U.S. Department of Energy
Hanford Site

21-PFD-0002 October 20, 2020

Mr. Craig E. Cameron, Project Manager
Superfund and Emergency Management Division
Site Cleanup Section 4
U.S. Environmental Protection Agency
825 Jadwin Avenue, Suite 210
Richland, Washington 99352

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

Addressees:

REMOVAL ACTION WORK PLAN FOR CENTRAL PLATEAU GENERAL DECOMMISSIONING ACTIVITIES, DOE/RL-2010-33, REVISION 1

This letter transmits the approved Removal Action Work Plan for Central Plateau General Decommissioning Activities, DOE/RL-2010-33, Revision 1 (Attachment), for your use.

If you have any questions please contact me, or your staff may contact Patty Ensign, of my staff, on (509) 372-3442.

Sincerely,

Mark S. French

Digitally signed by Mark S. French
Date: 2020.10.20 13:54:47 -07'00'

Mark S. French, Director
Project and Facilities Division
Richland Operations Office

PFD:PGE

Attachment

cc: See page 2

cc w/attach:
J. Bell, NPT
R. Buck, Wanapum
L. Contreras, YN
D. R. Einan, EPA
S. Hudson, HAB
M. Johnson, CTUIR
S. Leckband, HAB
N. M. Menard, Ecology
M. Murphy, CTUIR
S. N. Schleif, Ecology
J. H. Temple, Ecology
B. L. Weese, Ecology
M. Woods, ODOE
Administrative Record
Environmental Portal

cc w/o attach:
S. G. Austin, CHPRC
S. L. Brasher, MSA
R. L. Cathel, CH2
S. W. Davis, MSA
G. J. Jackson, CHPRC

DOE/RL-2010-33
Revision 1

Removal Action Work Plan for Central Plateau General Decommissioning Activities

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

P.O. Box 550
Richland, Washington 99352

DOE/RL-2010-33
Revision 1

Removal Action Work Plan for Central Plateau General Decommissioning Activities

Date Published
June 2020

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

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

APPROVED
By Lynn M. Ayers at 9:38 am, Sep 15, 2020

Release Approval Date

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Signature Sheet

Having considered the extent to which the Removal Action Work Plan, DOE/RL-2010-33, *Removal Action Work Plan for Central Plateau General Decommissioning Activities*, could be inconsistent with *Comprehensive Environmental Response, Compensation, and Liability Act of 1980* processes or could alter schedules set forth in Appendix D of the *Hanford Federal Facility Agreement and Consent Order* (Tri-Party Agreement), the U.S. Department of Energy, the U.S. Environmental Protection Agency, and the Washington State Department of Ecology approve.

U.S. Department of Energy, Richland Operations Office	Mark S. French Digitally signed by Mark S. French Date: 2020.09.11 13:44:15 -07'00' Signature	Date
U.S. Environmental Protection Agency	CRAIG CAMERON Digitally signed by CRAIG CAMERON Date: 2020.09.11 15:14:23 -07'00' Signature	Date
Washington State Department of Ecology	Digitally signed by Temple, John (ECY) Date: 2020.09.14 08:15:04 -07'00' Signature	Date

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Contents

Appendices

Figures

Tables

Terms

ACM	asbestos-containing material
Action Memorandum	DOE/RL-2010-22, *Action Memorandum for General Hanford Site Decommissioning Activities*
ALARA	as low as reasonably achievable
ARAR	applicable or relevant and appropriate requirement
BFA	building footprint area
CAA	*Clean Air Act of 1990*
CERCLA	*Comprehensive Environmental Response, Compensation, and Liability Act of 1980*
CFR	*Code of Federal Regulations*
CRR	cultural resource review
D4	decontamination, deactivation, decommissioning, and demolition
dpm	disintegrations per minute
DOE	U.S. Department of Energy
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 Area Effluent Treatment Facility
HASP	health and safety plan
HEPA	high-efficiency particulate air (filter)
LDR	land disposal restriction
LLW	low-level waste
MEI	maximally exposed individual
ML	large PCB mark
NRC	National Response Center
NESHAP	“National Emission Standards for Hazardous Air Pollutants”
NTCRA	non-time-critical removal action
PCB	polychlorinated biphenyl

PPE	personal protection equipment
PTE	potential-to-emit
RAWP	removal action work plan
RCRA	*Resource Conservation and Recovery Act of 1976*
RWP	radiological work permit
SPOC	single point of contact
TEDE	total effective dose equivalent
Treatment Plan	DOE/RL-97-56, *Manhattan Project and Cold War Era Historic District Treatment Plan*
Tri-Party Agreement	*Hanford Federal Facility Agreement and Consent Order*
TSCA	*Toxic Substances Control Act of 1976*
UIC	underground injection control (well)
WAC	*Washington Administrative Code*
WIDS	waste information data system (site)

1 Introduction

This removal action work plan (RAWP) implements the Central Plateau-related workscope of the *Comprehensive Environmental Response, Compensation, and Liability Act of 1980* (CERCLA) *Action Memorandum for General Hanford Site Decommissioning Activities*, DOE/RL-2010-22 (Action Memorandum) which implements the selected alternative from DOE/RL-2010-14, *Engineering Evaluation/Cost Analysis for General Hanford Site Decommissioning Activities*. Specifically, this RAWP will be used for the decommissioning of Hanford excess industrial buildings and structures and cleanup of miscellaneous debris that are located within the Hanford Central Plateau. This RAWP is one of several RAWPs being developed to implement the activities covered in the Action Memorandum. The rationale for multiple RAWPs is to facilitate implementation of the workscope by U.S. Department of Energy (DOE) contractors in accordance with their separate contracts, procedures, and processes.

This document provides details necessary for implementation of Alternative 3: Decontamination, Deactivation, Decommissioning, and Demolition (D4) of Buildings/Structures and Cleanup of Debris, which was identified in the Action Memorandum[1] as the selected alternative. The RAWP identifies technical requirements of the removal action and details the work elements, performance measurements, project management and oversight, and schedules for implementation of the removal action.

This RAWP will implement the non-time-critical removal action (NTCRA), which will minimize the release or threat of release of hazardous substances from the Hanford excess industrial buildings/structures and miscellaneous debris that pose a risk to human health and the environment.

1.1 Purpose

This RAWP establishes the methods and activities to support the removal action, i.e., decommissioning of Hanford excess industrial buildings and structures and cleanup of miscellaneous debris. This RAWP describes:

1. The removal action elements and how they will be implemented, as well as the safety and health management and controls
2. Environmental management and controls, including applicable or relevant and appropriate requirements (ARARs), waste management, airborne emissions, reporting for non-routine releases, cultural/ecological resources
3. Project administration for the removal action

The intent of this RAWP is to identify the basis and to provide criteria for the preparation of work packages and subcontract task orders for the project tasks. Using the most recent information concerning the conditions for each building or structure or debris, field-level work packages will be developed to direct work activities and instruct workers in the applicable work methods.

[1] All descriptions and discussion pertaining to implementation of the removal action (i.e., DOE/RL-2010-22) apply only to work performed within the scope of this RAWP. Information regarding implementation of any other work is or will be addressed, as appropriate, in other documentation.

The removal action is consistent with the overall Hanford cleanup initiative and will, to the extent practicable, contribute to the efficient performance of any anticipated long-term remedial action, as required by 40 *Code of Federal Regulations* (CFR) 300.415(d). To accomplish this, the following removal action objectives were identified.

1. Protect human and ecological receptors from exposure to contaminants above acceptable exposure levels in buildings/structures.
2. Control the migration of contaminants from the buildings/structures and debris into the environment.
3. Facilitate and, to the extent practicable, be consistent with anticipated remedial actions at Hanford.
4. Achieve ARARs to the extent practicable.
5. Safely treat, as appropriate, and dispose of waste streams generated by the removal action.
6. Prevent adverse impacts to cultural and natural resources.
7. Reduce or eliminate the need for future surveillance, maintenance, or periodic inspection activities.

The DOE, as the lead agency for this removal action, will assign an on-scene coordinator that will oversee the response activities.

1.2 Scope

The scope encompasses excess industrial buildings and structures that were never used for radiological or chemical processing and cleanup of miscellaneous debris. However, these buildings, structures, and debris may be potentially contaminated with hazardous substances as a result of their proximity to Hanford Site contamination and based on the building/structures and debris components and contents (e.g., asbestos, paints, coatings, etc.). A listing of buildings/structures planned for decommissioning by DOE and subject to the scope of this RAWP is provided in Section 1.3.

Some buildings/structures slated for decommissioning may be found to be unsuitable for inclusion within the NTCRA, or DOE may find unforeseen future uses prior to performing the decommissioning. If this occurs and eliminating the buildings/structures from the list identified in Section 1.3 is appropriate, DOE will place documentation in the Administrative Record for this NTCRA identifying the building or structure and explaining why it is no longer appropriate for inclusion under the scope of the NTCRA. Furthermore, DOE may need to decommission other Hanford buildings and structures with similar characteristics, contaminants, and complexity to those specifically identified in Section 1.3. The Action Memorandum (DOE/RL-2010-22) allows for the potential future inclusion of such buildings and structures under the scope of this NTCRA. If additional buildings and structures are added to the list in Section 1.3, concurrence from Washington State Department of Ecology (Ecology) and the U.S. Environmental Protection Agency (EPA) will first be obtained, and DOE will place a letter in the Administrative Record for this NTCRA, identifying the building or structure to be added and explaining why it is sufficiently similar to the facilities specifically identified in the Action Memorandum (DOE/RL-2010-22) and this RAWP.

1.3 Site Conditions and Background

This section provides an overview of the site conditions and background information for Hanford and the buildings and sites subject to this removal action.

1.3.1 Physical Location

The Hanford Site lies within the semi-arid Pasco Basin of the Columbia Plateau in southeast Washington State. The site, a relatively undeveloped area of shrub-steppe habitat (a drought-resistant, shrub and grassland ecosystem) containing a rich diversity of plant and animal species, occupies an area of approximately 1,517 km^2 (586 mi^2) located north of the city of Richland. This area has restricted public access and provides a buffer for areas on the site that were used for nuclear materials production, waste storage, and waste disposal. The Columbia River flows eastward through the northern part of the site and then turns south, forming part of the eastern site boundary. Elevations across the central portion of the basin and the Hanford Site range from about 119 m (390 ft) above mean sea level at the Columbia River to 1,060 m (3,480 ft) above mean sea level at Rattlesnake Mountain, which forms the southwestern boundary of the site. Public access to the Hanford Site currently is restricted and controlled at the Wye Barricade on Route 4 and the Yakima and Rattlesnake Barricades on State Highway 240 (Figure 1-1).

The Hanford Site includes nearly 1,000 buildings/structures that are or have been used to support site activities. Many of these buildings/structures were not used for radiological or chemical processing, but may have some incidental contamination from proximity to other buildings/structures. Hanford excess industrial buildings/structures are potentially contaminated with radioactive and chemical hazardous substances and are generally small, wood-framed, metal, cinder block, or concrete structures used for offices, change rooms, material storage buildings, or effluent monitoring buildings. To qualify under this NTCRA, the buildings/structures must meet the following criteria:

- The buildings/structures are suitable for routine decommissioning and/or demolition methods.
- The buildings/structures have not been addressed by another approved CERCLA decision document or *Resource Conservation and Recovery Act of 1976* (RCRA) closure plan for which the implementation would eliminate the release or threat of release of hazardous substances to the environment.

The debris is located throughout the Hanford Site and includes miscellaneous aboveground utility structures and components that are no longer in use, abandoned fencing, concrete and rubble, scrap metal, and general solid wastes that may include some radiological or chemical components.

Table 1-1 provides a list of the building/structures that have been identified to undergo D4 through implementation of this RAWP. As identified in the Action Memorandum, additional buildings will be identified, subject to review and approval by EPA and Ecology.

