SECTION

1 OF 5

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DOE/RL-88-30
Revision 20

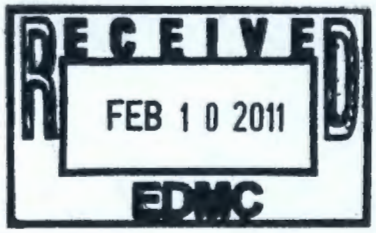
Hanford Site Waste Management Units Report

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



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Hanford Site Waste Management Units Report

J. P. Shearer
CH2M HILL Plateau Remediation Company

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INTRODUCTION

SCOPE AND PURPOSE

The Hanford Site Waste Management Units Report (HSWMUR) has been created to meet the requirements of the Tri-Party Agreement (TPA) Action Plan, Section 3.5, which states: "A waste management report...shall be generated annually by the DOE in January of each year, and posted electronically for regulator and public access. This report shall reflect all changes made in waste management unit status during the previous year."

This January 2011 version of the HSWMUR contains a comprehensive inventory of all 3318 sites in the Waste Information Data System (WIDS). The information for each site contains a description of each unit and the waste it contains, where applicable. The WIDS database provides additional information concerning the sites contained in this report and is maintained with daily changes to these sites.

DEFINITIONS

The HSWMUR shows the classification and reclassification designations for each site. These designations are based on definitions in TPA procedure TPA-MP-14. Full definitions and can be found in the procedure which is available at the following URL:
http://www.hanford.gov/files.cfm/TPA-MP14.pdf.

Classification designations are as follows:

- Accepted – The site has been evaluated and found to be a waste management unit. For sites added to WIDS since February 2, 2007, the approval date for TPA-MP-14 Rev. 1, this evaluation has also been approved by the appropriate regulatory agency. Sites added prior to February 2, 2007 were classified as Accepted based only on a contractor review.
- Accepted (Proposed) – The site has been evaluated and tentatively identified as being a waste management unit, but this evaluation has not yet been approved by the appropriate regulatory agency.
- Rejected – The site has been evaluated and found not to be a waste management unit. This evaluation has been approved by the appropriate regulatory agency.
- Rejected (Proposed) – The site has been evaluated and tentatively identified as not being a waste management unit, but this evaluation has not yet been approved by the appropriate regulatory agency.
- Discovery - The site has not yet had the evaluation completed.

Reclassification designations are as follows:

- <Blank> – The site has not been reclassified.
- Rejected – The site does not require remediation based on qualitative information such as a review of historical records, photographs, drawings, walkdowns, ground penetrating radar scans, radiation surveys, and shallow test pits.
- No Action – The site does not require remediation based on an assessment of quantitative data (e.g. analytical samples) collected for the site.
- Closed Out – The site meets applicable cleanup standards or closure requirements.

- Interim Closed Out – The site meets cleanup standards specified in an Interim Action Record of Decision, but a Final Record of Decision has not been issued.
- RCRA Postclosure – The site is a TSD unit that has been closed with waste in place and postclosure care, including monitoring and institutional controls, is being implemented
- Consolidated – The site will be dispositioned as part of another WIDS site.
- Deleted from NPL – The site is deleted from the National Priorities List or included in a final action published in the Federal Register.

ORGANIZATION

The waste management units at the Hanford Site are grouped into operable units (OUs) or waste management areas (WMAs). The groupings may be based on geographic location, types of waste received, and/or the ability to achieve economies of scale during remediation. Sites flagged as TBD (To Be Determined) haven't been assigned to an OU or WMA. Sites flagged as Not Applicable do not fit the criteria to be assigned to an OU or WMA.

The HSWMUR organization is based on the waste site grouping within the operable units and waste management areas.

100-BC-1

Site Code:	100-B-2	**Classification:**	Accepted
Site Names:	100-B-2, 181-B Backwash Trench, Backwash Trench, Undocumented Liquid Waste Site, Miscellaneous Stream #73	**ReClassification:**	No Action (11/18/2004)
Site Type:	Trench	**Start Date:**	1975
Site Status:	Inactive	**End Date:**	
Site Description:	The site is a trench that was constructed to receive backwash filter backflush from the 181-B Pumphouse. The trench was fed by a single 30 centimeter (12 inch) pipeline that originated at the backwash filter. The pipe is approximately 0.9 meters (3 feet) below grade and enters the trench from the west. Before construction of the trench, the backflush water was returned directly to the Columbia River.		
Waste Type:	Water		
Waste Description:	The site received river screen backwash water effluent.		

Site Code:	100-B-3	**Classification:**	Accepted
Site Names:	100-B-3, Hot Thimble Burial Ground, Undocumented Solid Waste Site	**ReClassification:**	No Action (4/2/2003)
Site Type:	Burial Ground	**Start Date:**	1952
Site Status:	Inactive	**End Date:**	
Site Description:	The site has been remediated and reclassified.		
Waste Type:	Equipment		
Waste Description:	A highly contaminated vertical thimble was removed from the 105-B Reactor Building in 1952 and temporarily buried in a trench. The thimble was later removed and taken to another burial ground. Radioactive contaminants may remain in the trench.		

Site Code:	100-B-4	**Classification:**	Not Accepted (9/9/1997)
Site Names:	100-B-4, Building Foundation, Undocumented Solid Waste Site	**ReClassification:**	
Site Type:	Spoils Pile/Berm	**Start Date:**	
Site Status:	Inactive	**End Date:**	
Site Description:	The site is a rectangular area 8.5 meters (28 feet) east/west by 13.1 meters (43 feet) north/south and encircled by large stones neatly stacked 0.3 meters (1 foot) high. Inside the area and on the north end is a 4 meter (13 foot) by 4.0 meter (13 foot) area encircled by 0.3 meter (1 foot) soil berm. Two 0.3 meter (1 foot) mounds of soil are in the south portion of the area. The surrounding area appears to have been a plowed field that was cleared of large stones. A long line of similar rocks runs parallel to the perimeter road, between the encircled area and the road. The site is distinguishable from the surrounding area only by the arrangement of large stones and soil. During a site visit on 9/13/94, two metal objects were present nearby, but didn't appear to be necessarily associated with this site. One of the objects looked like an empty, rusty paint can.		

Site Code:	100-B-5	**Classification:**	Accepted
Site Names:	100-B-5, Effluent Vent Disposal Trench, 116-B-9, 105-B Effluent Vent Trench	**ReClassification:**	Interim Closed Out (9/11/2003)
Site Type:	Trench	**Start Date:**	1954
Site Status:	Inactive	**End Date:**	1956
Site Description:	The site has been remediated and closed out. The site was the result of leakage that occurred at a junction box [probably at the 0.61-meter (2-foot) vent pipe], where the 1.4-meter (54-inch) 100-B Reactor cross tie pipeline effluent joined the 1.7-meter (66-inch) 100-C Reactor pipeline effluent, resulting in contamination of the area (Dorian and Richards).		
Waste Type:	Process Effluent		
Waste Description:	The waste was process effluent contaminated soil. Sample numbers (Dorian and Richards) and depths were: B - 4.6, 6.1, 8.4 meters (15, 20, 27.5 feet); C - 3.05 meters (10 feet); D - 4.6, 6.1, 8.4 meters (15, 20, 27.5 feet); E - 4.6, 5.3, 7.6 meters (15, 17.5, 25 feet); F - 4.6, 6.1, 8.4 meters (15, 20, 27.5 feet); H - 6.1 meters (20 feet). Samples were analyzed for plutonium-238, plutonium-239/240, strontium-90, hydrogen-3, europium-152, cobalt-60, europium-154, cesium-234, cesium-137, europium-155, and uranium.		

Site Code:	100-B-7	**Classification:**	Not Accepted (4/10/2002)
Site Names:	100-B-7, 100-B Service Water Pipelines, 100-B Clean Water Pipelines	**ReClassification:**	
Site Type:	Product Piping	**Start Date:**	1944
Site Status:	Inactive	**End Date:**	1968
Site Description:	The site encompasses the clean water upstream pipelines for the 100-B Area, including underground pipelines used to transport raw, fire, export, and sanitary water from the river pumphouse, to the water treatment facilities and to 100-B Area facilities and fire hydrants. Excluded lines are those within buildings, process and septic sewer pipes, pipes that carried water treated with sodium dichromate, and all lines that are downstream from the reactor building, i.e., those lines that carry cooling water from the reactor to the retention basin, trench, and/or the river are excluded.		
Waste Type:	Water		
Waste Description:	Only uncontaminated piping remains.		

Site Code:	100-B-8	**Classification:**	Accepted
Site Names:	100-B-8, 100-B Reactor Cooling Water Effluent Underground Pipelines (See Subsites)	**ReClassification:**	Interim Closed Out (4/20/2004)
Site Type:	Radioactive Process Sewer	**Start Date:**	1944
Site Status:	Inactive	**End Date:**	1968

Site Description: The site encompassed the underground 100-B Reactor cooling water effluent pipelines. These included the effluent pipelines that transported 118-B-8 (105-B Reactor) cooling water from the reactor core to the 116-B-11 (107-B) Retention Basin, and from the basin to the 116-B-7 (1904-B) outfall structure. This waste site included all associated expansion and valve boxes and excluded the retention basin, outfall structure, and those effluent pipelines that were within the confines of the 105-B Reactor Building or that run from the outfall structure to the bottom of the river. It also excludes all reactor influent pipelines that are upstream (untreated and treated water pipelines) of the 105-B Reactor Building.

Waste Type: Process Effluent

Waste Description: The waste is radioactively contaminated steel piping, concrete, and soil. Reactor cooling water became radioactively contaminated as it passed through the reactor core. Activation products created in the water included calcium-41, chromium-51, and zinc-65. Activation products from the reactor core that were picked up and transported by the cooling water included tritium, carbon-14, cobalt-60, nickel-63, and europium-152/154/155. Fuel element fission products, such as strontium-90, and cesium-137, as well as transuranics such as plutonium-239/240 were introduced into cooling water due to fuel cladding failures. Concentrations of radionuclides in cooling water during normal reactor operations were approximately 0.2 microcuries/liter. Concentrations of radionuclides have built up in rust flakes and scale on the inner surfaces of the pipelines and in sludge in the diversion and junction boxes. Average beta-gamma concentrations for the effluent pipeline scale and junction/diversion boxes were 83,000 and 120,000 picocuries/liter, respectively. Average plutonium-239/240 concentrations were 66 picocuries/gram for the effluent pipeline scale and 720 picocuries/gram for the sludge at the bottom of the diversion and junction boxes. Direct readings of the bottom of the effluent pipelines averaged approximately 40,000 counts/minute with a Geiger-Mueller probe. Additional chemicals were added to the effluent for purposes of water treatment. These included aluminum sulfate (alum), with excess hydrated calcium oxide, sulfuric acid, chlorine, and sodium dichromate. Water pH was maintained at about 7.5, and the free chlorine residual was approximately 0.2 milligrams/liter.

SubSites:

SubSite Code: 100-B-8:1

SubSite Name: 100-B-8:1, 100-B Area South Effluent Pipelines

Classification: Accepted

ReClassification: Interim Closed Out

Description: Cleanup Verification Package 2003-00022 (CVP) has documented completion of remedial action for the 100-B-8:1 subsite. The CVP demonstrated that remedial action at the 100-B/C south pipelines site had achieved remedial action objectives (RAOs) and goals (RAGs) as established in the Interim Action Record of Decision for the 100-BC-1, 100-BC-2, 100-DR-1, 100-DR-2, 100-FR-1, 100-FR-2, 100-HR-1, 100-HR-2, 100-KR-1, 100-KR-2, 100-IU-2, 100-IU-6, and 200-CW-3 Operable Units (ROD) and the Remedial Design Report/Remedial Action Work Plan for the 100 Area (RDR/RAWP).

The site included the underground 105-B Reactor effluent pipelines running from within 7.5 meters (25 feet) of the reactor building north to B Avenue, including all associated expansion joints and valve boxes. Also included are the cross-tie underground lines that connected the 105-B Reactor effluent system to the 105-C Reactor effluent pipeline system. Sites that are excluded from the CVP are the associated retention basin and outfall structure, which was treated as unique waste sites. The 105-B Reactor effluent pipeline subsites (100-B-8:2) are located north of B Avenue and were addressed in a separate CVP.

Waste site contaminants of concern (COCs) identified through process knowledge were listed in the 100 Area Remedial Action Sampling and Analysis Plan (SAP). The original COCs identified in the sampling and analysis plan for this site consisted of americium-241, cesium 137, cobalt-60, europium-152, europium-154, europium-155, plutonium-238, plutonium 239/240, strontium-90, and uranium-238.

Based on the results of sampling during 100-B/C pipeline and outfall remediation, lead, mercury, total chromium, and hexavalent chromium were added to the original COC list as contaminants of potential concern. Since in-process sample analyses returned detected results for all four analytes, they were retained and evaluated as COCs throughout the CVP. The final COC list for this site, therefore, consisted of the following: americium-241, plutonium-239/240, cesium-137, strontium-90, cobalt-60, uranium-238, europium-152, lead, europium-154, mercury, europium-155, total chromium, plutonium-238, hexavalent chromium.

Cleanup verification samples including QA/QC samples consisted of 50 shallow zone samples, 11 deep zone samples, 56 overburden samples. The final verification samples were collected between November 10, 2003, and concluded on November 19, 2004, and were analyzed for the established COCs. The numerous sample numbers were listed in appendix A of CVP-2003-00022 and also in the HEIS database.

At the completion of remedial action, the excavation was approximately 48,260 meters squared (519,466 square feet) in area. Approximately 244,656 metric tons (269,742 tons) of material, including soil, debris, and piping were removed from the 100-B/C south pipelines site and disposed of at the Environmental Restoration Disposal Facility.

The remaining soils at these sites have been sampled, analyzed, and modeled, while contaminated material has been excavated and disposed at ERDF. These results also indicated that residual concentrations in the shallow zone will support future land uses that can be represented (or bounded) by a rural-residential scenario, and that residual concentrations throughout the site pose no threat to groundwater or the Columbia River.

The acceptability of unrestricted direct exposure to deep zone soils has not been demonstrated; therefore, institutional controls to prevent uncontrolled drilling or excavation into the deep zone (i.e., below 4.6 meters [15 feet]) are required. The site was verified to be remediated in accordance with the ROD and may be backfilled.

SubSite Code: 100-B-8:2

SubSite Name: 100-B-8:2, 100-B Area North Effluent Pipelines

Classification: Accepted

ReClassification: Interim Closed Out

Description: Cleanup Verification Package 2003-00019 (CVP) documented completion of remedial action for the 100-B/C Effluent Pipeline subsites located north of B Avenue (100-B-8:2, 100-C-6:2, 100-C-6:3, and 100-C-6:4) (collectively referred to as the 100-B/C north pipelines site). The 100-B-8:2 subsite portion includes the 105-B Reactor effluent pipelines from B Avenue north to the 116-B-11 Trench (labeled as pipelines 3 and 4 in Figures 2 and 3 of the CVP), the pipelines from the 116-B-11 Retention Basin to the 116-B-7 Outfall (located just north of pipelines 3 and 4 terminations, Figures 2 and 3 of the CVP), and the east-west connecting pipeline from 100-B-8:2 to the diversion box for the 100-C-6 pipelines, which was just south of the 116-C-5 Retention Basin (labeled as pipeline 11 in Figures 2 and 3). It also includes the pipeline connecting this diversion box to the 116-C-5 Retention Basin (labeled as pipeline 25 in Figures 2 and 3) and the northernmost section of pipe 11 (Figures 2 and 3) that

drained into the 116-C-5 Retention Basin; these pipelines were removed and backfilled but not entirely sampled as part of the 116-C-5 remedial action (BHI 1997).

Cleanup verification for pipes 11 and 25 were conducted as part of CVP-2003-00019. Drawings identifying previous sampling locations were used to ensure that pipe 11 and pipe 25 corridors were excavated to below clean backfill elevations prior to verification sampling.

Excavation was driven by remedial action objectives for direct exposure, protection of groundwater, and protection of the Columbia River. For the respective points of compliance, remedial action goals (RAGs) were established to identify radionuclide and nonradionuclide contaminants of concern (COCs).

Waste site COCs identified through process knowledge are listed in the 100 Area Remedial Action Sampling and Analysis Plan (DOE RL 2001). The COCs identified in the sampling and analysis plan for this site consisted of americium-241, cesium 137, cobalt-60, europium-152, europium-154, europium-155, plutonium-238, plutonium 239/240, strontium-90, and uranium-238.

Based on verification sampling results from the 100-B/C outfalls site, total chromium, hexavalent chromium, lead, and mercury were added to the original COC list as contaminants of potential concern (COPC). Since verification sample analyses returned detected results for all four analytes, they were retained and evaluated as COCs.

Cleanup verification samples including QA/QC samples consisted of 193 shallow zone samples, 104 deep zone samples, 260 overburden samples, and 72 discovery area samples. The final verification samples were collected between August 12, 2002, and concluded on July 24, 2003, and were analyzed for the established contaminants of concern. The sample numbers are too numerous to list and as of March 2004 have not been reported to HEIS, however they are available in appendix A of CVP-2003-00019 .

At the completion of remedial action, the excavation was approximately 135,000 meters squared (443,000 square feet) in area with an average depth of approximately 7.5 meters (25 feet). Approximately 244,656 metric tons (269,742 tons) of material including soil, debris, and piping were removed from the 100 B/C north pipelines site and disposed at the Environmental Restoration Disposal Facility.

The CVP demonstrated that remedial action at the 100-B/C north pipelines site had achieved the RAOs and corresponding RAGs established in the approved ROD (EPA 1995), and in the RDR/RAWP (DOE RL 2002). The remaining soils at these sites have been sampled, analyzed, and modeled. The results of this effort indicate that the materials from the 100-B-8:2, 100-C-6:2, 100 C-6:3, and 100-C-6:4 sites that contained COCs at concentrations exceeding RAGs have been excavated and disposed of at ERDF.

These results also indicate that residual concentrations in the shallow zone and discovery areas will support future land uses that can be represented (or bounded) by a rural-residential scenario, and that residual concentrations throughout the site pose no threat to groundwater or the Columbia River. The acceptability of unrestricted direct exposure to deep zone soils has not been demonstrated; therefore, institutional controls to prevent uncontrolled drilling or excavation into the deep zone (i.e., below 4.6 meters [15 feet]) are required.

Site Code:	100-B-10	**Classification:**	Accepted
Site Names:	100-B-10, 107-B Basin Leak and Warm Springs	**ReClassification:**	No Action (4/11/2002)

Site Type:	Unplanned Release	**Start Date:**	1949
Site Status:	Inactive	**End Date:**	

Site Description: The site is an unknown location along the Columbia River shoreline. It was reported in February 1949 as a warm springs below the 116-B-11 Retention Basin, and was attributed to leaks in the wall of the north basin.

This spring no longer exists and the precise location is unknown. The groundwater that fed the spring is a separate Operable Unit (100-BC-5).

Waste Type: Water

Waste Description: A sample of the water showed beta activity of 4E-03 microcuries/liter.

Site Code:	100-B-11	**Classification:**	Accepted
Site Names:	100-B-11, 115-B/C Caisson Site, 115-BC Sump, 115-BC Drywell, 115-B Tank, 115-B/C Caisson Valve Pit	**ReClassification:**	No Action (7/15/2004)
Site Type:	Storage Tank	**Start Date:**	1944
Site Status:	Inactive	**End Date:**	1969

Site Description: The site has been demolished and is no longer discernible from the surrounding area. The site was a steel pipe structure (caisson) about 1.2 meters (4 feet) in diameter and 1.5 meters (5 feet) deep with a bottom and a steel plate placed over the top. The site was self contained without any incoming or outgoing piping. This caisson was identified during a pre-demolition walk-through of the 115-B/C Gas Recirculation Building.

Waste Type: Soil

Waste Description: Originally, the caisson contained a yellowish-colored soil which was sampled for pH and EP toxic metals. Sample results indicated a pH of 8 and 72,500 milligrams/liter of chromium. Additional samples were taken (after caisson removal) from soil directly underneath and around the outside of the caisson. Results from these samples showed chromium levels ranging from 0.08 milligrams/liter to 9.14 milligrams/liter. The caisson contained approximately 0.37 cubic meters (13 cubic feet) of chromate contaminated soil.

Site Code:	100-B-12	**Classification:**	Accepted
Site Names:	100-B-12, Filter Box Radiological Materials Area (RMA)	**ReClassification:**	Interim Closed Out (5/31/2001)
Site Type:	Storage	**Start Date:**	
Site Status:	Inactive	**End Date:**	

Site Description: The location is a gravel field with sparse, weedy vegetation that matches the rest of the fenced 100-BC area.

The site was a Radiological Materials area (RMA) with four metal boxes containing filters, that rested on shoring that sat on the bare soil. An additional six filter frames, marked as having fixed contamination, rested directly on the soil.

Waste Type: Equipment

Waste Type: Equipment

Waste Description: The radiological contamination is fixed on the filter frames.

Site Code:	100-B-14	**Classification:**	Accepted
Site Names:	100-B-14, 100-B Area Process and Sanitary Sewer Underground Pipelines (See Subsites)	**ReClassification:**	Interim Closed Out (3/1/2007)
Site Type:	Process Sewer	**Start Date:**	1944
Site Status:	Inactive	**End Date:**	1969

Site Description: The waste site encompassed pre-reactor underground process and sanitary pipelines and sewers, and was divided into seven subsites for decision-making purposes based on functional use and geographical location. The subsites included: 1) Main Process Sewer Collection Pipelines, 2) Sanitary Sewer Pipelines, 3) West Process Sewer Feeder Pipelines from 182-B and 183-B, 4) Cooling Water Pipelines and Tunnels from 190-B, 5) Sodium Dichromate and Sodium Silicate Pipelines, 6) Process Sewer Feeder Pipeline from 184-B and 184-B Ash Slurry Line, and 7) Process Sewer Feeder Pipelines from 185-B and 190-B.

Waste Type: Equipment

Waste Description: The waste site consisted of abandoned process and sanitary sewer pipelines, and residual chemicals remaining on the pipes. Chemical additives to the reactor cooling water included aluminum sulfate (alum) with excess hydrated calcium oxide, sulfuric acid, chlorine, and sodium dichromate. Water pH was maintained at about 7.5, the free chlorine residual was approximately 0.2 milligrams/liter, and sodium dichromate was added at a rate of about 2 milligrams/liter. One length of the product piping held undiluted sodium dichromate: the pipe from the 185-B/190-B to the 108-B Building (per drawing M2913, Sheet 5). This pipeline was in use only for a few years, until the sodium dichromate was added to the cooling water at the 185-B Building. (Note: Reference: WHC-SD-EN-TI-169 is for 100-F, and applies equally to 100-B).

SubSites:

SubSite Code: 100-B-14:1

SubSite Name: 100-B-14:1, Main Process Sewer Collection Pipelines

Classification: Accepted

ReClassification: Interim Closed Out

Description: Remedial action and evaluation of the 100-B-14:1 subsite has been documented in the Remaining Sites Verification Package (RSVP) (RSVP-2004-005). The subsite has met the objectives for interim closure as established in the Remedial Design Report/Remedial Action Work Plan for the 100 Area (RDR/RAWP) and the Interim Action Record of Decision for the 100-BC-1, 100-BC-2, 100-DR-1, 100-DR-2, 100-FR-1, 100-FR-2, 100-HR-1, 100-HR-2, 100-KR-1, 100-KR-2, 100-IU-2, 100-IU-6, and 200-CW-3 Operable Units, Hanford Site, Benton County, Washington (Remaining Sites ROD).

The subsite consisted of the reinforced concrete process sewer main that formerly serviced the 105-B Reactor Building; the 108-B Chemical Pumphouse and Tritium Separation Facility; and 100-B water treatment facilities then discharged to the 116-B-7 Outfall Structure. Vitrified clay feeder pipelines associated with the 108-B facility were also included in the subsite.

Remediation of the subsite was performed from January 2005 through April 2006 as part of the 100-B/C Area Remaining Pipes and Sewers remediation. In general, remediation of the pipelines consisted of the excavation and stockpiling (on-site) of overburden soils presumed to contain no residual contamination above cleanup levels; removal of soils around and approximately 0.3 meters (1 foot) below the pipelines; and disposal of the pipeline and suspect potentially contaminated soil at the Environmental Restoration Disposal Facility (ERDF).

Excavation at the upgradient (southeastern) end of the pipeline near the former 108-B facility was restricted within the shallow zone (less than 4.6 meters [15 feet] below ground surface [bgs]), and extended into the deep zone further downgradient, near the influent of the feeder line associated with the 105-B Reactor Building. The maximum depth of excavation was approximately 7.6 meters (25 feet) bgs, near the outfall of the pipeline at the northern end of the site. Due to co-location and concurrent remediation of differing functional pipeline groups, excavated and disposed material quantities could not be explicitly separated for the subsite. Following a determination that cleanup criteria had been attained, the excavation was backfilled with stockpiled overburden and borrow material. Railroad rails discovered and stockpiled during excavation of the site were also backfilled in the western portion of the excavation.

The Contaminants of Potential Concern (COPCs) for confirmatory sampling at the subsite were identified based on existing analytical data and process knowledge of the facilities serviced by the sewer system. The COPC list included metals, hexavalent chromium, semivolatile organic compounds (SVOCs), polychlorinated biphenyls (PCBs), and alpha-, beta-, and gamma-emitting radionuclides. Additional isotope-specific analysis was also performed for one confirmatory sample based on the results of initial radionuclide analyses.

The results of confirmatory sampling were used to determine the contaminants of concern (COCs) for verification sampling. Site COCs included carbon-14, cesium-137, cobalt-60, europium-152, europium-154, europium-155, and hexavalent chromium. Tritium was also included as a COC for the deep zone only because the process sewer formerly serviced the 108-B Tritium Separation Facility and this radionuclide was detected in a confirmatory sample collected from the pipeline, but was mistakenly not included in analyses performed for underlying soils

Initial cleanup verification sampling was conducted concurrently with variance sampling from May 30 to June 19, 2006. Additional verification sampling for carbon-14 in stockpiled overburden material was conducted from September 19 to 29, 2006. All verification samples were submitted to offsite laboratories for analysis using approved U.S. Environmental Protection Agency analytical methods as required per the Sampling and Analysis Plan (SAP). Based on process knowledge and the results of the confirmatory sampling activity for the subsite, this pipeline received radioactive waste stream discharges. Accordingly, the radioactive liquid waste effluent sites cleanup and closeout approach was implemented for the site, as described in the SAP.

Subsite Verification sample data were provided by the laboratories in 23 sample delivery groups (SDGs). The samples were listed by SDG in Table 8 of the RSVP. The SDGs K0388 and K0584 were submitted for third-party validation. No major deficiencies were identified in the analytical data set, all of which is acceptable for decision-making purposes. Samples were analyzed using analytical methods approved by the U.S. Environmental Protection Agency (EPA), and the results were compared against the cleanup criteria specified in the RDR/RAWP. The results were stored in the Washington Closure Hanford Environmental Restoration (ENRE) project-specific database prior to being provided to the Hanford Environmental Information System (HEIS).

Based on statistical evaluation of the resulting verification sampling data, the residual contaminant concentrations meet the cleanup criteria specified in the RDR/RAWP and the Remaining Sites ROD.

The results of verification sampling illustrated that residual contaminant concentrations does not preclude any future uses (as bounded by the rural-residential scenario) and allow for unrestricted use of shallow zone soils (i.e., surface to 4.6 meters [15 feet] deep). The results also demonstrated that residual contaminant concentrations are protective of groundwater and the Columbia River. The acceptability of unrestricted exposure to deep zone portions of this site has not been demonstrated; therefore, institutional controls to prevent uncontrolled drilling/excavation are necessary.

SubSite Code: 100-B-14:2

SubSite Name: 100-B-14:2, Sanitary Sewer Pipelines

Classification: Accepted

ReClassification: Interim Closed Out

Description: This subsite consisted of remaining sewers and pipelines in the 100 B/C area. Included in the subsite were: 1607-B7 pipeline from the 183-B facility to the stub at the excavation remaining from 2003 remedial action at the 1607-B7 septic system. It also included the pipelines from the following D&D facilities to their link with the 1607-B2 main drain line: the 1700 Buildings, the 108-B facility, the 185/190-B facilities, and the 115-B facility.

The Remaining Sites Verification Package (RSVP) 2006-055 for 1607-B2 and 100-B-14:2 has documented that the current site conditions supported a reclassification to interim closed out. Evaluations and verification sampling results for the RSVP demonstrated that the sites have achieved the remedial action objectives and the corresponding remedial action goals established in the Remedial Design Report/Remedial Action Work Plan for the 100 Area (RDR/RAWP) and the Interim Action Record of Decision for the 100-BC-1, 100-BC-2, 100-DR-1, 100-DR-2, 100-FR-l, 100-FR-2, 100-HR-1, 100-HR-2, 100-KR-1, 100-KR-2, 100-IU-2, 100-IU-6, and 200-CW-3 Operable Units, Hanford Site (Remaining Sites ROD).

Remediation of the 100-B-14:2 and 1607-B2 waste sites was performed in stages from January 2005 through June 2006 as part of the 100-B/C Area Remaining Pipes and Sewers remediation project. All excavation was restricted within the shallow zone (less than 4.6 meters [15 feet] bgs), with an average depth of approximately 2.5 meters [8 feet] bgs, and a maximum depth of approximately 4 meters [13 feet] bgs at the septic tank. Excavation at the northern portion of the site continued to greater depth due to concurrent remediation of the underlying 100-B-14:1 process sewer. Excavated and disposed material quantities could not be explicitly separated for each site due to co-location and concurrent remediation of differing functional pipeline groups.

Due to its proximity to the reactor building the southernmost portion of the 1607-B2 collection line which formerly serviced the 105-B Reactor Building, was not removed. This portion of the pipeline will be addressed in the 118-B-8, 105-B Reactor waste site.

Site remediation consisted of the removal of the sewer piping, septic tank, and drain field where applicable, as well as adjacent, potentially-contaminated soils for disposal at the Environmental Restoration Disposal Facility (ERDF). Remedial actions were performed so as to not preclude any future uses (as bounded by the rural-residential scenario) and to allow unrestricted use of shallow zone soils [i.e., surface to 4.6 meters (15 feet) deep].

Following site remediation, verification sampling was performed separately from August 2005 to July 2006 for the 100-B-14 subsites and 1607-B2:1 excavations and associated BCL material and soil within the remediation footprints. Parts of the 100-B-14 and 1607-B2:2 excavations were combined into one decision unit for the purposes of verification sampling, due to the small footprint of the 100-B-14:2 (area 1) pipelines, and sampled in June 2006.

The laboratory-reported data results for all constituents were stored in the Washington Closure Hanford ENRE project-specific database prior to archiving in HEIS. The data was also included in Appendix B of the RSVP. The results indicated that the waste removal action achieved compliance with the remedial action objectives for the waste sites. Statistical evaluation of the verification sampling data indicated that residual contaminant concentrations did not preclude any future uses (as bounded by the rural-residential scenario) and allow for unrestricted use of shallow zone soils [i.e., surface to 4.6 meters (15 feet) deep]. The results also demonstrated that residual contaminant concentrations were protective of groundwater and the Columbia River. These sites do not have a deep zone component; therefore, no deep zone institutional controls were required.

SubSite Code: 100-B-14:3

SubSite Name: 100-B-14:3, West Process Sewer Feeder Pipelines from 182-B and 183-B

Classification: Accepted

ReClassification: No Action

Description: The subsite consisted of the process sewer pipelines that exited from the 182-B reservoir and 183-B water treatment facilities. These process sewer lines were collected into a single 1.67 meter (5.5-foot) reinforced concrete box sewer that fed into the main process sewer collection line serving the 185-B/190-B Pumphouse, 105-B Reactor, and the 108-B Tritium Separation Facility. The basis for separating this subsite from the main process sewer line was that these lines carried effluent from facilities known to be potential sources of radioactive and chemical contaminants.

A focused sampling approach was selected for this site, biased toward worst-case sample locations and locations that were accessible. Results of the sampling event were used to make decisions for reclassification of the site in accordance with the Waste Site Reclassification Guideline TPA-MP-14 (RL-TPA-90-0001).

Confirmatory sampling was conducted in October 2003. The sampling approach consisted of collecting three samples of pipe scale material from each of three manholes and one soil sample from below one manhole/pipe. The maximum detected results from the scale and soil samples were used to support waste site reclassification. A summary of the evaluation of the scale and soil sample results were compared against the applicable remedial action goals (RAGs).

