain waste that will be generated during the removal action. This requirement is action-specific.
"Requirements for Universal Waste," WAC 173-303-077	ARAR	Identifies waste exempted from regulation under WAC 173-303-140 and WAC 173-303-170 through 173-303-9907 (excluding WAC 173-303-960). This waste is subject to regulation under WAC 173-303-573.	Substantive requirements of these regulations are applicable to materials encountered during the removal action. Specifically, the substantive standards for management of universal waste are applicable to the interim management of certain waste that will be generated during the removal action. This requirement is action-specific.
"Land Disposal Restrictions," WAC 173-303-140(4)	ARAR	This regulation establishes state standards for land disposal of dangerous waste and incorporates by reference the Federal land disposal restrictions of 40 CFR 268 that are applicable to solid waste designated as dangerous or mixed waste in accordance with WAC 173-303-070(3).	The substantive requirements of this regulation are applicable to materials encountered during the removal action. Specifically, dangerous and/or mixed waste 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 waste generation. The actual offsite treatment of such waste would not be ARAR to this removal action, but would be subject to all applicable laws and regulations. This requirement is action-specific.

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Table 5-2. Identification of State Applicable or Relevant and Appropriate Requirements and to Be Considered for the Removal Action. (4 sheets)

ARAR Citation	ARAR or TBC	Requirement	Rationale for Use
"Requirements for Generators of Dangerous Waste," WAC 173-303-170	ARAR	Establishes the requirements for dangerous waste generators.	Substantive requirements of these regulations are applicable to materials encountered during the removal action. Specifically, the substantive standards for management of dangerous and/or 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. This requirement is action-specific.
<b>General Regulations for Air Pollution Sources, WAC 173-400 and WAC 173-460</b>			
Specific subsection: WAC 173-400-040	ARAR	Requires all sources of air contaminants to meet standards for visible emissions, fallout, fugitive emissions, odors, emissions detrimental to persons or property, sulfur dioxide, concealment and masking, and fugitive dust. Requires use of reasonably available control technology.	Substantive requirements of the general standards for control of fugitive emissions are applicable to removal actions at the site due to the generation of fugitive dust that occurs during excavation or other types of construction activities. These requirements are action-specific.
"Controls for New Sources of Toxic Air Pollutants," WAC 173-460  Specific subsections: WAC 173-460-030, WAC 173-460-060, WAC 173-460-070, WAC 173-460-080, WAC 173-460-150, WAC 173-460-160	ARAR	Requires best available control technology for regulated emissions of toxic air pollutants (toxic best available control technology) and demonstration that emissions of toxic air pollutants will not endanger human health or safety.	Substantive requirements of these regulations would be applicable to removal actions performed at the site, if a treatment technology that emits toxic air emissions were necessary during the implementation of the removal action. These requirements are action-specific.
<b>"Asbestos" Benton Clean Air Agency, Regulation 1, Article 8</b>			
Section 8.02 "CFR Adoption by Reference"; Section 8.03 "General Requirements"	TBC	Incorporates the Federal requirements of 40 CFR 61, Subpart M and 40 CFR 763, Subpart E by reference. Requires established controls and work practices for managing and disposing regulated asbestos-containing material (reasonable available control technology).	Selected alternative may include the removal or disturbance of regulated asbestos containing material (reasonable available control technology) that must be conducted in accordance with the applicable requirements and work practices.

Table 5-2. Identification of State Applicable or Relevant and Appropriate Requirements and to Be Considered for the Removal Action. (4 sheets)