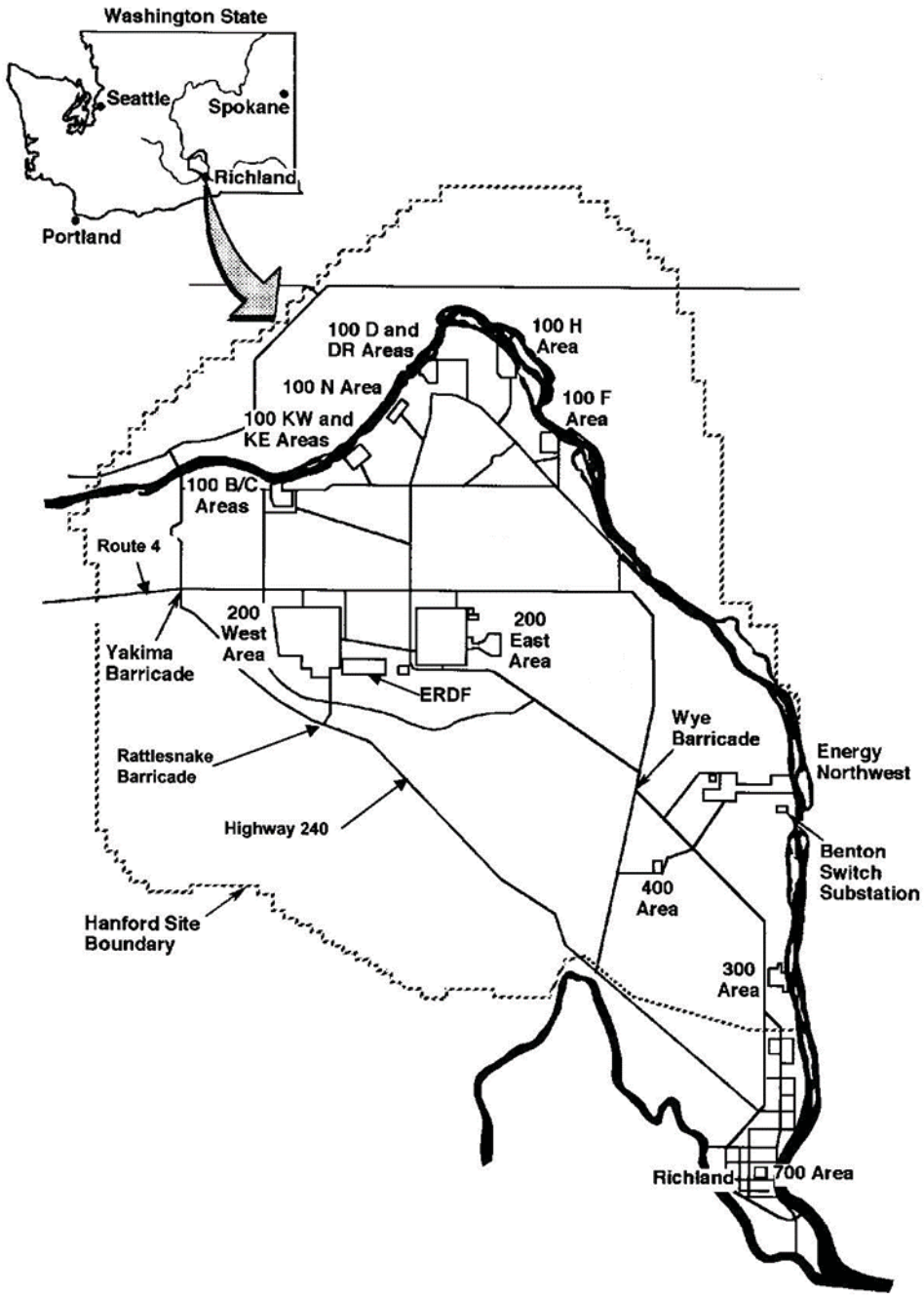

Figure 1-1. Hanford Site.

Table 1-1. Building/Structure List and Locations

Building/Structure Designation	Area	ERDF Approximate Waste Quantity (ton)
613	600	70
614	600	10
616	600	1,240
620	600	10
622	600	10
626	600	10
6265	600	290
6267	600	140
6268	600	210
6270	600	380
6290	600	700
6291	600	20
6292	600	30
6293	600	150
6653	600	20
251W	600	980
2901W	600	10
506B	600	140
506BA	600	380
609A	600	3,240
609D	600	250
609G	600	240
609H	600	310
622A	600	30
622B	600	20
622C	600	90
622F	600	260
622R	600	1,480
6265A	600	60
6266A	600	60
6266B	600	20
6653A	600	10
MO280	600	740
MO292	600	740
MO315	600	50
MO667	600	20
2025EA	200E	700

Table 1-1. Building/Structure List and Locations

Building/Structure Designation	Area	ERDF Approximate Waste Quantity (ton)
2025EC71	200E	10
207BA	200E	10
209EA	200E	410
2101HV	200E	1,200
2101M	200E	12,900
2103HV	200E	30
2105HV	200E	200
210A	200E	70
210E	200E	10
211B	200E	380
211BA	200E	80
211BA151	200E	10
211BB	200E	10
2125E	200E	100
214A	200E	80
215C	200E	250
217A	200E	80
217B	200E	40
218B	200E	10
219B	200E	10
221A	200E	70
221BA	200E	10
221BC	200E	464
221BD	200E	1,365
221BG	200E	10
221BK	200E	2,988
222B	200E	4,929
2220E	200E	170
2230E	200E	120
2237E	200E	60
2258E	200E	10
225B-BA	200E	50
225BA	200E	386
225BB	200E	39
225BC	200E	80
225BD	200E	20
225BE	200E	260

Table 1-1. Building/Structure List and Locations

Building/Structure Designation	Area	ERDF Approximate Waste Quantity (ton)
225BF	200E	331
225BG	200E	120
225E	200E	1,583
225EC	200E	10
2400E	200E	60
2402EA	200E	20
2402EC	200E	10
2402EG	200E	40
2403E	200E	90
2403EA	200E	20
2404E	200E	20
241A201	200E	230
241AN273	200E	20
241AN274	200E	10
241AN801	200E	10
241AP273	200E	20
241AP801	200E	10
241AW273	200E	20
241AW801	200E	10
241AZ156	200E	80
241AZ271	200E	90
241B701	200E	10
241C73	200E	10
241C90	200E	20
241CR271	200E	2,986
241CX40*	200E	413
242A81	200E	50
242A-BA	200E	190
242AC	200E	60
242AL11	200E	100
242AL71	200E	10
243G1	200E	100
243G1A	200E	30
243G2	200E	90
243G3	200E	40
243G4	200E	50
243G6	200E	30
243G81	200E	10

Table 1-1. Building/Structure List and Locations

Building/Structure Designation	Area	ERDF Approximate Waste Quantity (ton)
243G82	200E	10
243G9	200E	20
244AR701	200E	20
244AR715	200E	40
2451E	200E	10
246S	200E	100
2506E1	200E	40
2506E2	200E	40
252A	200E	45
252AB	200E	3425
252AC	200E	126
252E	200E	70
2701AB	200E	220
2701EC	200E	30
2701HV	200E	170
2701M	200E	20
2703E	200E	310
2704HV	200E	20,270
2707AR	200E	1,551
271CR	200E	416
2711A	200E	987
2711B	200E	20
2711E	200E	570
2711E66	200E	100
2711E66A	200E	10
2711EA	200E	360
2711EB	200E	360
2711EC	200E	10
2712A	200E	30
2712B	200E	10
2714A	200E	170
2715B	200E	40
2715EC	200E	80
2715ED	200E	60
2716B	200E	646
2716E	200E	60
2718E	200E	140
2719EA	200E	150

Table 1-1. Building/Structure List and Locations

Building/Structure Designation	Area	ERDF Approximate Waste Quantity (ton)
271AB	200E	660
271BA	200E	30
2721E	200E	1,320
2721EA	200E	600
2727E	200E	790
272AW	200E	2,020
272B	200E	140
272BA	200E	80
272BB	200E	70
272E	200E	1,500
272HV	200E	290
2734EA	200E	30
273E	200E	480
274AW	200E	740
274E	200E	310
2750E	200E	8,030
2751E	200E	1,200
2752E	200E	1,200
2753E	200E	1,200
275E	200E	470
275EA	200E	3,280
275E-BA	200E	40
276B	200E	110
277A	200E	260
278AW	200E	150
281A	200E	10
282B	200E	20
282BA	200E	20
282E	200E	110
282EA	200E	30
282EB	200E	50
282EC	200E	220
282ED	200E	30
283E	200E	3,070
283EA	200E	230
283E-BA	200E	50
284E	200E	4,810
284EB	200E	1,270

Table 1-1. Building/Structure List and Locations

Building/Structure Designation	Area	ERDF Approximate Waste Quantity (ton)
2901A	200E	130
2902B	200E	210
2902E	200E	70
2902HV80	200E	160
2902HV82	200E	140
2902HV83	200E	40
291AA	200E	1,545
291AB	200E	10
291AC	200E	10
291AG	200E	10
291AH	200E	144
291AJ	200E	10
292AA	200E	274
292AB	200E	8296
292B	200E	50
294B	200E	30
295A	200E	219
295AA	200E	157
295AB	200E	442
295AC	200E	223
295AD	200E	366
295AE	200E	30
C8S49	200E	20
C8S77	200E	10
MO029	200E	220
MO041	200E	150
MO104	200E	110
MO110	200E	10
MO112	200E	80
MO211	200E	50
MO232	200E	150
MO234	200E	740
MO247	200E	150
MO248	200E	150
MO251	200E	150
MO252	200E	150
MO253	200E	150
MO254	200E	150

Table 1-1. Building/Structure List and Locations

Building/Structure Designation	Area	ERDF Approximate Waste Quantity (ton)
MO256	200E	150
MO257	200E	150
MO266	200E	150
MO267	200E	150
MO268	200E	150
MO269	200E	150
MO272	200E	130
MO276	200E	1,180
MO277	200E	1,180
MO282	200E	150
MO283	200E	150
MO284	200E	150
MO285	200E	890
MO286	200E	890
MO294	200E	1,180
MO312	200E	20
MO354	200E	100
MO370	200E	10
MO377	200E	40
MO386	200E	148
MO388	200E	150
MO398	200E	20
MO399	200E	30
MO400	200E	370
MO405	200E	1,110
MO407	200E	370
MO408	200E	220
MO410	200E	220
MO413	200E	590
MO414	200E	890
MO421	200E	20
MO434	200E	150
MO439	200E	60
MO493	200E	230
MO497	200E	60
MO501	200E	20
MO503	200E	10
MO511	200E	140

Table 1-1. Building/Structure List and Locations

Building/Structure Designation	Area	ERDF Approximate Waste Quantity (ton)
MO546	200E	20
MO571	200E	60
MO722	200E	150
MO723	200E	150
MO724	200E	150
MO725	200E	150
MO727	200E	30
MO730	200E	50
MO732	200E	150
MO733	200E	120
MO734	200E	150
MO742	200E	20
MO816	200E	30
MO840	200E	60
MO844	200E	60
MO850	200E	230
MO890	200E	10
MO919	200E	110
MO974	200E	40
MO979	200E	150
MO996	200E	110
MO997	200E	110
MO998	200E	20
TC272HV	200E	70
200CC-BA	200W	40
201W	200W	30
211S	200W	180
211T	200W	200
211T52	200W	10
212S	200W	70
216ZP1A	200W	30
216ZP1	200W	35
216ZP1B	200W	25
216ZP1C	200W	25
218W5-252	200W	10
218W5-252A	200W	10
2120WA	200W	200
2120WB	200W	200

Table 1-1. Building/Structure List and Locations

Building/Structure Designation	Area	ERDF Approximate Waste Quantity (ton)
2220W	200W	170
222SA	200W	380
222S-BA	200W	70
222SD	200W	90
222SF	200W	60
222SH	200W	60
222T	200W	1,200
225W	200W	50
2259W	200W	30
225WA	200W	20
225WB	200W	10
2262W	200W	50
2263W	200W	40
2265W	200W	30
2300W	200W	110
2304W	200W	60
2306W	200W	70
2307W	200W	70
2308W	200W	70
2309W	200W	290
2310W	200W	120
2314W	200W	40
2315W	200W	20
2318W	200W	80
234-5Z-BA	200W	150
234-5Z-BE	200W	16
2402W	200W	10
2402WB	200W	320
2402WC	200W	320
2402WD	200W	320
2402WE	200W	320
2402WF	200W	320
2402WG	200W	320
2402WH	200W	320
2402WI	200W	320
2402WJ	200W	320
2402WK	200W	320
2402WL	200W	320