The sample results demonstrated that the subsite has achieved the remedial action objectives and remedial action goals (RAGs) established in the Remedial Design Report/Remedial Action Work Plan for the 100 Area and the Interim Action Record of Decision for the 100-BC-1, 100-BC-2, 100-DR-1, 100-DR-2, 100-FR-1, 100-FR-2, 100-HR-1, 100-HR-2, 100-KR-1, 100-KR-2, 100-IU-2, 100-IU-6, and 200-CW-3 Operable Units, Hanford Site, Benton County, Washington (commonly called the Remaining Sites Record of Decision). These results indicated that scale in the pipelines and associated residual soil concentrations support future unrestricted land uses that can be represented (or bounded) by a rural residential scenario. The results also demonstrated that residual contaminant concentrations support unrestricted future use of vadose zone soil and that contaminant levels remaining in the soil are protective of groundwater and the Columbia River. Because all results attained the direct exposure remedial action goals (RAGs), deep zone institutional controls are not

required.

SubSite Code: 100-B-14:4

SubSite Name: 100-B-14:4, Cooling Water Pipelines and Tunnels from 190-B

Classification: Accepted

ReClassification: No Action

Description: This subsite included the pipes and tunnels from the 190-B Building to the road east of the 105-B Reactor. The pipes from the edge of the road to the reactor should be included in 118-B-8, as they cannot be removed until the reactor is addressed.

The Cooling Water Pipe Tunnels Site meets the Remedial Action Objectives specified in the Remaining Sites ROD, U.S. Environmental Protection Agency, Region 10, Seattle, Washington. The pipelines were removed and the tunnels collapsed in 1993 during deactivation and decommissioning of the 190-B pump house. There is no history of radiological contamination associated with the 100-B Reactor cooling water tunnels and no radiological contamination was detected during decommissioning of the tunnels. There were no known process incidents at 105-B Reactor that would have introduced radiological contamination from the reactor into the tunnels. Additionally, since the 105-B cooling water tunnels had the same source of water as the 105-C cooling water tunnels, the 105-B tunnels were analogous to the 105-C tunnels.

Historical sampling indicated that no unacceptable levels of residual hexavalent chromium existed in the 105-C tunnels. The pipelines were removed and the remaining concrete at the site was analogous to concrete in the 105-C cooling water tunnels. The 105-C tunnels have been determined to meet the cleanup criteria, therefore the site also meets the cleanup criteria and the remaining contaminant levels were protective of groundwater and the Columbia River. All samples were less than the criteria of 2.0 mg/kg for protection of groundwater and Columbia River.

SubSite Code: 100-B-14:5

SubSite Name: 100-B-14:5, Sodium Dichromate and Sodium Silicate Pipelines

Classification: Accepted

ReClassification: No Action

Description: The subsite consisted of the sodium dichromate and sodium silicate product pipelines that transferred product from 108-B Building to 185/190-B facilities.

Confirmatory sampling was conducted in October 2003. The original sampling approach consisted of collecting one sample of pipe scale and one soil sample from below each pipe at two sampling locations. Since no scale or sediment was found in the piping at the selected locations, two alternative soil locations along the piping were sampled. The maximum detected results from soil samples were used to support waste site reclassification.

The sample results demonstrated that the subsite has achieved the remedial action objectives and remedial action goals (RAGs) as established in the Remedial Design Report/Remedial Action Work Plan for the 100 Area (RDR/RAWP) and the Interim Action Record of Decision for the 100-BC-1, 100-BC-2, 100-DR-1, 100-DR-2, 100-FR-1, 100-FR-2, 100-HR-1, 100-HR-2, 100-KR-1, 100-KR-2, 100-IU-2, 100-IU-6, and 200-CW-3 Operable Units, Hanford Site, Benton County, Washington (commonly called the Remaining Sites Record of Decision). These results show that any residual soil concentrations support future unrestricted land uses that can be represented (or bounded) by a rural residential scenario. The results

demonstrated that residual concentrations support unrestricted future use of shallow zone soil (i.e., surface to 4.6 meters [15 feet]), and that contaminate levels remaining in the soil were protective of groundwater and the Columbia River. The site does not have a deep zone, therefore, institutional controls are not required.

SubSite Code: 100-B-14:6

SubSite Name: 100-B-14:6, Process Sewer Feeder Pipeline from 184-B and 184-B Ash Slurry Line

Classification: Accepted

ReClassification: No Action

Description: This subsite included the process sewer pipelines from the 184-B Powerhouse, flowing north to the ash pit, and flowing east to the main trunk line (100-B-14:1) on both the north and south sides of the powerhouse.

Confirmatory sampling was conducted in September and October 2003. The maximum detected results from the scale and soil samples were used to support waste site reclassification.

The Waste Site Evaluation for 184-B Powerhouse Pipelines sample results demonstrated that the site has achieved the remedial action objectives and remedial action goals (RAGs) established in the Remedial Design Report/Remedial Action Work Plan for the 100 Area and the Interim Action Record of Decision for the 100-BC-1, 100-BC-2, 100-DR-1, 100-DR-2, 100-FR-1, 100-FR-2, 100-HR-1, 100-HR-2, 100-KR-1, 100-KR-2, 100-IU-2, 100-IU-6, and 200-CW-3 Operable Units, Hanford Site, Benton County, Washington, commonly called the Remaining Sites Record of Decision. These results indicated that scale and associated residual soil concentrations support future unrestricted land uses that can be represented (or bounded) by a rural residential scenario. The results also demonstrated that residual contaminant concentration supports unrestricted future use of shallow zone soil (i.e., surface to 4.6 meters [15 feet]), and that contaminant levels remaining in the soil are protective of groundwater and the Columbia River. This site does not have a deep zone; therefore, no deep zone institutional controls are required.

SubSite Code: 100-B-14:7

SubSite Name: 100-B-14:7, Process Sewer Feeder Pipelines from 185-B and 190-B

Classification: Accepted

ReClassification: No Action

Description: This subsite consisted of the pipelines that were used to control the temperature of process water used in association with the 185-B Deaeration Building and the 190-B Pumphouse. The pipelines were from the south side of the 185-B and 190-B facilities and ended at the sump on the southeast corner of 190-B. The subsite included the sump.

Confirmatory sampling was conducted during October 2003. The contaminants of potential concern (COPCs) were identified based on existing analytical data, historical process information, and historical uses and practices associated with the 185 B/190-B sump and pipeline facilities. The COPCs included inductively coupled plasma (ICP) metals, mercury, and hexavalent chromium. At the location where a 46-centimeter (18-inch) pipe entered the sump, some suspect fibrous insulating material was observed. This fibrous material was sampled for asbestos analysis. The absence of radionuclide contamination was confirmed using gamma energy analysis (GEA) and gross alpha and gross beta analyses. On this basis, no radionuclide COPCs were identified for this site.

The Remaining Sites Verification Package (RSVP-2004-011) demonstrated that the site had achieved the remedial action objectives and remedial action goals (RAGs) established in the Remedial Design Report/Remedial Action Work Plan for the 100 Area (RDR/RAWP) and the Interim Action Record of Decision for the 100-BC-1, 100-BC-2, 100-DR-1, 100-DR-2, 100-FR-1, 100-FR-2, 100-HR-1, 100-HR-2, 100-KR-1, 100-KR-2, 100-IU-2, 100-IU-6, and 200-CW-3 Operable Units, commonly called the Remaining Sites Record of Decision. These results document that pipe scale and associated residual soil concentrations supported future unrestricted land uses that can be represented (or bounded) by a rural residential scenario. The results also demonstrated that residual concentrations supported unrestricted future use of shallow zone soil (i.e., surface to 4.6 meters [15 feet]), and contaminant levels remaining were protective of groundwater and the Columbia River. This site does not have a deep zone; therefore, no deep zone institutional controls are required.

Site Code:	100-B-15	**Classification:**	Accepted
Site Names:	100-B-15, 100BC River Effluent Pipelines, 100BC River Lines	**ReClassification:**	
Site Type:	Radioactive Process Sewer	**Start Date:**	
Site Status:	Inactive	**End Date:**	
Site Description:	This site includes the 100-B/C Area river effluent pipelines (river lines) that extend from each of the three outfalls into the main channel of the Columbia River.		
Waste Type:	Process Effluent		
Waste Description:	The waste includes the pipelines and the contaminated scale contained within them. Contaminants of concern/potential concern are based on those for the outfalls themselves. They include americium-241, cesium-137, cobalt-60, europium-152, europium-154, europium-155, nickel-63, plutonium-238, plutonium-239/240, strontium-90, tritium, uranium-234, uranium-235, uranium-238, hexavalent chromium, total chromium, mercury, and lead.		

Site Code:	100-B-16	**Classification:**	Accepted
Site Names:	100-B-16, Utility Poles and Fixtures Debris Pile	**ReClassification:**	Interim Closed Out (6/29/2005)
Site Type:	Dumping Area	**Start Date:**	
Site Status:	Inactive	**End Date:**	
Site Description:	The site has been remediated and interim closed out.		
Waste Type:	Misc. Trash and Debris		
Waste Description:	The waste includes creosote-treated wood poles and cross beams, lead-tipped bolts and other debris. A few small boxes were seen that could be transformers. The possible transformers do not seem to be leaking any oil. Other debris included particle board, conduit, light fixtures, wire, insulators, junction boxes, chain link fencing and incandescent light bulbs.		

Site Code:	100-B-17	**Classification:**	Not Accepted (5/18/2009)
Site Names:	100-B-17, Transite on Columbia River	**ReClassification:**	Rejected (8/19/2010)

	Shoreline at 100B		
Site Type:	Dumping Area	**Start Date:**	
Site Status:	Inactive	**End Date:**	
Site Description:	The site is an old dumping area. The site is below the high water mark and is visible only at very low river flow.		
Waste Type:	Demolition and Inert Waste		
Waste Description:	The waste is a mixture of material ranging from corrugated transite, fire brick, milk bottles, concrete form fittings, small rebar, pipe fittings, chunks of vitrified clay, nuts and bolts. The corrugated transite consists of 15-20 large chunks that vary from 0.61 to 1.83 m (2 to 6 ft), 0.15 to 0.61 m (0.5 to 2 ft) wide, spread over most of a 220 sq m (2400 sq ft), in a single layer orientation. The transite is covered with green slime and the metal pieces are extremely rusted. Likely, the material has been in the river for a long time. The corrugated transite is not breaking into smaller chunks.		

Site Code:	100-B-18	**Classification:**	Accepted
Site Names:	100-B-18, 184-B Powerhouse Debris Pile	**ReClassification:**	Interim Closed Out (11/30/2007
Site Type:	Dumping Area	**Start Date:**	
Site Status:	Inactive	**End Date:**	
Site Description:	The site consisted of a debris pile containing miscellaneous demolition waste from the decommissioning activities of the 184-B Building and the 184-B Power House.		
Waste Type:	Misc. Trash and Debris		
Waste Description:	Suspect asbestos-containing materials such as siding, roofing, lagging, and wrapping were interspersed in the debris pile.		

Site Code:	100-B-19	**Classification:**	Accepted
Site Names:	100-B-19, 100-B/C Stained Soil Sites, 100B/C Chemical Contaminated Surface Soil Areas	**ReClassification:**	Interim Closed Out (1/13/2010)
Site Type:	Unplanned Release	**Start Date:**	
Site Status:	Inactive	**End Date:**	
Site Description:	Prior to remediation the 100-B-19 waste site consisted of six stained soil locations that were dispersed within the 100-B/C Area. They were created after a WCH 2004 orphan sites field visit of the 100-B/C Area. Three of the locations (SS-100BC-001, SS-100BC-002, and SS-100BC-003) contained reddish-to purple-colored coarse-grained garnet material on the surface. The other three locations (SS-100BC-004, SS-100BC-005, and SS-100BC-006) had yellow-stained surface soil that was ultimately determined to originate from sulfuric acid. An agreement was made among the Environmental Protection Agency (EPA), the U.S. Department of Energy, Richland Operations Office (DOE-RL), and the Environmental Restoration Contractor Team on May 5, 2005, that a general cleanup action to remove the garnet-like material and yellow-stained soils would occur at each of the six locations. Additionally, one multi-aliquot sample would be collected of the underlying soils at each of the six locations.		

Waste Type: Chemical Release

Waste Description: The waste is contaminated (stained) soil. Contaminants of potential concern (COPCs) include hexavalent chromium, lead, and mercury for yellow stained sites.

Site Code: 100-B-20 **Classification:** Accepted

Site Names: 100-B-20, 1716-B Maintenance Garage Underground Tank **ReClassification:** Interim Closed Out (9/27/2006)

Site Type: Maintenance Shop **Start Date:**

Site Status: Inactive **End Date:**

Site Description: The site has been remediated and interim closed.

The site consisted of an underground gas and/or oil tanks near the garage. The garage was used for maintenance of 100-B area vehicles. The facility and tanks have been removed.

Waste Type: Soil

Waste Description: While the records indicate that the underground gasoline tank was removed and no contamination was found in soil samples, no documentation of when the oil storage tank was removed could be found. Additional potential contamination sources include the former grease pit, lubricating fluids, battery acid in the high bay area, and asbestos shake siding.

Contaminants of potential concern (COPCs) would include total petroleum hydrocarbons (TPH) and polychlorinated biphenyls (PCBs).

Site Code: 100-B-21 **Classification:** Accepted

Site Names: 100-B-21, 100-B/C Miscellaneous Pipelines (See Subsites) **ReClassification:**

Site Type: Process Sewer **Start Date:**

Site Status: Inactive **End Date:**

Site Description: The site consists of a variety of underground pipelines that were uncovered during removal of the 100-B/C Reactor effluent pipelines and soils. The pipelines did not belong to previously-established waste sites, they have been grouped together based on the type of pipeline and potential closeout pathways for each.

Waste Type: Process Effluent

Waste Description: Contaminants of Potential Concern are listed only for sites known to have contaminants.

(DS-100BC-002) Contaminants of potential concern are asbestos, semivolatile organic analytes, phenathrene, fluoranthene, pyrene, benzo (a, b, and k) anthracene, chrysene, mercury, and lead.
(DS-100BC-016) The potential contaminants of concern are asbestos, lead, and arsenic.
(DS-100BC-019) The potential contaminants of concern are americium-241, and asbestos.
(DS-100BC-022) The potential contaminants of concern include asbestos.

SubSites:

SubSite Code: 100-B-21:1

SubSite Name: 100-B-21:1, Steel Pipeline Segment

Classification: Accepted

ReClassification: No Action

Description: Discovery pipelines that could not be associated with a previously-established waste site were grouped together into the 100-B-21 waste site based on the type of pipeline and potential closeout pathways for each. Two of these pipeline segments, (DS-IOOBC-016 and DS-100BC-022), were designated as subsite 100-B-21:1. The Remaining Sites Verification Package (RSVP) 2005-052 has demonstrated that the pipeline segments have met the objectives for reclassification to "no action". The current site conditions have achieved the remedial action objectives and the corresponding remedial action goals as established in the Remedial Design Report/Remedial Action Work Plan for the 100 Area (RDR/RAWP) and the Interim Action Record of Decision for the 100-BC-1, 100-BC-2, 100-DR-I, I00-DR-2, 100-FR-1, 100-FR-2, 100-HR-1, 100-HR-2, 100-KR-1, 100-KR-2, 100-IU-2, 100-IU-6, and 200-CW-3 Operable Units, (ROD).

The evaluation of these pipelines included site histories, analytical data, process knowledge, and field observations based on field screening, and laboratory data.

The DS-100BC-016 pipeline segment consisted of a 20-centimeter (8-inch) diameter, east-west-running steel pipe found during excavation of waste site 100-C-6, the 100-C Reactor effluent underground pipelines. The pipe had an asbestos-containing tar-based spiral wrap. Where the pipeline crossed the excavation of the 100-C-6 pipelines, the pipeline segment was removed. Approximately 50 meters (164 feet) of the pipeline was disposed at the Environmental Restoration Disposal Facility. The potential contaminants of concern were asbestos, lead, and arsenic. On 9/24/2003, samples J00YH1 (Chemistry) and J00YJ0 (Field Screening) were collected. The pipeline analytical data results detected total chromium (26.4-mg/kg)-and-lead-(48.4 mg/kg)-above-background-levels-and-confirmed-asbestos (4-8% chrysotile) in the pipe wrap. The total chromium and lead results were above background, but below direct exposure levels. RESidual RADioactivity (RESRAD) analysis illustrated that total chromium and lead will not reach groundwater or the river within 1,000 years, and, therefore, they are considered protective of groundwater and the river. The risk associated with asbestos was that of direct exposure to friable asbestos fibers. Because the asbestos on this pipe was suspended in a tar-based compound, it was considered nonfriable. The segment, therefore, does not require further remediation and was recommended for a no action decision. The pipeline was left in place at coordinates, E 565473, N 144463, and elevation 145.194.

The DS-100BC-022 pipeline segment consisted of a 2.5- centimeter (1-inch) diameter pipeline discovered during the remediation of the 100-C-3 site. The pipeline was documented in an area to the southeast of the 105-C Reactor near the former location of the 119-C sample building. The pipeline connected to a larger 10.2- centimeter (4-inch) pipeline south of where the smaller section of pipeline was discovered. The larger pipeline was a water supply line, and no contaminants of potential concern were identified beyond the asbestos commonly found in the wrapping on this type of pipe. The small pipeline was considered analogous to the larger pipeline. A sample of the pipe wrap was taken and tested for asbestos. The analytical result confirmed 3% to 8% chrysotile in the tar wrap on the pipe. Again, the asbestos is in a nonfriable form and does not represent a risk warranting CERCLA action. The pipeline segment, therefore, does not require further remediation and is recommended for a no action decision.

Soil cleanup levels were established in the interim action ROD based on a limited ecological risk assessment. A baseline risk assessment for the river corridor portion of Hanford began in

2004, which includes a more complete quantitative ecological risk assessment. That baseline risk assessment will be used as part of the final ROD for the site.

SubSite Code: 100-B-21:2

SubSite Name: 100-B-21:2, Asbestos/Tar Wrapped Pipeline

Classification: Accepted

ReClassification: Interim Closed Out

Description: The Remaining Sites Verification Package 2008-003 documents that the 100-B-21:2 subsite meets the objectives for Interim Closed Out as established in the Remedial Design Report/Remedial Action Work Plan for the 100 Area and the Interim Action Record of Decision for the 100-BC-1, 100-BC-2, 100-DR-1, 100-DR-2, 100-FR-1, 100-FR-2, 100-HR-1, 100-HR-2, 100-KR-1, 100-KR-2, 100-IU-2, 100-IU-6, and 200-CW-3 Operable Units (Remaining Sites Rod).

The pipeline segment was located 30.5 meters (100 feet) east of the east edge of the 116-B-7 flume and 34 meters (111 feet) north of the 100-B/C perimeter road and north of the former location of 116-B-11 Retention Basin. It was an asbestos-wrapped section of metal pipeline protruding from the ground, approximately 1.5 meters (5 feet) long by 2.5 centimeters (1 inch) in diameter. The history of the 100-B-21:2 pipeline, prior to its discovery in 2003, is unknown. The pipeline did not appear on the historical construction drawings. The location and orientation of the pipeline suggested that it was associated with the 116-B-11 Retention Basin and discharged to the river embankment. It was smaller than most drain lines, suggesting it was a pressurized water pipe, though the exact purpose remained unknown. The northern end of the 100-B-21:2 pipeline, originally discovered at N145362, E565307, was located west of the 116-B-7 outfall structure and north of the 100-BC perimeter road. During remediation the pipeline was determined to extend due south, under the 100-BC perimeter road to the edge of 116-B-11 Retention Basin excavation boundary.

Remedial activities were conducted from June through September 2003 and included field screening, sampling, and geophysical investigations. An additional geophysical survey in March 2007 of the 100-B-21:2 pipeline segment was performed using ground penetrating radar with results similar to those found in 2003. The geophysical interpretation identified the pipeline and noted low amplitude anomalies (thought to be large boulders) in the subsurface. The pipeline, soil in contact with the pipe, and soil 0.3 meters (1 foot) below the pipeline were removed and disposed of at ERDF. A total of approximately 91 metric tons (100 US tons) of material was disposed at ERDF. No anomalies were discovered during the remedial action.

The COCs and COPCs as listed in The Work Instruction for Verification Sampling of the 100-B-21:2, Discovery Pipeline DS-1OOBC-002 included : europium-154, arsenic, barium, cadmium, chromium, lead, mercury, selenium, silver, hexavalent chromium, acenaphthene, anthracene, Bis(2-ethylhexyl)phthalate, carbaxole, dibenzofuran, fiuorene, indeno(1,2,3-cd)pyrene, phenanthrene, pyrene. A characterization sampling event (J00YF7, J00YH7) occurred on September 3, 2003. The pipeline was severed 1.9 meters (6.2 feet) from its end, uplifted, and the scale dumped into a plastic bag. No elevated readings were discovered by an HPT who took direct readings of the scale.

The sampling results showed that residual soil concentrations supported future land uses that can be represented (or bounded) by a rural-residential scenario. The results also demonstrated that residual contaminant concentrations support unrestricted future use and are protective of groundwater and the Columbia River. This site does not have a deep zone; therefore, no deep zone institutional controls are required.

SubSite Code: 100-B-21:3

SubSite Name: 100-B-21:3, Asbestos Wrapped Steel Pipeline

Classification: Accepted

ReClassification: Interim Closed Out

Description: The Remaining Sites Verification Package for the 100-B-21:3 (RSVP-2008-052) subsite has documented that the current site conditions have achieved the remedial action objectives (RAOs) and the corresponding remedial action goals (RAGs) as established in the Remedial Design Report/Remedial Action Work Plan for the 100 Area (RDR/RAWP) and the Interim Action Record of Decision for the 100-BC-1, 100-BC-2, 100-DR-1, 100-DR-2, 100-FR-1, 100-FR-2, 100-HR-1, 100-HR-2, 100-KR-1, 100-KR-2, 100-IU-2, 100-IU-6, and 200-CW-3 Operable Units, (ROD).

Discovered in 2003, the DS-100BC-019 pipeline was described as a 20 cm (8-in.) diameter steel pipe with an asbestos-containing, tar-based spiral pipeline wrap and mechanical joints. This pipeline protruded from a sidewall of a railroad track bed cut, located just south of the 116-B-15 Percolation Pit, and ran in a north-south direction.

In March 2007, geophysical surveys were performed over the site using ground-penetrating radar (GPR). A linear anomaly that was interpreted to be the target pipeline was oriented north-south and continued to the southern edge of the investigation area where it was obscured by a highly reflective horizon. It was uncertain whether the pipeline continued past the southern boundary of the survey area; however, during remedial activities it was verified that the pipeline extended past the boundary. In September 2007, GPR was used to trace the pipeline from the last exposed point in the excavation; the line was interpreted to bend to the west and extended approximately 60 m (200 ft) to the location of the DS-100BC-016 pipeline.

In June 2007, during remedial activities, it was discovered that the DS-100BC-019 pipeline and DS-100BC-016 pipeline were connected; therefore, the DS-100BC-016 pipeline was incorporated into the 100-B-21:3 subsite and both pipeline segments were removed. The DS-100BC-016 pipeline, mapped at Washington State Plane coordinates N 14463, E 565473, had been investigated separately and reclassified as No Action in the 100-B-21:1 subsite.

The contaminants of potential concern (COPCs) for the subsite were identified in the Work Instruction for Verification Sampling of the 100-B-21:3, DS-100BC-019 Discovery Pipeline Waste Site and were listed in Table 1 of the RSVP. Asbestos and semivolatile organic compounds were included as COPCs based on positive sample results for asbestos and benzo(a)pyrene. The 100-B-21, 100-B/C Miscellaneous Pipelines Remove, Treat, and Dispose Report used process knowledge from other underground pipeline waste sites to include arsenic, barium, cadmium, chromium (total), hexavalent chromium, lead, mercury, selenium, and silver as COPCs. Gamma energy analysis (GEA) was requested due to the unknown nature of the pipelines. Although not considered COPCs, the expanded list of inductively coupled plasma (ICP) metals was also analyzed.

In October 2008, 10 verification soil samples and 1 field duplicate were collected from the excavated area. Three soil samples and one field duplicate were collected from the overburden stockpiles and staging pile area. These samples were analyzed for the COPCs.

Overburden soils were removed from above the pipeline and placed into two stockpile areas. A total of approximately 850 metric tons (940 US tons) of material was disposed at the Environmental Restoration Disposal Facility and consisted of the DS-100BC-019 and DS-100BC-016 pipelines, soil in contact with the pipelines, and soil 0.3 m (1 ft) below the pipeline. Photographs of remedial activities were presented in Appendix A of the RSVP.

A reclassification of Interim Closed Out for the subsite is supported based on site history, process knowledge, field observations, and laboratory data. Residual concentrations at the site support future unrestricted remaining sites land uses that can be represented (or bounded) by a rural-residential scenario and are considered protective of human health, groundwater, and the Columbia River. The site does not have a deep zone or residual contaminant concentrations that would require any institutional controls.

SubSite Code: 100-B-21:4

SubSite Name: 100-B-21:4, Pipeline from the 105-C Reactor East to 116-C-2B Sump

Classification: Accepted

ReClassification: Interim Closed Out

Description: The Remaining Sites Verification Package, RSVP-2009-041, has documented that the subsite has met the remedial action objectives (RAOs) and remedial action goals (RAGs) as established in the Remedial Design Report/Remedial Action Work Plan for the 100 Area (RDR/RAWP)) and the Interim Action Record of Decision for the 100-BC-1, 100-BC-2, 100-DR-1, 100-DR-2, 100-FR-1, 100-FR-2, 100-HR-1, 100-HR-2, 100-KR-1, 100-KR-2, 100-IU-2, 100-IU-6, and 200-CW-3 Operable Units (Remaining Sites ROD).

The 100-B-21:4 subsite was located in the 100-BC-1 Operable Unit of the Hanford Site, and was previously classified as the DS-100BC-044 discovery pipeline segment. The 20-cm (8-in.) stainless steel, radioactive chemical waste pipeline was at a depth of 6.1 m (20 ft) below ground surface (bgs). The pipeline ran from the northwestern corner of the 105-C Reactor Building, under the 105-C Metal Examination Facility (MEF), and discharged into the 116-C-2B Pluto Crib Pump Station. Although there is documentation of a smaller pipeline exiting the MEF and connecting to the DS-100BC-44 pipeline, this smaller pipeline or residual connection joints were not found during remediation, and they are assumed to have never been present. Drain lines from the MEF to the 116-C-2B sump and other facilities are believed to have been removed during decontamination and decommissioning activities at the 105-C Reactor Building or during field remediation of the 100-C-6:1 process effluent pipelines.

Remedial action at the waste site was performed in April 2009. The site was excavated to a depth of 7.5 m (25 ft), generating approximately 7,095 bank cubic meters (BCM) (9,280 bank cubic yards [BCY]) of overburden material stockpiled for evaluation for use as clean backfill. The excavation encountered and disposed of approximately 64 m (210 ft) of 20-cm (8-in.) stainless steel pipeline encased in concrete, and approximately 400 BCM (523 BCY) of debris and soil were sent for disposal at the Environmental Restoration Disposal Facility (ERDF).

The contaminants of potential concern (COPCs) for verification sampling of the waste site were identified based on existing historical information, in-process sampling results, and the contaminants of concern (COCs) for the 116-C-2A, B, and C sites. These COPCs included americium-241, cesium-137, cobalt-60, europium-152, europium-154, europium-155, plutonium-238, plutonium-239/240, strontium-90, uranium-233/234, uranium-235, uranium-238, hexavalent chromium, total chromium, lead, and mercury. Although not considered COPCs, antimony, barium, beryllium, boron, cadmium, cobalt, copper, manganese, molybdenum, nickel, selenium, silver, vanadium, and zinc were analyzed as constituents of the expanded inductively coupled plasma (ICP) metals list.

Verification sampling was conducted in August and September 2009 to support a determination that residual contaminant concentrations at this site met the cleanup criteria specified in the RDR/RAWP and the Remaining Sites ROD. The verification sample results were provided in Appendix B of the RSVP and indicated that the waste removal action

achieved compliance with the site remedial action objectives (RAOs) for the waste site.

These results show that residual soil concentrations support future land uses that can be represented (or bounded) by a rural-residential scenario. The results also demonstrate that residual contaminant concentrations support unrestricted future use of shallow zone soil (i.e., surface to 4.6 m [15 ft]) and that contaminant levels remaining in the soil are protective of groundwater and the Columbia River.

The acceptability of direct contact with residual deep zone contamination has not been demonstrated; therefore, institutional controls to prevent uncontrolled drilling or excavation into the deep zone are required.

Site Code:	100-B-22	**Classification:**	Accepted
Site Names:	100-B-22; 100-B Water Treatment Facilities, Pipelines, and Surrounding Soils (See Subsites)	**ReClassification:**	Interim Closed Out (3/22/2010)
Site Type:	Dumping Area	**Start Date:**	
Site Status:	Inactive	**End Date:**	

Site Description: This site consists of the 100-B water treatment facilities, pipelines and associated soils. To facilitate remedial requirements and regulatory documentation, the site has been divided into subsites. Subsite 1 consists of the underground transfer piping that interconnected the 100-B Area Water Treatment Facilities and associated soils. Subsite 2 consists of the water treatment facility structures (183-B Filter House, 185-B Deaeration Building, 195-B Process Pump House).

Waste Type: Soil

Waste Description: Contaminants of Potential Concern: Contaminants of potential concern (COPCs) include lead, mercury, hexavalent chromium, and polychlorinated biphenyls (PCBs).

Fill material was placed over potentially contaminated soil.
Sulfuric acid was added at the 183-B Head house for more than 20 years. Much of the sulfuric acid was known to be contaminated with significant amounts of lead and mercury. The sulfuric acid was unloaded at the facility from two railroad car locations. It is reasonable to assume that, during the early hectic years of operation, some unplanned and unreported spills may have occurred. No record has been found that the soil in the area of the headhouse was sampled and tested for lead and mercury prior to backfilling.

Waste Type: Soil

Waste Description: Fill material placed over potentially contaminated soil and demolished concrete structures.

The concrete flocculation and sedimentation basins were collapsed into themselves, and backfilled at least partially with waste material. No record has been found characterizing this waste material, nor has a record been found that any soil samples were taken.

Waste Type: Equipment

Waste Description: Best available information (Sharpe and Linville 2000, Plate 4) indicates that the underground piping connecting the 183-B Filter House and the 185-B/190-B Process Pump House is still in place. The lines are up to 600 meters (1,968 feet) long, and include reinforced concrete, cast iron, and steel pipes up to 137 centimeters (54 inches) in diameter. The paths of the lines are

generally north of and parallel to an existing road, N144406; and south of and parallel to an existing road, N144631.

Waste Type: Soil

Waste Description: Two 75,700 liter (20,000 gallon) acid storage tanks, believed to contain concentrated sulfuric acid, were located 12.2 meters (40 feet) south of the south end of the 185-B Deaeration Plant. Acid was unloaded from railroad cars near this location and acid was transferred from these tanks into the Deaeration Plant. The sulfuric acid was contaminated with significant concentrations of lead and mercury. It is prudent to assume unplanned and unreported leaks and spills of this acid may have occurred during the many years of operation of this plant. No records have been found to indicate that soil samples for lead and mercury were taken from this area during or after decommissioning. The tanks were located at E565113, N144451.

Waste Type: Soil

Waste Description: Concrete is located approximately 1 meter (3 feet) below clean fill material.

Decommissioning of the 185-B Deaeration Plant, 190-B Process Pump House, and associated pipe tunnels, generally allowed any portion of a structure that was 1 meter (3 feet) below grade to be left in place. Foundation concrete for both buildings, as well as the demolished parts of the tunnels, remain underground, generally within the area bounded by E565103 and E565245, and N144444 and N144584.

SubSites:

SubSite Code: 100-B-22:1

SubSite Name: 100-B-22:1, Piping Between 183-B and the 185-B/195-B Building(s)

Classification: Accepted

ReClassification: No Action

Description: A reclassification to no action based on reviews of the site history, process knowledge, and field observations has been documented in the Remaining Sites verification Package 2005-042 (RSVP). The current site condition achieves the remedial action objectives and the corresponding remedial action goals established in the Remedial Design Report/Remedial Action Work Plan for the 100 Area (RDR) and the Interim Action Record of Decision for the 100-BC-1, 100-BC-2, 100-DR-1, 100-DR-2, 100-FR-1, 100-FR-2, 100-HR-1, 100-HR-2, 100-KR-1, 100-KR-2, 100-IU-2, 100-IU-6, and 200-CW-3 Operable Units, (Remaining Sites ROD).

The RSVP indicated that the only additives to the process water in the pipelines came from the 183-B facility. Chemicals added at the 183-B facility included chlorine, sulfuric acid, alum, ferric sulfate, Separan® (a coagulant), and lime. Sulfuric acid used for water treatment at the Hanford site, historically had lead and mercury contamination. Where sulfuric acid was spilled or otherwise allowed to collect, lead and mercury have been found above the remedial action goals. These areas were most commonly associated with the transportation and handling of concentrated sulfuric acid. Trace contamination from the sulfuric acid that was added to adjust the pH of the water, would be dilute in the cooling water. There was no evidence to suggest that the pipelines were ever a source of human health risk due to the addition of sulfuric acid.