ARAR Citation	ARAR or TBC	Requirement	Rationale for Use
<b>Radiation Protection -- Air Emissions, WAC 246-247</b>			
"Radiation Protection -- Air Emissions," WAC 246-247-035(1)(a)(ii)	ARAR	This regulation establishes requirements equivalent to 40 CFR 61, Subpart H by reference. Radionuclide airborne emissions from the demolition and excavation areas shall be controlled so as not to cause the DOE Hanford Site to exceed amounts that would cause an exposure to any member of the public of greater than 10 mrem/yr effective dose equivalent.	Substantive requirements of this standard are applicable because this removal action may include activities such as excavation, demolition, decontamination, and stabilization of contaminated areas and equipment, each of which may provide airborne emissions of radioactive particulates to unrestricted areas. As a result, requirements limiting emissions apply. This is a risk-based standard for the purposes of protecting human health and the environment. This requirement is action-specific.
"Radiation Protection -- Air Emissions," "Standards," WAC 246-247-040(3) WAC 246-247-040(4)	ARAR	Emissions shall be controlled to ensure that emission standards are not exceeded. Actions creating new sources or significantly modified sources shall apply best available controls. All other actions shall apply reasonably achievable controls.	Substantive requirements of this standard are applicable because fugitive, diffuse and point source emissions of radionuclides to the ambient air may result from activities, such as demolition and excavation of contaminated soils and operation of exhausters and vacuums, performed during the removal action. This standard exists to ensure compliance with emission standards. These requirements are action-specific.
"Monitoring, Testing, and Quality Assurance," "WAC 246-247-075(1) and -(2) and -(4)	ARAR	Establishes the monitoring, testing, and quality assurance requirements for radioactive air emissions from major sources. Effluent flow rate measurements shall be made and the effluent stream shall be directly monitored continuously with an in-line detector or representative samples of the effluent stream shall be withdrawn continuously from the sampling site following the specified guidance. The requirements for continuous sampling are applicable to batch processes when the unit is in operation. Periodic sampling (grab samples) may be used only with lead agency prior approval. Such approval may be granted in cases where continuous sampling is not practical and radionuclide emission rates are relatively constant. In such cases, grab samples shall be collected with sufficient frequency so as to provide a representative sample of the emissions. When it is impractical to measure the effluent flow rate at a source in accordance with the requirements or to monitor or sample an effluent stream at a source in accordance with the site selection and sample extraction requirements, the waste site owner or operator may use alternative effluent flow rate measurement procedures or site selection and sample extraction procedures as approved by the lead agency.  Emissions from nonpoint and fugitive sources of airborne radioactive material shall be measured.	Substantive requirements of this standard are applicable because fugitive and diffuse and point source emissions of radionuclides to the ambient air may result from activities, such as demolition and excavation of contaminated soils and operation of exhausters and vacuums, performed during the removal action. This standard exists to ensure compliance with emission standards. These requirements are action-specific.

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Table 5-2. Identification of State Applicable or Relevant and Appropriate Requirements and to Be Considered for the Removal Action. (4 sheets)

ARAR Citation	ARAR or TBC	Requirement	Rationale for Use
		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.	
"Monitoring, Testing, and Quality Assurance," WAC 246-247-075(3)	ARAR	Methods to implement periodic confirmatory monitoring for minor sources may include estimating the emissions or other methods as approved by the lead agency.	Fugitive and diffuse emissions from the demolition and excavation and related activities will require periodic confirmatory measurements to verify low emissions. This requirement is action-specific and applicable.
"Monitoring, Testing, and Quality Assurance," WAC 246-247-075(8)	ARAR	Site emissions resulting from non-point and fugitive sources of airborne radioactive material shall be measured. Measurement techniques may include ambient air measurements, or in-line radiation detector or withdrawal of representative samples from the effluent stream, or other methods as determined by the lead agency.	Fugitive and diffuse emissions of airborne radioactive material due to demolition and excavation and related activities will require measurement. This requirement is action-specific and applicable.
"General Standards," WAC 246-247-040(4) and "General Standards for Maximum Permissible Emissions," WAC 173-480-050(1)	ARAR	At a minimum all emission units shall make every reasonable effort to maintain radioactive materials in effluents to unrestricted areas ALARA. Control equipment of sites operating under ALARA shall be defined as reasonably available control technology and as low as reasonably achievable control technology.	The potential for fugitive and diffuse and point source emissions due to demolition and excavation and related activities will require efforts to minimize those emissions. This requirement is action-specific and applicable.
"Emission Monitoring and Compliance Procedures," WAC 173-480-070-(2)	ARAR	Determine compliance with the public dose standard by calculating exposure at the point of maximum annual air concentration in an unrestricted area where any member of the public may be.	Fugitive and diffuse and point source emissions resulting from demolition and excavation and related activities will require assessment and reporting. This requirement is action-specific and applicable.
<b>To-Be-Considered pursuant to relevant waste acceptance criteria</b>			
<i>Environmental Restoration Disposal Facility Waste Acceptance Criteria</i> (WCH-191)	TBC	This document establishes waste acceptance criteria for the Environmental Restoration Disposal Facility.	Waste destined for management at Environmental Restoration Disposal Facility must meet acceptance criteria to ensure proper disposal.
40 CFR 61, Subpart H, "National Emission Standards for Emissions of Radionuclides Other than Radon from Department of Energy Facilities." 40 CFR 268, "Land Disposal Restrictions." WAC 173-303, "Dangerous Waste Regulations."			WAC 173-400, "General Regulations for Air Pollution Sources." WAC 173-460, "Controls for New Sources of Toxic Air Pollutants." WAC 173-480, "Ambient Air Quality Standards and Emission Limits for Radionuclides." WAC 246-247, "Radiation Protection -- Air Emissions."
ALARA = as low as reasonably achievable ARAR = applicable or relevant and appropriate requirement CERCLA = <i>Comprehensive Environmental Response, Compensation, and Liability Act of 1980</i>			CFR = <i>Code of Federal Regulations</i> DOE = U.S. Department of Energy TBC = to-be-considered WAC = <i>Washington Administrative Code</i>