Table 1-1. Building/Structure List and Locations

Building/Structure Designation	Area	ERDF Approximate Waste Quantity (ton)
241SX281	200W	30
241SX701	200W	40
241SY272	200W	20
241SY276	200W	10
241T701	200W	10
241TX701	200W	10
242T271	200W	10
242T601	200W	80
242TC	200W	10
2420W	200W	20
2506W1	200W	40
252S	200W	60
252W	200W	40
2620W	200W	330
267Z	200W	10
2704S	200W	650
2707SX	200W	110
2708S	200W	10
2710S	200W	30
2710W	200W	10
2711S	200W	10
2712S	200W	10
2712T	200W	10
2713W	200W	80
2713WB	200W	20
2713WC	200W	140
2715S	200W	20
2715T	200W	50
2715WA	200W	190
2715ZL	200W	10
2716S	200W	140
2716T	200W	20
2718S	200W	16
2719WB	200W	370
2722W	200W	110
2727W	200W	190
2727WA	200W	190
272S	200W	690

Table 1-1. Building/Structure List and Locations

Building/Structure Designation	Area	ERDF Approximate Waste Quantity (ton)
272WA	200W	1,240
272W-BA	200W	50
2724WB	200W	150
2734S	200W	40
273W	200W	480
2740W	200W	890
2754W	200W	370
275W	200W	320
276S	200W	12,621
277T	200W	100
278WA	200W	150
282W	200W	110
282WA	200W	30
282WB	200W	10
282WC	200W	220
282WD	200W	30
283W	200W	3,370
283WA	200W	230
283WB	200W	20
283W-BA	200W	50
283WC	200W	60
283WD	200W	30
283WE	200W	80
283WF	200W	30
284W	200W	4,110
284WB	200W	140
285W	200W	10
286W	200W	10
2901S	200W	210
2902W	200W	70
2904SA	200W	10
296S012	200W	5
HS0001	200W	20
HS0002	200W	20
MO011	200W	130
MO014	200W	70
MO015	200W	50
MO016	200W	50

Table 1-1. Building/Structure List and Locations

Building/Structure Designation	Area	ERDF Approximate Waste Quantity (ton)
MO017	200W	50
MO027	200W	150
MO028	200W	220
MO031	200W	220
MO032	200W	220
MO037	200W	440
MO039	200W	220
MO107	200W	130
MO223	200W	50
MO235	200W	150
MO240	200W	150
MO244	200W	220
MO249	200W	150
MO250	200W	150
MO264	200W	150
MO273	200W	740
MO278	200W	740
MO279	200W	740
MO281	200W	1,180
MO287	200W	890
MO288	200W	30
MO289	200W	30
MO290	200W	150
MO291	200W	740
MO295	200W	20
MO406	200W	220
MO409	200W	300
MO412	200W	440
MO428	200W	150
MO429	200W	150
MO432	200W	150
MO433	200W	150
MO437	200W	150
MO438	200W	150
MO444	200W	50
MO446	200W	50
MO450	200W	10
MO459	200W	70

Table 1-1. Building/Structure List and Locations

Building/Structure Designation	Area	ERDF Approximate Waste Quantity (ton)
MO556	200W	100
MO563	200W	50
MO573	200W	20
MO710	200W	10
MO720	200W	1,180
MO721	200W	300
MO739	200W	40
MO743	200W	440
MO760	200W	120
MO837	200W	50
MO841	200W	100
MO847	200W	20
MO892	200W	110
MO906	200W	110
MO939	200W	50
MO956	200W	120
MO970	200W	270
MO971	200W	270
MO2109	200W	47
MO2110	200W	47
MO2111	200W	47
MO2112	200W	59
MO2113	200W	47
MO2114	200W	59
MO2115	200W	59
MO2116	200W	47
MO2117	200W	59

Table 1-1. Building/Structure List and Locations

Building/Structure Designation	Area	ERDF Approximate Waste Quantity (ton)
MO2118	200W	47
MO2119	200W	47
MO2120	200W	47
MO2121	200W	47
MO2122	200W	59
MO2123	200W	59
MO2124	200W	71
MO2177	200W	10
MO2304	200W	10
MO2305	200W	10
MO2306	200W	10
MO2307	200W	10
MO2506	200W	12
MO6500	200W	12
X8	200W	10
HO-64-5928	200W	5
2701-ZE	200W	20
2701-ZC	200W	5
VB-OSS and VB-E	200W	5
Hanford Steam Lines	200E and 200W	1,200
221T R13 Structure	200W	8
221T R17 Structure	200W	8

*Building 241CX40 will not be demolished per letter “Tank 241-CX-72 at Strontium Semiworks” from Ecology to DOE and Westinghouse Hanford Company (9404884).

1.3.2 Release or Threatened Release into the Environment of a Hazardous Substance, Pollutant, or Contaminant

Contaminant sources addressed by this RAWP include both radioactive and chemical hazardous substances.

The primary sources of hazardous substances potentially include, but are not limited to the following:

- Americium-241
- Cesium isotopes
- Cobalt-60
- Europium isotopes
- Strontium-90
- Plutonium isotopes
- Uranium isotopes
- Tritium (in exit signs)
- Asbestos-containing material (ACM)
- Cadmium
- Beryllium
- Lead paint and shielding
- Polychlorinated biphenyls (PCBs) (e.g., light ballasts and surface coatings)
- Mercury (typically found in electrical switches, gauges, thermometers and lighting)
- Refrigerants (e.g., Freon)
- Lubricants
- Corrosives
- Creosote
- Arsenic
- Biological hazards from animal intrusion in facilities
- Chemicals (old containers of residual chemical constituents)

The removal activities will be performed in accordance with contractor procedures that ensure control over hazardous substances. The contractor's standards and procedures for management of hazardous substances ensure that personnel removing, handling, and disposing of waste perform work in a manner that achieves the following objectives:

- Protects the safety of employees and the general public
- Minimizes spills and releases to the environment
- Meets applicable DOE, federal, state, and local regulatory requirements

1.3.2.1 Asbestos

ACM could be found in and around buildings/structures and within miscellaneous debris. Unnecessary disturbance of vessel or piping insulation, loose floor tiles, transite wall coverings or panels, sheetrock, electrical wire insulation, ducting, or other suspect ACM will be avoided.

1.3.2.2 Cadmium

Cadmium is a byproduct of the metal-finishing process and could also be present in electrical equipment. At certain levels, cadmium is regulated as a hazardous waste. If waste containing cadmium above regulatory limits is generated, it will be treated, as appropriate, prior to disposal.

1.3.2.3 Beryllium

Beryllium contamination could be present in buildings/structures and debris addressed under this removal action. Although beryllium is not regulated as a hazardous waste, there are health and safety requirements that must be addressed when working with beryllium-contaminated structures.

1.3.2.4 Lead

Lead may exist in surface coatings (e.g., lead-based paint, lead-shielded cables), plumbing, and in other forms (e.g., lead shot, brick, sheet, and cast-lead forms). Personnel must exercise caution to avoid disturbing or contacting lead or suspect lead material.

1.3.2.5 PCBs

PCBs may be found in facilities/structures and debris (e.g., painted surfaces and waste oils). Materials removed or demolished that contain or may contain PCBs will be removed for disposal consistent with substantive standards of *Toxic Substances Control Act of 1976* (TSCA)

1.3.2.6 Mercury

Mercury could be present in electrical equipment. At certain levels, mercury is regulated as a dangerous waste. Waste containing mercury above regulatory limits will require treatment prior to disposal.

1.3.2.7 Refrigerants

Refrigerants are regulated due to their effect on the ozone layer of the atmosphere. Refrigerants will be "recovered" to the extent practicable prior to disposal of the equipment.

1.3.2.8 Lubricants

Lubricants may contain hazardous substances. Equipment will be drained of lubricants to the extent practicable prior to disposal.

1.3.2.9 Commercial Solvents

Commercial solvents may be categorized as a dangerous waste. Equipment will be drained of commercial solvents that may require treatment prior to disposal.

1.3.2.10 Corrosives

Corrosives may be encountered. In the State of Washington, corrosive solids and liquid waste above the regulatory limits must be treated, as appropriate, prior to disposal.

1.3.2.11 Sodium Vapor and Mercury Vapor Lighting

Sodium vapor and mercury vapor lighting may be dispositioned through the Hanford Site Centralized Consolidated Recycling Center in lieu of disposal. Sodium and mercury above certain concentrations are regulated as dangerous waste. Regulated materials destined for disposal will be treated, as appropriate.

1.3.2.12 Biological Hazards

Biological hazards such as bird and rodent carcasses and feces could be encountered. Such materials, if contaminated with hazardous substances, will be treated and disposed as appropriate.

1.3.2.13 Chemicals

The potential exists for the discovery of residual chemicals (e.g., solvents, greases, hydraulic and fuel oils, and aerosols). These materials will be recycled or disposed in accordance with requirements of the receiving facility.

2 Removal Action Elements

The following subsections provide a general description of the work activities that will be performed as part of the D4 and debris cleanup activities.

2.1 Removal Action Work Activities

Implementation of this removal action may include the following activities:

- Remove the nonradiological and radiological hazardous substances from within and around the buildings/structures, as appropriate
- Decontaminate, fix contamination, and isolate systems, as needed
- Demolish each building/structure to grade or below, as appropriate
- Deactivate remaining below-grade structures (e.g., basements, utilities) and fill void spaces
- Clean up miscellaneous debris
- Dispose of wastes generated during D4 or debris cleanup activities
- Stabilize the area, as needed.

Using the most recent information concerning field conditions, work packages will be developed to direct work activities and instruct workers in the most appropriate work methods. Work packages will be written in accordance with this RAWP. Existing contractor procedures and specifically developed instructions will be used to perform and control the removal and disposal activities. Field activities are described in more detail in Section 2.2.

2.2 Field Activities

The following subsections describe the field activities that may be associated with this removal action.

2.2.1 Mobilization and Site Preparation

Mobilization and site preparation may include the following:

- Establishing site utility services (e.g., temporary power, lighting, and water)
- Constructing roads, field support facilities, waste container survey and storage areas, and decontamination stations. Hanford Site roadways will be constructed of existing site materials, except the surface course, which may be imported
- Isolating and/or verifying isolation of utilities and systems
- Identification of underground injection control (UIC) wells in the proximity of the work area and notifying the company single point of contact (SPOC).

2.2.2 Removal Activities

The following subsections describe removal activities.

2.2.2.1 Removal of Hazardous Substances

Nonradiological and radiological hazardous substances will be removed from within and around the buildings/structures, as needed prior to demolition to facilitate compliance with ARARs and to meet waste acceptance criteria for the Environmental Restoration Disposal Facility (ERDF) or other disposal facility. Refer to Section 1.3.2 for the list of the primary hazardous substances.

Removal and disposal of asbestos and ACM will be performed in accordance with the substantive provisions of the *Clean Air Act and Amendments* (40 CFR 61, Subpart M) as identified in the Action Memorandum, which require special precautions to control airborne emissions of asbestos fibers during asbestos removal activities.

Asbestos abatement activities will be performed in full compliance with all substantive "National Emission Standards for Hazardous Air Pollutants" (NESHAP) standards that are ARAR for the work. Prior to the commencement of the demolition a thorough inspection of the affected facility will be performed for the presence of asbestos, including Category I and Category II nonfriable asbestos containing material (ACM). All Category II nonfriable ACM will generally be presumed to be potentially friable and will be removed prior to the start of actual demolition activities. If DOE identifies any Category II ACM that should be allowed to remain in place during demolition based on knowledge that the demolition will not render friable, information identifying the planned demolition approach and describing how the Category II ACM will not become crumbled, pulverized or reduced to powder, by the forces expected to act on it during the demolition or otherwise friable will be provided in advance to EPA for approval. Category I nonfriable ACM will also be removed prior to the start of actual demolition activities, except in situations where demolition practices will be used that can be or have been demonstrated to the satisfaction of EPA to not render the Category I ACM friable, consistent with NESHAP standards. Demonstration can be performed using existing EPA or Washington State guidance regarding asbestos abatement under NESHAP. Such Category I nonfriable ACM must not be in poor condition and planned demolition activities must not subject the ACM to sanding, grinding, cutting, or abrading. In all cases, ACM that is either friable or cannot be demonstrated to remain nonfriable during a demolition will be removed prior to such demolition as required by NESHAP.