Process knowledge indicated that the pipelines were upstream of facilities where sodium dichromate was added to the process water and of the 105-B Reactor. The pipelines,

therefore, would not have received discharges containing elevated levels of radionuclides or metals, including lead and hexavalent chromium. Originally, the sodium dichromate was brought into the 185-B/190-B Buildings as a concentrated solution through the sodium dichromate lines (100-B-14:5) that entered on the north side of the building. Cooling water pipelines between the 190-B Building and the 105-B Reactor were part of 100-B-14:4 waste site.

Examination of excavated trenches as well as historical documents and drawings indicated that all of the pipelines were more than 0.15 meters (6 inches) in diameter and were used for cooling water not for the transfer of concentrated chemical solutions. Three small-diameter pipelines, used as chemical transfer lines, were found plumbed into the 183-B and 190-B Buildings. Two of these pipelines, the sodium dichromate and the sodium silicate pipelines (100-B-14:5) connected the 108-B Building to the 185-B/190-B Buildings. The 100-B-14:5 site has been remediated and closed. The third small-diameter pipeline has been identified as the sodium dichromate line designated as the 100-B-28 waste site. Remediation of the 100-B-28 site is expected in 2007.

The basis for the no action determination precluded the need for sampling at this site, and therefore a comparison between soil data and ecological screening levels was not necessary. A baseline risk assessment for the river corridor portion of the Hanford Site began in 2004, which included a more complete quantitative ecological risk assessment. That baseline risk assessment will be used as part of the final closeout decision for this site.

Reclassification evaluations have illustrated that residual soil concentrations support future land uses that can be represented (or bounded) by a rural residential scenario. The evaluations also demonstrated that residual contaminant concentrations support unrestricted future use and that contaminant levels remaining in the soil are protective of groundwater and the Columbia River. This site does not have a deep zone; therefore, no deep zone institutional controls are required.

SubSite Code: 100-B-22:2

SubSite Name: 100-B-22:2; Water Treatment Facilities and Surrounding Soils ;183-B Filter House, 185-B Deaeration Building, 195-B Process Pump House, and Associated Soils

Classification: Accepted

ReClassification: Interim Closed Out

Description: The 100-B-22 waste site consisted of the former 100-B water treatment facilities, including pipelines between the facilities, and potentially impacted soils. The three former water treatment facilities are the 183-B Filter Plant, the 185-B Deaeration Plant, and the 190-B Process Pumphouse. These facilities were designed to supply, treat, store, and transport cooling water to the 105-B Reactor. They have been decommissioned and demolished to approximately 1 m (3 ft) below ground surface (Griffin 1988, Marske 1994). Subsite 2 consisted of the 183-B Filter House, 185-B Deaeration Plant, and 190-B Process Pumphouse footprints and associated soils. The 183-B clearwells are excluded from this waste site, as they are addressed separately as the 126-B-2 waste site.

A reclassification to Interim Closed Out for the 100-B-22:2 subsite is supported based on site history, process knowledge, field observations, and comparison of residual contaminant concentrations against RAGs. The Remaining Sites Verification Package (RSVP-2010-004) for 100-B-22:2 has documented that the site has met the remedial action objectives (RAOs) and the corresponding remedial action goals (RAGs) as established in the Remedial Design Report/Remedial Action Work Plan for the 100 Area and the Interim Action Record of Decision for the 100-BC-1, 100-BC-2, 100-DR-1, 100-DR-2, 100-FR-1, 100-FR-2, 100-HR-1, 100-HR-2, 100-KR-1, 100-KR-2, 100-IU-2, 100-IU-6, and 200-CW-3 Operable Units.

(Remaining Sites ROD).

The entry points for process chemicals into the former facilities were targeted for visual investigation and focused sampling. Based on confirmatory sampling performed in 2007 and 2009 the results of this investigation, it was determined that remediation was required only for a small drain line associated with the 183-B headhouse. Remediation was performed in May 2009, by excavating approximately 40 bank cubic meters (50 bank cubic yards) of pipe debris and soil and disposing it at the Environmental Restoration Disposal Facility.

Contaminants of potential concern (COPCs) for the 100-B-22:2 site were determined based on process knowledge. Hexavalent chromium and total chromium were considered COPCs due to past handling and usage of sodium dichromate at the facilities. Lead, mercury, and sulfate were included as COPCs due to past usage of sulfuric acid for coagulant preparation and pH modification. The bauxite used for alum generation contained naturally occurring radionuclides at higher levels than local background; therefore, gross alpha and beta proportional counting and gamma spectroscopy were also performed for selected samples.

Decontamination of facility interiors was performed as part of decommissioning of the 183-B, 185-B, and 190-B buildings (Griffin 1988, Marske 1994). The remaining footprint of these facilities contains inert concrete debris and structural material, along with other clean fill used to bring the site to grade. Therefore, in development of a confirmatory investigation strategy with the U.S. Environmental Protection Agency (EPA) and the Department of Energy, Richland Office (DOE-RL), it was decided that entry points for process chemicals into these facilities represented the worst case for potential remaining contamination. The Work Instruction for Confirmatory Sampling of the 100-B-22:2 Water Treatment Facilities identified three such locations for excavation of test pits and sampling. The laboratory-reported data results for all constituents were stored in the WCH ENRE project-specific database prior to provision to HEIS and are also presented in Appendices B and D of the RSVP.

The subsite has been evaluated in accordance with the Remaining Sites ROD and the RDR/RAWP. A portion of the site was remediated due to elevated contamination; verification sampling results show residual concentrations of COCs/COPCs for this area meet the RAOs for direct exposure, groundwater protection, and Columbia River protection. Confirmatory sampling results for other site areas demonstrated that the RAOs have been attained without need for remedial action. In accordance with this evaluation, the sample results support a reclassification of the subsite to Interim Closed Out.

The results of verification sampling for this remedial action and the results of confirmatory sampling for the remainder of the subsite show that residual contaminant concentrations do not preclude any future uses (as bounded by the rural-residential scenario) and allow for unrestricted use of shallow zone soils (i.e., surface to 4.6 m [15 ft] deep). The results also demonstrate that residual contaminant concentrations are protective of groundwater and the Columbia River. This site does not have residual contaminant concentrations that would require any deep zone institutional controls.

Site Code:	100-B-23	**Classification:**	Accepted
Site Names:	100-B-23, 100-B/C Surface Debris	**ReClassification:**	Interim Closed Out (6/16/2008)
Site Type:	Dumping Area	**Start Date:**	
Site Status:	Inactive	**End Date:**	
Site Description:	The site consisted of various sizes and forms of scattered surface debris in the 100-B/C Area which has been identified as potentially dangerous/CERCLA waste.		

Waste Type: Asbestos (non-friable)

Waste Description: Contaminants of potential concern (COPCs) include asbestos, lead, oil, and creosote. Debris is scattered across the 100-B/C area.

Waste Type: Misc. Trash and Debris

Waste Description: Pieces of lead sheet.

Waste Type: Oil

Waste Description: Oil from automobile oil filters on soil surface; scattered oil filters.

Waste Type: Misc. Trash and Debris

Waste Description: The treated wood locations are isolated; that is, not within existing or abandoned railroad beds or utility laydown yards. These locations contain one or more horizontal railroad ties, posts, or poles imbedded or resting on the surface, more or less weathered. The locations do not include posts, poles, plywood, or other wood materials that does not appear to have been a treated wood.

Site Code: 100-B-24 **Classification:** Accepted

Site Names: 100-B-24, 1904-B1 Spillway (Flume), 100-B-15:1 Flumes from Outfall Structures 116-B-7, 132-B-6, 132-C-2 **ReClassification:** No Action (9/18/2006)

Site Type: Outfall **Start Date:**

Site Status: Inactive **End Date:**

Site Description: The site has been sampled and found to meet the requirements for reclassification to "No Action". The flume has been decommissioned and backfilled. The 100-B-24 Spillway (also referred to as a flume) was constructed of concrete and led from the 116-B-7 outfall structure to the river shoreline.

Waste Type: Construction Debris

Waste Description: No evidence has been found that the flume was ever put into service. If it had been used the COPCs for the 100-B-24 spillway would be the same as those for the 116-B-7 outfall structure, which are as follows: Americium-241, cobalt-60, cesium-137, europium-152, europium-154, europium-155, tritium, nickel-63, uranium-234, uranium-235, uranium-238, plutonium-238, plutonium-239/240, strontium-90, total chromium, hexavalent chromium, lead, and mercury.

Site Code: 100-B-25 **Classification:** Accepted

Site Names: 100-B-25, 1904-B2 Spillway, 132-B-6 Outfall, 100-B-15:1 Flumes from Outfall Structures 116-B-7, 132-B-6, 132-C-2 **ReClassification:** Interim Closed Out (1/13/2010)

Site Type: Outfall **Start Date:**

Site Status: Inactive **End Date:**

Site Description: The site has been remediated and reclassified to Interim Closed Out. The site consisted of a Spillway (also referred to as a flume.) The spillway was constructed of concrete and led from the 132-B-6 outfall structure, via a heavy riprap extension on the end of the concrete spillway, to the river shoreline. During decommissioning projects in the 1980's, the spillway walls were collapsed and the structure was covered with clean soil.

Waste Type: Demolition and Inert Waste

Waste Description: Possible chemical and/or radionuclide contamination (see Contaminants of Potential Concern).

No evidence has been found that the flume was ever put into service. If it had been used, the COPCs for the 100-B-25 spillway would be the same as those for the 132-B-6 outfall structure, which are as follows: Americium-241, cobalt-60, cesium-137, europium-152, europium-154, europium-155, tritium, nickel-63, uranium-234, uranium-235, uranium-238, plutonium-238, plutonium-239/240, strontium-90, total chromium, hexavalent chromium, lead, and mercury.

Site Code: 100-B-26 **Classification:** Accepted

Site Names: 100-B-26, 1904-C Spillway, 100-B-15:1 Flumes from Outfall Structures 116-B-7, 132-B-6, 132-C-2 **ReClassification:** No Action (9/18/2006)

Site Type: Outfall **Start Date:**

Site Status: Inactive **End Date:**

Site Description: The site has been reclassified to No Action. The riprap section of the spillway remains, with the upper portion covered by clean fill. A rudimentary road crosses the otherwise exposed lower riprap section.

Waste Type: Construction Debris

Waste Description: If ever put into service, the COPCs for the 100-B-26 spillway would be the same as those for the 132-C-2 Outfall, which are as follows: Americium-241, cobalt-60, cesium-137, europium-152, europium-154, europium-155, tritium, nickel-63, uranium-234, uranium-235, uranium-238, plutonium-238, plutonium-239/240, strontium-90, total chromium, hexavalent chromium, lead, and mercury.

Site Code: 100-B-27 **Classification:** Accepted

Site Names: 100-B-27, Sodium Dichromate Spill **ReClassification:** Interim Closed Out (4/12/2010)

Site Type: Unplanned Release **Start Date:**

Site Status: Inactive **End Date:**

Site Description: The site was an unplanned release of sodium dichromate that was discovered while removing the western staging pile associated with the cleanup of the 126-B-3 Coal Pit.

Soil contamination associated with the spill consisted of a fairly narrow, near-vertical plume in the upper vadose zone (to approximately 11 m [36 ft] below ground surface [bgs]). Below this depth, the plume continued downward in a generally northeasterly direction. Soil contamination was found down to the groundwater table, located approximately 13.5 m (44 ft) bgs.

Waste Type: Chemical Release

Waste Description: The contaminant of potential concern is Cr6. Sample results for J030K6 show greater than 500 mg/kg total chromium (15,000 ug/L chromium by TCLP). Elevated chromium concentrations were also detected in waste characterization samples that were collected from segregated soil (J03CP6 and J03CP7).

The waste was soil contaminated with sodium dichromate. The suspected source of the sodiium dichromate is consistent with handling and delivery of this material in bagged dry form. Sodium dichromate was delivered in dry form until about 1955 when modifications were made to use liquid sodium dichromate.

Site Code:	100-B-28	**Classification:**	Accepted
Site Names:	100-B-28, 183-C Headhouse to 183-B Pumphouse Sodium Dichromate Transfer Pipeline	**ReClassification:**	Interim Closed Out (3/22/2010)
Site Type:	Product Piping	**Start Date:**	
Site Status:	Inactive	**End Date:**	

Site Description: This site consisted of an underground sodium dichromate pipeline from the 183-C Head House to the 183-B Filter Plant/Pump House. The pipeline was originally a soft water supply line from the 184-B Power House to the 183-C Head House.

According to the RSVP in 1962, the pipeline was modified to transfer sodium dichromate from the 183-C Headhouse to the 183-B Filter Plant. The northern end of the waste site was located approximately 430 m (1,410 ft) directly west of the 105-B Reactor, and the southern end of the pipeline was 9 m (28 ft) northwest of the former 183-C Filter Plant (Figure 1). The remaining southern portion of the pipeline is considered within the footprint of the 100-C-7:1 waste site. The portion of the former soft water line leading to the 184-B Power House was confirmed to have been isolated during modification of the pipeline and was not associated with sodium dichromate transfer.

Waste Type: Abandoned Chemicals

Waste Description: Concentrated sodium dichromate solution was drained from the converted softwater pipeline (1-3) excavated and opened at the 100-C-7 waste site (dichromate unplanned release) north of the 183-C Head House. The 7.6-cm (3-in) softwater line was modified in 1962 to serve as a sodium dichromate solution transfer line from the 183-C Head House to the 183-B Filter Plant

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Site Code:	100-B-29	**Classification:**	Not Accepted (3/30/2009)
Site Names:	100-B-29, Pipe Located Southeast of the 183-B Clearwells	**ReClassification:**	
Site Type:	Product Piping	**Start Date:**	
Site Status:	Inactive	**End Date:**	

Site Description: The site consisted of an approximately 0.15 m (6 in) diameter carbon steel pipe, about 3 m (10 ft) long, with a partially intact mastic wrap (P6120025). The pipe was oriented in a northwest to southeast direction. The northwesterly end was jagged metal suggesting that it may have been severed during an excavation. T

Site Code:	100-B-32	**Classification:**	Accepted
Site Names:	100-B-32, Soil Contamination Area Associated with Legacy Waste, SCA #1	**ReClassification:**	Interim Closed Out (1/13/2010)
Site Type:	Unplanned Release	**Start Date:**	2005
Site Status:	Inactive	**End Date:**	2009

Site Description: The site had been a Surface Contamination Area (SCA) found on the haul route from the 118-B-1 Burial Ground to the container transfer area. The area was previously posted as an SCA due to multiple locations of elevated radiological activity identified by LARADS. Field instrumentation indicated a location with approximately 3.4 million dpm/100 square centimeters beta/gamma activity at this spot. The hot spot measured approximately 25 square centimeters. The contamination at this location was matrixed with the asphalt and is believed to be a legacy of past practices and operations. Down-posting efforts following completion of remediation and closure activities in the area confirmed an area of significantly elevated radiological activity at the location listed.

No other areas of significant elevated activity were identified along the posted haul route at the locations previously identified based on 2005 LARADS data.

Waste Type: Soil

Waste Description: The waste is contaminated soil and asphalt. The contaminants of potential concern are radiological contaminates. The source of this material is unknown.

Site Code:	100-B-33	**Classification:**	Accepted
Site Names:	100-B-33, Soil Contamination Area 2 Associated with Legacy Waste, SCA #2	**ReClassification:**	Interim Closed Out (1/13/2010)
Site Type:	Unplanned Release	**Start Date:**	
Site Status:	Inactive	**End Date:**	

Site Description: The site is a Surface Contaminated Area (SCA). The site was discovered during GPERS surface soil surveys of the north-east quadrant of the 100-BC Area in July - August 2007. The readings found showed an elevated area averaging 15,000 cpm over a 150 square meter area with a max reading of 93,000 cpm.

Waste Type: Soil

Waste Description: The waste is contaminated soil. The contaminants of potential concern are radiological contaminants. The source of this material is unknown.

Site Code:	116-B-1	**Classification:**	Accepted
Site Names:	116-B-1, 107-B Liquid Waste Disposal Trench, Process Effluent Trench	**ReClassification:**	Interim Closed Out (12/8/1999)
Site Type:	Trench	**Start Date:**	1950
Site Status:	Inactive	**End Date:**	1968

Site Description: The site has been remediated and closed out.

The 116-B-1 Liquid Waste Disposal Trench was dug to receive effluent routed from 116-B-11

(107-B Retention Basin). The unit ran from southwest to northeast. The site included the 40.6 centimeter (16 inch) diameter steel piping from 116-B-11. Historical documents described the trench as a french drain or an excavation that was partly or completely filled with coarse gravel and had dimensions of 61 meters (200 feet) long by 9.1 meters (30 feet) wide by 4.6 meters (15 feet) deep. A geophysical investigation of 116-B-1 performed in November and December 1996 showed the trench was almost twice as long as indicated by historical information (see Dimensions). The Ground Penetrating Radar (GPR) survey identified a pipeline, labeled #10 in the survey report, entering the trench at its southwest end. No other pipelines were evident. A significant volume of buried debris was present in the northeastern half of the trench.

Waste Type: Process Effluent

Waste Description: The site received effluent from the 107-B Retention Basin at times of high activity due to fuel element failures. The fission products of 54 fuel ruptures were routed to this site.

Waste Type: Misc. Trash and Debris

Waste Description: Geophysical investigation identified a high concentration of subsurface debris in the northeastern half of the trench.

Site Code:	116-B-2	**Classification:**	Accepted
Site Names:	116-B-2, 105-B Storage Basin Trench, B-Storage Basin Crib	**ReClassification:**	Interim Closed Out (2/24/2000)
Site Type:	Trench	**Start Date:**	1946
Site Status:	Inactive	**End Date:**	1946

Site Description: This site was remediated and closed out on February 24, 2000. It is no longer marked or posted.

The trench was used one time to receive approximately 4E+06 liters (1.1E+06 gallons) of storage basin water that became contaminated when a fuel rod was accidentally cut in half. The trench was backfilled after use with clean dirt.

Waste Type: Water

Waste Description: This unit was dug and used once after a fuel element was accidentally cut in half in the 105-B Storage Basin. Basin water was discharged to this unit in an attempt to remove radionuclides from the fuel storage basin cooling water for contamination control.

Site Code:	116-B-3	**Classification:**	Accepted
Site Names:	116-B-3, 105-B Pluto Crib	**ReClassification:**	Interim Closed Out (2/24/2000)
Site Type:	Crib	**Start Date:**	1951
Site Status:	Inactive	**End Date:**	1952

Site Description: The 116-B-3 Pluto Crib has been remediated and was closed out on February 24, 2000. It is no longer marked or posted.

This unit was a wooden crib shored with railroad ties, filled with gravel and covered to grade with clean soil. A concrete marker indicates the position of the crib. Clukey (1954) indicates that the crib is a french drain, otherwise defined as a "tile or pipe buried vertically, sometimes

gravel-filled". After its use, the crib was reportedly unearthed and shored with wooden ties.

Waste Type: Water

Waste Description: The site received effluent from reactor tubes containing ruptured fuel elements.

Site Code:	116-B-4	**Classification:**	Accepted
Site Names:	116-B-4, 105-B Dummy Decontamination French Drain, 105-B Dummy Decontamination Disposal Crib	**ReClassification:**	Interim Closed Out (2/24/2000)
Site Type:	French Drain	**Start Date:**	1957
Site Status:	Inactive	**End Date:**	1968

Site Description: This site has been remediated and closed out. It is no longer marked or posted.

The unit had a graded rock and sand bottom. It was marked with four yellow steel posts and had a curved stainless steel pipe in the center along with a painted concrete marker. The site included a feed pipe that originated at the 105-B Building.

Waste Type: Process Effluent

Waste Description: The site received spent acid and rinse water from the 105-B Dummy (fuel element spacers and reactor hardware) Decontamination Facility.

Site Code:	116-B-5	**Classification:**	Accepted
Site Names:	116-B-5, 116-B-5 Crib, 116-B-5 Trench, 108-B Crib	**ReClassification:**	Interim Closed Out (1/14/1997)
Site Type:	Crib	**Start Date:**	1950
Site Status:	Inactive	**End Date:**	1968

Site Description: The crib structure and its contents have been removed. The crib was constructed of concrete timbers and consisted of 12 rectangular cells in a single row. Each cell was partially filled with sandy gravel and had a separate concrete lid. For cleanup purposes, the cells were identified using the letters "A" through "L", with cell A being the southernmost cell.

Waste Type: Process Effluent

Waste Description: The site received liquid tritium wastes from the 108 Building. Only wastes of less than 1 microcuries/cubic centimeter were discharged to this unit.

Site Code:	116-B-6A	**Classification:**	Accepted
Site Names:	116-B-6A, 111-B Crib No. 1, 116-B-6-1	**ReClassification:**	Interim Closed Out (5/17/2000)
Site Type:	Crib	**Start Date:**	1951
Site Status:	Inactive	**End Date:**	1968

Site Description: This site has been remediated and closed out.

Waste Type: Process Effluent

Waste Description: The unit received radioactive liquid wastes from equipment decontamination performed in the 111-B Building, as well as from the decontamination of fuel element spacers performed at the 111-B Building Decontamination Station.

Site Code:	116-B-6B	**Classification:**	Accepted
Site Names:	116-B-6B, 111-B Crib No. 2, 116-B-6-2	**ReClassification:**	Interim Closed Out (2/24/2000)
Site Type:	Crib	**Start Date:**	1950
Site Status:	Inactive	**End Date:**	1953

Site Description: This site has been remediated and closed out. The site was commonly known as the 116-B-6B Crib, although it has also been known as 111-B Crib No. 2 and as 116-B-6-2.

Waste Type: Process Effluent

Waste Description: The site received radioactive wastes from equipment decontamination performed in the 111-B Building as well as liquid wastes from fuel element spacer decontamination.

Site Code:	116-B-7	**Classification:**	Accepted
Site Names:	116-B-7, 1904-B-1 Outfall Structure, 1904-B1	**ReClassification:**	Interim Closed Out (7/25/2002)
Site Type:	Outfall	**Start Date:**	1944
Site Status:	Inactive	**End Date:**	1972

Site Description: The site has been remediated and closed out.

The outfall was excavated, sampled and backfilled to match the surrounding grade.

Waste Type: Process Effluent

Waste Description: The outfall was originally used for both process sewer and reactor cooling water disposal until 1954 when it was used exclusively for process sewer disposal.

Site Code:	116-B-9	**Classification:**	Accepted
Site Names:	116-B-9, 104-B-2 French Drain	**ReClassification:**	Interim Closed Out (2/24/2000)
Site Type:	French Drain	**Start Date:**	1952
Site Status:	Inactive	**End Date:**	1954

Site Description: The site has been remediated and closed out.

The site is a french drain that was related to the 104-B-2 Tritium Laboratory (118-B-9). The site includes the feed pipeline that originated at the 104-B Building. The drain was not originally apparent from the surface. Ground Penetrating Radar (GPR) revealed an anomaly consistent with a french drain. Photo images #2 and #3 show the french drain.

Waste Type: Process Effluent

Waste Description: The site received waste water from the P-10 Storage Building drain. Since the P-10 project involved tritium production, tritium may be a potential contaminant. The drain is not currently posted as being contaminated. An evaluation to determine potential contaminants for the 100 Area SAP resulted in four COPCs: coalt-60, cesium-137, europium-152, and strontium-90.

Site Code:	116-B-10	**Classification:**	Accepted
Site Names:	116-B-10, 108-B Dry Well, Quench Tank	**ReClassification:**	Interim Closed Out (2/24/2000)
Site Type:	Injection/Reverse Well	**Start Date:**	1950
Site Status:	Inactive	**End Date:**	1968

Site Description: The site was remediated in 1999 and closed out in February 2000. It is no longer marked or posted.

The site was a french drain with a metal manhole type cover and constructed of a 61-centimeter (24-inch) vitrified clay pipe on subsurface concrete slab. It was covered with a plywood cover and clean backfill material. A 3.8-centimeter (1.5-inch) drain line was added in the mid-50s that came from the experimental tube and other hardware decontamination facility. All piping leading into the drain was removed at the time of the 108-B demolition.

Waste Type: Process Effluent

Waste Description: This site received liquid decontamination wastes from the 108-B Tube Examination and Experimental Facility. During the tritium recovery programs, the site also received liquid decontamination wastes from the mask and small tool decontamination station located on the second floor and storm runoff from the fan room roof. The 108-B Building was involved with tritium recovery activities so tritium is a possible contaminant of concern.

Site Code:	116-B-11	**Classification:**	Accepted
Site Names:	116-B-11, 107-B Retention Basin, 116-B-11 Retention Basin	**ReClassification:**	Interim Closed Out (12/8/1999)
Site Type:	Retention Basin	**Start Date:**	1944
Site Status:	Inactive	**End Date:**	1968

Site Description: The site has been remediated and closed out. It includes the retention basin and the two effluent pipes running parallel to, and adjacent to, the north side of the basins. These pipes were removed as part of the plume removal during the retention basin remedial action.

Waste Type: Water

Waste Description: This unit received cooling water effluent from the 105-B Reactor for radioactive decay and thermal cooling prior to release to the Columbia River. Total radionuclide inventories in the vicinity of the unit ranged from 5 to over 400 curies. Eighty percent of the total radionuclide inventory is contained within the soil adjacent to the unit. Approximately 10 curies have leached into the concrete floor and walls.

Site Code:	116-B-12	**Classification:**	Accepted
Site Names:	116-B-12, 117-B Crib, 117-B Seal Pit Crib	**ReClassification:**	Interim Closed Out (2/24/2000)

Site Type:	Crib	**Start Date:**	1961
Site Status:	Inactive	**End Date:**	1968
Site Description:	This site has been remediated and closed out. The site was a crib with bottom measurements of 6.1 meters (20 feet) by 15.24 meters (50 feet).		
Waste Type:	Process Effluent		
Waste Description:	The site received drainage from the confinement system in the 117-B Building seal pits. From process knowledge, the waste site contaminants of concern (COCs) identified in the SAP (DOE-RL 1998) include strontium-90, uranium-238, and hexavalent chromium (Cr+6).		

Site Code:	116-B-13	**Classification:**	Accepted
Site Names:	116-B-13, 107-B South Sludge Trench, 116-B-8, 107-B #2 Grave, Basin Sludge Burial Pit	**ReClassification:**	Interim Closed Out (7/22/1999)
Site Type:	Trench	**Start Date:**	1952
Site Status:	Inactive	**End Date:**	1952
Site Description:	This site has been remediated, backfilled, and revegetated. It has been closed out.		
Waste Type:	Sludge		
Waste Description:	The unit received low-level sludge waste from the bottom of 116-B-11 (107-B Retention Basin). During maintenance clean out operations, sludge was disposed of in the trench. There is no indication from available records that this site directly received any regular and/or high-volume effluent wastes. Potential contaminants of concern included: americium-241, cobalt-60, cesium-137, europium-152, europium-154, europium-155, plutonium-238, plutonium-239/240, strontium-90, uranium-238, total chromium, hexavalent chromium (Cr+6), mercury, and lead.		

Site Code:	116-B-14	**Classification:**	Accepted
Site Names:	116-B-14, 107-B North Sludge Trench, 107-B Liquid Waste Disposal Trench No. 1, 116-B-2, 107-B #1 Grave	**ReClassification:**	Interim Closed Out (7/22/1999)
Site Type:	Trench	**Start Date:**	1948
Site Status:	Inactive	**End Date:**	1948
Site Description:	The 116-B-14 site appears as an open field covered with cobbles and sparse vegetation. The site has been remediated and closed out.		
Waste Type:	Sludge		
Waste Description:	The unit received low-level sludge waste from the bottom of 116-B-11 (107-B Retention Basin). During maintenance clean out operations, sludge was disposed of in the trench. There is no indication from available records that this site directly received any regular and/or high-volume effluent wastes. After its use, the waste site was covered with about 1.8 meters (6 feet)		

of soil.

Potential contaminants of concern included: americium-241, cobalt-60, cesium-137, europium-152, europium-154, europium-155, plutonium-238, plutonium-239/240, strontium-90, uranium-238, total chromium, hexavalent chromium (Cr+6), mercury, and lead.

Site Code:	116-B-15	**Classification:**	Accepted
Site Names:	116-B-15, 105-B Fuel Storage Basin Cleanout Percolation Pit, 105-B Fuel Storage Discharge Pond, 105-B Pond	**ReClassification:**	No Action (12/8/2003)
Site Type:	Pond	**Start Date:**	1984
Site Status:	Inactive	**End Date:**	1985

Site Description: This site has been evaluated and determined to meet remedial action objectives. The evaluation and sampling results support the reclassification to No Action. The unit was a large, open, excavated pit, rectangular in shape. The site was used from November 1984 to December 1985.

Waste Type: Water

Waste Description: The unit received processed water from the 105-B Fuel Storage Basin. During the cleaning of this basin, the radiologically contaminated shielding water was processed through a system that utilized ion exchange columns. Before discharging the water to the unit, composite samples were taken to ensure that radionuclide concentrations were below release criteria in Table II of DOE Order 5480.1. No known chemical substances were present in the water; however, chemical analysis during that period was not a standard practice, and there is no evidence that it was performed.

Site Code:	116-B-16	**Classification:**	Accepted
Site Names:	116-B-16, 111-B Fuel Examination Tank	**ReClassification:**	Interim Closed Out (5/17/2000)
Site Type:	Storage Tank	**Start Date:**	
Site Status:	Inactive	**End Date:**	1968

Site Description: This site has been remediated and closed out.

The unit was a vegetation free, cobble-covered field located within a barricaded area at the former site of the 111-B Building. The floor, foundation, and tank were the only remaining portions of the building. The fuel examination tank was located along the west side of the barricaded area. A curved, capped ventilation pipe extended about 25 centimeters (10 inches) above ground just north and east of the tank location. The barricaded area was surrounded by light duty steel posts with light duty chain and has been posted with "Caution: Underground Radioactive Material" signs. The tank was constructed of concrete. It is believed that the tank was filled with either sand or concrete before the site was abandoned.

Waste Type: Process Effluent

Waste Description: The unit is believed to have received wastes similar to those identified in 116-B-6A (111-B Crib No. 1); i.e., radioactive waste from equipment decontamination, the 111-B Building, and liquid wastes from fuel element spacer decontamination.

Site Code:	118-B-5	**Classification:**	Accepted
Site Names:	118-B-5, Ball 3X Burial Ground	**ReClassification:**	Interim Closed Out (5/24/2004)
Site Type:	Burial Ground	**Start Date:**	1953
Site Status:	Inactive	**End Date:**	1953
Site Description:	The site has been remediated and interim closed out.		
Waste Type:	Equipment		
Waste Description:	The unit received 40.00 cubic meters (1410 cubic feet) of highly contaminated metallic wastes, including thimbles and step plugs that were removed from the 100-B Reactor during the performance of work for the Ball 3X project. The Ball 3X project replaced the liquid boron system for emergency reactor control with a system using solid boron-steel and carbon-steel balls. Potential contaminates include: C-14, Co-60, Ni-63		

Site Code:	118-B-7	**Classification:**	Accepted
Site Names:	118-B-7, 111-B Solid Waste Burial Site	**ReClassification:**	Rejected (12/9/2004)
Site Type:	Burial Ground	**Start Date:**	1951
Site Status:	Inactive	**End Date:**	1968
Site Description:	The unit appears as the southern portion of a cobble-covered field. The central portion of the field is covered with natural vegetation and there is a permanent concrete marker in the southern section.		
Waste Type:	Equipment		
Waste Description:	This unit received small amounts of waste from the 111-B Facility, which was originally used as a charge makeup and reactor fuel inspection station. After one year, the 111-B Facility was used as a decontamination facility for equipment and a workshop for low-level contaminated equipment. This unit also received decontamination materials and assorted equipment from that building. Small amounts of reactor hardware may have also been placed in this unit. Potential contaminates include: Co-60, Ni-63, RCRA metals		

Site Code:	118-B-8	**Classification:**	Accepted
Site Names:	118-B-8, 105-B Reactor Building, B Reactor (See Subsites)	**ReClassification:**	
Site Type:	Reactor	**Start Date:**	1944
Site Status:	Inactive	**End Date:**	1968
Site Description:	The site consisted of the 105-B Reactor Building complex which originally included the inactive plutonium production reactor block with associated shielding and controls, an irradiated fuel storage basin, and contaminated portions of the reactor building. See the subsites for detailed information.		
Waste Type:	Equipment		

Waste Description: This Reactor building contained an estimated 23,500 curies of radionuclides, 79,800 kilograms (88 tons) of lead, and 227 kilograms (500 pounds) of cadmium.