- 1 A variety of waste streams would be generated under the proposed removal action alternatives. It is  
2 anticipated that most of the waste will designate as LLW. However, quantities of dangerous or mixed  
3 waste, PCB-contaminated waste, and asbestos and asbestos-containing material could also be generated.  
4 The majority of the waste will be in a solid form.
- 5 The identification, storage, treatment, and disposal of hazardous waste and the hazardous component of  
6 mixed waste are governed by RCRA. The State of Washington, which implements RCRA requirements  
7 under *Washington Administrative Code* (WAC) 173-303, "Dangerous Waste Regulations," has been  
8 authorized to implement elements of the RCRA program. The dangerous waste regulations for generation  
9 and storage would apply to the management of any dangerous or mixed waste generated at the 212-N, -P,  
10 and -R Facilities. Treatment standards for dangerous or mixed waste subject to RCRA land disposal  
11 restrictions are specified in WAC 173-303-140, which incorporates 40 CFR 268, "Land Disposal  
12 Restrictions," by reference.
- 13 The management and disposal of PCB wastes are governed by the *Toxic Substances Control Act of 1976*  
14 (TSCA) and 40 CFR 761 ("PCBs Manufacturing, Processing, Distribution in commerce, and Use  
15 Prohibitions"). The TSCA regulations contain specific provisions for PCB waste, including PCB waste  
16 that contains a radioactive component. The PCBs are also considered underlying hazardous constituents  
17 under RCRA and, thus, could be subject to WAC 173-303 and 40 CFR 268 requirements.
- 18 Removal and disposal of asbestos and asbestos-containing material are regulated under the *Clean Air Act*  
19 *of 1990* and 40 CFR 61, Subpart M ("National Emission Standards for Asbestos"). These regulations  
20 provide for special precautions to prevent environmental releases or exposure to personnel of airborne  
21 emissions of asbestos fibers during removal actions.
- 22 Waste that is designated as LLW that meets ERDF acceptance criteria will be disposed at ERDF, which is  
23 engineered to meet appropriate performance standards. Alternate potential disposal locations may be  
24 considered when the removal action occurs if a suitable and cost-effective location is identified. Any  
25 potential alternate disposal location will be evaluated for appropriate performance standards to ensure that  
26 it is adequately protective of human health and the environment.
- 27 Waste designated as dangerous or mixed waste would be treated as appropriate to meet land disposal  
28 restrictions and ERDF acceptance criteria, and disposed at ERDF. The ERDF is engineered to meet  
29 technical requirements for "landfills" in accordance with WAC 173-303-665. Applicable packaging and  
30 pre-transportation requirements for dangerous or mixed waste generated at the 212-N, -P, and -R  
31 Facilities would be identified and implemented before movement of any waste.
- 32 Some of the aqueous waste designated as LLW, dangerous, or mixed waste would be transported to ETF  
33 for treatment and disposal in accordance with the NCP "offsite rule" (40 CFR 300.440). The ETF is  
34 a RCRA-permitted facility authorized to treat aqueous waste streams generated on the Hanford Site and to  
35 dispose of these streams at a designated state-approved land disposal facility in accordance with  
36 applicable requirements.
- 37 Waste designated as PCB remediation waste likely would be disposed at ERDF, depending on whether it  
38 meets the waste acceptance criteria. The PCB waste that does not meet ERDF waste acceptance criteria  
39 would be retained at a PCB storage area meeting the requirements for TSCA storage and would be  
40 transported for future disposal at an appropriate disposal facility.
- 41 Asbestos and asbestos-containing material would be removed, packaged as appropriate, and disposed  
42 at ERDF.