In instances where beryllium-contaminated materials may be present, special controls for beryllium will be necessary. Beryllium-contaminated materials will be managed in a manner that ensures worker protection. Prior to demolition, beryllium contamination may be fixed in place, as required.

Known liquid PCBs will be removed from buildings/structures prior to demolition. Other PCBs will only be removed as needed prior to demolition to facilitate proper disposal in accordance with ARARs and the waste acceptance criteria for ERDF or other receiving facility. PCB surface coatings and PCB spills (e.g., dried paints, adhesives) on concrete and other materials (both porous and non-porous materials) may be stabilized or fixed in place prior to demolition and the resulting demolition debris disposed as PCB bulk product waste or PCB remediation waste, as appropriate.

Where slabs or below-grade structures with suspected PCBs will be left in place, sampling may be performed to determine if potentially previously contaminated surfaces meet the substantive PCB decontamination standards of 40 CFR 761.79 without further action. When such sampling is performed, the results will be used to determine the TSCA status of the slab or structure to be left in place. If the results of sampling indicate presence of PCB contamination above applicable levels from 40 CFR 761,the contamination will be removed from the slab or structure to be left in place, if practicable, in accordance with substantive standards of 40 CFR 761.79(b) or (c). Materials separated from the contaminated slab or structure will be disposed as PCB waste. Subsequent sampling of the slab or structure to be left in place will be performed after decontamination. When decontamination is achieved to below applicable levels of

40 CFR 761.79, the slab or structure will no longer be subject to TSCA. If decontamination methods other than those addressed in 40 CFR 761.79(b) or (c) are determined necessary, concurrence of the alternate decontamination approach would be obtained from EPA prior to implementation.
If decontamination is impracticable or unachievable, the contractor may consult with the On Scene Coordinator regarding the slab or structure to determine if placement of the slab or structure into waste information data system (WIDS) site is appropriate. If so, the site will be identified by DOE as a new site under the *Hanford Federal Facility Agreement and Consent Order* (Tri-Party Agreement) (Ecology et al. 1989), with concurrence by Ecology and EPA.

Mercury-containing equipment (e.g., switches, gauges, and thermometers), refrigerants, lubricants, caustics, sodium vapor and mercury vapor lights, and any chemical containers will be removed and disposed or will be recycled.

Other hazardous substance contamination on surfaces or embedded in the structural materials, such as lead paint, heavy metals (e.g., cadmium and arsenic), and creosote, may be fixed in place prior to demolition and the resulting structural materials disposed as solid, hazardous or mixed waste, as appropriate, depending on the levels of contamination and waste characterization results.

2.2.2.2 Decontamination Activities

Decontamination of equipment, waste containers, etc. to support this removal action will generally be performed using dry methods (e.g., brushing or wiping, high-efficiency particulate air [HEPA]-filtered vacuum cleaners) to the extent possible. When the use of wet methods (e.g., water wash, pressure washers) is required to achieve decontamination objectives, the associated water or cleaning solutions will be collected, and work will be conducted by trained site workers in accordance with the following best management practices.

- Decontamination activities will be performed within the area of contamination.
- The amount of water used to clean equipment will be minimized, using raw or potable water.
- Soaps, detergents, or other cleaning agents may be added to wash water as long as there are no regulated levels of constituents present.

In some instances, more aggressive equipment decontamination methods (e.g., grinding or wet grit blasting) may be used for equipment decontamination if other methods fail, and will also be conducted by trained site workers using best management practices to minimize the potential for airborne contamination and waste generation.

The project may also opt to perform other methods of equipment washing and/or decontamination for a completed site (e.g., wrap the equipment for transfer to a decontamination pad, provide for a temporary facility at the site to collect wash water, or fix the contamination to the equipment). Decontamination fluid/wash water that is collected will be managed in accordance with Section 4.2 of this RAWP.

2.2.2.3 Demolition Activities

Demolition of building and structures will include removal of above-grade structures. The majority of the demolition will require the use of heavy equipment (e.g., excavator with various attachments) to demolish the structures. Other standard industry or conventional demolition practices also may be used (e.g., hydraulic shears with steel shear jaws, concrete pulverizer jaws or breaker jaws, cranes with wrecking ball, pneumatic hammers, mechanical saws, cutting torches, and/or controlled explosives). Demolition methods will be selected based on the structural elements to be demolished, remaining contamination, location, and integrity of the structure. Controls such as portable ventilation filter units, HEPA-filtered

vacuum cleaners, greenhouses, fogging agents, and/or water may be used to control dust generated from demolition activities. The amount of water used will be minimized to prevent ponding and runoff. Additional stormwater run-on and run-off controls may be implemented, as needed. Such controls, if applicable, will be described in the work packages.

Equipment and piping within and around the buildings/structures, including pumps, pipes, tanks, boilers, compressors, ductwork, electrical components, and other equipment may be removed, as necessary. Below-grade structures will be removed and disposed of in the same fashion as above-grade buildings and structures. However, if below-grade structures (including basements, pipes and utility systems) are not contaminated or may be decontaminated, they will optionally be left in place, void spaces backfilled, and brought to grade. Backfill will consist of clean fill materials and/or inert demolition waste from the above-grade structures. Piping and drains entering or exiting each building/structure below-grade will be plugged or grouted to prevent potential pathways to the environment. Depending on the configuration of the area to be excavated, shoring or sloping may be required to comply with safety requirements and to reduce the quantity of excavated soil. Excavations will be backfilled and/or contoured after removal action is completed.

Demolition and disposal of the Hanford steam lines and associated above-grade components and support structures will be addressed by this removal action. The Hanford steam lines are located throughout the central plateau and contain or may contain asbestos insulation which will be removed and packaged for disposal at the ERDF in accordance with NESHAP, Subpart M standards.

There is potential for encountering contamination to surrounding soils during the course of decommissioning work. Soil that is contaminated with substances that are known or easily determined to be associated with normal building/structure operation or maintenance will be removed for disposal during building/structure demolition, as appropriate. Such excavation will be performed using an observational approach with visual inspections, radiological and chemical field screening, and focused judgmental sampling where appropriate. Depth of excavation in these situations will be determined by the on-scene coordinator in consultation with EPA and Ecology. Depth of excavation will be consistent with any anticipated remedial action to the extent practicable. Alternatively, if the contaminated soil has not been removed the site will be identified by DOE as a new WIDS site under the Tri-Party Agreement, with concurrence by Ecology and EPA.

2.2.3 Stabilization

Upon completion of removal activities at a site, the site will be stabilized in a manner that will mitigate potential industrial safety hazards and not unduly hinder future remediation, should it be necessary.

2.2.4 Sampling Activities

As needed, sampling plans will be developed to support waste characterization and disposal activities. The EPA-developed data quality objectives process for data collection, sampling and sampling rationale will be used in developing such plans. Where process knowledge, historical analytical data, and radiological and chemical screening are sufficient to characterize waste for disposal, a sampling and analysis plan is not required.

2.2.5 Waste Disposal

Waste management and disposal activities will be performed in accordance with waste management ARARs identified in the Action Memorandum, DOE/RL-2010-22, and as discussed in Section 4.2 of this document.

3 Safety and Health Management and Controls

This section describes safety and health management and controls that will be performed for the removal activities.

3.1 Emergency Management

The contractor's Emergency Management Program (including preparedness, planning, and response) contains the administrative responsibilities for compliance with DOE/RL-94-02, *Hanford Emergency Response Plan*, and all applicable DOE Orders. The Emergency Management Program establishes a coordinated emergency response organization capable of planning for, responding to, and recovering from industrial, security, and hazardous material incidents. Emergency action plans for contractor-managed hazardous facilities identify the capabilities necessary to respond to emergency conditions, provide guidance and instruction for initiating emergency response actions, and serve as a basis for training personnel in emergency actions for each facility.

The emergency response actions within the emergency action plan are provided for recognizing incidents and/or abnormal conditions, initiating protective actions, and making the proper notifications. Emergency response for this project will include required notification to the National Response Center for reportable quantity releases and on-scene coordinator notification for other emergency situations.

3.2 Safeguards and Security

Access to the Hanford Site is restricted. Access to each removal action area is controlled by the contractor using such items as fences and signs. Access requirements for employees, non-employees, and/or visitors are defined in a health and safety plan (HASP).

3.3 Safety and Health Program

The potential personnel and environmental hazards are those associated with the non-routine activities of D4 operations. The buildings/structures, and cleanup of miscellaneous debris that are the subject of this removal action were never used for radiological or chemical processing. However, these buildings, structures, and debris may be potentially contaminated with hazardous substances as a result of their proximity to Hanford Site contamination and based on the building/structure and debris components and contents (e.g., asbestos, paints, coatings, and so forth).

Because of the potential for these buildings/structures and debris to be contaminated with hazardous substances (both chemical and radiological), the HASP prepared for this action will address chemical, radiological, and physical hazards as described in the following subsections. The HASP will specify the physical and administrative controls and requirements for work activities for the protection of both personnel and the environment.

3.3.1 Worker Safety Program

The Integrated Safety Management System/Environmental Management System will be incorporated into all work activities. The program includes the following elements:

- Organizational structure specifying the official chain of command and the overall responsibilities of supervisors and employees
- Comprehensive work plan developed before work begins at a site to identify operations and objectives and to address the logistics and resources required to accomplish project goals

- HASP developed when workers could be exposed to hazardous substances
- Worker training commensurate with individual job duties and work assignments
- Medical surveillance program administered to comply with the Occupational Safety and Health
- Administration requirements (29 CFR 1910.120)
- Contractor's internal work requirements and processes
- Voluntary protection program

3.3.2 Health and Safety Plan and Activity Hazards Analysis

A HASP will be prepared that defines the chemical, radiological, and physical hazards and specifies the controls and requirements for implementing D4 and debris cleanup work activities associated with this RAWP.

Access and work activities are controlled in accordance with approved work packages, as required by established internal work requirements and processes. A HASP addresses the health and safety hazards of each phase of site operation and includes the requirements for hazardous waste operations and/or construction activities, as specified in 29 CFR 1910.120. As part of work package development, a job or activity hazards analysis will be written to identify the hazards associated with specific tasks already not covered under a HASP. The elements included in a HASP are as follows:

- General overview of the hazards associated with the area
- List of employee training assignments
- List of personal protection equipment (PPE) to be used at the work site
- Medical surveillance requirements
- Work site control measures
- Emergency response
- Confined space entry internal work requirements and processes
- Spill containment program

A pre-job briefing will be held with the involved workers. This briefing will include reviews of the hazards that could be encountered and the associated requirements.

3.3.3 Radiological Controls and Protection

The radiological controls and protection program is defined in DOE-approved programs and contractor-approved internal work requirements and processes. The radiological controls and protection program implements the contractor's policy to reduce risks to safety or health to levels that are as low as reasonably achievable (ALARA) and to ensure the adequate protection of workers [2]. The contractor's radiological protection program meets the requirements of 10 CFR 835. Appropriate dosimetry, PPE, ALARA planning, periodic surveys, and radiological control technical support will also be provided.

[2] Worker safety and health standards are not environmental standards per se and therefore not potential ARARs. Instead, compliance with applicable safety and health regulations is required external to the CERCLA ARAR process. However, a discussion of the safety and health requirements is included in this appendix, as a result of the nature and importance of these standards.

In addition to a HASP, a radiological work permit (RWP) will be prepared, as needed, for work in areas with potential radiological hazards. The RWP extends the Radiological Protection Program to the specific work site or operation. All personnel assigned to the project and all work site visitors must strictly adhere to the provisions identified in HASP and RWP.