Waste Type: Asbestos (friable)

Waste Description: The Reactor Building is estimated to contain 85.0 cubic meters (3000 cubic feet) of asbestos.

SubSites:

SubSite Code: 118-B-8:1

SubSite Name: 118-B-8:1, 105-B Reactor Building

Classification: Accepted

ReClassification:

Description: The reactor rested on a 7.0-meter (23-foot) thick concrete foundation topped with cast iron blocks that served as a thermal shield. The building walls consisted of reinforced concrete in the lower portions and concrete blocks in the upper portions with thickness varying from 0.9 to 1.5 meters (3 to 5 feet). The roof was composed of precast concrete roof tiles, except for the discharge area enclosure and inner horizontal rod room where the roof was composed of 1.8-meter (6-foot) thick reinforced concrete.

The reactor core consisted of a graphite "stack" that measured 8.5 meters (28 feet) from front to rear, 11.0 meters (36 feet) from side to side, and 11.0 meters (36 feet) from top to bottom. The stack was pierced front to rear by 2,004 process channels that held the fuel elements. Nine horizontal channels for control rods entered from the left side and 29 vertical channels for safety rods entered from the top. Six test holes labeled A through F, leading from the right, existed for irradiation of experiments, foils, counters, ionization chambers, and special samples. The horizontal control rod (HCR) and vertical safety rod (VSR) channels, as well as the test holes, were lined with a thin sheet of aluminum known as a "thimble".

The graphite core was surrounded by a cast iron thermal shield layer. Cooling for the top, side, and bottom shields were provided by circulating water tubes imbedded in the blocks. The entire reactor block was then enclosed in a welded steel box that functioned to confine the inert gas atmosphere within the reactor. Expansion joints were placed on the corners of the block to allow for thermal expansion and expansion bellows were located at each process tube opening. The bellows served as gas seals as the process tubes expanded and contracted with temperature and with the distortions of the graphite.

The fuel storage basin was located at the rear of the reactor. The concrete basin area served as a collection, storage, and transfer facility for the irradiated fuel elements discharged from the reactor. The water in the basins served both as coolant and as shielding. The basin consisted of a discharge chute and fuel element pickup area, a storage area, a transfer area, and a wash pad area.

SubSite Code: 118-B-8:2

SubSite Name: 118-B-8:2, 105-B French Drains

Classification: Accepted

ReClassification:

Description: The subsite consists of French drains around the periphery of the 105-B Reactor Building. During two walk downs in September 2004, 14 suspect French drain locations were recorded using global positioning system (GPS) instrumentation and were photographed.

No information could be found to corroborate what liquid waste streams from the building were discharged to each of these suspect drains. Because B Reactor was a first-of-a-kind operation and a national priority, it is prudent to assume that any of these suspect drains could have received unplanned and/or unrecorded releases of both radioactive and nonradioactive CERCLA wastes. It should be noted that the soil associated with some of the French drains at both D Reactor and F Reactor have tested positive for heavy metals and fission products. (See sites 100-F-10, 116-D-6 and 116-F-11.)

French drains were designed to receive nonradioactive liquids from the 105-B Reactor Building, via over-ground and/or underground piping. The discharges included steam condensate and floor drain wastes. The liquids would percolate through the gravel/soil fill, and out the open end at the bottom of the drain into the native soil.

Because of variables, each of the suspect drain sites will require further investigation prior to cleanup activities, including removal of covers and visual inspection and sampling of drain fill material and surrounding native soil.

During walkdowns on 9/7/04 by M. R. Schwab and J. C. Womack and 9/13/04 by J. P. Kiesler and W. Coffin around the periphery of the 105-B Building, 14 suspect French drain locations were recorded using global positioning system (GPS) instrumentation and were photographed. Most of the suspect drains had protective covers, and no visual inspection was attempted beneath those covers. Some of the covers had been penetrated by over-ground piping, and others had holes that suggested previous discharge points. Other French drains may have received discharges from underground piping.

Contaminants of potential concern (COPCs) for the French Drains included gamma emission analysis (GEA), gross alpha, gross beta, hexavalent chrome, inductively coupled plasma (ICP) metals, and polychlorinated biphenyls (PCBs). Several of these are methods for determining general fission products; however, the statement is consistent with current cleanup practices as listed in the sampling and analysis plans (SAPs).

French Drain #1 (field personnel assigned numbering to correspond to photos) is a concrete box with a wooden cover, less than 1 square meter (10.8 square feet) in cross-section. It is located adjacent to the northeast corner of the 105-B Building, under a sign painted on the concrete block wall labeled Drain 1, and has a pink-colored steam condensate line coming out of the wall, which disappears into the soil directly adjacent to the box. It was located at E 565331, N 144524.

French Drain #4 is a concrete box with a wooden cover, less than 1 square meter (10.8 square feet) in cross-section. It is located adjacent to the southeast corner of the 105-B Building, under a sign painted on the concrete block wall labeled Drain 4, the cover is penetrated by a 10 centimeter (4 inch) pipeline that emanates from a larger line. It is located at E 565331, N 144502.

French Drain #11 is a confined space about 5 meters (16 feet) from a northeast corner of the 105 B Building, with a red, metal manhole cover with no over-ground lines to it. It is located at E 565320, N 144531.

French Drain #12 is a confined space near a northeast corner of the 105-B Building, with a metal manhole cover penetrated by a 1.3 centimeter (0.5 inch) and a 2.5 centimeter (1 inch) pink-colored pipeline. It is located at E 565310, N 144533.

French Drain #13 appears to be a clay or concrete pipe adjacent to a northeast corner of the 105 B Building, less than 1 meter (3 feet) in diameter, with only soil visible on its surface,

and penetrated by 10.2 centimeter (4 inch) pipeline. It is located at E 565310, N 144535.

French Drain #14 is a 1.4 meter (4.6 foot) diameter concrete pipe, 2.5 meters (8 feet) from the northeast corner of the 105-B Building. It appears to have a cover (a lifting ring is shown in the photo) and has no over-ground pipelines to it. It is located at E 565299, N 144562.

French Drain #15 is a 20 centimeter (8 inch) clay pipe on the northwest corner of the 105 B Building, apparently filled with soil, no cover, and with no over-ground lines to it. It is located at E 565263, N 144545.

French Drain #16 is a 1 meter (3 foot) diameter concrete pipe near the northwest corner of the 105-B Building, with only soil visible on its inside, and with one 2.5 centimeter (1 inch) pipe penetrating the top of the drain, and a second, capped line terminating just above its surface. It is located at E 565262, N 144541.

French Drain #18 is a 1 meter (3 foot) diameter confined space along the west wall of the 105 B Building, and has a metal cover. The cover has a 7.6 centimeter (3 inch) hole in it, and a similar-sized pipe terminates near the surface of the cover. It is located at E 565252, N 144499.

French Drain #19 is a 1.4 meter (4.6 foot) diameter concrete confined space along the west wall of the 105-B Building. It has a solid, concrete cover with no over-ground lines running to it. It is located at E 565252, N 144491.

French Drain #20 is a 1 meter (3 foot) diameter concrete pipe near the southwest corner of the 105-B Building, and has a metal cover. A 2.5 centimeter (1 inch) pipe penetrates the cover, and a similar-sized pipeline terminates just above a second hole in the cover. It is located at E 565255, N 144473.

French Drain #21 is a 1 meter (3 foot) diameter concrete pipe along the south wall of the 105 B Building just outside a door marked Inner Inst. Room. It has a metal cover, penetrated by a pink-colored 1.3 centimeter (0.5 inch) pipeline. It is located at E 565284, N 144495.

French Drain #22 is a 1 meter (3 foot) diameter confined space along the south wall of the 105 B Building, and has a metal cover. A pink-colored 2.5 centimeter (1 inch) pipeline penetrates the cover, and two other lines enter the soil near the confined space. It is located at E 565299, N 144492.

French Drain #23 is a white-painted, insolated pipe that directly enters the soil along the south wall of the 105-B Building. It is located at E 565308, N 144492.

SubSite Code: 118-B-8:3

SubSite Name: 118-B-8:3, 105-B Miscellaneous Pipeline Segments

Classification: Accepted

ReClassification:

Description: The subsite consists of pipeline segments (DS-100BC-013, 014, 017, and 018, 024, 025, 026, 027, 028, 035, 041 and 043), that were deferred from 100-B-21. Documentation states that the segments were within the 7.6 meter (25 foot) buffer zone and identified during removal of effluent pipelines and site characterization in the 100-B/C Area. Pipelines that went toward the reactor were cut approximately 15.2 meters (50 feet) from the reactor footprint so as not to disturb the 105-B Reactor structure. The numbering system for the segments was created and assigned by the subcontractor as they were recorded in the field.

The coordinates were recorded using a Trimble survey grade Global Positioning Satellite (GPS) instrument, (centimeter accuracy), location coordinates were described in terms of Washington State Plane easting (E), northing (N), and elevation in NAVD88 (meters). For selected sites, Ground-Penetrating Radar (GPR) was also utilized. Dimensions were noted during site characterization. Contaminants of Potential Concern were listed only for segments known to have contaminants. The sample data results have not been loaded into HEIS.

There were two pipelines associated with the 120-B-1 Battery Acid Sump inlet and outlet pipelines that were left in place. They were cut off and grouted at the edge of the 120-B-1 remediation footprint. These have been assigned to the 118-B-8:3 subsite (RSVP-2006-057).

Other pipelines in this subsite were the southern most part of the 1607-B2 septic system collection lines. They were not remediated with the 1607-B2 site because of their proximity to the reactor facility. They will be addressed with disposition of the 105-B facility (RSVP-2006-055).

DS-100BC-013 pipeline segment was 20 centimeters (8 inches) diameter steel line, length unknown. The coordinates at the cut end were E 565322.97, N 144540.94, and elevation 141.71 meters. It was discovered during the excavation of the 16.5 meter (54 inch) cross-tie effluent pipeline. The pipeline segment was shallow and did not appear on project drawings. It has been cut off, the end pinched closed, and the site backfilled. No sampling was conducted.

DS-100BC-014 pipeline segment was a 20 centimeter (8 inch) diameter (estimated), steel line, length unknown. The coordinates at the cut end were E 565337.60, N 144532.97, and elevation 142.22. This pipeline was located approximately 14.5 meters (47.6 feet) east of the DS-100BC-013 segment. It was discovered during the excavation of the effluent pipelines northeast of 105-B. The pipeline was shallow and not apparent on project drawings. It has been cut off, the end pinched closed, and the site backfilled.

DS-100BC-017 pipeline segment was a 20 centimeter (8 inch) diameter (estimated), steel pipeline that entered a junction box, length unknown. The coordinates at the cut end were E 565313.35, N 144550.66, and elevation 141.01 meters. It was pinched closed and backfilled in place. The pipeline was not apparent on project drawings. No sampling was conducted.

DS-100BC-018 pipeline segment was a 30.5 centimeter (12 inch) diameter (estimated) steel pipeline, length unknown. It ran at a diagonal to the former junction box. The coordinates at the exposed ends were (E 565311.85, N 144550.88) and elevation 142.84 meters and E 565317.95, N 144542.72, and elevation 142.98 meters. The pipeline, which was left intact, could not be found on project drawings. No sampling was conducted.

DS-100BC-024 pipeline segment was a large-diameter pipeline (actual diameter and length were unknown). The coordinates at the cut end were E 565320.28, N 144549.81, and elevation 141.25 meters. It has been cut off, covered with plastic and plywood, and backfilled. No sampling was conducted.

DS-100BC-025 pipeline segment was a large-diameter pipeline (actual diameter and length were unknown). The coordinates at the cut end were E 565320.71, N 144545.69, and elevation 138.25. It has been cut off, covered with plastic and plywood, and backfilled. No sampling was conducted.

DS-100BC-026 pipeline segment was a large-diameter pipeline (actual diameter and length were unknown). The coordinates at the capped end of the pipeline were E 565331.46, N 144547.78, and elevation 138.05 meters. The pipeline entered the excavation from the south

sidewall and angled northeast toward a large diversion box. The pipeline was found capped with a steel plate. It was not identified on project drawings. No sampling was conducted.

DS-100BC-027 pipeline segment was a concrete pipeline (actual diameter and length were unknown). The coordinates at the end of the segment were E 565341.83, N 144535.68, and elevation 139.28 meters. On 6/16/2003 field screening for radiological control was performed. No analytical samples were collected.

DS-100BC-028 pipeline segment was a vitreous clay pipeline (actual diameter and length were unknown), embedded in concrete in tandem with DS-100BC-027, entering the pipeline excavation south of a junction box. The pipeline coordinates at the end were E 565340.04, N 144536.38, and elevation 139.19 meters. Sections of this pipeline to the south have not been removed. This pipeline was not identified on project drawings. Fine-grained sediment was observed along the bottom of the pipeline. It was unclear if the material was from processes associated with the pipeline or washed in from dust-suppression efforts during remediation. On 6/16/2003 field screening for radiological control was performed, however, no analytical samples were collected.

DS-100BC-035 pipeline segment was a 137.2 centimeters (54 inches) large-diameter concrete pipeline (length unknown) encased in concrete. The coordinates were E 565306.48, N 144581.69, and elevation 139.80 meters. The structure was capped with plastic and plywood and had a tar/asbestos gasket at the cold joint of the concrete encasement. Contaminants of concern was asbestos. On 3/5/2003, sample J00J04 was collected from the gasket material and sent for asbestos analysis.

DS-100BC-041 pipeline segment was of undetermined diameter [at least 30.5 centimeters (12 inches), actual diameter and length were unknown], just below grade. The coordinates were E 565327.99, N 144535.81, and elevation 142.68 meters. No sampling was conducted. This pipeline was believed to travel in a southwest direction toward a metal plate covered structure on the northeast of the 105-B Reactor Building. The pipeline was not found on project drawings.

DS-100BC-43 consisted of a group of pipelines around the south and southwest sides of the 105-B Reactor. The following alpha characters have been added as an indicator for a specific pipeline. The pipeline coordinates were estimated from the center (not accounting for bends) of lines. The diameters of these pipelines were unknown; the lengths were: A - E 565341, N 144510, 58.7 meters (192.6 feet) long; B - E 565335, N 144523, 12.6 meters (41.3 feet) long; C - E 565336, N 144508, 12.7 meters (41.7 feet) long; D - E 565335, N 144504, 10.6 meters (34.8 feet); E - E 565335 N 144492, 12.7 meters (41.6 feet) long; F - E 565335, N 144486, 11.5 meters (37.8 feet); G - E 565313; N 144480, 73 meters (239.5 feet) long. No sampling was conducted.

Site Code:	118-B-9	**Classification:**	Accepted
Site Names:	118-B-9, 104-B-1 Tritium Vault and 104-B-2 Tritium Laboratory, 104-B2 Storage Building	**ReClassification:**	No Action (7/15/2004)
Site Type:	Storage	**Start Date:**	1950
Site Status:	Inactive	**End Date:**	1955
Site Description:	The site is a gravel-covered field. The site consisted of two concrete masonry facilities identified as 104-B-1 Tritium Vault and 104-B-2 Tritium Laboratory. Both structures were demolished and their associated foundations removed to 1 meter (3 feet) below grade. The excavated areas were then backfilled and graded to match the existing terrain. Demolition took place beginning in mid-		

September 1996 and was completed in October 1996.

Waste Type: Equipment

Waste Description: The unit (104-B-2) contained trace amounts of radioactive waste. It was used to store containers of reactor refueling components from 105-B and 105-C Reactors. No liquid contaminants were involved. Bird droppings were also found in small quantities.

Following demolition activities, two 1.2 by 1.2 by 2.44-meter (4 by 4 by 8-foot) plywood burial boxes equivalent to 7.25 cubic meters (9.5 cubic yards) were taken to a burial ground. The burial boxes have numbers 100B-96-0002 and 100B-96-0017 and were shipped on 12/3/96 to burial ground 218-W-5, trench 29.

Waste Type: Demolition and Inert Waste

Waste Description: The facility (104-B-1) contained asbestos, consisting of caulking around exterior vents. Following demolition activities, 0.92 cubic meters (1.2 cubic yards) of non-friable cement asbestos board (CAB) were put into a dumpster and hauled away. The material was then shipped to Basin Disposal, Pasco for eventual disposal in the RABANCO landfill, Roosevelt. WA.

Total asbestos material identified was non-friable Category I: asphalt roofing 55 square meters (592 square feet), non-friable Category II: joint caulking 1.21 square meters (13 square feet), non-friable Category II: transite wall board 63.92 square meters (688 square feet). The total category I was 55 square meters (592 square feet) and Category I was 65.13 square meters (701 square feet).

Waste Type: Demolition and Inert Waste

Waste Description: Lead based paint was found on the roof trim, vents, and exterior doors. Following demolition activities, 0.7646 cubic meters (1 cubic yard) of lead base painted wood was disposed to an offsite vendor's container (where other 100-B/C small buildings hazardous waste was temporarily stored). This material was identified as number 200E-96-0015 and was packaged in a Laidlaw box and shipped offsite to Laidlaw Lone Mountain Facility on Manifest A6344 on 12/9/96.

Waste Type: Demolition and Inert Waste

Waste Description: The building was constructed of concrete block and the foundation was concrete. Following demolition activities, 110 cubic meters (144 cubic yards) of concrete rubble was disposed of in the 100-F Clearwell.

Waste Type: Demolition and Inert Waste

Waste Description: Following demolition activities, 0.7646 cubic meters (1 cubic yard) of miscellaneous metal from the two buildings was taken and staged with the 190-C recycle material.

Site Code:	118-B-10	**Classification:**	Accepted
Site Names:	118-B-10, Ball 3X Storage Vault	**ReClassification:**	Interim Closed Out (5/24/2004)
Site Type:	Storage Tank	**Start Date:**	
Site Status:	Inactive	**End Date:**	

Site Description: The site has been remediated and interim closed out.

Before remediation, the location of this burial ground showed as a concrete pad with a metal marker at the ground surface in a gravel field. It was otherwise unmarked.

In November 2001 the site appeared as a vegetation-free area that had been covered with cobbles piled to 0.6 meters (2 feet) above grade. However, this location was wrong. As shown on Drawing H-1-19820 and confirmed by ground-penetrating radar (GPR), the mound of cobble is backfill over a process sewer that was constructed over the ventilation tunnel to 115-B. The pipeline had to be close to the surface because of the tunnel, so it was encased in concrete and covered with 18 inches of backfill.

Waste Type: Equipment

Waste Description: The waste is a radioactive metal storage tank used to store radioactive boron balls from the ball 3X system.

Site Code:	120-B-1	**Classification:**	Accepted
Site Names:	120-B-1, 105-B Battery Acid Sump	**ReClassification:**	Interim Closed Out (9/25/2006)
Site Type:	Sump	**Start Date:**	1944
Site Status:	Inactive	**End Date:**	1969

Site Description: The site has been remediated and interim closed. The sump and underlying soils were removed on June 13, 2006. The site was backfilled with clean soil from the 100-B Area borrow pit.

Waste Type: Chemicals

Waste Description: The site contained unknown amounts of sulfuric acid from spillage during use and servicing of an emergency power battery bank inside the 105-B Building. The residual liquid and sludge were analyzed for heavy metals in 1986 using the EP Toxicity Test and chromium was found.

Site Code:	126-B-1	**Classification:**	Accepted
Site Names:	126-B-1, 184-B Power House Ash Pit, 188-B Ash Disposal Area	**ReClassification:**	Rejected (6/25/1998)
Site Type:	Coal Ash Pit	**Start Date:**	1944
Site Status:	Inactive	**End Date:**	1969

Site Description: The 126-B-1 site is a large vegetation covered depression and surrounding ash piles. The depression is approximately 60 meters (200 feet) long, 60 meters (200 feet) wide, and 3 meters (10 feet) deep. An earthen berm divides the site into two sections. The pit is bounded on the north, east, and west sides by three large ash piles that extend 9 to 10 meters (30 to 33 feet) high. On the west side of the pit is a large wooden ramp that is in a state of disrepair. A large pipe enters the depression in the southwest corner. Including the surrounding ash piles, the overall site dimensions are approximately 200 meters by 200 meters (650 feet by 650 feet).

Waste Type: Ash

Waste Description: The site received coal ash from the 184-B Powerhouse. Coal ash from analogous sites has been analyzed using the EP Toxicity Test in accordance with WAC 173-303, and no hazardous

materials were found.

Site Code:	126-B-2	**Classification:**	Accepted
Site Names:	126-B-2, 183-B Clearwells	**ReClassification:**	No Action (3/20/2007)
Site Type:	Dumping Area	**Start Date:**	
Site Status:	Inactive	**End Date:**	

Site Description: The site has been evaluated and reclassified to No Action.

The site consisted of two underground concrete reservoirs, or clearwells, separated in the center by the remains of a demolished pump room. A concrete piping structure was located above ground at the southeast corner of the clearwell site.

Waste Type: Demolition and Inert Waste

Waste Description: No waste was deposited at the clearwells in the past. However, this unit is scheduled for future use as a disposal site for demolition and inert solid waste after the 126-B-3 Coal Pit and demolition landfill is closed. The remaining portion of the pumphouse currently contains waste from the demolition of the above ground portion. These wastes were believed to include steel, concrete, and asbestos transite.

Site Code:	126-B-3	**Classification:**	Accepted
Site Names:	126-B-3, 184-B Coal Pit	**ReClassification:**	Interim Closed Out (8/8/2006)
Site Type:	Dumping Area	**Start Date:**	1943
Site Status:	Inactive	**End Date:**	1968

Site Description: The site has been remediated and interim closed.

The site consisted of a pit originally excavated to store coal for use in the 184-B powerhouse from 1943 through 1968. After coal storage was discontinued, the site was used as a demolition landfill.

Waste Type: Demolition and Inert Waste

Waste Description: This unit contains waste from demolished 100-B Facilities. These include released portions of 108-B, 117-B, 117-C, 115-BC, and 184-B. This unit is likely to contain lead acid batteries. There are aluminum filter frames from the 117-B and 117-C Facilities on the surface on the south side. Steel staircases and ladders have been deposited on the surface on the northeast side of the site.

Site Code:	126-B-4	**Classification:**	Accepted
Site Names:	126-B-4, B Area Brine and Salt Dilution Pits, 126-B-4 Brine Pit. 184-B Salt Dissolving Pit and Brine Pump House	**ReClassification:**	Rejected (9/9/1997)
Site Type:	Sump	**Start Date:**	1944
Site Status:	Inactive	**End Date:**	1969

Site Description: The salt dissolving pits and brine pump pit were part of a single below-grade concrete structure that provided brine for the 184-D Powerhouse. The structure has been demolished and buried in situ. No evidence of the site remains at the surface. Before the structure was demolished, it was described as being partially backfilled with rubble with approximately 1900 liters (500 gallons) of water in the brine pump pit.

The two salt dissolving pits each had inner dimensions of 4.3 meters (14 feet) long by 2.4 meters (8 feet) wide by 2.8 meters (9.25 feet) tall. They had a design high water line 2.4 meters (7.75 feet) from the pit bottom. An overflow slot connecting the two dissolving pits was located 0.3 meters (1 foot) above the high water line. The bottom of each pit was filled with a 12.7 centimeter (5 inch layer) of 1.3 to 2.6 centimeter (1/2 to 1 inch) gravel topped by a 17.8 centimeter (7 inch) layer of 0.3 to 0.6 centimeter (1/8 to 1/4 inch) gravel. The dissolving pits each had a 2.4 meter (8 foot) by 0.9 meter (3 feet) opening at the top for receiving salt. Each pit had a capacity of 23,600 kilograms (52,000 pounds) of salt.

The brine pump pit is located adjacent to the two salt dissolving pits. The pit was 3.3 meters (10.67 feet) long by 2.2 meters (7.33 feet) wide by 2.1 meters (7 feet) deep. It held two pumps and associated piping (all brass) for the brine system. The floor of the pump pit sloped toward a 46 by 46 by 46 centimeter (18 by 18 by 18 inch) sump in a corner.

Waste Type: Demolition and Inert Waste

Waste Description: The structure was demolished and buried in situ.

Site Code:	128-B-1	**Classification:**	Not Accepted (9/9/1997)
Site Names:	128-B-1, 100 B/C Burning Pit, 100-B Burning Pit	**ReClassification:**	
Site Type:	Burn Pit	**Start Date:**	1943
Site Status:	Inactive	**End Date:**	1968

Site Description: The site has been described as a burn pit. During a field investigation on October 17, 1995, it was noted that the area is covered with cheatgrass and appears undisturbed with no evidence of burning. An elevated area to the south is covered with rabbitbrush, boulders. and appears to be disturbed. The elevated area also shows no evidence of burning.

Site Code:	128-B-2	**Classification:**	Accepted
Site Names:	128-B-2, 100-B Burn Pit #2	**ReClassification:**	Interim Closed Out (12/21/2005
Site Type:	Burn Pit	**Start Date:**	1948
Site Status:	Inactive	**End Date:**	1968

Site Description: The site has been remediated and interim closed out. The site covers a large area, covered in places with gravel and vegetation.

Waste Type: Misc. Trash and Debris

Waste Description: The site received nonradioactive, combustible materials. Old paint cans and sandblast sand can still be seen at the site. Office waste, paint waste, chemicals, and solvent were burned at this site. It appears that clean fill material has been added to the site, indicating that the site may have also been used as a solid waste landfill.

Site Code:	128-B-3	**Classification:**	Accepted
Site Names:	128-B-3, 100-B Dump Site, 128-B-3 Coal Ash and Demolition Waste Site, 128-B-3 Burning Pit Site, 600-57	**ReClassification:**	Interim Closed Out (11/17/2006
Site Type:	Burn Pit	**Start Date:**	1944
Site Status:	Inactive	**End Date:**	1968

Site Description: The site has been remediated and reclassified, however institutional controls are to be maintained on the river embankment area to prevent activities that would mobilize residual contaminants to travel to groundwater or the river. Institutional controls will be maintained until such time that the results of a baseline risk assessment can be considered (for a final site remedy, closure).

The 128-B-3 Coal Ash and Demolition Waste Site is an area where dumping and burning of waste material had occurred. The site was visible in a 1968 aerial photo and appeared to have been divided into a construction debris dumping area to the south and a combustible waste burning area to the north. The site was separated into the two sections by an ash covered roadway. At the site's southern edge was an area of vegetation-free gravel, covered with what was described as a "white-colored spray".

Waste Type: Misc. Trash and Debris

Waste Description: Coal ash, burning evidence, and demolition rubble can be seen at the surface of the site. A 1952 shop manual was found among the waste.

Site Code:	132-B-1	**Classification:**	Accepted
Site Names:	132-B-1, 108-B Tritium Separation Facility	**ReClassification:**	No Action (3/1/2004)
Site Type:	Process Unit/Plant	**Start Date:**	1944
Site Status:	Inactive	**End Date:**	1975

Site Description: This site has been evaluated and determined to meet remedial action objectives. The evaluation and sampling results support the reclassification to No Action. The site is now a flat cobble field.

Waste Type: Demolition and Inert Waste

Waste Description: The main radionuclide present at the site is tritium.

Site Code:	132-B-2	**Classification:**	Accepted
Site Names:	132-B-2, 116-B Reactor Exhaust Stack, 132-B-2 Stack	**ReClassification:**	
Site Type:	Stack	**Start Date:**	1944
Site Status:	Inactive	**End Date:**	1968

Site Description: The unit is part of the 105-B Reactor Gas and Exhaust Air System. The unit is still standing and constructed of reinforced concrete with a base diameter of approximately 4.9 meters (16 feet).

Waste Type: Demolition and Inert Waste

Waste Description: Until the 117 Filter Building was built in 1960, air moving from the least contaminated zones through increasingly contaminated zones was discharged to the unit unfiltered. The unit received low-level contamination from the reactor.

Site Code: 132-B-3 **Classification:** Accepted

Site Names: 132-B-3, 108-B Ventilation Exhaust Stack Site, 108-B Tritium Pilot Facility, Ventilation Exhaust Stack Site **ReClassification:** No Action (12/8/2003)

Site Type: Burial Ground **Start Date:**

Site Status: Inactive **End Date:**

Site Description: This site has been evaluated and determined to meet remedial action objectives. The evaluation supports reclassification to No Action.

The site consisted of a trench, which was used to bury low-level contaminated rubble from the demolition of the 108-B Ventilation Exhaust Stack, also known as the 108-B Tritium Pilot Facility Ventilation Exhaust Stack. The trench was 9.1 meters (30 feet) wide, 5.5 meters (18 feet) deep, and 76 meters (250 feet) long. The stack foundation was found to be free of contamination. It was destroyed separately, buried in place and covered with clean fill material. Although it was on the opposite side of the road, it was considered to be part of this site.

Waste Type: Demolition and Inert Waste

Waste Description: The 91-meter (300-foot) stack was demolished in 1983 and buried at this site. The stack was built of reinforced concrete and had a stainless steel liner. The total radionuclide inventory of the buried stack rubble is 21 millicuries.

Site Code: 132-B-4 **Classification:** Accepted

Site Names: 132-B-4, 117-B Filter Building **ReClassification:** No Action (4/2/2003)

Site Type: Process Unit/Plant **Start Date:** 1961

Site Status: Inactive **End Date:** 1968

Site Description: Historical data compiled for the Calculation Brief number 0100B-CA-V0128 was of sufficient quality and quantity to support reclassification of the site.

The ventilation exhaust filter building housed blowers and particulate filters used to treat the ventilation exhausted from the B Reactor Building. Included in this site were the 117-B Building, the intake ventilation duct from the 105-D Reactor Building, and the exhaust ventilation ducts to the 116-B Reactor Exhaust Stack.

Waste Type: Demolition and Inert Waste

Waste Description: The site contained radiologically contaminated debris. Total radionuclide inventory in this unit was estimated to be 92 nanocuries. The radionuclides comprising this inventory were tritium, carbon-14, cesium-137, strontium-90, and plutonium-239/240. Of these radionuclides, strontium-90 was the most restrictive in the allowable residual contamination level (ARCL) calculations. Cobalt-60, europium-152, europium-153, and europium-155 were not identified in any of the samples analyzed.

Site Code:	132-B-5	**Classification:**	Accepted
Site Names:	132-B-5, 115-B/C Gas Recirculation Facility	**ReClassification:**	No Action (1/5/2004)
Site Type:	Process Unit/Plant	**Start Date:**	1944
Site Status:	Inactive	**End Date:**	1968

Site Description: This site has been evaluated and determined to meet remedial action objectives. The evaluation supports reclassification to "No Action".

The unit consisted of a vacuum and pressure seal pit and tunnels. It was a single-story reinforced concrete structure with a basement. It was 6.1 meters (20 feet) above and 3.4 meters (11 feet) below grade, and the width ranged from 22 meters (72 feet) to 30 meters (98 feet).

Waste Type: Demolition and Inert Waste

Waste Description: The resident radionuclides are tritium, carbon-14, cobalt-60, strontium-90, cesium-137, europium-152, and plutonium-239.

Site Code:	132-B-6	**Classification:**	Accepted
Site Names:	132-B-6, 1904-B-2 Outfall Structure Site, 116-B-8, 1904-B2	**ReClassification:**	Interim Closed Out (7/25/2002)
Site Type:	Outfall	**Start Date:**	1954
Site Status:	Inactive	**End Date:**	1968

Site Description: The site has been remediated and closed out.

A dirt road leading to the site is crossed by a vegetation-free outfall structure wall that was left intact when the structure was backfilled to grade.

Waste Type: Process Effluent

Waste Description: The unit received and discharged reactor coolant effluent wastes to the river. The 1904-B2 Outfall received cooling water and process drainage from B Reactor and discharged through a 168-centimeter (66-inch) effluent line (100-B-15) to the middle of the Columbia River. A 1992 report states, "surface contamination is known to be present at the 132-B-6 spillway." Other documents reviewed provided no information about wastes or contamination.

Site Code:	1607-B1	**Classification:**	Accepted
Site Names:	1607-B1, 1607-B1 Septic Tank System, 124-B-1, 1607-B1 Sanitary Sewer System	**ReClassification:**	No Action (8/30/2007)
Site Type:	Septic Tank	**Start Date:**	1944
Site Status:	Inactive	**End Date:**	1960

Site Description: The site included a septic tank, tile field, and associated pipelines from the 1701-B badge house,1720-B patrol building, 1709-B Fire headquarters, and the change rooms.

The site currently appears as a vegetation and gravel covered area that is raised about 1.2 meters (4 feet) above the surrounding terrain. The septic tank is clearly marked on historical drawings

in the location of the raised mound.

Waste Type: Sanitary Sewage

Waste Description: According to documentation, the site received unknown amounts of sanitary sewage from the 1701-B Badgehouse (security checkpoint), the 1709-B Fire Station, the 1720-B Patrol Change Room, and offices.