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

14 All alternatives can be performed in compliance with the waste management ARARs. Waste streams will  
15 be evaluated, designated, and managed in compliance with ARAR requirements. Before disposal, waste  
16 will be managed in a protective manner to prevent releases to the environment or unnecessary exposure to  
17 personnel.

### 18 **5.3.2 Standards Controlling Emissions to the Environment**

19 The proposed removal action alternatives have the potential to generate both radioactive and toxic/criteria  
20 airborne emissions.

21 **5.3.2.1 Radiological Air Emissions.** The state implementing regulation, WAC 173-480, “Ambient Air  
22 Quality Standards and Emission Limits for Radionuclides,” sets standards that are as stringent as, or more  
23 so than, the Federal *Clean Air Act of 1990* and amendments, and under the Federal implementing  
24 regulation, 40 CFR 61, Subpart H (“National Emission Standards for Emissions of Radionuclides Other  
25 than Radon from Department of Energy Facilities”) The EPA’s partial delegation of the 40 CFR 61  
26 authority to the State of Washington includes all substantive emissions monitoring, abatement, as well as  
27 reporting aspects of the Federal regulation. The state standards protect the public by conservatively  
28 establishing exposure standards applicable to the maximally exposed public individual. Under  
29 WAC 246-247-030(15), the maximally exposed individual is any member of the public (real or  
30 hypothetical) who abides or resides in an unrestricted area, and may receive the highest total effective  
31 dose equivalent from the emission unit(s) under consideration, taking into account all exposure pathways  
32 affected by the radioactive air emissions. All combined radionuclide airborne emissions from the DOE  
33 Hanford Site “facility” are not to exceed amounts that would cause an exposure to any member of the  
34 public of greater than 10 mrem/yr effective dose equivalent. The state implementing regulation,  
35 WAC 246-247, “Radiation Protection – Air Emissions,” which adopts the standards of WAC 173-480,  
36 and 40 CFR 61, Subpart H requires verification of compliance with the 10 mrem/yr standard and would  
37 be applicable to the removal action.

38 WAC 246-247 further addresses sources emitting radioactive airborne emissions by requiring monitoring  
39 of such sources. Such monitoring requires physical measurement (i.e., sampling) of the effluent or  
40 ambient air. The substantive provisions of WAC 246-247 that require monitoring of radioactive airborne  
41 emissions would be applicable to the removal action.

42 The above-stated implementing regulations further address control of radioactive airborne emissions  
43 where economically and technologically feasible (WAC 246-247-040[3] and -040[4], “General  
44 Standards,” and associated definitions). To address the substantive aspect of these requirements, best or  
45 reasonably achieved control technology could be addressed by ensuring that applicable emission control  
46 technologies (those successfully operated in similar applications) would be used when economically and

1 technologically feasible (i.e., based on cost/benefit). If it is determined that there are substantive aspects  
2 of the requirement for control of radioactive airborne emissions once ARARs are finalized, then controls  
3 will be administered as appropriate using the best methods from among those that are reasonable and  
4 effective.