The standard contractor's controls for work in radiological areas are assessed as adequate to control project activities. These controls will identify the specific conditions and will govern the specific requirements for an activity, periodic radiation and contamination surveys of the work area, and periodic or continuous observation of the work by the radiological controls organization. The ALARA planning process will be used to identify shielding requirements, contamination control requirements, radiation monitoring requirements, and other radiation control requirements for the individual tasks conducted during the projects.

Measures also will be taken to minimize impacts to the environment during work activities. Section 4.3 of this RAWP addresses the controls to be used during project activities to address the potential release of the radionuclides into the environment, but not to the exclusion of 10 CFR 835 requirements. Radiological worker exposure will be monitored using approved occupational radiological protection methods.

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4 Environmental Management and Controls

4.1 Applicable or Relevant and Appropriate Requirement Compliance

The ARARs for this removal action are identified in the Action Memorandum, DOE/RL-2010-22. The key ARARs include waste management standards, standards controlling releases to the environment, and standards for protection of cultural and natural resources.

4.2 Waste Management Plan

A variety of waste streams will be generated under this removal action. It is anticipated that some of the waste will potentially be determined to be low-level waste (LLW). However, dangerous or mixed waste, PCB waste, and asbestos and asbestos-containing material also could be generated. The majority of the waste will be in a solid form. However, some liquid wastes might be generated. Waste management activities will be performed in accordance with the following ARARs:

- The *Atomic Energy Act of 1954* for management by DOE of radioactive waste.
- RCRA, as implemented by 40 CFR 260 through 268 and *Washington Administrative Code* (WAC) 173-303 for management of dangerous waste. The identification, storage, treatment, and disposal of hazardous waste and the hazardous component of mixed waste are governed by RCRA. The State of Washington, which implements RCRA requirements under WAC 173-303, has been authorized to implement most elements of the RCRA program. The dangerous waste standards for generation and storage will apply to the management of any dangerous or mixed waste generated by the decommissioning activities at the Hanford excess industrial buildings/ structures and as a result of debris cleanup activities. Treatment standards for dangerous or mixed waste subject to RCRA land disposal restrictions (LDRs) are specified in WAC 173-303-140, which incorporates 40 CFR 268 by reference.
- TSCA includes standards for management of PCB waste. The disposal of PCB wastes are governed by regulations at 40 CFR 761. PCB wastes that are generated during decommissioning and debris cleanup activities will be disposed at ERDF or other appropriate facility in accordance with the substantive provisions of 40 CFR 761.PCBs also are considered underlying hazardous constituents under RCRA for waste that designates as dangerous or mixed waste, and thus could require treatment to meet WAC 173-303 and 40 CFR 268 requirements.
- The *Clean Air Act of 1990* (CAA), as implemented by 40 CFR 61, Subpart M. Removal and disposal of asbestos and ACM are regulated under the CAA (40 CFR 61, Subpart M). These regulations provide for special precautions to control environmental releases or exposure to personnel due to airborne emissions of asbestos fibers during removal actions.

Wastes generated through implementation of this removal action will be disposed of at ERDF, the preferred waste disposal facility, in accordance with the waste acceptance criteria (WCH-191, *Environmental Restoration Disposal Facility Waste Acceptance Criteria*). Alternate onsite and/or offsite waste treatment or disposal facilities that meet 40 CFR 300.440 criteria may be considered if determined to be suitable.

DOE may also identify certain wastes generated from activities under the scope of the NTCRA for use in remedial actions, such as backfill, under the barrier associated with the 221-U Facility (EPA 2005) remedy, if such wastes meet applicable criteria of the decision document. DOE would consult with Ecology and EPA for candidate wastes prior to decisions regarding such use (including identification of storage locations).

Waste management activities that may be addressed in the work packages include waste characterization, designation, staging, packaging, handling, marking, labeling, segregation, storage, transportation, and disposal and are briefly described in the following subsections.

4.2.1 Projected Waste Streams

Projected waste streams anticipated to be generated under this RAWP are identified as follows:

- Liquids (e.g., decontamination liquids)
- Miscellaneous solid waste (e.g., PPE, cloth, plastic, wipes, wood, equipment, tools, pumps, wire, metal casing, plastic piping, and sample returns)
- Spent/ excess chemicals/ reagents and used oils
- D4 debris (e.g., structural materials, concrete, wood, rebar, metal/plastic pipes, wire, equipment, pumps, tanks, boilers, compressors, ductwork, and electrical components)
- General construction debris, office/lunch waste

4.2.2 Waste Characterization, Designation, and Disposal

Waste generated through implementation of this removal action will be characterized in accordance with the contractor's procedures and the waste acceptance criteria of the receiving facility. Characterization is performed using a variety of information that includes, but is not limited to, process knowledge, historical analytical data, sampling and analysis, and radiological and chemical screening.

Contractor personnel will assess the buildings, structures and debris before the demolition and removal activities begin and, as needed, during the removal action. As appropriate, radiological surveys will be performed using hand-held or other instruments or equipment.

Waste characterization information will be used to develop the following, as applicable:

- Contaminant identification
- Contaminant concentrations
- Waste treatment requirements
- Waste packaging and disposal requirements
- Worker health and safety precautions
- Decontamination requirements
- Operational precautions
- Waste acceptance documents
- Waste transportation documents

4.2.2.1 Sample Waste

Screening and analysis of both solids and liquids may be conducted using offsite or Hanford Site laboratories. Samples from onsite laboratories may be returned to the area of contamination. Unused samples and associated laboratory waste from offsite analyses will be managed by the laboratory in accordance with contract specifications. Waste from field screening and Hanford Site laboratories will be managed depending on whether it has been altered. Altered samples will be contained and disposed at ERDF or other appropriate facilities as authorized by EPA (e.g., 200 Area Effluent Treatment Facility [ETF]).

4.2.2.2 Waste Handling, Storage and Packaging

Non-bulk containers or packages of waste requiring tracking (e.g., hazardous, mixed) will be assigned a unique tracking number by a waste specialist. If a container is in poor condition, the contents will be transferred to a container in good condition.

Bulk waste may be placed in roll-off containers or haul trucks for ERDF disposal. The containers will be covered when waste is not being added or removed. Lightweight material (e.g., plastic and paper) will be bagged, if appropriate, prior to placement in the container to eliminate the potential for materials blowing out of the container or truck. Waste will be staged in the area of contamination or a site-specific waste storage area or at the ERDF, as appropriate.

Applicable packaging and pre-transportation requirements for dangerous or mixed waste generated by the removal action will be identified and implemented before movement of waste. Before being removed from the area of contamination or site-specific waste storage area, containers and haul trucks being released from radiologically controlled areas will meet exterior contamination limits. Other waste-type-specific handling and packaging requirements may be applicable and will be described in the contractor's work documents, as appropriate.

The building footprint area (BFA) is defined to include the individual building/structure footprint and the surrounding area suitable to support D4 of buildings/structures and excavations. Waste management locations outside of the BFA and within the onsite area will meet the substantive requirements of the ARARs. For waste management inside the BFA, safe and effective management practices will be established to ensure protection of human health and the environment during performance of demolition and related work.

For the buildings/structures addressed under this action, the onsite area is defined as the main industrial portion of the building/structure or group of buildings/structures, and includes ERDF container queues used under this work plan. Within the onsite area only the substantive provisions of the ARARs will be applied.

As an alternative to management within the BFA, waste that is not immediately transported to ERDF or other EPA-approved disposal facility may be stored in staging piles. Staging piles used for the onsite management of materials that designate as dangerous waste will be operated in accordance with substantive provisions of standards and design criteria prescribed in 40 CFR 264.554, paragraphs (d) through (k) as follows:

- Staging piles will be used only as part of this removal action for temporary storage at a facility and must be located within the contiguous property where the waste to be managed in the staging piles is oriented.
- The staging pile will be designed to prevent or minimize releases of hazardous wastes and hazardous constituents into the environment and minimize or adequately control cross-media transfer. To protect

human health and the environment, this may include installation of berms, dust control practices, or using plastic liners or covers, as appropriate.

- The staging pile must not operate more than 2 years (measured from the first time remediation waste is placed in the pile), except when EPA grants an operating term extension. A record of the date when remediation waste was first placed in the staging pile must be maintained until final closeout of the site is achieved.
- Ignitable or reactive waste will not be placed in a staging pile unless it has been treated or mixed before being placed in the pile so that the waste no longer meets the definition of ignitable or reactive waste, or the waste is managed to protect it from exposure to any material or condition that may cause it to ignite.
- Incompatible wastes will not be placed in the same staging pile, unless the requirements in 40 CFR 264.17(b) have been met. The incompatible materials will be separated or the waste will not be piled on the same base where incompatible wastes or materials were previously piled, unless the base has been decontaminated sufficiently to comply with 40 CFR 264.17(b).

Approval of this RAWP by EPA constitutes general authorization to operate staging piles during the execution of this removal action. Specific staging pile locations will be identified in project drawings and approved by EPA. Field operations of staging piles will be accomplished as described above.

Once the materials have been removed, to close out the staging pile, characterization of the residual soil will be performed as appropriate. In cases where staging piles for industrial waste sites are located in an uncontaminated area, the observational approach may be used. In situations where sampling is appropriate and results indicate presence of residual contamination, efforts will be made to remove such contamination.

4.2.2.3 Waste Profile

The contractor will provide waste characterization and necessary transport papers. Waste profiling for establishing values for the waste-tracking form may take place concurrently with removal action activities. Field-screening measurements may be used to obtain data to adjust the waste-tracking form. The waste profile may be adjusted (as necessary) through a combination of in-process field-screening methods, analytical laboratory analysis, and notification of the field engineer.

4.2.3 Waste Generation Management

Marking, labeling, segregation, and staging of waste containers will be performed or directed by the waste specialist. Wastes will be stored at a site specific waste container storage area or area of contamination, unless otherwise identified in contractor work packages. The following sections describe management of specific hazardous substances.

4.2.3.1 Miscellaneous Solid Waste

Miscellaneous solid waste, including rubblized demolition materials, debris, and soils will be managed as appropriate for the nonradiological and radiological contaminants present or suspected to be present, if any. Miscellaneous solid waste that has contacted suspect dangerous or suspect mixed waste will be treated as such. Field screening will be used to segregate radioactive waste from no radiation added (nonradioactive) waste. Container(s) will be properly marked and labeled. The containers will be segregated as appropriate, then staged at the designated waste container storage area or within the area of contamination. Miscellaneous solid waste will be dispositioned based on waste characterization information.

4.2.3.2 Hazardous/Dangerous Waste, Low-Level Waste, and Mixed Waste

These wastes will be packaged, stored, and transported to prevent dispersion and public exposures. Waste-specific storage and packaging requirements will be described in the contractor's work documents, as appropriate.

4.2.3.3 Asbestos Waste

Removal, handling, packaging, and disposal of asbestos and ACM will be performed in accordance with substantive provisions of 40 CFR 61.145(c), 40 CFR 61.150, 29 CFR 1926.1101, and the contractor's procedures for ACM removal.

4.2.3.4 PCB Waste

PCB waste that meets ERDF waste acceptance criteria will be sent to ERDF for disposal in accordance with the substantive requirements of 40 CFR 761.

PCB surface coatings (e.g., dried paints, adhesives) could be present on various surfaces. Such coatings will meet the ERDF waste acceptance criteria at any PCB concentration. Therefore, in some situations, demolition debris (e.g., concrete and other structural materials) potentially coated, painted, or contaminated with PCBs may be conservatively disposed as PCB bulk product waste or PCB remediation waste, as appropriate, in lieu of sampling to determine the presence or absence of PCBs on the materials.

The PCB bulk product waste and/or PCB remediation waste will be managed in accordance with applicable substantive provisions of 40 CFR 761 upon removal from the BFA to a centralized or other established storage area within the CERCLA onsite area (following approval of a centralized area by EPA). Containers managed outside the BFA in identified onsite areas will be marked with a large PCB mark (ML) marking (CAUTION - CONTAINS PCBs) consistent with 40 CFR 761.