Site Code: 1607-B2 **Classification:** Accepted

Site Names: 1607-B2, 1607-B2 Septic Tank System, 124-B-2, 1607-B2 Sanitary Sewer System (See Subsites) **ReClassification:** Interim Closed Out (3/13/2007)

Site Type: Septic Tank **Start Date:** 1944

Site Status: Inactive **End Date:**

Site Description: The site has been remediated and interim closed out.

The site consisted of subsite 1) Septic drainfield and subsite 2) the septic tank and pipeline.

Waste Type: Sanitary Sewage

Waste Description: This unit received sanitary sewage from the 100 B/C Area office buildings, the 105-B Reactor Building, and the 190-B Pumphouse. All office buildings have been removed; however, the sewer lines to the respective buildings remained in place.

SubSites:

SubSite Code: 1607-B2:1

SubSite Name: 1607-B2:1, 1607-B2 Septic Drainfield

Classification: Accepted

ReClassification: Interim Closed Out

Description: The drain field was constructed of 10-centimeter (4-inch) vitrified pipe, concrete pipe, or drain tile with a total of 1097.3 meters (3600 linear feet) of piping (2.4 meters [8 linear feet] per capita). The laterals were open-jointed and spaced 2.4 meter (8 feet) apart.

A historical drawing illustrated that the drain field was "to be located in field" near the septic tank, but did not show the exact location.

SubSite Code: 1607-B2:2

SubSite Name: 1607-B2:2, 1607-B2 Septic Tank and Pipeline

Classification: Accepted

ReClassification: Interim Closed Out

Description: The septic tank was constructed of reinforced concrete; the walls and floor were 25 centimeters (10 inches) thick.

During a March 2000 field visit, it was observed that the top of the septic tank was at grade level. Except for the north side which was above grade. In many areas the edges of the

concrete were obscured by soil and vegetation. There were three manholes in the top of the tank covered by metal covers with handles. The septic tank was surrounded by six black and yellow striped posts, each about 0.9 meter (3 feet) high, and a light-duty barricade chain. The site was identified with a blue and white "Septic Tank" sign.

Site Code:	1607-B3	**Classification:**	Accepted
Site Names:	1607-B3, 1607-B3 Septic Tank System, 124-B-3, 1607-B3 Sanitary Sewer System	**ReClassification:**	Closed Out (5/31/2001)
Site Type:	Septic Tank	**Start Date:**	1944
Site Status:	Inactive	**End Date:**	1974

Site Description: The site is a closed out septic system which includes a septic tank, tile field, and associated piping. The site is no longer apparent and appears as a cobble-covered field with natural vegetation growing on its surface.

The 1607-B3 Septic Tank was constructed of reinforced concrete. The tank was 2.9 meters (9.5 feet) long, 1.4 meters (4.5 feet) wide and 3.5 meters (11.42 feet) deep (inner dimensions). The tank had a design capacity of 6,360 liters (1,680 gallons) based on a user capacity of 48 persons, a flow of 132 liters (35 gallons) of sewage per capita per day, and an average detention time of 1 day. The top of the tank was at the ground surface and the tank was accessible through three 0.9-meter (3-foot) manholes.

Waste Type: Sanitary Sewage

Waste Description: This unit received an unknown amount of sanitary sewage from 184-B Powerhouse.

Site Code:	1607-B4	**Classification:**	Accepted
Site Names:	1607-B4, 1607-B4 Septic Tank System, 124-B-6, 1607-B4 Sanitary Sewer System, 1607-B4 Septic Tank	**ReClassification:**	Closed Out (2/23/2001)
Site Type:	Septic Tank	**Start Date:**	1944
Site Status:	Inactive	**End Date:**	2000

Site Description: The site is a closed out septic system associated with the 151-B Substation. A sign stating Abandoned Septic Tank per WAC (246-272-1850) DynCorp Environmental is posted at the site. There are four yellow posts surrounding the structure. Within the posts are the old wooden cover, a pile of sand, and cobble.

The septic tank is concrete box that had a wooden lid covered with asphalt roofing material. The reinforced concrete septic tank is 1.8 meters (6 feet) long, 0.9 meters (3 feet) wide, and 2.5 meters (8 feet, 4 inches) deep (inner dimensions). The tank had a design capacity of 1325 liters (350 gallons) based on a user capacity of 10 persons, a flow of 132 liters (35 gallons) of sewage per capita per day, and an average detention time of 1 day. The tank walls are 20 centimeters (8 inches) thick with a 15 centimeter (6 inch) floor. The tile field was constructed of 10 centimeter (4 inch) pipes with a minimum length of 2.4 meter (8 feet) per capita. The laterals are open-jointed and spaced 2.4 meters (8 feet) apart.

Waste Type: Sanitary Sewage

Waste Description: This unit received sanitary sewage from 151-B Electrical Distribution Facility. The flow rate to the unit was estimated at less than 132 Liters (35 gallons) per day.

Site Code: 1607-B5 **Classification:** Accepted

Site Names: 1607-B5, 1607-B5 Septic Tank System, 1607-B4, 1607-B4 Septic Tank System, 124-B-4, 1607-B4 Sanitary Sewer System **ReClassification:**

Site Type: Septic Tank **Start Date:** 1944

Site Status: Inactive **End Date:**

Site Description: The septic tank can be identified by a 20 centimeter (8 inch) capped steel vent pipe. The cap is stamped with the words septic tank. It is surrounded by a vegetation-free graveled parking lot. The pipe extends above grade about 0.76 meters (2.5 feet). The drain field runs southeast of the tank. Due to the 2001 tank content sample results, the site was posted with Underground Radioactive Material signs.

Waste Type: Sanitary Sewage

Waste Description: This unit received sanitary sewage from 181-B/C River Pumphouse. The flow rate to the unit was estimated at approximately 35 gal/day (130 L/day). In January 2001, the tank was sampled and analyzed for radionuclides. All radionuclides were undetected except for cesium-137, which was 38.3 picocuries per liter and gross beta, which was 1.8 picocuries per liter.

Site Code: 1607-B6 **Classification:** Accepted

Site Names: 1607-B6, 1607-B6 Septic Tank System, 1607-B5, 1607-B5 Septic Tank System, 124-B-5, 1607-B5 Sanitary Sewer System **ReClassification:**

Site Type: Septic Tank **Start Date:** 1944

Site Status: Active **End Date:**

Site Description: The site currently appears as a small concrete box with a wooden lid. It is posted with a "Confined Space" warning sign. There is a yellow steel post at each of its four corners. The reinforced concrete septic tank is 8 ft 4 in (2.5 m) deep with a 25-person capacity (35 gal [130 L] per capita) and an average detention period of 24 hr. Its walls are 8 in (20 cm) thick and its floor is 6 in (15 cm) thick. The tile drain field is 4 in (10 cm) vitrified pipe, concrete pipe or drain tile with a minimum of 8 linear ft (2.4 m) per capita. The laterals are open-jointed and spaced 8 ft (2.4 m) apart. This system is active.

This system includes the feed pipeline from the 183-B Filter House, the septic tank, and the drain field.

Waste Type: Sanitary Sewage

Waste Description: This unit receives 35 gal/day (130 L/day) of sanitary sewage from the 182-B Pump Station and cooling water and leakage from pumps located in the 182-B facility. It also received sewage from 183-B Headhouse, which was decommissioned in 1987.

Site Code: 1607-B7 **Classification:** Accepted

Site Names:	1607-B7, 1607-B7 Septic Tank System, 1607-B7 Sanitary Sewer System, 124-C-1	**ReClassification:**	Interim Closed Out (7/27/2003)
Site Type:	Septic Tank	**Start Date:**	1944
Site Status:	Inactive	**End Date:**	1969

Site Description: The site has been remediated and interim closed out.

The site consisted of a septic tank and drain field. The tank was constructed of reinforced concrete with a brick manhole access. The drain field was located due east of the tank.

Waste Type: Sanitary Sewage

Waste Description: This unit received an unknown amount of sanitary sewage from 183-B Water Treatment Plant.

Site Code:	116-C-1	**Classification:**	Accepted
Site Names:	116-C-1, 107-C Liquid Waste Disposal Trench	**ReClassification:**	Interim Closed Out (1/21/1999)
Site Type:	Trench	**Start Date:**	1952
Site Status:	Inactive	**End Date:**	1968

Site Description: This site has been interim closed out after remediation. It has been backfilled and revegetated. The revegetation included a test plot to determine the need for additional topsoil and irrigation on remediated waste sites.

The 116-C-1 site was constructed in 1952 and is located northeast of the 116-C-5 Retention Basin facility, approximately 253 meters (830 feet) from the 100-year flood level of the Columbia River.

Waste Type: Process Effluent

Waste Description: The site received effluent overflow from 116-C-5 (107-C Retention Basin) during reactor outages due to ruptured fuel elements. Beginning in 1955, this site also served 116-B-11 (107-B Retention Basin). The trench was used in 1967 for an infiltration test in which the total cooling water volume from B-Reactor was disposed in the trench. During the test, an estimated 4.4E+10 liters (1.17E+10 gallons) of effluent water were released. From process knowledge, the waste site contaminants of concern (COCs) identified are: Americium-241, Cobalt-60, Cesium-137, Europium-152, -154, -155, Nickel-63, Plutonium-238, -239/240, Strontium-90, Uranium-238, Total Chromium, Hexavalent chromium, Mercury, and Lead.

Site Code:	116-C-5	**Classification:**	Accepted
Site Names:	116-C-5, 116-C-5 Retention Basins, 107-C Retention Basins	**ReClassification:**	Interim Closed Out (12/8/1999)
Site Type:	Retention Basin	**Start Date:**	1952
Site Status:	Inactive	**End Date:**	1969

Site Description: The site has been remediated, backfilled, and revegetated.

Waste Type: Process Effluent

Waste Description: The basins received cooling water effluent from the 105-B and 105-C Reactors for radioactive decays and thermal cooling prior to release to the Columbia River. The total radionuclide inventories in the vicinity of the basins ranged from 5 to over 400 curies. Eighty percent of the total radionuclide inventory is contained within the soil adjacent to the basins. Approximately 10 curies leached into the basins' floors and walls.

Site Code: 132-C-2 **Classification:** Accepted

Site Names: 132-C-2, 1904-C Outfall, 116-C-4 **ReClassification:** Interim Closed Out (7/25/2002)

Site Type: Outfall **Start Date:**

Site Status: Inactive **End Date:**

Site Description: The site has been remediated and closed out.

Waste Type: Process Effluent

Waste Description:

Site Code: 600-34 **Classification:** Accepted

Site Names: 600-34, 100-B Baled Tumbleweed Disposal Site **ReClassification:** Rejected (9/9/1997)

Site Type: Dumping Area **Start Date:**

Site Status: Inactive **End Date:**

Site Description: The site is a dumping area used for disposal of miscellaneous waste. The dumping area is within a borrow or gravel pit which is 3.0 to 4.6 meters (10 to 15 feet) deep.

Waste Type: Misc. Trash and Debris

Waste Description: The main concentration of waste is located in the eastern section of the pit. However, there is minor surface rubble spread over the pit floor. Visible wastes include wood (timbers and ties), piles of a silt-like material, sheet metal, cardboard, roofing material, concrete, electrical insulators, and a 10 liter (5 gallon) plastic bucket (090-NRC Paragon Molding Co. Melrose Park,Ill.). Pre-Hanford waste is also evident including barbed wire, what appears to be old farm equipment, and remnants of wire wrapped wooden irrigation pipe. Bales of tumbleweeds were located at the site in 1992, but have since been removed.

Site Code: 600-56 **Classification:** Accepted

Site Names: 600-56, Pre-Hanford Farm Site, Undocumented Solid Waste Site **ReClassification:** Rejected (9/9/1997)

Site Type: Dumping Area **Start Date:**

Site Status: Inactive **End Date:**

Site Description: The site is the abandoned waste from what appears to be a pre-MED (Manhattan Engineering District) farm. The site is identifiable by scattered debris, piles of rocks, and an excavated pit.

Waste Type: Misc. Trash and Debris

Waste Description: Miscellaneous waste at the site included wood, metal buckets, cans, and wire fencing.

Waste Type: Batteries

Waste Description: Several aging dry cell batteries were found at the site. In September 1997, a field visit was performed by B. D. Schilperoort. He examined the batteries and noted that they appeared to have been in a fire. Some material was removed from the inside of a battery surrounding a carbon electrode. A 50/50 test for corrosivity found neutral pH. A lead test swab found no evidence of lead. The conclusion based on the field investigation was that no hazardous constituents remained in the batteries.

Site Code:	600-67	**Classification:**	Accepted
Site Names:	600-67, Bruggemann's Fruit Storage Warehouse	**ReClassification:**	Rejected (2/6/2001)
Site Type:	Storage	**Start Date:**	1922
Site Status:	Inactive	**End Date:**	1943

Site Description: The Bruggemann's Warehouse site is the remaining single story warehouse, associated foundations, piping, and debris surrounding the site. During 1998 and 2000 field visits, an abandoned fuel tank was identified adjacent to the warehouse. The tank has a 0.6 meter (2 foot) filler pipe showing above ground. All other pipes seen in the area could be attributed to the facility water system.

The building is considered culturally significant because of its good condition and use of native materials for construction. It is in the process (as of January 2001) for listing on the National Register of Historic Places.

The main warehouse construction consists of local cobblestones in a concrete matrix. An extension of similar construction is present on the south end; it is unknown if this is original to the building or a later addition. The long axis of the warehouse runs north-south. The horizontal wood sheathing of the gable roof is still present on the rafters. On the southeast corner, however, the roof has caved in. Small nails in the roof sheathing indicate that shingles were probably present at one time. The roof overhangs the east and west walls. A cobblestone chimney emerges from the crest of the gable near the south end of the roof. On the west elevation, there is a distinct straight line of cobbles running along the length of the wall about 3 feet (0.9 meters) above grade. A wooden door with a wood frame is in the center of the elevation. On the south edge of the doorway is a wooden plank off its hinges that looks like a garage door. The doors are orange with dark brown decorative trim and each bears two wood frame windows. The north half of this wall has a distinctly straight line of cobbles about 2 feet (0.6 meters) above grade, similar to the west and north walls. On the south wall of the warehouse, there is a wood frame doorway just east of center. The cobblestone extension at the south end of the warehouse is missing its roof. Above most of the structure's doors and windows, the cobblestones are arranged to form decorative arches. The east wall appears to be the main entrance. On all four corners of the building and in the center of the east wall, decorative columns taper diagonally from the ground to the top of the wall, There is a wood frame doorway near the south end. A tall wood frame window south of the door, and two similar windows are north of the door. On the west wall is a single window. The north wall of the extension faces the warehouse, and there is approximately 1 meter (3 feet) between the two walls. In the center of the wall is a doorway with a small square window east of it. A large pile of cobbles lies outside the chain link fence south of the extension.

Foundations to the east of the warehouse show other facilities related to fruit packing. A possible

fruit washing facility shows evidence of two parallel tables with troughs underneath for draining. Also east of the warehouse is a round concrete foundation with heavy steel eyebolts, presumably to support a tank for pressurized water.

Waste Type: Misc. Trash and Debris

Waste Description: Farm debris was observed around the site including fence posts, pipe, food tins, buckets, farm machinery parts, barbed wire, and wire.

Waste Type: Storage Tank

Waste Description: The underground storage tank was used for storing fuel. Approximately 5 centimeters (1.97 inches) of water and fuel residue remained in the bottom of the tank in February 1998 and September 2000.

Site Code: 600-230 **Classification:** Accepted

Site Names: 600-230, RCRA General Inspection
200WFY97 Item #4 Historic Disposal Site
ReClassification: No Action (5/25/2006)

Site Type: Dumping Area **Start Date:**

Site Status: Inactive **End Date:**

Site Description: The site has been evaluated and reclassified to "No Action".

The site consisted of an area of household debris typical of items found at pre-Manhattan Project farm sites.

Waste Type: Batteries

Waste Description: Miscellaneous household garbage including, one C cell battery was found.

Waste Type: Barrels/Drums/Buckets/Cans

Waste Description: Empty food cans, paint cans, buckets and glass.

Site Code: 600-231 **Classification:** Not Accepted (5/31/2001)

Site Names: 600-231, RCRA General Inspection
200WFY97 Item #5 Historic Disposal Site
ReClassification:

Site Type: Dumping Area **Start Date:**

Site Status: Inactive **End Date:**

Site Description: The site contains pre-Hanford debris, including several rusty metal food containers, empty paint cans, buckets, glass, small pieces of concrete, cable, barbed wire, sheet metal, and a rubber tire.

Waste Type: Barrels/Drums/Buckets/Cans

Waste Description: The debris is buckets, cans and wire.

Waste Type: Misc. Trash and Debris

Waste Description: Small pieces of concrete, a rubber tire and glass.

Site Code: 600-253 **Classification:** Not Accepted (2/6/2001)

Site Names: 600-253, Gravel Pit #24, Pit 24 **ReClassification:**

Site Type: Depression/Pit (nonspecific) **Start Date:**

Site Status: Active **End Date:**

Site Description: Gravel Pit #24 is a large excavated area that is actively used as a source of gravel and sand material. Because the bottom of the pit reached groundwater, a wetland was deliberately created in 1999 by excavating a little deeper and contouring the bottom to form islands and different depths of water.

The pit was expanded to the west in 2000 as a source of additional backfill for remedial actions in the 100 B Area.

Site Code: 600-264 **Classification:** Accepted

Site Names: 600-264, Abandoned Oil Drum **ReClassification:** Rejected (6/28/2001)

Site Type: Dumping Area **Start Date:**

Site Status: Inactive **End Date:** 1943

Site Description: When discovered, the 55 gallon drum was laying on its side, surrounded by orchard smudge pots. The drum was inside a recently erected "Caution" tape barrier. No soil discoloration was noted in March 2000, but according to Ron Del Mar, who made the report when the drum was removed (April 18, 2000), there had been past spills to the ground from the drum. A field visit in September 2000 showed a small area of old, hardened oil-soaked ground. This oiled area was removed in June 2001. Two other drums were nearby, one to the south and one to the north. Both of these drums were empty and neither showed discolored soil underneath.

Waste Type: Oil

Waste Description: The oil remaining has hardened on the ground surface.

100-BC-2

Site Code:	100-B-1	**Classification:**	Accepted
Site Names:	100-B-1, Surface Chemical and Solid Waste Dumping Area, Laydown Yard	**ReClassification:**	Interim Closed Out (4/24/2006)
Site Type:	Dumping Area	**Start Date:**	
Site Status:	Inactive	**End Date:**	

Site Description: The site was an old laydown yard and adjacent dumping area. Miscellaneous debris is scattered in the southern area of the site. There are many areas of vegetation stress and the soil appears to be discolored by oil.

Waste Type: Misc. Trash and Debris

Waste Description: The solid waste at the site consists of miscellaneous debris such as wooden power poles, lighting fixtures, coils of wire, broken glass, small amounts of broken transite, a bottle of hand cream, and four 20-centimeter (8-inch) Plexiglas filter columns.

Waste Type: Oil

Waste Description: Petroleum contaminated soil was also noted and verified with field screening tests. Areas of soil appear to be discolored by oil. A field screening test on the soil with ENSYS Petro and Polyaromatic Hydrocarbons (PAH) kits indicated petroleum contamination. The Petro results were greater than 10 parts per million and less 100 parts per million total petroleum hydrocarbons (TPH). The PAH results were greater than 1 part per million and less than 10 parts per million polyaromatic hydrocarbons.

Site Code:	100-B-30	**Classification:**	Not Accepted (3/16/2009)
Site Names:	100-B-30, Pipe Located South of the 100-B/C Perimeter Road	**ReClassification:**	
Site Type:	Product Piping	**Start Date:**	
Site Status:	Inactive	**End Date:**	

Site Description: The site consists of an approximately 0.08 m (3 in) carbon steel pipe, over 4 m (13 ft) long, with a coupling joint on one end. The pipe appears to be lined with concrete. The other end was severed, possibly with the use of a cutting torch.

The pipe is oriented in a northwest to southeast direction and is not part of an intact system. The southeasterly end of the pipe is partially buried below grade and the presence of vegetation at that end suggests that the pipe has been at this location for an extended period of time. There is no evidence of staining or any additional pipe or piping systems in the area, and is located in an area of other scattered surface debris outside the 100-B/C perimeter fence. The pipe is believed to be surficial debris only.

Waste Type: Equipment

Waste Description: The waste is a single segment of pipe.

Site Code:	100-B-31	**Classification:**	Accepted

Site Names:	100-B-31, Garnet Sand Located at 183-C Clearwell Pads	**ReClassification:**	Interim Closed Out (1/13/2010)
Site Type:	Unplanned Release	**Start Date:**	
Site Status:	Inactive	**End Date:**	
Site Description:	The site consisted of scattered garnet sands on the 183-C Clearwell concrete pads and the surrounding soils. The complete extent of the garnet sands has not been investigated.		
Waste Type:	Chemicals		
Waste Description:	The waste is garnet sand mixed with the material that was sandblasted. Confirmatory sampling is needed to determine if there are any contaminants of potential concern.		

Site Code:	118-B-1	**Classification:**	Accepted
Site Names:	118-B-1, 105-B Burial Ground, 105-B Solid Waste Burial Ground, Operations, Solid Waste Burial Ground, 108-B Burial Ground, Ext. to BG No. 1	**ReClassification:**	Interim Closed Out (1/9/2008)
Site Type:	Burial Ground	**Start Date:**	1944
Site Status:	Inactive	**End Date:**	1973
Site Description:	This unit currently appears as a vegetation-free mound of cobbles raised 0.6 to 0.9 meters (2 to 3 feet) above the surrounding terrain. A 12 by 60-meter (40 by 200-foot) vegetation-covered extension near the northwest corner of the main burial ground, is raised 0.9 to 1.2 meters (3 to 4 feet) above the surrounding terrain. Part of the site is also bounded by permanent yellow markers. The site is now posted as a Soil Contamination Area, signs are required as an institutional control to prevent irrigation.		
Waste Type:	Equipment		
Waste Description:	The burial ground received general reactor waste from the 105B and 105N reactors, including the following: aluminum tubes, irradiated facilities, thermocouples, vertical and horizontal aluminum thimbles, stainless steel gun barrels, wastes from operation of the P-10 tritium separation project, and expendables such as plastic, wood, and cardboard. Waste materials were typically buried 6.1 meters (20 feet) below grade and were covered with a minimum of 1.2 meters (4 feet) of clean soil; actual soil cover ranged from 0.6 meters (2 feet) to greater than 4.3 meters (14 feet). Potential Contaminants include Ag-108m, C-14, Co-60, Cs-137, Eu-152, Eu-154, Eu-155, H-3, Ni-59, Ni-63, Sr-90, cadmium, Cr+6, lead, mercury, boron, graphite, PCBs, SVOAs, TPH, and VOAs. Permanent concrete markers surrounded the site, and "Caution: Underground Radioactive Material" signs were posted. Blue and green ground penetrating radar survey stakes had been placed around the perimeter and in lines crossing the site. A 12 by 4.6-meter (40 by 15-foot), vegetation-free, cobble-covered portion about 46 meters (50 yards) north of the southeast corner is bounded by steel posts and light-duty barricade chain; warning signs are posted on that section.		

Site Code:	118-B-2	**Classification:**	Accepted
Site Names:	118-B-2, Construction Burial Ground No.	**ReClassification:**	Interim Closed Out (4/5/2005)

	1, Minor Construction Burial Ground No. 1		
Site Type:	Burial Ground	**Start Date:**	1952
Site Status:	Inactive	**End Date:**	1956
Site Description:	The site has been remediated and interim closed out. The unit was a burial ground containing a trench that ran east and west.		
Waste Type:	Construction Debris		
Waste Description:	The unit was used for disposal of 100 cubic meters (131 cubic yards) of dry waste from the 107-B Basin repairs and waste from the 115-B Gas Recirculation Facility alterations. Potential Contaminants are: Co-60, Cs-137, Eu-152, Eu-154, Eu-155, Sr-90, chromium, Cr+6, lead, mercury, PCBs		

Site Code:	118-B-3	**Classification:**	Accepted
Site Names:	118-B-3, Construction Burial Ground No. 2	**ReClassification:**	Interim Closed Out (4/5/2005)
Site Type:	Burial Ground	**Start Date:**	1956
Site Status:	Inactive	**End Date:**	1960
Site Description:	The site has been remediated and interim closed out. The unit contained many trenches running east and west.		
Waste Type:	Construction Debris		
Waste Description:	The unit was used for the disposal of solid waste from the effluent line modification and for disposal of reactor-generated solid waste during various modification programs. Potential contaminates include: Co-60, Cs-137, Eu-152, Eu-154, Eu-155, Ni-63, Pu-238, Pu-239/240, Sr-90, chromium, lead, mercury, PCBs		

Site Code:	118-B-4	**Classification:**	Accepted
Site Names:	118-B-4, 105-B Spacer Burial Ground, 105-B Dummy Burial Ground	**ReClassification:**	Interim Closed Out (5/24/2004)
Site Type:	Burial Ground	**Start Date:**	1956
Site Status:	Inactive	**End Date:**	1958
Site Description:	The site has been remediated and interim closed out.		
Waste Type:	Equipment		
Waste Description:	The unit was used for disposal of fuel spacers dummies. Potential contaminants included: Co-60, Cr+6		

Site Code:	118-B-6	**Classification:**	Accepted
Site Names:	118-B-6, 108-B Solid Waste Burial Ground, 108-B Solid Waste Burial Ground No. 2	**ReClassification:**	Interim Closed Out (6/8/2006)

Site Type:	Burial Ground	**Start Date:**	1950
Site Status:	Inactive	**End Date:**	1953
Site Description:	The site has been remediated and interim closed. The site has been backfilled and leveled to grade. The unit consisted of two concrete caissons (pipes) 5.5 meters (18 feet) long by 1.8 meters (6 feet) in diameter, that were buried vertically in the ground and capped with a concrete pad. The concrete pad had two pear-shaped steel lids that provided access to the caissons.		
Waste Type:	Equipment		
Waste Description:	The unit received the following types and amounts of wastes: 26,500 kilograms (58,500 pounds) of spent lithium-aluminum alloy, 21,300 kilograms (47,000 pounds) of lead from pots, 45 kilograms (100 pounds) of mercury from manometers and Toepler pumps, 1,720 kilograms (3,800 pounds) of aluminum cladding, and 1,360 kilograms (3,000 pounds) of palladium. Additionally, it contains a total of 21,200 kilograms (23.4 tons) of wastes generated as a result of the P-10 tritium production project in the 108-B Facility. Potential contaminants include: H-3, lead, mercury		

Site Code:	1607-B8	**Classification:**	Accepted
Site Names:	1607-B8, 1607-B8 Septic Tank System, 124-C-2, 1607-B8 Sanitary Sewer System, Septic Tank & Disposal Field for 190-C Pumphouse	**ReClassification:**	Interim Closed Out (7/29/2003)
Site Type:	Septic Tank	**Start Date:**	1951
Site Status:	Inactive	**End Date:**	1969
Site Description:	The site has been remediated and interim closed out. The site consisted of a septic tank and tile field. The vertical tank was constructed of steel and had a 1,325-liter (350-gallon) capacity. The tile field was oriented north-south and was located to the south of the septic tank. The tile field was constructed of 20-centimeter (8-inch) vitrified clay pipe laid with open joints.		
Waste Type:	Sanitary Sewage		
Waste Description:	This unit received an unknown quantity of sanitary sewage from the 190-C Pumphouse.		

Site Code:	1607-B9	**Classification:**	Accepted
Site Names:	1607-B9, 1607-B9 Septic Tank System, 1607-B9 Sanitary Sewer System, 124-C-3	**ReClassification:**	Interim Closed Out (8/28/2003)
Site Type:	Septic Tank	**Start Date:**	
Site Status:	Inactive	**End Date:**	
Site Description:	The site has been remediated and interim closed out. The site was a septic tank and tile field.		
Waste Type:	Sanitary Sewage		

Waste Type:	Sanitary Sewage
Waste Description:	This unit received an unknown amount of sanitary sewage from the 105-C Reactor Building.

Site Code:	1607-B10	**Classification:**	Accepted
Site Names:	1607-B10, 1607-B10 Septic Tank System, Sewage Disposal Field	**ReClassification:**	Interim Closed Out (7/29/2003)
Site Type:	Septic Tank	**Start Date:**	1952
Site Status:	Inactive	**End Date:**	1969
Site Description:	The site has been remediated and interim closed out. The site consisted of a septic tank and tile field. A steel pipe riser 20 centimeters (8 inches) in diameter and 84 centimeters (33 inches) above grade marked the location of the tank.		
Waste Type:	Sanitary Sewage		
Waste Description:	The unit received only sanitary sewer wastes from the headhouse of the 183-C Water Treatment Plant. There were no known discharges of hazardous chemicals or radionuclides.		

Site Code:	1607-B11	**Classification:**	Accepted
Site Names:	1607-B11, 1607-B11 Septic Tank System	**ReClassification:**	Interim Closed Out (7/29/2003)
Site Type:	Septic Tank	**Start Date:**	1952
Site Status:	Inactive	**End Date:**	1969
Site Description:	The site has been remediated and interim closed out. The site consisted of a septic tank and drain field.		
Waste Type:	Sanitary Sewage		
Waste Description:	There were no known discharges of hazardous chemicals or radionuclides into the unit. The unit received only sanitary sewer wastes from the 183-C Filter Building & Pump Room (183-C Water Treatment Plant).		

Site Code:	100-C-2	**Classification:**	Not Accepted (9/9/1997)
Site Names:	100-C-2, Possible Building Foundation and Parking Lot, Monitoring Station 1614-B-1	**ReClassification:**	
Site Type:	Foundation	**Start Date:**	
Site Status:	Inactive	**End Date:**	
Site Description:	The site is a small square concrete slab and nearby gravel parking area. Northwest of the slab is a gravel road with a gravel area on the other side. A few small pieces of asbestos transite, a few dry-cell batteries, and some steel anchoring cable were noted around the site during a 9/13/94 field investigation by Kathryn J. Moss.		

Site Code:	100-C-3	**Classification:**	Accepted
Site Names:	100-C-3, 119-C Sample Building French Drain, 119-C French Drain	**ReClassification:**	Interim Closed Out (7/28/2003)
Site Type:	French Drain	**Start Date:**	1960
Site Status:	Inactive	**End Date:**	
Site Description:	The site has been remediated and interim closed out.		
Waste Type:	Water		
Waste Description:	The 119-C Sample Building was built in 1960 and contained "water cooled" air sample monitoring equipment. Effluent from the sampling equipment, the building's swamp cooler, and janitorial waste would have been disposed to this drain.		

Site Code:	100-C-4	**Classification:**	Not Accepted (9/9/1997)
Site Names:	100-C-4, Export Water Line Valve Pit	**ReClassification:**	
Site Type:	Valve Pit	**Start Date:**	
Site Status:	Active	**End Date:**	
Site Description:	The site is a valve pit located along the export water line. The pit is marked with post and chain. The 1.8 by 1.8 meter (6 by 6 foot) wooden cover is caving into the valve pit. The cover is posted with a "Danger: Cave-In Potential" sign.		

Site Code:	100-C-5	**Classification:**	Not Accepted (4/11/2002)
Site Names:	100-C-5, 100-C Service Water Pipelines, 100-C Clean Water Pipelines	**ReClassification:**	
Site Type:	Product Piping	**Start Date:**	1952
Site Status:	Inactive	**End Date:**	1969
Site Description:	The site encompasses the clean water upstream pipelines for the 100-C Area, including underground pipelines used to transport raw, fire, export, and sanitary water from the river pumphouse, to the water treatment facilities and to 100-C Area facilities and fire hydrants. Lines within buildings, process and septic sewer pipes, pipes that carried water treated with sodium dichromate, and all lines that are downstream from the reactor building, i.e., those lines that carry cooling water from the reactor to the retention basin, trench, and/or the river are excluded.		
Waste Type:	Water		
Waste Description:	Only uncontaminated piping remains.		

Site Code:	100-C-6	**Classification:**	Accepted
Site Names:	100-C-6, 100-C Reactor Cooling Water Effluent Underground Pipelines (See Subsites)	**ReClassification:**	
Site Type:	Radioactive Process Sewer	**Start Date:**	1952

Site Status: Inactive **End Date:** 1969

Site Description: The site includes the underground 105-C Reactor cooling water effluent pipelines. These include those effluent pipelines that transported 105-C Reactor cooling water from the reactor to the 116-C-5 (107-C Retention Basin), and from the basin to the 132-B-6 and 132-C-2 Outfall Structures and/or to the 116-C-1 Liquid Waste Disposal Trench. This waste site includes all associated expansion and valve boxes and excludes the retention basin (separate site), outfall structures (separate sites), and those effluent pipelines that are within the confines of the 105-C Reactor Building or that run from the outfall structures to the bottom of the river. It also excludes all reactor influent pipelines that are upstream of the reactor building.