5 **5.3.2.2 Criteria/Toxic Air Emissions.** Under WAC 173-400, "General Regulations for Air Pollution  
6 Sources," and WAC 173-460, "Controls for New Sources of Toxic Air Pollutants," requirements are  
7 established for the regulation of emissions of criteria/toxic air pollutants. The primary nonradioactive  
8 emissions resulting from this removal action will be fugitive particulate matter. In accordance with  
9 WAC 173-400-040, "General Standards for Maximum Emissions," reasonable precautions must be taken  
10 to (1) prevent the release of air contaminants associated with fugitive emissions resulting from  
11 excavation, materials handling, or other operations; and (2) prevent fugitive dust from becoming airborne  
12 from fugitive sources of emissions. The use of treatment technologies that would result in emissions of  
13 toxic air pollutants that would be subject to the substantive applicable requirements of WAC 173-460 are  
14 not anticipated to be a part of this removal action. Treatment of some waste encountered during the  
15 removal action may be required to meet ERDF waste acceptance criteria. In most cases, the type of  
16 treatment anticipated would consist of solidification/stabilization techniques such as macroencapsulation  
17 or grouting, and WAC 173-460 would not be considered an ARAR. If more aggressive treatment is  
18 required that would result in the emission of regulated air pollutants, the substantive requirements of  
19 WAC 173-400-113(2) and WAC 173-460-060 would be evaluated to determine applicability.

20 Emissions to the air will be minimized during implementation of the removal action through use of  
21 standard industry practices such as the application of water sprays and fixatives, or effluent air filtration.  
22 These techniques are considered to be reasonable precautions to control emissions as required by the  
23 regulatory standards.

## 1 5.4 NEPA

2 In accordance with DOE NEPA policy, DOE CERCLA documents are required to incorporate NEPA  
3 values (e.g., analysis of cumulative, offsite, ecological, and socioeconomic impacts) to the extent  
4 practicable.

5  
6 Cumulative impacts might occur in both the short term and long term because of the interrelationships  
7 between the 212-N, -P and -R facilities removal action and other 200 Areas activities, such as remediation  
8 of waste sites and groundwater, deactivation and D&D of other facilities, and operation of waste  
9 treatment or disposal facilities.

10  
11 Short-term cumulative impacts were considered in terms of both air quality and resource allocation. With  
12 appropriate work controls, airborne releases from the 212-N, -P and -R facilities were expected to be  
13 minor under all of the removal action alternatives, so the contribution to cumulative impacts on local and  
14 regional air quality would be minimal. With respect to resource allocation, Alternatives Two through  
15 Four as well as other 200 North Area activities would require resources in terms of budget, materials, and  
16 disposal space. The contribution to cumulative impacts would be less for Alternative Two in the short  
17 term and greater for Alternatives Three and Four, which would require additional budget resources. In  
18 the long-term, Alternative Two is expected to cost more because the long-term S&M costs are incurred  
19 while the threat of release still remains and further action, such as demolition, will eventually be required.

20  
21 In the long term, the overall cumulative effect of the 212-N, -P and -R facilities removal action and other  
22 activities in the 200 North Areas would be to enhance the protection of personnel, the public, and the  
23 environment, which is consistent with the values expressed by the regulators, stakeholders, affected  
24 tribes, and the public. Alternatives Two through Four would contribute to this expanded protection, with  
25 Alternatives Three and Four creating the greatest and most long-term positive effect.

26  
27 None of the alternatives would be expected to adversely affect existing ecological or cultural resources or  
28 to have any socioeconomic impacts, including disproportionately high and adverse impacts to minority or  
29 low-income populations. Alternatives Two through Four would require an irreversible and irretrievable  
30 commitment of resources in the form of land area for waste disposal.

31  
32 In addition, none of the alternatives would adversely affect groundwater, surface water, or water quality  
33 resources. Alternatives Three and Four also would require a commitment of resources required to  
34 stabilize the basins with cement, gravel or other backfill material (Alternative Three) and for excavation  
35 and the clean fill material to backfill and/or contour the sites (Alternative Four).

36  
37 Lastly, none of the alternatives would result in any transportation impacts or cause any unavoidable  
38 adverse impacts.

1 **5.5 ESTIMATED COSTS**

2 This criterion considers the relative cost of the alternatives, to the extent that the costs can be quantified.  
 3 The total estimated costs for each alternative (as described in Sections 5.1.2 through 5.1.4) are presented  
 4 in Table 5-3.

5

Table 5-3. Total Estimated Costs for the 212-N, -P, and -R Facilities Removal Action Alternatives.