Areas outside the BFA containing packaged PCBs will be marked with signs posting "DANGER-UNAUTHORIZED PERSONNEL KEEP OUT" at each entrance. The ML marking will also be posted in accordance with 40 CFR 761.

Staging of containerized PCB waste will be performed in a manner that satisfies the substantive provisions of 40 CFR 761.65(b). Containerized PCB waste may be staged outdoors in "overpack" containers. Although the "overpack" containers may not represent the typical concept of a "facility," they satisfy the substantive requirements for roof, walls, nonporous floors, and spill protection.

4.2.3.5 Equipment

Equipment used to support the removal action that contacts dangerous and/or mixed waste will be decontaminated as described in Section 2.2.2.2. If the equipment cannot be decontaminated, the equipment will be designated for disposal at the ERDF or other appropriate facility.

4.2.3.6 Decontamination Fluids

Decontamination fluids that meet the substantive provisions of existing Hanford state waste discharge permits may be discharged accordingly. Alternatively, decontamination fluids (water and/or non-dangerous cleaning solutions) generated from cleaning equipment and tools in the area of contamination may need to be contained, sampled, and as necessary transported, and discharged into the ETF or solidified for disposal at ERDF.

4.2.4 Management of Waste Containers

Waste containers, including the ERDF roll on/roll off containers, are inspected before use to ensure container integrity. The containers will be stored inside the applicable site-specific waste container

storage area or area of contamination or at a centralized location on the central plateau if prior concurrence is obtained by EPA and Ecology. Containers awaiting analytical results will be marked and labeled as appropriate. Containers showing signs of deterioration will be over packed or repackaged, as necessary.

Spills or releases will be reported as stated in Section 4.5. In the event of a spill or release, action will be taken to protect human health and the environment.

4.2.5 Final Disposal

Wastes generated through implementation of this removal action will be dispositioned at appropriate waste disposal facilities in accordance with the waste acceptance criteria of those facilities. The ERDF is the preferred disposal location for wastes meeting the ERDF waste acceptance criteria.

Waste that does not meet the ERDF waste acceptance criteria may be sent to an offsite facility (e.g., ETF) subject to the facility having received a determination of acceptability by the EPA, in accordance with the Off-Site Rule, 40 CFR 300.400, as applicable.

Aqueous waste determined to be LLW or designated as dangerous or mixed waste may be transported to the ETF for treatment, followed by discharge under Washington's State Waste Discharge Program. ETF is a RCRA-permitted unit authorized to treat aqueous waste streams generated on the Hanford Site and dispose of these streams at a designated state-approved land disposal facility in accordance with applicable requirements. Alternatively, liquids may be solidified for disposal at the ERDF if the waste meets the ERDF waste acceptance criteria.

Waste designated as PCB remediation waste or PCB bulk product waste will be disposed at ERDF, if it meets the waste acceptance criteria. PCB waste that does not meet ERDF waste acceptance criteria may be retained onsite or at a PCB storage area and will be transported for future disposal at an appropriate disposal facility.

4.2.6 Waste Disposal Records

Original Onsite Waste Tracking Forms will be sent to ERDF with each container shipped. Original sample reports and a copy of the Original Onsite Waste Tracking Form for each ERDF container will be retained and forwarded to the assigned waste specialist for inclusion in the project file following final waste disposition.

4.2.7 Waste Treatment

Treatment (e.g., solidification, separation, elementary neutralization, mercury amalgamation, size reduction, repackaging) of certain waste streams may be necessary to provide safe transport, meet waste disposal facility waste acceptance criteria, and/or to address LDR. When necessary, treatment may be conducted at the generating site, ERDF or at an EPA approved offsite facility (e.g., ETF). Offsite treatment must be performed at a facility approved by the EPA in accordance with 40 CFR 300.440. Return of treated waste from offsite treatment facilities for disposal at the ERDF requires authorization from DOE.

4.2.8 Waste Minimization and Recycling

Waste minimization practices will be followed to the extent technically and economically feasible during waste management. Introduction of clean materials into a contamination area as well as contamination of clean materials will be minimized to the extent practicable. Emphasis will be placed on source reduction to eliminate or minimize the volume of waste generated.

Materials released offsite for disposal/recycle must be certified free of contamination in accordance with DOE guidance for non-real property. Waste materials meeting this criterion are not considered CERCLA waste and therefore are not subject to the 40 CFR 300.440 offsite acceptability determination.

4.3 Airborne Emissions

Airborne emissions associated with this removal action will be minimized by the use of appropriate work controls. Airborne releases of contaminants during these removal actions will be controlled in accordance with DOE radiation control and substantive air pollution control standards in order to maintain emissions of air pollutants at the Hanford Site to ALARA levels.

4.3.1 Radiological Airborne Emissions

Although not expected, radioactive contamination may be encountered, resulting in a potential for airborne emissions from certain removal activities performed during this removal action. While the D4 activities and cleanup of miscellaneous debris will be conducted over a period of several years, for purposes of conservatism in calculating the maximum potential for airborne emissions and related impacts, the calculations are based upon an assumption that all removal activities will occur within a single year. Based on historical data reviews and current radiological surveillance information, nearly all of the buildings/structures identified within this RAWP are believed to contain no measurable radiological contamination, and those that do will contain very little. A summary of the maximum estimated building/structure radiological inventory and resultant environmental airborne releases and their impacts is provided in Appendix A. Contamination that may be encountered during the removal activities, including demolition and excavation, is addressed by the estimates in Appendix A.

The emissions estimates are based on the primary isotopes that could be encountered for release and that would comprise the isotopes most responsible for offsite dose. It is recognized that essentially any isotope may be present, but those isotopes other than the primary list would occur in very limited quantities such that their impacts would not affect the overall numeric estimates of public dose. Characterization data will be used to confirm the adequacy of the conservative inventory assumptions for the buildings, structures, and miscellaneous debris and associated emissions estimates. If unusual or excessive radiological contamination is encountered, beyond the conservative estimates, the on-scene coordinator will be consulted and activities reevaluated or deferred, as appropriate to ensure potential impacts are assessed for substantive compliance with the controlling standards.

The removal action will be evaluated and tracked to determine the potential for radionuclide airborne emissions from any point source or diffuse/fugitive source that may be encountered. To accomplish this, radiological field survey data and/or other characterization data will be utilized to estimate the total (unabated) potential release (in curies) for comparison with the upper bounds represented by the maximum estimated inventory and associated release estimates presented in Appendix A. The exposure (dose) estimates in Appendix A are based on inventory values and assumed fractions released, and have been calculated using the DOE guidance for calculating potential-to-emit (PTE) radiological releases and doses (DOE/RL-2006-29, *Calculating Potential-to-Emit Radiological Releases and Doses),* or modeled using the CAP88 PC computer model (EPA-approved versions). As presented in Appendix A, the maximum estimated exposure to any public individual would be 8.1E-02 mrem/year total effective dose equivalent (TEDE) or less from any one building/structure removal activity, including associated excavation. This is well below the overall Hanford Site standard of 10 mrem/year TEDE.

Airborne emissions control and emissions monitoring requirements for any radiological air emissions will be provided as required, based on the calculated/modeled value of the potential emissions and resultant public exposure, and will be included in the contractor's work packages.

4.3.2 Criteria/Toxic Emissions

The primary source of emissions resulting from this removal action will be fugitive particulate matter. In accordance with WAC 173-400-040(3) and (8), reasonable precautions will be taken to (1) prevent the release of air contaminants associated with fugitive emissions resulting from demolition, materials handling, or other operations; and (2) prevent fugitive dust from becoming airborne from fugitive sources of emissions.

Operation of trucks and other diesel-powered equipment during these removal activities would be expected, in the short term, to introduce quantities of sulfur dioxide, nitrogen dioxide, particulates, and other pollutants to the atmosphere, typical of similar-sized construction projects. These releases would not be expected to cause any air quality standards to be exceeded. Dust generated during removal activities would be minimized by watering or other dust-control measures, e.g., use of fixatives. Vehicular and equipment emissions will be controlled and mitigated in compliance with the substantive standards for air quality protection that apply to the Hanford Site. These techniques are considered reasonable precautions to control fugitive emissions as required by the substantive requirements.

Emissions that would be subject to the substantive applicable requirements of WAC 173-460 after use of treatment technologies are not anticipated to be a part of this removal action.

Treatment of some waste encountered during the removal action may be required to meet the ERDF waste acceptance criteria. In most cases, the type of treatment anticipated will consist of solidification/stabilization techniques such as macroencapsulation or grouting, and WAC 173-460 will not be considered an ARAR because the work will not result in the emission of toxic air pollutants at regulated levels. If more aggressive treatment is required that would result in the emission of regulated air pollutants above de minimis emission values in WAC 173-460-150, the substantive requirements of WAC 173-400-113(2) and WAC 173-460-060 will be evaluated to determine applicability and satisfy substantive requirements determined to be ARAR.

4.3.3 Asbestos Emissions

Removal and disposal of asbestos and ACM are regulated under the CAA. The substantive provisions of these regulations provide for special precautions to prevent environmental releases or exposure to personnel of airborne emissions of asbestos fibers during removal actions.

4.3.4 Emission Limits and Controls

Based on analysis of the potential emissions and analysis of available control technologies, the following controls have been selected for use during the removal action.

- Water will be applied, as needed, during any excavation and backfilling/recontouring activities, to spray for suppression of fugitive emissions including dust.
- Fixatives will be applied to structural materials, debris and equipment, and/or contaminated soil as needed, to minimize airborne contamination during the removal action activities for fugitive emissions and dust. Fixative application techniques may include spraying, fogging, brushing on, pouring, or some other method, as necessary.
- Fixatives or cover material (e.g., soil, gravel, etc.) will be applied to disturbed contaminated soils, when field activities will be inactive more than 24 hours except as noted in the next bullet.
- If a fixative has already been applied and the fixed contaminated items will remain undisturbed, further use of fixatives will not be needed. The fixatives or other controls will not be applied when the contaminated items are frozen, or it is raining, snowing, or other freezing precipitation is falling.

- Field activities will be temporarily ceased and the area placed in a safe configuration if airborne contamination control measures are not expected to be adequate, based on site conditions (e.g., excessive wind). Additionally, a fixative will be applied to the demolition site and debris piles as needed to help control dust and radiological and non-radiological contaminants.
- Waste packages will remain closed, except during packaging and waste inspection activities, once they are staged.
- Operational limits for removable or transferable radioactive contamination levels will be established in the activity work packages and associated radiation work plans. Fixatives or other physical controls will be employed if removable or transferable contamination levels (other than specks of contamination) above 100,000 disintegrations per minute (dpm) per 100 cm^2 beta/gamma or exceeding 2,000 dpm per 100 cm^2 alpha are measured or expected.

4.3.5 Monitoring Requirements

As presented in Appendix A, even the conservative assumptions for upper bounding potential releases result in minor potential for emissions of radionuclides. Therefore, the substantive monitoring requirements will entail periodic confirmatory measurement to verify low emissions, and this may be achieved by various methods including radiological field surveys, engineering calculations, or ambient air monitoring.

Many of the buildings/structures identified within this RAWP are believed to have little or no radiological contamination based on historical data reviews. The PTE from buildings/structures with no appreciable radiological contamination is negligible. As an alternate approach (i.e., in lieu of applying an emission estimate), a summary of the facility environmental hazards may be provided to EPA for review and approval confirming that an emission estimate is not required. In situations where such approval is granted, no radiological controls would be needed for associated D4 activities. If, however, contamination is discovered during the D4 activities, an emissions estimate will be prepared and provided to EPA for review and approval.

4.4 Liquid Effluents

Liquid effluents may be generated during the removal action activities (e.g., decontamination solutions, water sprays for dust suppression). Liquid effluents will be managed in a manner consistent with substantive provisions in existing Hanford state waste discharge permits to minimize potential for impacts to groundwaters from the removal action.

Discharge to the environment of liquid effluents will be controlled during removal activities through the use of standard industry practices. Water spray for dust suppression will be used in a manner that minimizes the potential for ponding or runoff that could result in the spread of hazardous substances.