Waste Type: Process Effluent

Waste Description: The waste was contaminated steel piping, concrete, and soil. Reactor cooling water became radioactively contaminated as it passed through the reactor core. Activation products created in the water included calcium-41, chromium-51, and zinc-65. Activation products from the reactor core that were picked up and transported by the cooling water included tritium, carbon-14, cobalt-60, nickel-63, and europium-152/154/155. Fuel element fission products such as strontium-90, and cesium-137, as well as transuranics such as plutonium-239/240 were introduced into cooling water due to fuel cladding failures. Concentrations of radionuclides in cooling water during normal reactor operations were approximately (0.2 microcuries/liter). Concentrations of radionuclides have built up in rust flakes and scale on the inner surfaces of the pipelines and in sludge in the diversion and junction boxes. Average beta-gamma concentrations for the effluent line scale and junction/diversion boxes are 83,000 and 120,000 picocuries/liter, respectively. Average plutonium-239/240 concentrations are 66 picocuries/gram for the effluent line scale and 720 picocuries/gram for the sludge at the bottom of the diversion and junction boxes. Direct readings of the bottom of the effluent lines averaged approximately 40,000 counts/minute with a Geiger-Mueller probe. Additional chemicals were added to the effluent for purposes of water treatment. These included aluminum sulfate (alum), with excess hydrated calcium oxide, sulfuric acid, chlorine, and sodium dichromate. Water pH was maintained at about 7.5, and the free chlorine residual was approximately 0.2 milligrams/liter. The waste is any remaining process effluent and the contaminated pipelines.

SubSites:

SubSite Code: 100-C-6:1

SubSite Name: 100-C-6:1, 100-C Area South Effluent Pipelines

Classification: Accepted

ReClassification: Interim Closed Out

Description: This subsite included the underground reactor effluent pipelines surrounding the 118-C-3:1 (105-C Reactor) to within 1.5 meters (5 feet) of the reactor foundation, and running north from the reactor to B Avenue. This subsite excluded two 110 foot sections of pipeline that passed beneath the Export Water Line, see 100-C-6:5.

The Cleanup Verification Package 2003-00022 (CVP), documented completion of remedial action for the 100-C-6:1 subsite. Also included are the cross-tie underground lines that connected the 105-B Reactor effluent system to the 105-C Reactor effluent pipeline system. Sites that are excluded from the CVP are the associated retention basin and outfall structure, which was treated as unique waste sites. The 105-C Reactor effluent pipeline subsites (100-C-6:2, 100-C-6:3, 100-C-6:4) were located north of B Avenue and addressed in a separate CVP.

Remedial action objectives and goals for the 100-B/C south pipelines site were established by

the U.S. Environmental Protection Agency (EPA) and the U.S. Department of Energy, Richland Operations Office, in concurrence with the Washington State Department of Ecology. For the 100-B/C south pipelines site, these goals and objectives are documented in the Interim Action Record of Decision for the 100-BC-1, 100-DR-1, and 100-HR-1 Operable Units and the Remedial Design Report/Remedial Action Work Plan for the 100 Area.

Waste site contaminants of concern (COCs) identified through process knowledge are listed in the 100 Area Remedial Action Sampling and Analysis Plan. The original COCs identified in the sampling and analysis plan for this site consisted of americium-241, cesium 137, cobalt-60, europium-152, europium-154, europium-155, plutonium-238, plutonium 239/240, strontium-90, and uranium-238.

Based on the results of sampling during 100-B/C pipeline and outfall remediation, lead, mercury, total chromium, and hexavalent chromium were added to the original COC list as contaminants of potential concern. Since in-process sample analyses returned detected results for all four analytes, they are retained and evaluated as COCs throughout the CVP. The final COC list for this site, therefore, consisted of the following: americium-241, plutonium-239/240, cesium-137, strontium-90, cobalt-60, uranium-238, europium-152, lead, europium-154, mercury, europium-155, total chromium, plutonium-238, hexavalent chromium.

Cleanup verification samples including QA/QC samples consisted of 50 shallow zone samples, 11 deep zone samples, 56 overburden samples. The final verification samples were collected between November 10, 2003, and concluded on November 19, 2004, and were analyzed for the established contaminants of concern. The numerous sample numbers are listed in appendix A of CVP-2003-00022 and also in the HEIS database.

At the completion of remedial action, the excavation was approximately 48,260 meters squared (519,466 square feet) in area. Approximately 244,656 metric tons (269,742 tons) of material, including soil, debris, and piping were removed from the 100-B/C south pipelines site and disposed of at the Environmental Restoration Disposal Facility.

The CVP demonstrated that remedial action at the 100-B/C south pipelines site had achieved the RAOs and corresponding RAGs established in the approved ROD and RDR/RAWP. The remaining soils at these sites have been sampled, analyzed, and modeled. The results of this effort indicated that the materials from the 100-C-6:1 site that contained COCs at concentrations exceeding RAGs have been excavated and disposed of at ERDF. These results also indicated that residual concentrations in the shallow zone will support future land uses that can be represented (or bounded) by a rural-residential scenario, and that residual concentrations throughout the site pose no threat to groundwater or the Columbia River.

The acceptability of unrestricted direct exposure to deep zone soils has not been demonstrated; therefore, institutional controls to prevent uncontrolled drilling or excavation into the deep zone (i.e., below 4.6 meters [15 feet]) are required. The 100-C-6:1 site was verified to be remediated in accordance with the ROD and may be backfilled.

SubSite Code: 100-C-6:2

SubSite Name: 100-C-6:2, 100-C Area North Effluent Pipelines

Classification: Accepted

ReClassification: Interim Closed Out

Description: Cleanup Verification Package 2003-00019 (CVP) documented completion of remedial action for the 100-B/C Effluent Pipeline subsites located north of B Avenue (100-B-8:2, 100-C-6:2, 100-C-6:3, and 100-C-6:4) (collectively referred to as the 100-B/C north pipelines site). The

100-C-6:2 subsite included the 105-C Reactor effluent pipelines from B Avenue north to the 116-C-5 Retention Basin, and included the diversion box just south of the 116-C-5 Retention Basin (labeled as pipes 22, 23, and 26 in Figures 2 and 3 of CVP 2003-00019).

Excavation was driven by remedial action objectives for direct exposure, protection of groundwater, and protection of the Columbia River. For the respective points of compliance, remedial action goals (RAGs) were established to identify radionuclide and nonradionuclide contaminants of concern (COCs).

Waste site COCs identified through process knowledge are listed in the 100 Area Remedial Action Sampling and Analysis Plan (DOE RL 2001). The COCs identified in the sampling and analysis plan for this site consisted of americium-241, cesium 137, cobalt-60, europium-152, europium-154, europium-155, plutonium-238, plutonium 239/240, strontium-90, and uranium-238.

Based on verification sampling results from the 100-B/C outfalls site, total chromium, hexavalent chromium, lead, and mercury were added to the original COC list as contaminants of potential concern (COPC). Since verification sample analyses returned detected results for all four analytes, they were retained and evaluated as COCs.

Cleanup verification samples including QA/QC samples consisted of 193 shallow zone samples, 104 deep zone samples, 260 overburden samples, and 72 discovery area samples. The final verification samples were collected between August 12, 2002, and concluded on July 24, 2003, and were analyzed for the established contaminants of concern. The sample numbers are too numerous to list and as of March 2004 had not been reported to HEIS, however they are available in appendix A of CVP-2003-00019 .

At the completion of remedial action, the excavation was approximately 135,000 meters squared (443,000 square feet) in area with an average depth of approximately 7.5 meters (25 feet). Approximately 244,656 metric tons (269,742 tons) of material including soil, debris, and piping were removed from the 100 B/C north pipelines site and disposed at the Environmental Restoration Disposal Facility.

The CVP demonstrated that remedial action at the 100-B/C north pipelines site had achieved the RAOs and corresponding RAGs established in the approved ROD (EPA 1995), and in the RDR/RAWP (DOE RL 2002). The remaining soils at these sites have been sampled, analyzed, and modeled. The results of this effort indicated that the materials from the 100-B-8:2, 100-C-6:2, 100 C-6:3, and 100-C-6:4 sites that contained COCs at concentrations exceeding RAGs have been excavated and disposed of at ERDF. These results also indicate that residual concentrations in the shallow zone and discovery areas will support future land uses that can be represented (or bounded) by a rural-residential scenario, and that residual concentrations throughout the site pose no threat to groundwater or the Columbia River. The acceptability of unrestricted direct exposure to deep zone soils has not been demonstrated; therefore, institutional controls to prevent uncontrolled drilling or excavation into the deep zone (i.e., below 4.6 meters [15 feet]) are required.

SubSite Code: 100-C-6:3

SubSite Name: 100-C-6:3, 100-C Retention Basin to Outfalls Effluent Pipelines

Classification: Accepted

ReClassification: Interim Closed Out

Description: Cleanup Verification Package 2003-00019 (CVP) documented completion of remedial action for the 100-B/C Effluent Pipeline subsites located north of B Avenue (100-B-8:2, 100-C-6:2, 100-C-6:3, and 100-C-6:4) (collectively referred to as the 100-B/C north pipelines site). The

100-C-6:3 subsite included the 105-C underground effluent pipelines that ran between the 116-C-5 Retention Basin, 116-C-1 Trench, 132-B-6 Outfall, and 132 C 2 Outfall, and between the 116-B-11 Retention Basin and 116-B-1 Trench. Also included are the westernmost pipelines from the 116-C-5 Retention Basin to the junction box south of 116-C-5, and the pipeline on the north side of 116-C-5 that ran to the junction box immediately north of the eastern basin. The pipelines in this subsite are labeled as 12 through 21 and 42, in Figures 2 and 3 of CVP-2003-00019. One section of this subsite, labeled as pipeline 16 in the sample design figures, was removed and backfilled but not entirely sampled as part of the 116-C-5 remedial action (BHI 1997). Section 16 has been sampled for cleanup verification with this subsite.

For complete documentation from CVP-2003-00019 and cleanup verification sampling information refer to 100-C-6:2.

SubSite Code: 100-C-6:4

SubSite Name: 100-C-6:4, B/C Pipelines Discovery Areas

Classification: Accepted

ReClassification: Interim Closed Out

Description: Cleanup Verification Package 2003-00019 (CVP) documented completion of remedial action for the 100-B/C Effluent Pipeline subsites located north of B Avenue (100-B-8:2, 100-C-6:2, 100-C-6:3, and 100-C-6:4) (collectively referred to as the 100-B/C north pipelines site). This CVP also included eleven areas discovered to have radiological contamination above background, called "discovery areas." They are collectively identified as subsite 100-C-6:4.

Some areas were identified prior to commencement of the 100-B/C pipeline remediation activities, while others were found during the pipeline remediation process. The source of contamination for these areas has not been established, although the adjacent effluent piping and the 116-C-5 Retention Basins are suspected sources. The locations of the discovery areas in relation to the pipelines were shown in Figure 2 of CVP-2003-00019.

For complete documentation from CVP-2003-00019 and cleanup verification sampling information refer to 100-C-6:2.

SubSite Code: 100-C-6:5

SubSite Name: 100-C-6:5, Pipelines Sections Under Export Water Line

Classification: Accepted

ReClassification:

Description: Approximately 110 foot gap in the removal of the south 100 B/C pipelines. The lines were left in place so as not to undermine the 42 inch export water line that passes above the effluent lines.

Site Code:	100-C-7	**Classification:**	Accepted
Site Names:	100-C-7, 183-C Filter Building /Pumproom Facility Foundation and Demolition Waste (See Subsites)	**ReClassification:**	
Site Type:	Dumping Area	**Start Date:**	
Site Status:	Inactive	**End Date:**	

Site Description: The site has been backfilled and graded to match the surrounding terrain. No trace of the 183-C Filter Building/Pumproom was identified.

Another area of yellow stained soil has been observed near the sedimentation basins. Information about this area has been added as a subsite. The area has a chain around it with a 'Danger Authorized Personnel Only' sign.

Waste Type: Chemicals

Waste Description: The concrete foundation located in the 183-C Pumproom is contaminated with sodium dichromate. Characterization data showed the contamination at the worst location to be 20 centimeters (8 inches) deep, half the thickness of the floor. Therefore, assuming the contamination averaged a depth of 15 centimeters (6 inches) throughout and covered a total area of 93 square meters (1000 square feet), a quantity of 14 cubic meters (500 cubic feet) was calculated.

Waste Type: Demolition and Inert Waste

Waste Description: The 183-C Filter Building foundation and clearwells were filled with demolition and inert waste materials and leveled to grade.

Waste Type: Asbestos (friable)

Waste Description: An underground asbestos wrapped steam line was encountered during the foundation demolition along the north clearwell. Due to the length and location of the steam line, the small area uncovered during the excavation work was not remediated. The pipe was wrapped in plastic, marked with "DANGER ASBESTOS HAZARD" tape, and covered again with soil.

SubSites:

SubSite Code: 100-C-7:1

SubSite Name: 100-C-7:1, Yellow Stained Soil/183-C Water Treatment Facility Head House

Classification: Accepted

ReClassification:

Description: The stained soil was observed in early April 2002. It is located north of the 183-C Head House and adjacent to the northwest corner of the 183-C Sedimentation Basins. Discussions with project personnel concerning the past use of this area indicate that the appearance of the stain is consistent with sodium dichromate.

It is believed that a railroad spur was used to deliver water treatment supplies to the 183-C Head House. One of these chemicals was sodium dichromate, a corrosion inhibitor, used to treat the reactor cooling water. The Final Decommissioning Report for the 183-C Filter Building/Pumproom Facility (BHI-01005) states that the sodium dichromate was stored, mixed and spilled in various locations throughout the 183-C Pump Room Facility where it was then pumped into the four large exterior tanks and stored for the 190-C Process Pump House.

It is unclear as to how the Sodium Dichromate was transferred from the Head House, west of the sedimentation basins, to the Pump Room Facility, east of the basins. The stained area may be a result of this transfer process.

Site Code:	100-C-8	**Classification:**	Accepted
Site Names:	100-C-8, 105C Hydraulic Oil Release	**ReClassification:**	Rejected (3/13/2002)
Site Type:	Unplanned Release	**Start Date:**	1998
Site Status:	Inactive	**End Date:**	1998

Site Description: The site is not marked or posted, no visible evidence of the spill remains because the concrete rubble that it was spilled on has been removed.

Waste Type: Oil

Waste Description: Unocal Unax AW46 Hydraulic Oil, unregulated product.

Site Code:	100-C-9	**Classification:**	Accepted
Site Names:	100-C-9, 100-C Area Process and Sanitary Sewer Underground Pipelines (See Subsites)	**ReClassification:**	Interim Closed Out (7/11/2007)
Site Type:	Process Sewer	**Start Date:**	1952
Site Status:	Inactive	**End Date:**	1969

Site Description: This site consisted of approximately 3,000 meters (9,842.5 feet) of 100-C area miscellaneous underground pipelines separated into four subsites. The subsites included: the main process sewers associated with the 105-C Reactor operations, the sanitary sewer feeder pipelines to four septic systems (1607-B8, 1607-B9, 1607-B10), the 183-C Clearwell pipelines, and the 100-C cooling water transfer lines and tunnels.

All of the subsites have been reclassified (for individual reclass status see the subsites), therefore, the site is considered closed out.

Waste Type: Equipment

Waste Description: The subsite consisted of the non-radioactively contaminated process and septic sewer pipelines associated with the 105-C Reactor operations. The 1607-B9 septic system serviced the 105-C Reactor and thus may be radioactively contaminated. Any contamination associated with these pipelines was expected to be in residual amounts.

Chemical additives to the reactor cooling water included aluminum sulfate (alum) with excess hydrated calcium oxide, sulfuric acid, chlorine, and sodium dichromate. Water pH was maintained at about 7.5, the free chlorine residual was approximately 0.2 milligrams/liter, and sodium dichromate was added at a rate of about 2 milligrams/liter. (Note: Reference: WHC-SD-EN-TI-169 is for 100-F, and applies equally to 100-C).

SubSites:

SubSite Code: 100-C-9:1

SubSite Name: 100-C-9:1, 100-C Main Process Sewer Collection Line

Classification: Accepted

ReClassification: Interim Closed Out

Description: In accordance with the Remaining Sites Verification Package (RSVP-2004-012), the verification sampling results supported a reclassification of the subsite to Interim Closed Out.

The current site conditions have achieved the remedial action objectives and the corresponding remedial action goals established in the Remedial Design Report/Remedial Action Work Plan for the 100 Area (RDR/RAWP) and the Interim Action Record of Decision for the 100-BC-1, 100-BC2, 100-DR-1, 100-DR-2, 100-FR-1, 100-FR-2, 100-HR-1, 100-HR-2, 100-KR-1, 100-KR-2, 100-IU-2, 100-IU-6, and 200-CW-3 Operable Units, (Remaining Sites ROD).

The subsite included pipelines from the 183-C and 190-C facilities that fed into the main process sewer which consisted of a dual 1.2-meter by 1.8-meter (48-inch by 72-inch)-reinforced concrete box sewer that shared a central dividing wall. The duel reinforced concrete box sewers were often referred to as the twin box culvert. The floor, top, and walls of the twin box culvert were approximately 0.3 meters (1 foot) thick. Given the construction sequence, leaks from the cold joints could have developed at any point along the length of the structure between the floor and walls.

The main process sewer began down-gradient from the 183-C sedimentation basins and was oriented east-west, running to the north of the 100-C Area water treatment and pump house facilities. Multiple feeder pipes of various sizes from the 183-C and 190-C facilities discharged into the twin box culvert. The intended purpose of these pipelines was to handle diluted, nonhazardous process wastes and storm water. Sanitary wastes were handled separately via multiple septic systems. North of the 105-C Reactor Building, the twin box culvert changed orientation to approximately north-south and ran north to the former 132-C-2 outfall.

Remedial action was divided into a northern and a southern section due to the length of the required excavation of approximately 1875 meters (6150 feet). The entire northern section along with a minimum of 0.3 meters (1 foot) of underlying soil was excavated between November 22, 2004, and February 2005. Approximately 14,639 metric tons (16,137 U.S. tons) of contaminated soil and concrete were disposed at the Environmental Restoration Disposal Facility. Verification sampling of the northern excavation was performed on August 23, 2005.

The southern portion consisted of a deep zone [i.e., more than 4.6 meters (15 feet) deep section of the twin box culvert and a shallow zone which included a section of the twin box culvert and the feeder lines from the 100-C water treatment facilities. Remediation of the southern portion shallow zone began in December 2004, and was completed on April 19, 2006. Approximately 5,851 metric tons (6,450 U.S. tons) of contaminated soil and concrete were removed for disposal at ERDF. The deep zone portion of the southern twin box culvert was left in place. Verification sampling of the southern excavation was performed July 27 through July 29, 2006.

The results of confirmatory sampling, cold joint soil sampling, and agreements with the EPA were used to develop the contaminants of concern (COCs) for verification sampling. Confirmatory sampling found concentrations of antimony, cadmium, total chromium, hexavalent chromium, copper, lead, manganese, and mercury to be above the cleanup criteria. These analytes were carried forward as COCs for verification sampling. Gridded radiological surveys of the excavations and stockpiles did not indicate the presence of radiological contamination above background; therefore radionuclides were not included as COCs for verification sampling. All analytical data were stored in the ENRE project-specific database prior to being submitted for inclusion in the HEIS database and summarized in Appendix A of the RSVP.

The results of verification sampling for both areas showed that residual contaminant concentrations in the shallow zone did not preclude any future uses (as bounded by the rural-residential scenario) and allowed for unrestricted use of shallow zone soils (i.e., surface to

4.6 meters [15 feet] deep). The results also demonstrated that residual contaminant concentrations were protective of groundwater and the Columbia River. The suitability of direct exposure to deep zone soils has not been demonstrated. Therefore, institutional controls will be needed to prevent uncontrolled drilling/excavation of the deep-zone section of the 100-C-9:1 Main Process Sewer Collection Line that was left in place.

Although not required by the Remaining Sites ROD, a comparison of ecological risk screening levels to the available analytical data has been made. Ecological screening levels for shallow zone soils were exceeded for antimony, boron, mercury, and vanadium. Exceedance of screening values does not necessarily indicate the existence of added risk to ecological receptors. Specifically, the values for antimony and vanadium were below the Hanford Site background levels, the concentrations measured for mercury were within the range of Hanford Site background levels, and the concentrations measured for boron were consistent with values seen elsewhere at the Hanford Site. Exceedance of ecological risk screening levels at the waste site will be evaluated in the context of additional lines of evidence for ecological effects following a baseline risk assessment for the river corridor portion of the Hanford Site, which includes a more complete quantitative ecological risk assessment. That baseline risk assessment will be used to support the final closeout decision for the waste site.

SubSite Code: 100-C-9:2

SubSite Name: 100-C-9:2, 100-C Sanitary Sewer Lines

Classification: Accepted

ReClassification: Interim Closed Out

Description: The Remaining Sites Verification Package (RSVP-2004-013) has documented that the 100-C-9:2 subsite has met the objectives for reclassification of the subsite to Interim Closed Out. The current subsite conditions have achieved the remedial action objectives and the corresponding remedial action goals established in the Remedial Design Report/Remedial Action Work Plan for the 100 Area (RDR/RAWP) and the Interim Action Record of Decision for the 100-BC-1, 100-BC2, 100-DR-1, 100-DR-2, 100-FR-1, 100-FR-2, 100-HR-1, 100-HR-2, 100-KR-1, 100-KR-2, 100-IU-2, 100-IU-6, and 200-CW-3 Operable Units, (Remaining Sites ROD).

The subsite consisted of the feeder pipelines for the former 1607-B8, 1607-B9, 1607-B 10, and 1607-B 11 septic systems (septic tank and drain field). All four of the septic systems and underlying contaminated soils were removed between March and May 2003, leaving the feeder pipelines in place.

Remedial action associated with each of the four feeder pipelines began in early 2005 and concluded on September 29, 2006. A total of approximately 3,701 metric tons (4,080 U.S. tons) of contaminated material was disposed at ERDF. Statistical and focused sampling to verify the completeness of remediation was performed, and analytical results were shown to meet the cleanup objectives for direct exposure, groundwater protection, and river protection. A summary of the remediation for each of the four septic system pipelines follows:

The pipeline from the 1607-B8 septic system was removed between March 23, 2005 and April 13, 2005. The site was excavated 2 meters (6.6 feet) below grade. A total of 266 metric tons (293 U.S. tons) of contaminated material was disposed at ERDF. The resulting trench was approximately 9 meters (29.5 feet) in length by 3.5 meters (11.5 feet) wide.

Remediation of the 1607-B9 pipeline began on May 23, 2005 through July 11, 2005. The site was excavated to 3.5 meters (11.5 feet) below grade, removing a total of 2,626 metric tons

(2,895 U.S. tons) of contaminated material that was disposed at ERDF. An additional 310 metric tons (342 U.S. tons) was removed on September 29, 2006, following detection of strontium-90 above the cleanup criterion in one verification sample.

During excavation of the pipeline on May 25, 2005, an anomaly consisting of reddish-brown material was discovered after a concrete structure was removed. Radiological readings were all at background levels. A sample (J03701) of the material was collected and analyzed for total metals, leachable metals (toxicity characteristic leaching procedure [TCLP]), and semivolatile organic compounds (SVOCs) to support waste characterization and disposal. There were no significant metal or SVOC concentrations associated with this anomaly. The COPCs for the pipeline were identified through process knowledge and analogous site data and consisted of inductively coupled plasma (ICP) metals, hexavalent chromium, pesticides, polychlorinated biphenyls (PCBs), and semivolatile organic compounds. Radiological screening was also performed using gross alpha, gross beta, and gamma energy analyses.

The 1607-B 10 pipeline was removed by March 2005. A total of approximately 9 meters (29.5 feet) of sanitary sewer pipeline and an estimated 45 metric tons (50 U.S. tons) of contaminated material was removed and sent to ERDF. The resulting trench was approximately 9 meters (29.5 feet) in length by 3.5 meters (11.5 feet) wide.

The 1607-B-11 pipeline was co-located and remediated with the subsite 100-C-9:1, (100-C main process sewer collection pipelines). The 100-C-9:1 process sewer pipeline was excavated to at least 4 meters (13 feet) below grade, which concurrently removed the 1607-B 11 sanitary sewer pipeline that was approximately 1.2 meters (4 feet) below grade. The remediation activities were completed by April 2006, removing approximately 40 meters (131 feet) of the sanitary sewer pipeline and an estimated 454 metric tons (500 U.S. tons) of contaminated material was removed and sent to ERDF.

Soil cleanup levels were established in the Remaining Sites ROD based on a limited ecological risk assessment. Although not required by the Remaining Sites ROD, a comparison against ecological risk screening levels was made for the site contaminants of concern (COC), contaminants of potential concern (COPC), and other constituents. Ecological screening levels were exceeded for antimony, boron, cadmium, total chromium, copper, lead, mercury, vanadium, and zinc.

Exceedance of screening values does not necessarily indicate the existence of risk to ecological receptors. Residual concentrations of antimony, cadmium, total chromium, copper, lead, mercury, vanadium, and zinc were within the range of Hanford Site background levels, and boron concentrations were consistent with those seen elsewhere at the Hanford Site (no established background value is available). Concentrations of chromium, copper, lead, mercury, and zinc were within the range of Hanford Site background levels. All exceedances of screening values at the subsite will be evaluated in the context of additional lines of evidence for ecological effects following a baseline risk assessment for the river corridor portion of the Hanford Site, which will include a more complete quantitative ecological risk assessment. That baseline risk assessment will be used to support the final closeout decision for the 100-C-9 site.

Verification sampling for the subsite was performed between April 25, 2006, and September 29, 2006, to support interim closeout. The samples were analyzed by offsite contract laboratories using U.S. Environmental Protection Agency (EPA) approved analytical methods, and the results were compared to the cleanup criteria specified in the RDR/RAWP. The laboratory results were stored in the Environmental Restoration (ENRE) project-specific database prior to being provided to the Hanford Environmental Information System (HEIS). The results were also presented in Appendix A of the RSVP.

The results of verification sampling have illustrated that residual contaminant concentrations do not preclude any future uses (as bounded by the rural-residential scenario) and allow for unrestricted use of shallow zone soils (i.e., surface to 4.6 meters [15 feet] deep). The results also demonstrated that residual contaminant concentrations were sufficiently protective of groundwater and the Columbia River to preclude further remedial action. Accordingly, an interim closure reclassification was supported for the pipelines subsite. The site does not have a deep zone or residual contaminant concentrations that would require any institutional controls.

SubSite Code: 100-C-9:3

SubSite Name: 100-C-9:3, 183-C Clearwell Pipelines

Classification: Accepted

ReClassification: No Action

Description: This subsite included the process sewer pipelines surrounding the 183-C Clearwells (demolished) to the point of junction with the main process sewer collection line. The clearwells were used to store treated cooling water for the 105-C reactor. Chromium was added to the treated water at concentrations between 2-4 ppm (parts per million) as a corrosion inhibitor. The primary contaminant of concern was hexavalent chromium.

Sampling and evaluation of this site have been performed in accordance with remedial action objectives and goals established by the Interim Action Record of Decision for the 100-BC-1, 100-BC-2, 100-DR-1, 100-DR-2, 100-FR-1, 100-FR-2, 100-HR-1, 100-HR-2, 100-KR-1, 100-KR-2, 100-IU-2, 100-IU-6, and 200-CW-3 Operable Units, Hanford Site, Benton County, Washington (Remaining Sites ROD). The selected action involved (1) sampling of the site, (2) demonstration through a combination of field screening and confirmational sampling that cleanup goals have been met, and (3) proposal of no further action.

The 183-C Clearwells Site (100-C-9:3) meets the Remedial Action Objectives specified in the Remaining Sites ROD, U.S. Environmental Protection Agency, Region 10, Seattle, Washington. These results show that residual soil concentrations support future land uses that can be represented (or bounded) by a rural-residential scenario. The results demonstrate that residual concentrations in the deep zone are protective of groundwater and the Columbia River. Institutional controls will be required because the evaluation of compliance with direct exposure standards failed for some of the semivolatiles.

This subsite consisted of the process sewer pipelines that drained from the 183-C Clearwells. The clearwell drains ran from circular aboveground steel tanks and connected to cast-iron process sewers surrounding the tanks. The cast-iron process sewers eventually drained to the main twin box process sewers that connected to the 190-C Facility. The basis for separating this site from the other 100-C-9 sites is that these process sewer lines were isolated from facilities known to be potential sources of radioactive and chemical contaminants.

Confirmatory sampling was conducted in October 2003. The COPCs included inductively coupled plasma (ICP) metals, mercury, hexavalent chromium, semivolatile organic compounds, and polychlorinated biphenyls. The sampling approach consisted of collecting four samples, two of soil and two of pipe scale material below 4.6 meters (15 feet) from the east junction box that was accessible where the cast-iron pipe connected to the main process sewer box (BHI 2003). The maximum detected results from the scale and soil samples were used to support waste site reclassification. A summary of the evaluation of the scale and soil sample results against the applicable remedial action goals (RAGs)

The 100-C-9:3 183-C Clearwells Process Sewer Pipelines (100-C-9:3) (BHI 2003) sample

results demonstrate that the site has achieved the objectives of remedial action and remedial action goals established in the Remedial Design Report/Remedial Action Work Plan for the 100 Area (RDR/RAWP) (DOE RL 2002) and the Interim Action Record of Decision for the 100-BC-1, 100-BC-2, 100-DR-1, 100-DR-2, 100-FR-1, 100-FR-2, 100-HR-1, 100-HR-2, 100-KR-1, 100-KR-2, 100-IU-2, 100-IU-6, and 200-CW-3 Operable Units, Hanford Site, Benton County, Washington (commonly called the Remaining Sites Record of Decision) (EPA 1999). These results show that scale and associated residual soil concentrations support future land uses that can be represented (or bounded) by a rural residential scenario. The results demonstrated that residual concentrations in the deep zone are protective of groundwater and the Columbia River. Institutional controls will be required because the evaluation of compliance with direct exposure standards failed for some of the semivolatiles.

SubSite Code: 100-C-9:4

SubSite Name: 100-C-9:4, 100-C Cooling Water Transfer Pipelines and Tunnels

Classification: Accepted

ReClassification: No Action

Description: This subsite consisted of the Cooling Water transfer lines located in tunnels between the 190-C Pump House and the 105-C Reactor building. Six 0.6 meter (24 inch) steel pipes located in two tunnels transferred treated cooling water from the 190-C Pump House to the 105-C Reactor. The portions of the tunnels from the 190-C building to just west of the Ventilation house of each tunnel were removed with D&D of the 190-C Building. A newly discovered 30-inch pipeline (not in a tunnel) from the 183-C to the 183-B building was also included in this subsite. Hexavalent chromium was the primary contaminant of concern inside the pipes. The floor of the tunnels may have been radiologically contaminated with reactor fission and activation products from previous releases of reactor effluent. Radiological contamination may also have existed as contaminated biological waste products (i.e. bat guano)

In the RSVP attached to the Reclassification Form 2004-015 the scope of the confirmatory sampling effort consisted of the cooling water pipes and tunnels to the reactor. Sampling efforts were conducted only on the pipes. Previous sampling and survey data associated with decontamination and decommissioning (D&D) activities at the 105-C cooling water pipe tunnels was used to evaluate the tunnels and soil. This D&D data, as well as a focused sampling approach at the analogous 100-B-14:4 site, were used to confirm current site conditions. The analogous, focused sampling data, previous tunnel sampling and survey data, and previous soil sampling beneath the tunnels was used to make decisions for reclassifying the site in accordance with the TPA-MP-14 (RL-TPA-90-0001) process.

The contaminants of potential concern (COPCs) for the feedwater pipes were identified based on existing analytical data, historical process information, and historical uses and practices associated with the 183-C Filter Building, the 190-C Process Pump House, and the associated feedwater pipelines. The COPCs included inductively coupled plasma (ICP) metals, mercury, hexavalent chromium, and polychlorinated biphenyls (PCBs).

In accordance with this evaluation, the confirmatory sampling results for pipe scale at an analogous site, previous sampling and surveying data associated with the concrete floor of the tunnels, and previous soil sampling from beneath the tunnels, support a no action reclassification of the 100-C-9:4 site. The current site conditions achieve the remedial action objectives and the corresponding RAGs established in the Remedial Design Report/Remedial Action Work Plan for the 100 Area (RDR/RAWP) and the Interim Action Record of Decision for the 100-BC-1, 100-BC-2, 100-DR-1, 100-DR-2, 100-FR-1, 100-FR-2, 100-HR-1, 100-HR-2, 100-KR-1, 100-KR-2, 100-IU-2, 100-IU-6, and 200-CW-3 Operable Units (Remaining Sites ROD). These results show that the site and contaminant levels remaining in the soil will be protective of groundwater and the Columbia River. It should be noted,

however, that with the maximum residual concentration of hexavalent chromium in the pipes, institutional controls are required to prevent an inhalation exposure pathway.