Alternative	Total Cost	
	Present Worth	Nondiscounted
Two – Continued S&M	1,680,000	2,329,000
Three – D&D (Building Structures Down to Basin, Not Including Basin or Underlying Soils/Structures)	3,870,000	4,678,000
Four – Expanded D&D (Including Building Basin, and Underlying Soils Up to 1 m [3.3 ft] Below Each Basin)	6,620,000	7,874,000

D&D = decontamination and decommissioning

S&M = surveillance and maintenance

6

7

8 **5.6 REMOVAL ACTION SCHEDULE**

9 The 212-N, -P, and -R Facilities removal action is scheduled to begin in May 2009.

10 The 212-N, -P, and -R Facilities removal action work plan (which includes air emission information and  
 11 a waste management plan) and the sampling and analysis plan will be submitted to EPA in accordance  
 12 with the Tri-Party Agreement during project activities for review and approval.

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**7.0 OUTSTANDING POLICY ISSUES**

2 There are no outstanding policy issues for this removal action.

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## 8.0 SELECTED ALTERNATIVE

The recommended removal action alternative for the 212-N, -P, and -R Facilities is "Alternative Four – Expanded D&D (Including Building Basins, and Underlying Soils Up to 1 m [3.3 ft] Below Each Basin)." This alternative provides the best balance of protecting human health and the environment associated with the hazardous substance inventory within each facility, meeting the removal action objectives, and providing a cost-effective option.

Alternative One does not provide overall protection to human health and the environment. Alternative Two provides adequate overall protection of human health and the environment, but at an increasing cost over time. Additionally, Alternative Two would not remove the radioactive or other hazardous substance inventory within each facility. The risk to human health and the environment from exposure resulting from facility deterioration increases with time, requiring eventual demolition and disposition of the structures. Furthermore, these alternatives are not consistent with remedial actions currently being evaluated for the 200 North Area. Therefore, neither of these alternatives was selected.

Alternative Three has somewhat lower costs, reduces worker exposure to industrial hazards, and requires a lesser commitment of additional backfill materials because the basin remains in place.

Alternatives Three and Four provide protectiveness. Removal of the aboveground structures and their inventory of radioactive materials and other hazardous substances substantially reduces the potential exposure threat to human health and the environment. However, alternative three would leave the basin and underlying soil for future remediation. Alternative Four provides protection from potential exposure to radioactive or other hazardous substances that may be present in the building basins or underlying soils and removes the material to a separate approved waste disposal location.

Alternatives Three and Four are both consistent with future remedial actions being considered in the area. However, Alternative Four also supports the geographical area closure approach for the 200 North Area.

Alternative Four, which removes the basins, also accomplishes the following objectives:

- Eliminates infiltration into a potential underlying waste site during the period between demolition and potential future remedial action because the contamination source has been removed
- Minimizes/reduces potential exposure to hazardous substances from the immediate underlying contaminated soil (if present).

Table 8-1. Cost Estimate for Alternative Four: Expanded D&D (Including Building Basins, and Underlying Soils Up to 1 Meter [3.3 Feet] Below Each Basin).

	Item	Estimated Cost (\$)
1	Project management/support	1,499,000
2	Characterization and investigation	681,000
3	Demolition preparation	594,000
4	Demolition	4,601,000
	<b>Total</b>	<b>7,375,000</b>
	<b>Present-Worth Discounted</b>	<b>6,160,000</b>

NOTE: Details on the removal alternative cost estimates are discussed in *212-N, -P, and -R Facilities Engineering Evaluation/Cost Analysis Cost Backup Report* (CHPRC-00023).

1

2 This decision document represents the selected removal action alternative as expanded D&D (including  
3 building basins, and underlying soils up to 1 m (3.3 ft) below each basin for the 212-N, -P, and  
4 -R Facilities based on the evaluation presented in the EE/CA and public comments. This alternative  
5 removes the potential for a release of hazardous substances that could pose a threat to public health and  
6 the environment, is protective of workers, and minimizes disposal costs. To the extent possible, by  
7 removing sources of contamination, this action will contribute to the efficient performance of any long-  
8 term remedial actions taken in this area. This proposal was developed in accordance with CERCLA, as  
9 amended by the *Superfund Amendments and Reauthorization Act* (SARA) and is not inconsistent with the  
10 NCP (40 CFR 300). This decision is based on the information provided in the Administrative Record for  
11 this project.

12

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**9.0 REFERENCES**

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