4.5 Notifications

Notification will be provided to the National Response Center (NRC) in accordance with 40 CFR 302 and company procedures for any previously unidentified discovery of a release of a hazardous substance into the environment in excess of a reportable quantity. Notification will also be provided to the NRC for unanticipated releases (i.e., releases that are not covered by the removal action) of hazardous substances to the environment.

Notification will be provided to the community emergency coordinator for the local emergency planning committee and to the State Emergency Response Commission will be provided if required by 40 CFR 355.

Notifications provided to the NRC and the community emergency coordinator will also be provided to the on-scene coordinator.

Notification will be provided for information purposes to the company SPOC regarding UIC wells identified during (and/or before or after) the implementation of this RAWP. The notification will identify to the SPOC the location of the UIC well(s) in adequate detail so the well can be tracked by the company for future purposes. The notification to the SPOC can be provided either via telephone or email.

4.6 Cultural and Ecological Resources

Cultural and ecological resource reviews will be performed, as appropriate, before starting the removal action activities to identify any potential impacts. The cultural and ecological resource reviews will be conducted in accordance with DOE requirements. If potential impacts are discovered by these reviews, an appropriate mitigation action plan will be developed and implemented. The following sections provide further detail for the implementation of these reviews.

4.6.1 Cultural Resources

A *National Historic Preservation Act*, Section 106, cultural resource review (CRR) will be conducted to address the demolition of the miscellaneous buildings and structures on the Hanford Site. All of the buildings/structures are located in areas that have been extensively disturbed by past construction activities. Hanford Site buildings/structures have been evaluated for their National Register of Historic Places eligibility as part of DOE/RL-97-56, *Manhattan Project and Cold War Era Historic District Treatment Plan* (Treatment Plan). Some buildings/structures have been determined to be contributing properties to the Manhattan Project/Cold War Era Historic District with mitigation in the form of documentation required. The Treatment Plan also requires that walkthroughs be completed to identify artifacts that are of educational and interpretive value. Before field activity begins, each building/structure requiring documentation will be evaluated for the following.

1. The type of documentation required for each building/structure (Historic Property Inventory Form or Expanded Historic Property Inventory Form).

2. The status of that documentation. In addition, as appropriate, walkthroughs of the buildings/structures will be conducted before demolition to finalize all mitigation requirements. CRR documentation requirements for any specific building/structure will be identified/completed before demolition activities begin.

Appropriate CRR(s) will also be conducted to address the cleanup of debris. A graded CRR could be developed to address cleanup of the debris that has been identified to date, as well as those that may be identified in the future, to ensure that adverse effects on potential archaeological sites are avoided. CRR documentation requirements, including any necessary site-specific field evaluations, will be identified/completed before debris cleanup begins.

Impacts on cultural resources in the vicinity of the removal actions will continue to be mitigated in accordance with DOE/RL-98-10, *Hanford Cultural Resources Management Plan*.

4.6.2 Ecological Resources

Ecological reviews will be carried out before work begins in areas where there is a potential for adverse impacts to sensitive or rare biological resources, consistent with existing routine procedures (DOE/RL-95-11, *Ecological Compliance Assessment Management Plan*). Because most of the demolitions will occur in areas that have been previously disturbed, the potential for effects on sensitive ecological resources is expected to be minimal.

All of the buildings/structures have the potential to support nesting by migratory birds, and building/structure-specific surveys must be conducted at each building/structure prior to decommissioning. Project engineers will consult with the ecological compliance staff in advance of planned decommissioning activities to allow for sufficient surveys. If nesting migratory birds are observed, decommissioning will be delayed until after the end of the nesting season. Many of the buildings/structures also have the potential to provide roosting habitat for various species of bats. Communal roost sites for many bat species are considered a high conservation priority for the Washington Department of Fish and Wildlife. Surveys for bats must be performed at each building/structure prior to decommissioning. If any are found, appropriate mitigation should be developed in consultation with qualified bat biologists. Spring and summer are the preferred seasons to survey for bats. No plant or animal species listed as threatened or endangered under the federal *Endangered Species Act*, or candidates for such protection, are known to be affected by the buildings/structures decommissioning. Very little native or natural habitat is present in the vicinity of the buildings/structures slated for decommissioning. However, care will be taken to avoid or minimize damage to any vegetation, especially shrubs or trees that are in the vicinity of the buildings/structures. Workers also will avoid all wildlife that may be found in and around the buildings/structures.

Appropriate ecological surveys of debris cleanup sites also will be conducted before field activities begin. Procedures to avoid or mitigate damage to sensitive areas identified during the reviews will be established before work begins, including activities occurring on the Hanford Reach National Monument environs. For example, it is expected that many of the sites will have relatively small collections of material that could be removed without undue disturbance of the surrounding areas. However, debris cleanup that will require travel of vehicles off maintained roadways or the use of other heavy equipment and/or excavation will require site-specific evaluation and review of the biological resources at the time the work is scheduled. If off-road travel is necessary during cleanup, additional disturbance will be minimized to the extent possible and planned to avoid any sensitive ecological resources identified within the area.

Impacts on ecological resources in the vicinity of the removal actions will continue to be mitigated in accordance with DOE/RL-96-32, *Hanford Site Biological Resources Management Plan* and DOE/RL-96-88, *Biological Resources Mitigation Strategy*.

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5 Project Administration

The following sections describe the management approach for implementation of the removal action, including schedule summary information, a description of the project team, training and qualifications, quality assurance and post-removal action activities.

5.1 Cost Summary

The projected cost, as identified in the Action Memorandum, is identified in Table 5-1.

Table 5-1. Summary of Present Worth Cost Estimate

Alternative	Present-Worth Cost
Alternative 3: Decontamination, Deactivation, Decommissioning, and Demolition (D4) of Buildings/Structures and Cleanup of Debris	$96,000,000

Notes: Accuracy range of the cost estimate is -30% to +50%.

5.2 Schedule

This removal action is expected to begin with the general decommissioning activities following issuance of this RAWP, which is anticipated to occur by April 21, 2010. As discussed in Section 1.2, the intent of this removal action is to allow the addition, or deletion, of buildings and structures to the scope of the removal action, as appropriate, and with Ecology and EPA concurrence. Because of the possibility that the scope may expand to accommodate additional buildings and structures, the schedule for completion of the NTCRA will continue until completion of D4 of the buildings/structures and cleanup of miscellaneous debris included within the contractor's authorized scope of work.

5.3 Project Team

The term "project team" includes the individuals working to accomplish the removal action. Accordingly, the project team includes the lead regulatory agencies, EPA and Ecology; the lead agency, DOE; the contractor removal action manager, site project manager, and environmental manager, all agents of DOE; and other contractor staff and subcontractors. The HASP contains the list of the key project team members, their roles and responsibilities, and the names of the respective individuals. As the HASP is kept up-to-date with current information, this information is not duplicated in this work plan.

5.4 Change Management

If a change arises that results in a fundamental change to the selected response action that is not within the scope of work, another engineering evaluation/cost analysis (EE/CA) or an EE/CA addendum and supporting documentation will be prepared to allow DOE to select a revised response action.

Established configuration/change control processes ensure that proposed changes are reviewed in relation to the specified commitments. If a breach of these commitments is discovered, work ceases so stabilization and/or recovery actions may be identified and implemented as appropriate. Change management will comply with the appropriate contractor's procedures.

Determining the significance of the change is the responsibility of DOE. Contractor management is responsible for tracking changes and obtaining appropriate reviews by contractor staff. Contractor management will discuss the change with DOE, and DOE will then discuss the type of change that is necessary with EPA and Ecology. Appropriate documentation will follow.

5.5 Personnel Training and Qualifications

During the performance of project activities, the experience and capabilities of the operating staff will be extremely important in maintaining worker and environmental safety. Day-to-day knowledge of ongoing operations, month-to-month understanding of conditions encountered, and lessons learned will be utilized for continued safe operations.

Training requirements will ensure that personnel have been instructed in the technologies to work safely in and around radiological areas, and to maintain their individual radiation exposure and the radiation exposures of others ALARA. Standardized core courses and training material will be presented, and site-specific information and technologies will be added to adequately train workers. Records of required training will be maintained in accessible files.

Health physics workers will be required to have completed and be current in radiological control technician qualification training. These training courses require the successful completion of examinations to demonstrate understanding of theoretical and classroom material.

Specialized training will be provided as needed to instruct workers in the use of nonstandard equipment, in the performance of abnormal operations, and in the hazards of specific activities. Specialized training could be provided by on-the-job training activities, classroom instruction and testing, or pre-job briefings. The depth of training in any discipline will be commensurate with the degree of the hazard(s) involved and the knowledge required for task performance.

Some activities will require the acquisition of expert services as opposed to project staff training.

The contractor training program will provide workers with the knowledge and skills necessary to safely execute assigned duties. A graded approach will be used to ensure that workers receive a level of training commensurate with their responsibility and that complies with applicable requirements. Specialized employee training will include pre-job safety briefings, plan-of-the-day meetings, and facility/work site orientations. Training and qualifications will be determined as required by job assignment for work activities.

The HASP, RWP, and activity hazards analysis will include specific requirements for project activities being conducted, which will include personal protective equipment and required training for project personnel.

5.6 Quality Assurance Program

Overall quality assurance for the RAWP will be planned and implemented in accordance with 10 CFR 830, Subpart A, "Quality Assurance Requirements;" EPA/240/B-01/003, *EPA Requirements for Quality Assurance Project Plans*, EPA QA/R-5; and EPA SW-846, *Test Methods for Evaluating Solid Waste: Physical/Chemical Methods*, Third Edition, Final Update III-A (EPA 1999). The quality assurance activities will use a graded approach based on the potential impact on the environment, safety, health, reliability, and continuity of operations. Other specific activities will include quality assurance implementation, responsibilities and authority, document control, quality assurance records, and audits.

5.7 Post-Removal Action Activities

If soil contamination is discovered that is not removed, the process identified in Section 2.2.2.3 will be followed.

5.7.1 Post-Removal Action Sample Collection

If contamination is discovered, post-removal action sample collection may be performed, if required by the process identified in Section 2.2.2.3.

5.7.2 CERCLA Cleanup Documentation

Removal activities completed as part of this removal action will be documented on a Facility Status Change Form. The form will provide a summary of the actions taken, the "as-left" condition of the area, the characterization data collected during the removal action, and an assessment of the underlying soil as applicable. The form will be approved by DOE to document completion of the removal action. The form and instructions are provided in Appendix B.

Field investigations (visual inspections, radiological and/or chemical field screening, etc.) will be conducted throughout the D4 process to assess potential contamination. If contamination to the surrounding soils is known, verified, or suspected, excavation will be conducted as discussed in Section 2.2.2.3, or the site will be identified by DOE as a new WIDS site under the Tri-Party Agreement with concurrence from Ecology and EPA.

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6 References

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40 CFR 263, "Standards Applicable to Transporters of Hazardous Waste," *Code of Federal Regulations.* Available at: http://ecfr.gpoaccess.gov/cgi/t/text/text-idx?c=ecfr&sid=f11ec333d6f059bc4460e6b1e81716f9&rgn=div5&view=text&node=40:25.0.1.1.4&idno=40

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Appendix A

Radiological Airborne Emissions Calculations

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This appendix provides the calculations for estimating the maximum potential-to-emit (PTE) radionuclides to the air as a result of the removal activities for the industrial buildings/structures and associated excavation discussed in Section 1.3. The PTE is defined as the rate of release of radionuclides from an emission unit based on the actual or potential discharge of the effluent stream that would result if all abatement control equipment did not exist, but operations are otherwise normal. Because nearly all of these buildings/ structures and surrounding soil are expected to contain little or no contamination, a contingent estimate of potential airborne impacts from any one of the buildings/structures and its associated soil site is provided, based on several bounding assumptions described as follows.