Site Code:	116-C-2A	**Classification:**	Accepted
Site Names:	116-C-2A, 105-C Pluto Crib, 116-C-2, 105-C Crib	**ReClassification:**	Interim Closed Out (3/15/2000)
Site Type:	Crib	**Start Date:**	1952
Site Status:	Inactive	**End Date:**	1969

Site Description: This site has been remediated and closed out.

The pluto crib was constructed of concrete ties that were notched and stacked in a log cabin formation.

Walls of concrete ties were constructed to divide the crib into 12 sections. Spaces between the ties were filled with sand. The crib was covered over by concrete roof slabs. A 20-centimeter (8-inch) well casing extended through the crib and ended 36 meters (118 feet) below grade.

Waste Type: Process Effluent

Waste Description: This unit was initially used for the disposal of reactor cooling effluent after fuel cladding failures. Unknown additional quantities of contaminated wastes included wash water from the decontamination of dummy fuel elements on the 105-C wash pad, contaminated water received from the 105-C Metal Examination Facility, and liquid wastes received from the 105-C Reactor rear face. Potential contaminants of concern include americium-241, plutonium-238/239/240, cobalt-60, cesium-137 and strontium-90. Reports vary as to the amounts of different chemicals disposed of at the Pluto Crib site. Two reports state that the crib contained 500 kilograms (1,100 pounds) of sodium dichromate, 1,000 kilograms (2,200 pounds) of sodium oxalate, and 1,000 kilograms (2,200 pounds) of sodium sulfamate. Another report, states that the crib contained 990 kilograms (2,180 pounds) of sodium dichromate, 2,100 kilograms (4,630 pounds) of sodium oxalate, and 6,600 kilograms (14,550 pounds) of sodium sulfamate. Sodium hydroxide and nitric acid were also believed to be disposed at the site. The total waste volume is listed as 7.5E+06 liters (1.98E+06 gallons).

Site Code:	116-C-2B	**Classification:**	Accepted
Site Names:	116-C-2B, 105-C Pluto Crib Pump Station, 116-C-2-1, 116-C-2B Pump Station	**ReClassification:**	Interim Closed Out (3/15/2000)
Site Type:	Pump Station	**Start Date:**	1952
Site Status:	Inactive	**End Date:**	1969

Site Description: This site has been remediated and interim closed out.

This unit was a rectangular shaped, concrete sump. A diamond-plate steel access hole cover was located in the northwest corner, and a vent was located at the east end. The site included all underground pipelines between the 105-C Reactor and the 116-C-2C Sand Filter.

Waste Type: Process Effluent

Waste Description: The unit received waste from the 105-C Reactor and pumped it into the 116-C-2C (105-C Pluto Crib Sand Filter).

Site Code:	116-C-2C	**Classification:**	Accepted
Site Names:	116-C-2C, 105-C Pluto Crib Sand Filter, 116-C-2-2, 116-C-8	**ReClassification:**	Interim Closed Out (3/15/2000)
Site Type:	Sand Filter	**Start Date:**	1952
Site Status:	Inactive	**End Date:**	1969

Site Description: This site has been remediated and closed out.

The structure was an open-bottom concrete box placed in a sand and gravel pit. It was covered with concrete shielding slabs. Contaminated water was spread over the surface of the sand filter media by distribution trays. The site included the underground pipelines from the 105-C Pluto Crib Sand Filter to the 116-C-2A Pluto Crib.

Waste Type: Process Effluent

Waste Description: The 105-C Pluto crib sand filter was sampled and surveyed between 2/6/76 and 4/5/76. Based on sample results, the sand filter contains an estimated radioactive inventory of 260 curies (Table 3.4-9, page 3-30) in 90,000 cubic feet of soil (about 6,100,000 Kg). Beta-gamma concentrations in the sand filter averaged 42,000 pCi/g with a maximum value reported of 7,300,000 pCi/g in a sample taken from an inlet distribution tray. Radioactivity in this sample was primarily due to cobalt-60 although high levels of strontium-90 (29,000 pCi/g) and cesium-137 (140,000 pCi/g) were present as well. This sample also contained 1,500 pCi/g plutonium-239/240. The average concentration of plutonium-239/40 in the sand filter was reported to be about 20 pCi/g for the entire mass of potentially contaminated soil column. Sample analyses for the sand filter are presented in Table 3.4-7 (page 3-28) by Dorian and Richards. The site may have received contaminated wastes from the decontamination of dummy fuel elements on the wash pad. Americium-241 is another potential contaminant of concern.

Site Code:	116-C-3	**Classification:**	Accepted
Site Names:	116-C-3, 105-C Chemical Waste Tanks	**ReClassification:**	Interim Closed Out (1/31/2008)
Site Type:	Storage Tank	**Start Date:**	1964
Site Status:	Inactive	**End Date:**	1969

Site Description: The site has been remediated, backfilled, and revegetated. Before remediaiton the site consisted of two below-grade chemical waste storage tanks, designed to receive and store chemical waste from the 105-C Reactor Metals Examination Facility (MEF) dejacketing process.

Site Code:	116-C-6	**Classification:**	Accepted
Site Names:	116-C-6, 105-C Fuel Storage Basin Cleanout Percolation Pit, 105-C Pond	**ReClassification:**	Interim Closed Out (12/8/2003)
Site Type:	Process Pit	**Start Date:**	1984
Site Status:	Inactive	**End Date:**	1985

Site Description: The site has been evaluated and determined to meet remedial action objectives. The evaluation supports reclassification to interim closed out.

The site was an unlined, L-shaped open excavated pit. Soil was excavated from the center and

used as a berm around its perimeter.

Waste Type: Water

Waste Description: This unit received water from the 105-C Fuel Storage Basin cleanout. Before being discharged to the pit, the radiologically contaminated shielding water in the basin was processed through ion exchange columns. Composite samples were taken to ensure that radionuclide concentrations were below release criteria in Table II of DOE Order 5480.1. No known hazardous substances were present in the water; however chemical analysis during that period was not a standard practice, and there is no evidence that any chemical analyses were performed.

Site Code:	118-C-1	**Classification:**	Accepted
Site Names:	118-C-1, 105-C Burial Ground, 105-C Solid Waste Burial Ground, 118-C-1 Burial Ground	**ReClassification:**	Interim Closed Out (7/19/2007)
Site Type:	Burial Ground	**Start Date:**	1953
Site Status:	Inactive	**End Date:**	1969

Site Description: The site was a burial ground that contained six small engineered disposal structures (rectangular pits with reinforced side walls) and many trenches running north and south. The site boundaries were permanently marked with concrete posts numbered C-70-1 through C-70-20.

Waste Type: Equipment

Waste Description: The unit was used for miscellaneous solid waste from 105-C Building that included process tubes, aluminum spacers, control rods, soft waste, and reactor hardware. The C Area Land Burial log (1962-1965) identified waste as trash, poison splines, dummies, hot laundry, fan filters, irradiated boron balls, ceramic samples, thimbles, gun barrels, and hoses.

The Burial Ground ROD reported that an estimate of the waste was 86 metric tons (94.8 tons) of boron, 1.1 metric tons (1.2 tons) of graphite, 0.51 metric tons (0.56 tons) of lead, 21.6 metric tons (23.8 tons) of lead/cadmium, and 96 metric tons (105.9 tons) of other materials. Potential contaminates include: Ag-108m, C-14, Co-60, Cs-137, Eu-152, Eu-154, Eu-155, H-3, Ni-59, Ni-63, Sr-90, Ba-133, Ca-41, cadmium, Cr+6, lead, boron, mercury, PCBs, SVOAs, TPH, and VOAs.

Site Code:	118-C-2	**Classification:**	Accepted
Site Names:	118-C-2, 105-C Ball Storage Tank, Ball 3X Storage Tank	**ReClassification:**	Interim Closed Out (7/30/2004)
Site Type:	Storage Tank	**Start Date:**	1969
Site Status:	Inactive	**End Date:**	1969

Site Description: The site has been remediated and interim closed out.

Waste Type: Equipment

Waste Description: During Ball 3X project work with a prototype contaminated ball sorter, the tank received highly radioactive, irradiated, nickel-plated boron steel and carbon steel balls for temporary storage so that they would decay radiologically before burial. Approximately 9,070 kilograms (20,000

pounds) of highly activated balls remain in the storage tank. Seventy percent of the balls remaining are boron steel, and thirty percent are carbon steel. A 1987 evaluation of the tank waste estimated that 80 curies of cobalt-60 and 1.6 curies of nickel-63 are present. Potential contaminants include: Co-60, Ni-63, Sr-90, Cs-137, Eu-152, Eu-154, U-238, Pu-238, Pu-239/240, chromium, lead, mercury

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Site Code:	118-C-3	**Classification:**	Accepted
Site Names:	118-C-3, 105-C Reactor Building (See Subsites)	**ReClassification:**	
Site Type:	Reactor	**Start Date:**	1952
Site Status:	Inactive	**End Date:**	1969

Site Description: The site consists of three subsites: 1) the inactive plutonium production 105-C Reactor Core and ISS Project, 2) 105-C Reactor Building Below-Grade Structures and Underlying Soils, 3) 105-C French Drains.

Waste Type: Equipment

Waste Description: In 1987, the facility was estimated to contain approximately 25,000 curies of radionuclides, 95,000 kilograms (105 tons) of lead, and 200 cubic meters (7000 cubic feet) of asbestos. During the Interim Safe Storage project, approximately 198 cubic meters (6600 cubic feet) of asbestos was removed along with 500 tons of interior and exterior transite panels. During 1996 through 1998, the total estimated inventory of lead was increased to 203 tons. Seventy tons of lead was removed. Material that was radioactively contaminated was take to the Environmental Restoration Disposal Facility (ERDF).

SubSites:

SubSite Code: 118-C-3:1

SubSite Name: 118-C-3:1, 105-C Reactor Core and ISS Project

Classification: Accepted

ReClassification:

Description: Beginning in 1996, decommission activities removed portions of the building, leaving only the reactor core and shield walls. The footprint of the building was reduced 81% during the Interim Safe Storage project from 5,528 square meters (59,500 square feet) to 1,059 square meters (11,400 square feet).

SubSite Code: 118-C-3:2

SubSite Name: 118-C-3:2, 105-C Reactor Building Below-Grade Structures and Underlying Soils

Classification: Accepted

ReClassification: Closed Out

Description: The remedial action involved the decommissioning and decontamination of associated structures and soils at the 105-C Reactor to the extent required leaving only the reactor core to be placed in Interim Safe Storage status. Remediation included the removal of hazardous and radiologically contaminated material from below grade rooms, tunnels and contaminated soils. Contaminated material was disposed of in the Environmental Restoration Disposal Facility (ERDF). The excavated areas were backfilled to grade with clean material.

SubSite Code: 118-C-3:3

SubSite Name: 118-C-3:3, 105-C French Drains

Classification: Accepted

ReClassification: Interim Closed Out

Description: The Remaining Sites Verification Package, (RSVP-2006-016) and the confirmatory sampling results support a reclassification of this site to interim closed out. The current site conditions have achieved the objectives for interim closed out as established in the Remedial Design Report/Remedial Action Work Plan for the 100 Area (RDR) and the Interim Action Record of Decision for the 100-BC-1, 100-BC-2, 100-DR-1, 100-DR-2, 100-FR-1, 100-FR-2, 100-HR-1, 100-HR-2, 100-KR-1, 100-KR-2, 100-IU-2, 100-IU-6, and 200-CW-3 Operable Units,(ROD).

The subsite is a collection of four french drains roughly located at the four corners of the 105-C Reactor Building. Each french drain was approximately 40.6 centimeters to 61 centimeters (16 inches to 24 inches) in diameter and had a 3.8 centimeter (1.5 inch) pipeline that ran to the french drain. The area around all four drains was disturbed and/or excavated during 105-C Reactor decommissioning activities. The area around the french drain to the southeast of the reactor was extensively excavated during the remediation of the 100-B/C south effluent pipelines. The entire area was backfilled and smoothed to grade after the various excavations. Prior to confirmatory sampling no visual surface indicators of the french drains remained, but no record of their removal or remediation could be found. To ensure complete cleanup of the Hanford Site a document search was conducted and found evidence of a potential liquid waste site. The french drains were likely condensate drains from the sealed steam heating system that would not have been subject to contamination from within the reactor building. However, the exact history of the drains is unknown, hence the need for the confirmatory sampling.

Confirmatory sampling was conducted on January 4, 2005. Excavations at the four french drain locations found three of the four drains partially intact. The fourth drain, #4 to the southeast, was not found in the excavation. The three french drains found were excavated and sampled just below the bottom of the drain. The southeast location was excavated to 4.6 m (15 ft) below ground surface and sampled at the bottom of the excavation. This sample design follows an agreement with the U.S. Environmental Protection Agency for sampling an analogous french drain at the 105-F Reactor, which was also removed during decontamination and decommissioning activities.

The contaminants of potential concern (COPCs) were developed for the 100-B/C south effluent pipelines, based on the 100 Area Remedial Action Sampling and Analysis Plan (SAP), they included americium-241, cesium-137, cobalt-60, europium-152, europium-154, europium-155, plutonium-238, plutonium-239/240, strontium-90, uranium-238, lead, mercury, total chromium, and hexavalent chromium. Because of some uncertainty and knowledge of previous investigations, the following analytical methods were also performed: polychlorinated biphenyls (PCBs), semivolatile organic analysis (SVOA), and the expanded inductively coupled plasma (ICP) metals list (antimony, arsenic, barium, beryllium, boron, cadmium, chromium [total], cobalt, copper, lead, manganese, molybdenum, nickel, silver, selenium, vanadium, and zinc). During confirmatory sampling, field screening for volatile organic compounds was performed to assess the need for volatile organic analysis (VOA). No volatile organic compounds were detected, and VOA was not performed on any of the samples.

Per the 105-C Reactor Interim Safe Storage Project Final Report, the walls of the structures within the area described were removed to 4.6 meters (15 feet) below grade. The Cleanup Verification Package for the 105-C Reactor Building Below-Grade Structures and

Underlying Soils released the soils under the reactor. The french drains were not included in cleanup activities associated with the Cleanup Verification Package for the 100 B 8:1 and 100-C-6:1 100-B/C South Effluent Pipelines.

These results show that residual soil concentrations support future land uses that can be represented (or bounded) by a rural-residential scenario. The results also demonstrate that residual contaminant concentrations support unrestricted future use of shallow zone soil (i.e., surface to 4.6 m [15 ft]) and that contaminant levels remaining in the soil are protective of groundwater and the Columbia River. This site does not have a deep zone; therefore, no deep zone institutional controls are required.

Site Code:	118-C-4	**Classification:**	Accepted
Site Names:	118-C-4, 105-C Horizontal Control Rod Storage Cave	**ReClassification:**	Interim Closed Out (9/11/2003)
Site Type:	Storage	**Start Date:**	1950
Site Status:	Inactive	**End Date:**	1969

Site Description: The site has been remediated and interim closed out.

The site consisted of two steel-plate tunnels covered with 1.2-meters (4-foot) of soil, gravel and asphalt emulsion. The two tunnels were grouted onto a concrete floor that had three equally spaced 0.6-meter (2-foot) diameter by 0.6-meter (2-feet) deep french drains beneath the centerline of the long axis of the structure. The french drains removed water runoff that could collect between the tunnels in the earth shielding.

Waste Type: Equipment

Waste Description: The tunnel was used for temporary storage for radioactive decay pending subsequent disposal. Some miscellaneous components are currently in the rod cave. The radiation reading at the entrance to the tunnel with the door open was once documented to be 5 millirads/hour.

Site Code:	124-C-4	**Classification:**	Not Accepted (9/9/1997)
Site Names:	124-C-4, Sanitary Waste Site	**ReClassification:**	
Site Type:	Sanitary Sewer	**Start Date:**	
Site Status:	Inactive	**End Date:**	

Site Description: This site was assigned by Bill Hayward based on the information from BHI D&D in the 1995 RARA Summary Report. D&D could not identify the site location nor could the BHI historian. The site is thought to be either 1607-B10 or 1607-B11 as they are the only remaining septic systems in the 100B Area that have a 124 alias assigned to them. If a determination can be made that it is one of above referenced septic systems, the 124-C-4 will be added to the site as an alias. This site reference (as a separate site) will then be removed from the database.

Site Code:	128-C-1	**Classification:**	Accepted
Site Names:	128-C-1, 100-C Burning Pit	**ReClassification:**	Interim Closed Out (8/10/2005)
Site Type:	Burn Pit	**Start Date:**	
Site Status:	Inactive	**End Date:**	

Site Description: The site has been remediated and interim closed out.

Waste Type: Misc. Trash and Debris

Waste Description: The burning pit received combustible materials such as office wastes, paint wastes, vegetation, and chemical solvents. Large metal items such as hardware, machinery, and other noncontaminated equipment were also deposited at the site.

Site Code: 132-C-1 **Classification:** Accepted

Site Names: 132-C-1, 116-C Reactor Exhaust Stack Site, 105-C Reactor Stack Site **ReClassification:** No Action (9/11/2003)

Site Type: Burial Ground **Start Date:** 1952

Site Status: Inactive **End Date:** 1969

Site Description: The site has been reclassified to "No Action".

This site was a burial area that contained rubble from the 105-C Reactor Stack, also known as the 116-C Reactor Exhaust Stack. The reactor stack was 5.1 meters (16.6 feet) in diameter and 61 meters (200 feet) high. It operated from 1952 through 1969, exhausting confinement air from the work areas in the reactor. The site currently appears as a vegetation-free, cobble-covered field adjacent to the 100-C Reactor. There are no markings or posts to identify it.

Waste Type: Demolition and Inert Waste

Waste Description: Sampling of the stack inlet was performed in 1976, using standard smear techniques. Low-level beta and gamma radiation was detected in the stack. It was estimated that the interior of the unit contained approximately 2.8 millicuries of radioactive materials. At the time of demolition (1983), the interior of the reactor stack contained approximately 2 millicuries of radioactive materials.

Site Code: 132-C-3 **Classification:** Accepted

Site Names: 132-C-3, 117-C Filter Building **ReClassification:** No Action (9/11/2003)

Site Type: Process Unit/Plant **Start Date:** 1961

Site Status: Inactive **End Date:** 1969

Site Description: The site has been evaluated and reclassified to "No Action".

The site now resembles a gravel parking lot.

Waste Type: Demolition and Inert Waste

Waste Description: Total radionuclide inventory in this unit is estimated to be 0.84 millicuries. The radionuclides comprising this inventory are tritium, carbon-14, cobalt-60, cesium-137, strontium-90, europium-154, plutonium-152, and plutonium-239/240. Of these radionuclides, strontium-90 is the most restrictive in the Allowable Residual Contamination Level (ARCL) calculations calculations.

Site Code: 600-33 **Classification:** Accepted

Site Names:	600-33, 105-C Reactor Test Loop Burial Site	**ReClassification:**	Rejected (12/9/2004)
Site Type:	Burial Ground	**Start Date:**	1963
Site Status:	Inactive	**End Date:**	1963
Site Description:	The waste site was a burial site for the 105-C Reactor Test Loop.		
Waste Type:	Equipment		
Waste Description:	The waste consists of a radioactive double-tube test loop, contaminated carbon-steel shielding pipe, and about 305 meters (1,000 feet) of cable used to remove the test loop from the 105-C Reactor. The test loop is approximately 5.5 to 6.1 meters (18 to 20 feet) long and consists of various sizes of stainless steel tubing. The test loop may have dose rates in excess of 100 rads/hour. Potential contaminants include: Co-60, Ni-63		

Site Code:	600-232	**Classification:**	Accepted
Site Names:	600-232, 100B Electrical Laydown Area	**ReClassification:**	Interim Closed Out (1/27/2005)
Site Type:	Dumping Area	**Start Date:**	
Site Status:	Inactive	**End Date:**	
Site Description:	The site has been remediated and interim closed. The area has been returned to it's natural appearance.		
Waste Type:	Equipment		
Waste Description:	The treated wood ends of the utility poles are categorized as dangerous waste. The site also contained various electrical utility materials such as steel cable, aluminum high-voltage wire, aluminum beams, aluminum poles, and insulators.		
Waste Type:	Equipment		
Waste Description:	The aluminum wire beams and poles are potentially recyclable.		
Waste Type:	Chemicals		
Waste Description:	Tar		

Site Code:	600-233	**Classification:**	Accepted
Site Names:	600-233, Vertical Pipe Near 100B Electrical Laydown Area	**ReClassification:**	Interim Closed Out (12/8/2005)
Site Type:	Storage Tank	**Start Date:**	
Site Status:	Inactive	**End Date:**	
Site Description:	The site has been remediated and interim closed out. Originally the site consisted of one vertical pipe extending 1.5 meters (4.9 feet) from the ground. During remedial activities two small pipes were discovered and added to the site, for a total of three. The area has been revegetated with grasses and native shrubs.		

Waste Type: Equipment

Waste Description: Steel pipelines.

Site Code:	600-252	**Classification:**	Not Accepted (2/6/2001)
Site Names:	600-252, Old Tank from RCRA General Inspection #LORIVFY97 Item #8	**ReClassification:**	
Site Type:	Dumping Area	**Start Date:**	
Site Status:	Inactive	**End Date:**	

Site Description: The site is an old, rusty, corrugated steel tank laying on its side. The tank is approximately 2.74 meters (9 feet) long, 0.91 meters (3 feet) in diameter, and has a 25.4 centimeter (10 inch) hole cut in its side near the bottom, and two short schedule 40 pipes on the side at either end (one pipe at each end).

This item meets the specific reporting criteria of the inspection as a solid waste disposal site not previously identified for remedial action. During a site inspection on October 8, 1997 the tank was measured to be (8 feet) 2.44 meters long and (3.5 feet) 1.07 meters in diameter with a tape measure.

Waste Type: Misc. Trash and Debris

Waste Description:

100-DR-1

Site Code:	100-D-1	**Classification:**	Accepted
Site Names:	100-D-1, Contaminated Drain, Contaminated Storm Drain	**ReClassification:**	
Site Type:	Process Sewer	**Start Date:**	
Site Status:	Inactive	**End Date:**	

Site Description: The site was a below grade cement junction box, with inside dimensions of 96.5 by 68.6 centimeters (38 by 27 inches) with a 30.5-centimeter (12-inch) culvert entering from the south side and running towards the south side of the Patrol Road. It had been covered with a 0.9 by 1.1-meter (3 by 3.5-foot) steel cover. The interior of the junction box and pipes were dry and showed no indication of being active. It had been posted with Radiological Contamination Area and Confined Space signs. The cement junction box has now been backfilled to grade.

Waste Type: Process Effluent

Waste Description: Leakage of the nearby retention basins and effluent discharge lines may have accumulated in a low area located between the 107-D Retention Basin (116-D-7) and the Patrol Road. The area was drained through a culvert which ran under the Patrol Road to this junction box and then through a 23-centimeter (9-inch) pipe to the 1904-D Outfall. Potential contaminants include Co-60, Cs-174, Cs-137, Eu-152, Eu-154, Eu-155, H-3, Pu-238, 239 and 241, Am-241, Sr-90, U-238, arsenic, chromium, cadmium, lead and sulfates.

Site Code:	100-D-2	**Classification:**	Accepted
Site Names:	100-D-2, Solid Waste Site, Lead Sheeting	**ReClassification:**	Interim Closed Out (3/19/2008)
Site Type:	Foundation	**Start Date:**	
Site Status:	Inactive	**End Date:**	

Site Description: The site appeared as a small lead sheet covering a concrete pad. It was not marked or posted.

Waste Type: Construction Debris

Waste Description:

Site Code:	100-D-3	**Classification:**	Accepted
Site Names:	100-D-3, Solid Waste Burial Ground, Silica Gel	**ReClassification:**	No Action (3/12/2009)
Site Type:	Burial Ground	**Start Date:**	
Site Status:	Inactive	**End Date:**	

Site Description: The site has been reclassified to No Action. It was a suspected burial ground that would have received contaminated silica gel from the drying towers in the 115-D/DR building. The site has been surface stabilized and resembles a gravel parking lot.

Waste Type: Abandoned Chemicals

Waste Description: The site contains contaminated silica gel removed from drying towers in the 115-D/DR Building.

Site Code: 100-D-4 **Classification:** Accepted

Site Names: 100-D-4, Sludge Trench #5, 107-DR Sludge Trench #5, 107-D-5, 107-D5 **ReClassification:** Interim Closed Out (3/25/1999)

Site Type: Trench **Start Date:** 1955

Site Status: Inactive **End Date:**

Site Description: The 100-D-4 site was constructed in 1953. This pit and two other identified sludge pits were associated with maintenance cleanout of the 116-DR-9 Liquid Effluent Retention Basin, which was constructed in the late 1940s. The 116-DR-9 Liquid Effluent Retention Basin was used to hold reactor effluent water for a brief period of time, allowing radioactive decay and thermal cooling to occur before the water was discharged to the Columbia River. The sludge pits were built for disposal of sludge removed from the bottom of the effluent retention basin to enable periodic maintenance and repairs to the basin during operation of the 100-D and 100-DR Reactors. There is no indication from available records that this sludge pit directly received any regular and/or high-volume liquid effluent wastes.

The sludge pit consisted of an approximately 630-square meter (6,779-square feet) unlined excavation (bottom dimension) with moderately sloped side walls. This pit extended to a depth of about 3 m (10 ft) below grade, and was surrounded by native sandy gravel soils at the base and side walls of the excavation. After shutdown of the 100-D and 100-DR Reactors in the 1970s, subsequent decommissioning of the effluent retention basin and associated sludge pits (as part of the Radiation Area Remedial Action Program) included placement of approximately 2 m (6 ft) of materials within the sludge pit. These materials consisted primarily of soil with some miscellaneous debris from the effluent basin and surrounding area. This sequence of material placement was followed by placement of approximately 1 m (3 ft) of clean soil cover for interim radiological, health, and safety protection purposes. The materials previously placed over the engineered pit structure (original pit excavation) are identified collectively as overburden materials.

Waste Type: Sludge

Waste Description: The site received radioactively contaminated sludge from the bottom of the 107-DR Retention Basin. From process knowledge, the waste site contaminants of concern (COCs) identified in the SAP include the following (DOE-RL 1998a): Americium-241, Cobalt-60, Cesium-137, Europium-152, Europium-154, Europium-155, Plutonium-238, Plutonium-239/240, Strontium-90, Hexavalent chromium, and Polychlorinated biphenyls (PCBs).

Site Code: 100-D-5 **Classification:** Accepted

Site Names: 100-D-5, Waste Site Near 103-D, Undocumented Solid Waste Site, Undocumented Solid Waste Site Near 103-D **ReClassification:** Interim Closed Out (4/23/2001)

Site Type: Burial Ground **Start Date:** 1950

Site Status: Inactive **End Date:** 1950

Site Description: The site was remediated and closed out with the 100-D, Group 3 waste sites.

Waste Type: Demolition and Inert Waste

Waste Description: The waste included reactor cooling water discharge, and debris generated in a 1950 modification. The contaminated soil and debris were removed and taken to ERDF along with 100-D, Group 3 waste site remediation (100-D-48:3, 100-D-49:3, and 100-D-6).

Site Code: 100-D-6 **Classification:** Accepted

Site Names: 100-D-6, Buried VSR Thimble, Minor Construction Burial Ground #1, Burial Ground 4D, 118-D-4D **ReClassification:** Interim Closed Out (4/23/2001)

Site Type: Burial Ground **Start Date:** 1953

Site Status: Inactive **End Date:** 1953

Site Description: The site was remediated and interim closed out with the 100-D, Group 3 waste sites.

Waste Type: Equipment

Waste Description: The burial ground contains contaminated thimbles, radioactive guides and miscellaneous waste removed from the 105-D Reactor during Ball 3X outage. The thimbles were made of aluminum, similar to that used for process tubes. Isotopic analysis of process tubes indicated the presence of manganese-54 and cobalt-60. The thimbles are expected to have similar composition. When buried, the thimbles' exterior surfaces would have been contaminated with activated graphite products and any remaining potassium borate solution from within the thimble tubes.

Site Code: 100-D-7 **Classification:** Accepted

Site Names: 100-D-7, Undocumented Solid Waste Site **ReClassification:**

Site Type: Dumping Area **Start Date:**

Site Status: Inactive **End Date:**

Site Description: The site contains a variety of debris such as broken concrete, brick, vitrified clay pipe, wood, rebar, various types of metal, lathe turnings, empty oil, solvent, paint cans, tar, and a white substance in two localized areas. The site appears to have additional debris buried under the surface and there is evidence of disturbance from heavy equipment. Several areas of stressed vegetation and two areas of subsidence were also observed.

Waste Type: Misc. Trash and Debris

Waste Description: Wastes include vitrified clay pipe, concrete, empty metal containers, glass, metal and wooden debris.

Site Code: 100-D-8 **Classification:** Accepted

Site Names: 100-D-8, 105-DR Process Sewer Outfall Site, Undocumented Liquid Waste Site, 1907-DR **ReClassification:**

Site Type: Outfall **Start Date:** 1949

Site Status:	Inactive	**End Date:**	1968
Site Description:	In 1978, the outfall structure was demolished, leveled, and covered to blend with the riverbank appearance.		
Waste Type:	Water		
Waste Description:	The outfall was used to discharge waste water from the 183-DR and 190-DR Water Treatment Facilities. Effluents included filter backwash effluent, storm runoff, and chemical discharges resulting from spills or releases relating to water treatment facilities. There is a potential for radioactive contamination from the 100-D Area Cask Pad storm drains.		

Site Code:	100-D-9	**Classification:**	Accepted
Site Names:	100-D-9, 184-DA Boiler Oil Tank, 184DA	**ReClassification:**	Interim Closed Out (8/10/2006)
Site Type:	Storage Tank	**Start Date:**	
Site Status:	Inactive	**End Date:**	
Site Description:	The site has been remediated and interim closed. This site consisted of an underground fuel storage tank that was believed to have been removed during general demolition efforts of the 100-D/DR area during 1985 and 1986. It now appears as a cobble-covered field with vegetation on the surface. The elevation at the top of the tank was 141 meters (464.0 feet) and was covered by at least 0.6 meters (2 feet) of overburden.		
Waste Type:	Equipment		
Waste Description:			

Site Code:	100-D-10	**Classification:**	Not Accepted (8/27/1997)
Site Names:	100-D-10, Storm Drain Outfall, Undocumented Liquid Waste Site	**ReClassification:**	
Site Type:	Depression/Pit (nonspecific)	**Start Date:**	
Site Status:	Inactive	**End Date:**	
Site Description:	The Technical Baseline Report (section 4.40) states that reportedly there was a small outfall structure upstream of the 1907-DR outfall. It was demolished at the same time as the 1907-DR outfall. The Technical Baseline Report states that the structure was similar in construction to the 1907-DR, only much smaller. It was used as a discharge outfall for the storm drain system of the 190-DR tank pit, which consisted of drains, sump, and pump to lift runoff to the outfall. The trench from the outfall structure to the waterline is apparent and appears to have a telephone cable buried in its bottom.		
Waste Type:	Stormwater Runoff		
Waste Description:	The unit reportedly received storm water run-off from the 190-DR tank pit.		

Site Code:	100-D-18	**Classification:**	Accepted
Site Names:	100-D-18, Sludge Trench #4, 107-D Sludge Trench #4, 107-D-4, 107-D4	**ReClassification:**	Interim Closed Out (9/26/2000)
Site Type:	Trench	**Start Date:**	1953
Site Status:	Inactive	**End Date:**	1953
Site Description:	This site has been remediated and was interim closed out on September 26, 2000. It is no longer posted.		
Waste Type:	Sludge		
Waste Description:	The site received contaminated sludge from the bottom of the 107-D Retention Basin (116-D-7).		

Site Code:	100-D-19	**Classification:**	Accepted
Site Names:	100-D-19, Sludge Trench #6, 107-D Sludge Trench #6	**ReClassification:**	Interim Closed Out (3/26/2001)
Site Type:	Trench	**Start Date:**	1953
Site Status:	Inactive	**End Date:**	1953
Site Description:	This site has been remediated and closed out. It was a trench dug for disposal of sludge from the bottom of the 107-D Retention Basin. The waste was covered by about 1.8 meters (6 feet) of clean fill.		
Waste Type:	Sludge		
Waste Description:	The site received radioactively contaminated sludge from the bottom of the 107-D Retention Basin.		