1. All building/structure removal and associated cleanup activity will be completed within a single year.
2. Each building/structure location is considered a separate potential source of emissions.
3. The bounding level of contaminated surface area to be impacted is 50,000 square meters.
4. Each building/structure location and associated soil site may exhibit some or all of the estimated PTE.
5. All alpha emitting isotopes are represented by Am-241 and all beta-gamma isotopes are represented by Cs-137+progeny. These isotopes exhibit the most conservative dose response (mrem per year/curie) factors so far as impacts to the maximally exposed public individual, and therefore were used for purposes of bounding any emissions impacts.
6. Location of all removal activities was assumed to be the 300 Area of the Hanford Site. Dose response factors for the 300 Area are the highest of any Hanford Site operating area.
7. For assigning release fractions to portions of the building/structure radionuclide inventory, all actions involving use of high-efficiency particulate air (HEPA) filtered vacuums, HEPA-filtered decontamination tools (e.g., scabblers, scarifiers) and gas/torch cutting or welding are assigned a release fraction of 1 as directed by the WAC-246-247-030(21)(a). Other pre-demolition and demolition activities including use of controlled explosives are assumed to have a release fraction of 1E-03 (for particulates and liquids).
8. For assigning a release fraction to the associated excavations, it was assumed that the entire soil radionuclide inventory is subject to a release fraction of 1E-03 for particulates and liquids.
9. The surface area and soil were assumed to be contaminated at levels on average of 1,000 disintegrations per minute (dpm)/100 cm^2 alpha and 100,000 dpm/100 cm^2 beta-gamma.
10. The overall PTE is for both demolition and excavation at each industrial site. The PTE is calculated as shown in Table A-1.
11. An example of a tracking log as shown in Tables A-2 and A-3 will be used at each site to estimate the potential emission curies handled at each industrial building/structure and associated excavation.

Table A-1. PTE Calculations

Annual Surface Area Contamination, 300 Area Bounding										
Isotope	**Field Survey (dpm)[a]**	**pCi/g**	**Soil Density (g/m^3)[j]**	**pCi/m^3[k]**	**Contaminated Surface Area (m^2)**	**Ci[b]**	**WAC 246-247-030-(21)(a) Release Factor**	**PTE (Ci/yr)[c]**	**Dose Factor (mrem/Ci)[d]**	**Unabated Effective Dose (mrem/yr TEDE to the MEI)[e]**
Cs-137+D	1.0E+05				5.0E+04	2.3E-01	1.0E-03	2.3E-04[f]	5.5E+00	1.3E-03
							1.0E+00	2.3E-03[f(a)]	5.5E+00	1.3E-02
Am-241	1.0E+03				5.0E+04	2.3E-03	1.0E-03	2.3E-06[f]	3.0E+02	6.9E-04
							1.0E+00	2.3E-05[f(a)]	3.0E+02	6.9E-03
Sub total										2.2E-02
Annual Soil Contamination, 300 Area Bounding										
Isotope	**Field Survey (dpm)[g]**	**pCi/g**	**Soil Density (g/m^3)[j]**	**pCi/m^3[k]**	**Contaminated Soil Excavated Volume (m^3)[l]**	**Excavated Ci[m]**	**WAC 246-247-030-(21)(a) Release Factor**	**PTE (Ci/yr released)[n]**	**Dose Factor (mrem/Ci)[o]**	**Unabated Effective Dose (mrem/yr TEDE to the MEI)[p]**
Cs-137+D	1.0E+05	2.8E+04[h]	1.6E+06	4.5E+10	4.2E+01	1.9E+00	1.0E-03	1.9E-03	5.5E+00	1.1E-02
Am-241	1.0E+03	2.4E+03[i]	1.6E+06	3.8E+09	4.2E+01	1.6E-01	1.0E-03	1.6E-04	3.0E+02	4.8E-02
Sub total										5.9E-02
Total										8.1E-02

a. Field Survey disintegration counts are per minute/100 cm^2 field instrument probe area. Note: 100 cm^2 = 0.01 m^2.
Note: These are not actual field instrument readings; these are field readings corrected by standard radiation protection protocol to dpm.

b. Ci=(Field Survey dpm/0.01 m^2)•(m^2 of Contaminated Surface Area)/(2.22E+12 dpm/Ci)
Note: 2.22E+12 dpm/Ci is derived from {Ci=[3.7E+10 disintegrations per second (dps)]•(60 sec/min)}.
[Definition of Ci is found in http://www.umich.edu/~radinfo/introduction/terms.htm]

c. PTE (Ci/yr Released)=[WAC 246-247-030(21)(a) Release Factor]•(Ci)

d. Dose Factor Source: DOE/RL-2006-29, *Calculating Potential-to-Emit Radiological Releases and Doses*, Table 4-11.

e. Unabated Effective Dose (mrem/yr TEDE to the MEI)=[PTE (Ci/yr)]•[Dose Factor (mrem/Ci)]

f. Assume 99 percent of the Ci (alpha and beta-gamma) are released as particulates or liquids.

f(a) Assume 1 percent of the Ci (alpha and beta-gamma) are released as a gas from torch cutting, etc. activities.

g. Field Survey dpm counts are as measured with field instruments, as described in footnote a.

h. From HNF-2418, *Soil Contamination Standards for Protection of Personnel*, Table 3. This table presents conversions of instrument readings (cpm) to pCi/g in soil. In this case, a Geiger-Mueller reading for Cs-137+D of 2.2E+04 counts per minute (cpm) is shown to be the equivalent of 6.2E+04 pCi/g. Using standard protocol to account for field survey instrument counting efficiency for beta-gamma, 1 cpm=10 dpm. 2.2E+04 cpm converts to 2.2E+05 dpm. As a result, pCi/g of Cs-137+D for 1.0E+05 dpm is calculated as follows: (1.0E+05 dpm/2.2E+05 dpm)•(6.2E+04 pCi/g)=2.8E+04 pCi/g.

i. From HNF-2418, *Soil Contamination Standards for Protection of Personnel,* Table 3. This table presents conversions of instrument readings to pCi/g in soil. In this case, the portable alpha meter (PAM) reading of 1.3E+00 cpm is shown to be the equivalent of 1.85E+01 pCi/g. Using standard protocol, 1 cpm=6 dpm for a PAM. 1.3E+00 cpm therefore converts to 7.8E+00 dpm. As a result, pCi/g of Am-241 for 1.00E+03 dpm is calculated as follows:
(1.00E+03 dpm/7.8E+00 dpm)•(1.85E+01 pCi/g)=2.4E+03 pCi/g.

j. From HNF-2418, *Soil Contamination Standards for Protection of Personnel*, Section 2, page 2.

k. pCi/m^3=(pCi/g)•[Soil Density (g/m^3)]

l. Administrative control

m. Excavated Ci=(pCi/m^3)•(1 Ci/1E+12 pCi)•(Contaminated Soil Excavation Volume m^3)

n. PTE (Ci/yr released)=(Excavated Ci)•[WAC 246-247-030(21)(a) "Release Factor"]

o. From DOE/RL-2006-29, *Calculating Potential-to-Emit Radiological Releases and Doses*, Table 4-11.

p. Unabated effective dose (mrem/yr TEDE to the MEI)=[PTE (Ci/yr Released)]•[Dose Factor (mrem/Ci)]

MEI = maximally exposed individual

PTE = potential-to-emit

TEDE = total effective dose equivalent

Table A-2. Building/Structure Potential Emissions Tracking for Contaminated Surface Area

Date	Building	Contaminated Surface Area (m^2)	Field Survey (dpm/100 cm^2 Alpha)	Curies Alpha[a]	Field Survey (dpm/100 cm^2 Beta-Gamma)	Curies Beta-Gamma[a]

Notes: If curies alpha will be greater than 2.3E-03 or the curies beta-gamma will be greater than 2.3E-01, contact the Environmental Compliance Officer before proceeding.

If dpm values will exceed those in Table A-1, contact the Environmental Compliance Officer.

a. Curies (Ci)=(Field Survey dpm/100 cm^2)•(100 cm^2/1E-02 m^2)•(Contaminated Surface Area m^2)•(1 Ci/2.22E+12 dpm).

Table A-3. Excavation Tracking

Date	Building	Field Survey dpm/100 cm^2 Alpha[a]	Field Survey dpm/100 cm^2 Beta-Gamma[b]	Contaminated Soil Excavated Volume (m^3)[c]

a. If dpm/100 cm^2 alpha will be greater than 1,000, contact the Environmental Compliance Officer before proceeding.

b. If dpm/100 cm^2 beta-gamma will be greater than 100,000, contact the Environmental Compliance Officer before proceeding.

c. If greater than 42 cubic meters of soil will possibly be removed, contact the Environmental Compliance Officer in advance.

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Appendix B

Facility Status Change Form

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B.1 Introduction

The purpose of the form is to document agreement among the parties on the status of facility deactivation, decontamination, decommissioning, and demolition (D4) operations and the disposition of underlying soil in accordance with the applicable regulatory decision documents. The form provides the following information to document either completion or deferral of a removal action:

- Quantitative information about the facility demolition
- The rationale/documentation of completion
- Photographs of the demolition activity
- Document that the wastes have all been shipped to the appropriate disposal facility
- Provide for U.S. Department of Energy (DOE) concurrence of completion, and
- Provide for a standard distribution of the form, including the Administrative Record

A copy of the form is provided in Table B-1.

B.2 Form Completion Instructions

B.2.1 Top Portion

The top portion of the form should be filled out to identify the facility and under which removal action the completion applies.

B.2.2 Section 1: Facility Status

Facility Status

The appropriate block will be marked to identify whether the facility removal action is complete or whether remaining actions are being deferred.

Description of Completed Activities and Current Conditions

This portion will identify the following:

- Whether the facility removal actions were performed in accordance with the applicable action memorandum
- Whether all hazardous material was removed from the facility prior to demolition
- When the demolition was completed and whether the foundation and any other sub-surface structures were removed
- Document final disposition of the demolition debris

Description of Deferral (as applicable)

This portion will be completed when activities are deferred. This may occur if contamination is discovered that is from an unknown source, or is extensive or unusually complex. A justification for the deferral will be provided (e.g., underlying waste sites, active utilities).

B.2.3 Section 2: Underlying Soil Status

Underlying Soil Status

The appropriate block will be marked to identify the relationship between the facility and waste sites.

Description of Current/As-Left Condition

This portion of the form will identify the following:

- Whether the underlying soils were a documented waste site
- If soil contamination was found as a result of the removal action
- Whether adjacent documented waste sites were affected
- A description of the method that will be used to backfill the excavated area

Identification of Documented Waste Site(s) or Nature of Potential Waste Site Discovery (as applicable):

This portion will describe any waste sites or potential waste sites that were encountered as a result of the removal action.

B.2.4 Section 3: List of Attachments

Supplemental information includes the following:

1. Facility information: Building history, characterization information including a summary of the collected sample data, and a description of the D4 activities that were performed
2. Underlying Soil: An assessment of the contaminants of concern that could be potentially released during facility demolition, and the final radiological survey
3. Evaluation of Related/Adjacent Waste Sites: This will include an assessment of the related/adjacent waste and how they were affected by the removal action
4. Project photographs

Table B-1. Facility Status Change Form

Date Submitted:	**Area:**	
Originator:	**Facility ID:**	**Control #:**
Phone:	**Action Memorandum:**	

This form documents the status of facility decontamination, deactivation, decommissioning, and demolition operations or debris removal in accordance with the applicable regulatory decision documents.

Section 1: Facility Status

☐ All D4 operations required by action memo complete.
☐ D4 operations required by action memo partially complete, remaining operations deferred.

Description of Completed Activities and Current Conditions:

Description of Deferral (as applicable):

Section 2: Underlying Soil Status

☐ No waste site(s) present. No additional actions anticipated.
☐ Documented waste site(s) present. Cleanup and closeout to be addressed under a separate CERCLA Response Action.
☐ Potential waste site discovered during D4 operations. Waste site identification number <to be> assigned. Cleanup and closeout to be addressed under a separate CERCLA Response Action.

Description of Current/As-Left Conditions:

Identification of Documented Waste Site(s) or Nature of Potential Waste Site Discovery (as applicable):

Section 3: List of Attachments

_____ _____
DOE-RL **Date**

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