Site Code:	100-D-20	**Classification:**	Accepted
Site Names:	100-D-20, Sludge Trench #3, 107-D Sludge Trench #3, 107-D-3, 107-D3	**ReClassification:**	Interim Closed Out (3/25/1999)
Site Type:	Trench	**Start Date:**	1953
Site Status:	Inactive	**End Date:**	1953
Site Description:	This site has been remediated and interim closed out. The 100-D-20 Sludge Pit was constructed in 1953. This pit and two other identified sludge pits were associated with maintenance clean out of the 116-D-7 Liquid Effluent Retention Basin, which was constructed in the late 1940s. The 116-D-7 Liquid Effluent Retention Basin was used to hold reactor effluent water for a brief period of time, allowing radioactive decay and thermal cooling to occur before the water discharged to the Columbia River. The sludge pits were built for disposal of sludge removed from the bottom of the effluent retention basin to enable periodic maintenance and repairs to the basin during operation of the 100-D and 100-DR Reactors. There is no indication from available records that this sludge pit directly received any regular and/or high-volume liquid effluent wastes. The sludge pit consisted of an approximate 575-square meter (6,189-square feet) unlined excavation (bottom dimension) with moderately sloped side walls, extended to a depth of about 2.1 meters (7 feet) below grade, and the pit was surrounded by native sandy gravel soils at the		

base and side walls of the excavation. After shutdown of the 100-D and 100-DR Reactors in the 1970s, subsequent decommissioning of the effluent retention basin and associated sludge pits (as part of the Radiation Area Remedial Action Program) included placement of approximately 2 meters (7 feet) of material within the sludge pit, which consisted primarily of soil with some miscellaneous debris material from the effluent basin and surrounding area. This sequence of material placement was followed by placement of approximately 1 meter (3 feet) of clean soil cover for interim radiological, health, and safety protection purposes. The materials previously placed over the engineered pit structure (original pit excavation) are identified collectively as overburden materials. A Geophysical Survey was done in 1996 that identified this trench as a disturbed zone that may also contain buried construction debris.

Waste Type: Sludge

Waste Description: The site received radioactively contaminated sludge from the bottom of the 107-D Retention Basin. From process knowledge, the waste site contaminants of concern (COCs) identified in the SAP include the following: americium-241, cobalt-60, cesium-137, europium-152, europium-154, europium-155, plutonium-238, plutonium-239/240, strontium-90, hexavalent chromium, and polychlorinated biphenyls.

Site Code:	100-D-21	**Classification:**	Accepted
Site Names:	100-D-21, Sludge Trench #2, 107-DR Sludge Trench #2, 107-D-2, 107-D2	**ReClassification:**	Interim Closed Out (3/25/1999)
Site Type:	Trench	**Start Date:**	1953
Site Status:	Inactive	**End Date:**	1953

Site Description: The 100-D-21 Sludge Pit was constructed in 1953. This pit and two other identified sludge pits were associated with maintenance cleanout of the 116-D-7 Liquid Effluent Retention Basin (LERF), which was constructed in the late 1940s. The 116-D-7 Liquid Effluent Retention Basin was used to hold reactor effluent water for a brief period of time, allowing radioactive decay and thermal cooling to occur before the water was discharged to the Columbia River. The sludge pits were built for disposal of sludge removed from the bottom of the effluent retention basin to enable periodic maintenance and repairs to the basin during operation of the 100-D and 100-DR Reactors. There is no indication from available records that this sludge pit directly received any regular and/or high-volume liquid effluent wastes.

The sludge pit consisted of an approximate 891-square meter (9,591-square feet) unlined excavation (bottom dimension) with moderately sloped side walls, extending to a depth of about 3 meters (10 feet) below grade. The pit was surrounded by native sandy gravel soils at the base and side walls of the excavation. After shutdown of the 100-D and 100-DR Reactors in the 1970s, subsequent decommissioning of the effluent retention basin and associated sludge pits (as part of the Radiation Area Remedial Action Program) included placement of approximately 2 meters (7 feet) of material within the sludge pit. The materials consisted primarily of soil with some miscellaneous debris material from the effluent basin and surrounding area. This sequence of material placement was followed by placement of approximately 1 meters (3 feet) of clean soil cover for interim radiological, health, and safety protection purposes. The waste was covered with about 1.8 meters (6 feet) of clean fill and marked with an above-ground concrete marker. The materials previously placed over the engineered pit structure (original pit excavation) are identified collectively as overburden materials.

Waste Type: Sludge

Waste Description: The site received radioactively contaminated sludge from the 107-DR Retention Basin. From process knowledge, the waste site contaminants of concern (COCs) identified in the SAP include the following (DOE/RL-96-22): Americium-241, Cobalt-60, Cesium-137, Europium-152, Europium-154, Europium-155, Plutonium-238, Plutonium-239/240, Strontium-90, Hexavalent chromium, and Polychlorinated biphenyls (PCBs).

Site Code:	100-D-22	**Classification:**	Accepted
Site Names:	100-D-22, Sludge Trench #1, 107-DR Sludge Trench #1, 107-D-1, 107-D1	**ReClassification:**	Interim Closed Out (3/25/1999)
Site Type:	Trench	**Start Date:**	1953
Site Status:	Inactive	**End Date:**	1953

Site Description: The site has been remediated and interim closed out.

Waste Type: Sludge

Waste Description: The site received radioactively contaminated sludge from the 107-DR Retention Basin. From process knowledge, the waste site contaminants of concern (COCs) identified in the SAP include the following: Americium-241, Cobalt-60, Cesium-137, Europium-152, Europium-154, Europium-155, Plutonium-238, Plutonium-239/240, Strontium-90, Hexavalent chromium, and Polychlorinated biphenyls (PCBs). A small volume of debris containing lead was encountered during remedial action, which was subsequently transported, treated, and disposed of at the ERDF. Because of the presence of lead-containing debris, lead was included as a COC per regulator request.

Site Code:	100-D-24	**Classification:**	Accepted
Site Names:	100-D-24, 119-D Sample Building Drywell	**ReClassification:**	No Action (9/19/2006)
Site Type:	French Drain	**Start Date:**	1959
Site Status:	Inactive	**End Date:**	

Site Description: The site consisted of a drywell that received drainage from a floor drain in the 119-D Sample Building. The sample building has been demolished and the surrounding area has been graded.

Waste Type: Process Effluent

Waste Description: The drywell received effluent from the building's evaporative cooler. It was likely that the floor drain also received sample waste and janitorial waste since the building had no other drains or connections to the process sewer system.

Site Code:	100-D-25	**Classification:**	Accepted
Site Names:	100-D-25, Unplanned Release: 107-DR Basin Leaks	**ReClassification:**	Interim Closed Out (1/6/2000)
Site Type:	Unplanned Release	**Start Date:**	1951
Site Status:	Inactive	**End Date:**	

Site Description: Leakage from the 107-DR Basin was confined to the south end and beneath the basin. Today the area cannot be separately distinguished in the gravel retention basin area.

Waste Type: Water

Waste Description: Radioactively contaminated effluent was released to the site.

Site Code: 100-D-26 **Classification:** Not Accepted (8/27/1997)

Site Names: 100-D-26, Borrow Pit, Potential Burial Trenches **ReClassification:**

Site Type: Depression/Pit (nonspecific) **Start Date:**

Site Status: Inactive **End Date:**

Site Description: The site is a borrow pit used as a source of clean fill. On July 10, 1997 a field investigation was performed by T. F. Johnson. The site appeared as a depression approximately 330 feet (100 meters) in diameter that was created from excavations with heavy equipment. Four distinct trenches were observed within the depression. All four trenches were covered with blown in tumbleweeds. A few tumbleweeds were removed for inspection and no waste or discolored soil was observed. An empty 208 liter (55 gallon) steel drum was located at the end of one trench and an empty 0.95 liter (1 quart) oil can was also observed near the site.

Waste Type: Barrels/Drums/Buckets/Cans

Waste Description: An empty steel 55 gallon drum and an empty 1 quart oil can were observed at the site.

Site Code: 100-D-29 **Classification:** Accepted

Site Names: 100-D-29, Effluent Line Leak #2 **ReClassification:** Interim Closed Out (3/25/2010)

Site Type: Unplanned Release **Start Date:** 1951

Site Status: Inactive **End Date:**

Site Description: The site is a release from the 107-DR Retention Basin. In the fall of 1952, there was extensive leakage of effluent water at the inlet end of the 107-DR retention basin that was caused by the pipes pulling loose from the basin wall from thermal expansion and contraction of the steel pipelines and the concrete basin wall. In order to repair the leak, a trench was dug to receive the leaked effluent so that repairs could be made. This trench formed a "dogleg" adjacent to the southwest corner of the basin towards the southeast end of the 107-D Retention Basin. (UNI-946)

The trench was covered by about 1.2 m (4 ft) of clean fill material upon completion of the basin repair. In the fall of 1952, a portion of the contaminated soils from this leak was used as fill around the pipeline anchor blocks south of the basin. All contaminated soil was then covered by 0.61 m (2 ft) of soil. Contaminated soil associated with the pipeline anchor blocks would have been removed with the 100-D-49, 100-DR Effluent Cooling Water Pipelines.

Waste Type: Soil

Waste Description: Contaminants of potential concern (COPCs) include: Co-60, Cs-134, Cs-137, Eu-152, Eu-154, Eu-155, H-3, The waste is contaminated soil from a temporarily constructed drainage trench. In the fall of 1952, readings up to 100 mrad/hr were detected at the surface of the mud leaking from the retention basin. The source is radioactive process effluent from the 107-D Retention Basin.

Site Code:	100-D-30	**Classification:**	Accepted
Site Names:	100-D-30, 190-D Sodium Dichromate Soil Contamination, 185-D, 189-D Decontamination & Demolition Project, 185-D Sodium Dichromate Trench & Sump	**ReClassification:**	
Site Type:	Unplanned Release	**Start Date:**	1945
Site Status:	Inactive	**End Date:**	1967

Site Description: The site is sodium dichromate contaminated soil. The site was discovered during the 185-D/189-D Subgrade Decontamination and Demolition Project. Sodium dichromate contamination was discovered in the soil along the entire length of the sodium dichromate trench of 185-D. The contamination was visually identified on concrete surfaces and on large cobbles in the soil by the yellow film on the surface. Photographs were taken during demolition of the subgrade structures and show the contaminated soil and structures.

Waste Type: Chemical Release

Waste Description: Sodium dichromate contamination is in the soil.

Site Code:	100-D-31	**Classification:**	Accepted
Site Names:	100-D-31, 100-D Water Treatment Facilities Underground Pipelines (See Subsites)	**ReClassification:**	
Site Type:	Process Sewer	**Start Date:**	1944
Site Status:	Inactive	**End Date:**	1994

Site Description: The site encompasses the underground pipelines that transported treated cooling water, and process sewer wastes, including all non-radioactive, waste streams from water treatment, reactor, and laboratory facilities. All of these underground pipelines are pre-reactor (pre-irradiation) disposal and supply lines, except for the septic sewer lines that fed the 1607-D2 septic tank.

Excluded from this site are the process sewer system that was constructed specifically for the 100-DR Reactor facilities, chemical supply, or underground effluent pipelines designed to dispose of radionuclide contaminated effluents and pipelines within buildings. These systems are addressed as separate WIDS sites. This site also does not include raw river water, potable water, or fire system water pipelines, or the sodium dichromate underground supply pipelines (100-D-56).

Waste Type: Water

Waste Description: The waste consists of steel piping, concrete, and soil (if contaminants are present). The water supply and process sewer drain pipelines at the 100-D Area provided for the supply and disposal of non-radioactive streams generated in water treatment and water treatment laboratories facilities and powerhouse operations. Known chemical additions to reactor cooling water included aluminum sulfate (alum) with excess hydrated calcium oxide, sulfuric acid, chlorine, and sodium dichromate. Water pH was maintained near 7.5, free chlorine residual at about 0.2 milligrams per liter, and sodium dichromate was added at a rate of about 2 milligrams per liter. The sodium dichromate product pipelines would have much greater concentrations. Sodium chloride was also used to regenerate water softeners in both water treatment and powerhouse operations.

The process sewer system connected to the 116-D-5 (1904-D Outfall) at the Columbia River shoreline. (The outfall and the pipelines that carried the process sewer and reactor effluent to the center bottom of the river are addressed by separate Waste Information Data System [WIDS] entries.) Specific chemicals and potential radionuclide content is currently unknown. However, minor amounts of radionuclide, chemical, and mercury contamination may be present in process sewer lines from the 185-D and 189-D/190-D complex as a result of laboratories once located in these now demolished facilities.

SubSites:

SubSite Code: 100-D-31:1

SubSite Name: 100-D-31:1, 1607-D2 Septic Sewer Pipeline

Classification: Accepted

ReClassification: Interim Closed Out

Description: The Remaining Sites Verification Package for subsites 100-D-31:1 and 100-D-31:2, RSVP-2010-006, has documented that the remedial action objectives (RAOs) and the corresponding remedial action goals (RAGs) have been met as established in the Remedial Design Report/Remedial Action Work Plan for the 100 Area (RDR/RAWP) (DOE-RL-96-17,Rev. 6) and the Interim Action Record of Decision for the 100-BC-1, 100-BC-2, 100-DR-1, 100-DR-2, 100-FR-1, 100-FR-2, 100-HR-1, 100-HR-2, 100-KR-1, 100-KR-2, 100-IU-2, 100-IU-6, and 200-CW-3 Operable Units,(Remaining Sites ROD) (EPA 1999).

Subsite one consisted of approximately 390 m (1,280 ft) long, 8 in. diameter segment of vitrified clay pipe (VCP) and was located to the northwest of the 105-D Reactor. The pipelines fed into the 1607-D2:3 portion of the 1607-D2 sanitary sewer system, which was the main sanitary sewer servicing the 100-D Area. It transported sewage from manhole S-21D north to manhole S-25D. This system of sewers was active from 1944 to 1994 and received effluent from the 1700-D, 1704-D, 1707-D, 1707-DA, 1708-D, 1713-D, 1716-D, 1717-D, 1718-D, 1719-D, 1722-D, 182-D, 183-D, 184-D, 185-D, 186-D, 189-D, 190-D, and 108-D Buildings.

Subsite two consisted of multiple segments of 8 in. diameter VCP, totaling approximately 365 m (1,200 ft) in length. This pipeline segment was located between manholes S-19D and S-21D, where it connected with the 100-D-31:1 pipeline. The pipelines from the following 1700-D Buildings were connected to the 100-D-31:2 pipelines: 1704-D, 1707-D, 1707-DA, 1713-DD, 1717-D, 1719-D, and 1722-D. Another portion of the pipeline was located east of manhole S-21D and serviced the 108-D Building.

Remedial action was performed between June 18, 2007 and July 17, 2008. The final excavation depths for 100-D-31:1 and 100-D-31:2 were approximately 5 m (16 ft) and 3 m (9 ft), respectively. The excavation resulted in approximately 2,512 bank cubic meters (BCM) (3,287 bank cubic yards [BCY]) of material removed for disposal at the Environmental Restoration Disposal Facility, including 756 m (2,480 ft) of pipe.

Several miscellaneous pipelines crossing over the subsites were encountered during excavation, however, none were connected. All of these pipelines will be addressed separately.

The Contaminants of potential concern for the subsites included antimony, barium, copper, cadmium, chromium (total), lead, manganese, nickel, silver, zinc, mercury, hexavalent chromium, cesium-137, cobalt-60, europium-152, europium-154, europium-155, uranium-233/234, uranium-235, uranium-238, polycyclic aromatic hydrocarbons (PAH), total petroleum hydrocarbons (TPH), volatile organic compounds (VOCs), and polychlorinated

biphenyls (PCBs).

Verification sampling was performed on August 11 and 12, 2009. The laboratory-reported verification data results for all constituents were stored in the WCH Environmental Restoration project-specific database prior to archival in the Hanford Environmental Information System and were also presented as Attachment 1 of the 95% upper confidence limit (UCL) calculation (Appendix B of the RSVP).

Analytical results show that residual contaminant concentrations support future land uses that can be represented (or bounded) by a rural-residential scenario. The results also demonstrate that residual contaminant concentrations support unrestricted future use of shallow zone soil (i.e., surface to 4.6 m [15 ft]) and contaminant levels remaining in the soil are protective of groundwater and the Columbia River.

SubSite Code: 100-D-31:2

SubSite Name: 100-D-31:2, 1700-D Series Buildings Septic Sewer Pipelines

Classification: Accepted

ReClassification: Interim Closed Out

Description: The Remaining Sites Verification Package for subsites 100-D-31:1 and 100-D-31:2, RSVP-2010-006, has documented that the remedial action objectives (RAOs) and the corresponding remedial action goals (RAGs) have been met as established in the Remedial Design Report/Remedial Action Work Plan for the 100 Area (RDR/RAWP) (DOE-RL-96-17,Rev. 6) and the Interim Action Record of Decision for the 100-BC-1, 100-BC-2, 100-DR-1, 100-DR-2, 100-FR-1, 100-FR-2, 100-HR-1, 100-HR-2, 100-KR-1, 100-KR-2, 100-IU-2, 100-IU-6, and 200-CW-3 Operable Units,(Remaining Sites ROD) (EPA 1999).

For specific remedial information see subsite 1.

SubSite Code: 100-D-31:3

SubSite Name: 100-D-31:3, 105-D Sewer Pipelines

Classification: Accepted

ReClassification:

Description: The 105-D sewer pipelines transported waste from the D-reactor north to manhole S 21D, as well as transported waste east from manhole S-13D toward the 1607-D2 septic tank. The 100-D-31:3 subsite includes the septic sewer pipelines exiting the northwest and east sides of the 108-D Building, and the septic sewer pipeline exiting the east side of the 1703-D Building.

105-D Reactor - two 25.4 centimeter (10 inch) process sewer lines, one from the northwest corner and the other from the west side of the building, proceed west and northwest respectively to a 91.44 centimeter (36 inch) line which leads in to the 205.74 centimeter (6 foot 9 inch) square line to the 116-D-5 outfall.

SubSite Code: 100-D-31:4

SubSite Name: 100-D-31:4, 190-D Sewer Pipelines

Classification: Accepted

ReClassification:

Description: The 190-D sewer pipelines are bound by manholes S-13D and P-9D to the east and manholes S-11D and P-13D to the west. The pipelines included in this subsection transported process

sewer waste from the northeast corner of the 186-D Building and the north side of the 190-D Building toward the 116-D-5 outfall. The pipelines also transported the septic sewer waste from the north side of the 186-D Building the north and east sides of the 190-D Building.

190-D High Bay - 45.72 centimeters (18 inch) process sewer line exited the north side to a 91.44 centimeter (36 inch) line, which headed west to the 205.74 centimeter (6 foot 9 inch) line to the 116-D-5 outfall -76.2 centimeter (30 inch) process sewer line exited the north side to a 91.44 centimeter (36 inch) line, which headed west to the 205.74 centimeter (6 foot 9 inch) line to the 116-D-5 Outfall.

SubSite Code: 100-D-31:5

SubSite Name: 100-D-31:5, 188-D Ash Disposal Pipeline

Classification: Accepted

ReClassification: Interim Closed Out

Description: The Remaining Sites Verification Package for the 100-D-31:5 subsite, (RSVP-2008-058), documents that the subsite has achieved the remedial action objectives (RAOs) and the corresponding remedial action goals (RAGs) as established in the Remedial Design Report/Remedial Action Work Plan for the 100 Area (RDR/RAWP) and in the Remaining Sites ROD.

The pipeline was located in a north-south orientation between the former 184-D Powerhouse and the 188-D Ash Disposal Basin. From the powerhouse, the 100-D-31:5 pipeline carried a slurry of coal ash and raw river water. The slurry was transported to the ash disposal basin (126-D-1 waste site).

Remedial action was performed between October 29, 2007, and January 9, 2008. There were no anomalies or stained soil discovered during remediation. Even though coal ash was present throughout the site, no ash or sediment was present in the pipeline. The 100-D-31:5 site was excavated to between 1.2 m (4 ft) and 1.7 m (5.5 ft) below grade. Approximately 852 bank cubic meters (BCM) (1,114 bank cubic yards [BCY]) of soil (overburden) was removed and stockpiled for evaluation for use as clean backfill. Approximately 94 BCM (123 BCY) of material was disposed at the Environmental Restoration Disposal Facility, including removal of the pipeline.

The COPCs for verification sampling were determined using historical process knowledge. Metals were identified as site COPCs; hexavalent chromium was also included as a COPC to support an evaluation of chromium in the vadose zone soil at the 100-D Area. Analytical data from coal ash samples collected in 1992 from the 188-D ash disposal basin indicated the presence of fluoride, nitrate, sulfate, and cyanide. Therefore, these constituents were added to the list of COPCs.

A preliminary examination of the analytical data from samples collected on August 26, 2008 found hexavalent chromium data with elevated practical quantization limits. In an effort to get better quality assurance/quality control (QA/QC) values, the project recollected the entire sample set on October 13 and December 30, 2008 and analyzed them for hexavalent chromium. The resulting data returned improved QA/QC values for hexavalent chromium. Rather than pick and choose individual sample data from the two sets of data the project chose to use the second data set, with the improved QA/QC values. However, it should be noted that the analytical results for hexavalent chromium were non-detected for all samples in both data sets.

Soil cleanup levels were established in the Remaining Sites ROD based on a limited ecological risk assessment. Although not required by the ROD, a comparison against

ecological risk screening levels has been made for the site contaminants of potential concern and other constituents. Screening levels were exceeded for barium, boron, mercury, manganese, selenium, vanadium, and zinc at the 100-D-31:5 subsite. Exceeding screening values is intended to trigger additional evaluation and does not necessarily indicate the existence of additional risk to ecological receptors. Concentrations of manganese, mercury, and vanadium are below site background levels. Concentrations of barium, selenium, and zinc are above background levels. No established background value is available for boron, although one is expected to be established as part of the Risk Assessment/Feasibility Study (RI/FS). Concentrations of barium, boron, selenium, and zinc will be evaluated in the context of additional lines of evidence for risk to ecological receptors as part of the final closeout decision for this site.

A calculation of the Hazard Quotient and Carcinogenic Risk Calculation for Protection of Groundwater was provided in Appendix A of the RSVP. A comparison of ecological risk screening levels to the barium, boron, mercury, manganese, selenium, vanadium, and zinc data was provided in Appendix E of the RSVP.

Verification sampling results support an evaluation that residual contaminant concentrations at the subsite do not preclude any future uses (as bounded by the rural-residential scenario) and allow for unrestricted use of shallow zone soils (i.e., surface to 4.6 m [15 ft] deep).

SubSite Code: 100-D-31:6

SubSite Name: 100-D-31:6, 184-D Powerhouse Sewer Pipelines

Classification: Accepted

ReClassification: Interim Closed Out

Description: The Remaining Sites Verification Package, (RSVP-2008-054) documents that the 100-D-31:6 (184-D Powerhouse Sewer Pipelines) subsite, has met the remedial action objectives (RAOs) and the corresponding remedial action goals (RAGs) for interim closure. The objectives were established in the Remedial Design Report/Remedial Action Work Plan for the 100 Area (RDR/RAWP) and the Interim Action Record of Decision for the 100-BC-1, 100-BC-2, 100-DR-1, 100-DR-2, 100-FR-1, 100-FR-2,100-HR-1, 100-HR-2, 100-KR-1, 100-KR-2, 100-IU-2, 100-IU-6, and 200-CW-3 Operable Units, (ROD). These results show that residual soil concentrations support future land uses that can be represented (or bounded) by a rural-residential scenario.

The subsite consisted of the 184-D powerhouse sewer pipelines, that transported sewer waste from the north and south sides of the 184-D Building to the 100-D-31:7, 116-D-5 and D-Pond Sewer Pipeline.

Remedial action at the subsite was performed between November 1, 2007 and March 5, 2008. The site was excavated between 1.5 m (5 ft) and 3.3 m (7.5 ft) below grade resulting in approximately 371 bank cubic meters (BCM) (485 bank cubic yards [BCY]) of material removed for disposal at the Environmental Restoration Disposal Facility, including approximately 329 m (1,079 ft) of vitreous clay pipe encased in concrete and 30 m (98 ft) of steel pipe. Approximately 2,440 BCM (3,192 BCY) of soil (overburden) was removed and stockpiled for evaluation as clean backfill.

The 100-D Area Technical Baseline Report indicated sodium sulfate, tri-sodium phosphate, and chromates were used to treat the 184-D powerhouse boiler water; therefore, analysis for anions by ion chromatography was added primarily to measure levels of sulfate. Verification sampling was performed on October 7, 2008, to collect data to determine if the remedial action goals had been met. The contaminants of potential concern for verification sampling included total chromium, lead, mercury, anions, pesticides, and polycyclic aromatic

hydrocarbons. Although not COPCs, arsenic, antimony, barium, beryllium, boron, cadmium, cobalt, copper, manganese, molybdenum, nickel, selenium, silver, vanadium, and zinc were included in the analyses of inductively coupled plasma (ICP) metals.

Verification samples were analyzed using U.S. Environmental Protection Agency-approved analytical methods. The laboratory-reported data results for all constituents were stored in the Environmental Restoration project-specific database prior to archival in the Hanford Environmental Information System and are presented in the RSVP in Attachment 1 of the 95% UCL calculations.

Soil cleanup levels were established in the ROD based on a limited ecological risk assessment. Although not required by the ROD, a comparison against ecological risk screening levels has been made for the site contaminants of concern and other constituents and is presented in Appendix C. Screening levels were exceeded for antimony, barium, boron, manganese, mercury, vanadium, and zinc. Exceeding screening values is intended to trigger additional evaluation and does not necessarily indicate the existence of risk to ecological receptors. Because concentrations of antimony, manganese, and vanadium are below background levels, it is believed that the presence of these constituents does not pose a risk to ecological receptors. Background values for Washington State are used only when Hanford Site specific background values are not available. An established background value is not available for boron at this time. Mercury (95% upper confidence limit [UCL] value above background), barium (95% UCL value below background but individual statistical sample results above background), and boron (no established background), will be evaluated in the context of additional lines of evidence for risk to ecological receptors as part of the final closeout decision for this site.

The subsite has been remediated in accordance with the Remaining Sites ROD and the RDR/RAWP. Analytical results for the sampling decision units were shown to meet the cleanup objectives for direct exposure, groundwater protection, and river protection. Accordingly, an interim closure reclassification is supported for the 100-D-31:6 subsite. The results also demonstrate that residual contaminant concentrations support unrestricted future use of shallow zone soil (i.e., surface to 4.6 m [15 ft]) and contaminant levels remaining in the soil are protective of groundwater and the Columbia River. The site does not have a deep zone or residual contaminant concentrations that would require any institutional controls.

SubSite Code: 100-D-31:7

SubSite Name: 100-D-31:7, 116-D-5 and D-Pond Sewer Pipeline

Classification: Accepted

ReClassification: Interim Closed Out

Description: The Remaining Sites Verification Package for the 100-D-31:7, RSVP-2010-046, has documented that the remedial action objectives (RAOs) and the corresponding remedial action goals (RAGs) have been met as established in the Remedial Design Report/Remedial Action Work Plan for the 100 Area and the Remaining Sites Record of Decision (ROD).

Subsite 7 consisted of pipelines that transported process and septic sewer waste from 1944 to 1994. During reactor operations, the nonradioactive overflows, process cooling waste streams, filter backwashes, and floor drains in nonradioactive areas became process sewer wastes. The main pipeline carried water treatment waste and rainwater runoff to the 116-D-5 Outfall until 1977, when the process sewer drainage was diverted solely to the 100-D Ponds (120-D-1) from 1977 to 1994.

Remedial action at the subsite began on November 5, 2007, and continued through December 9, 2009. The site was excavated to depths between 12 m (40 ft) and 16 m (53 ft) below grade,

resulting in approximately 17,684 bank cubic meters (BCM) (23,130 bank cubic yards [BCY]) of material removed for disposal at the Environmental Restoration Disposal Facility, including approximately 480 m (1,574.9 ft) of pipe.

An intact 946.3-L (250-gal) motor oil storage tank was found within the layback of the subsite approximately 12 m (36 ft) west of the demolished 1716-D Building. The tank was identified as being associated with the 130-D-1, 1716 Gasoline Storage Tank waste site.

While relocating the tank from the excavation layback, approximately 95 L (25 gal) of oily fluid spilled onto a polyethylene-lined containment area set up adjacent to the tank. No oily fluid was released to the soil. The oily fluid was sampled for waste designation, and the remaining fluid was absorbed using soil from the surrounding area. The soil underneath the tank was inspected and it was determined that no leaks had occurred from the pipe that was previously attached to the tank. All piping associated with the 130-D-1 waste site that was present within the 100-D-31:7 excavation was removed. The remaining soil will be assessed during remediation and closeout verification of the 130-D-1 waste site.

Contaminants of potential concern for the subsite were identified based on process knowledge and existing information about the 100-D-31 pipelines sites plus those identified in the 100 Area RDR/RAWP included: chromium (total) and mercury, antimony, barium, copper, cadmium, lead, manganese, nickel, silver, zinc, hexavalent chromium, cesium-137, cobalt-60, europium-152, europium-154, europium-155, strontium-90, uranium-233/234, uranium-235, uranium-238, pesticides, semivolatile organic compounds (SVOCs), polycyclic aromatic hydrocarbons (PAH), total petroleum hydrocarbons (TPH), and polychlorinated biphenyls.

On February 10, 2010, four verification soil samples were collected to support the construction of a land bridge at the northern end of the 100-D-31:7 pipeline subsite. The remaining statistical and focused verification soil samples were collected on April 27 and 29, 2010. All sampling was performed in accordance with the 100 Area Remedial Action Sampling and Analysis Plan. The laboratory-reported verification data results for all constituents were stored in the WCH Environmental Restoration (ENRE) project-specific database prior to archival in the Hanford Environmental Information System (HEIS) and were also presented as part of the 95% UCL calculation in Appendix B of the RSVP.

The results of verification sampling show that residual contaminant concentrations do not preclude any future uses (as bounded by the rural-residential scenario) and allow for unrestricted use of shallow zone soils (i.e., surface to 4.6 m [15 ft] deep). Therefore, institutional controls to prevent uncontrolled drilling or excavation into the deep zone are not required.

SubSite Code: 100-D-31:8

SubSite Name: 100-D-31:8, 183-D and 186-D Northern Sewer Pipelines

Classification: Accepted

ReClassification:

Description: The 183-D and 186-D northern sewer pipelines are reinforced concrete pipelines exiting the north side of the 183-D Building and 186-D Building, as well as an east-west trending reinforced concrete pipeline segment from junction box P-3D to junction box P-13D.

186-D - 30.48 centimeter (12 inch) process sewer line exited the northeast corner heading east to the 205.74 centimeter (6 foot 9 inch) line to the 116-D-5 outfall.

SubSite Code: 100-D-31:9

SubSite Name: 100-D-31:9, 183-D and 186-D Process Sewer Pipelines

Classification: Accepted

ReClassification:

Description: The 183-D and 186-D process sewer pipelines extend from the intersection with the reinforced concrete pipe (RCP) exiting the north side of the 183-D Building to manhole S-11D, and comprise the vitrified clay pipe and RCP pipelines from the east side of the 183-D Building and the west side of the 186-D Building.

183-D Filter Plant - eight 45.72 centimeter (18 inch) process sewer lines exited the west side and connected with a 68.58 centimeter (27 inch) line, which ran north to the 167.54 centimeter (5 foot 6 inch) concrete line, which ran east and met the 205.74 centimeter (6 foot 9inch) square line to the 116-D-5 outfall,
106.68 centimeter (42 inch) process sewer line exits the east side to junction P-6D, connecting to a 114.3 centimeter (3 foot 9 inch) pipe that ran north to a 167.54 centimeter (5 foot 6 inch) line, east to the 205.74 centimeter (6 foot 9 inch) line to the 116-D-5 outfall,
121.94 centimeter (48 inch) process sewer line exited the north side connecting to the 167.54 centimeter (5 foot 6 inch) line, to the 205.74 centimeter (6 foot 9 inch) line to the 116-D-5 outfall.

SubSite Code: 100-D-31:10

SubSite Name: 100-D-31:10, 182-D North Septic Sewer Pipeline

Classification: Accepted

ReClassification:

Description: The 182-D north septic sewer pipeline exited the northwest corner of the 182-D Building, and ends at manhole P-20D.

SubSite Code: 100-D-31:11

SubSite Name: 100-D-31:11, 182-D and 183-D Sewer Pipelines

Classification: Accepted

ReClassification:

Description: The 182-D and 183-D sewer pipelines transported treated cooling water and septic sewer waste from the east side of the 182-D building and the west side of the 183-D Building. The subsite is bounded to the south by manhole "conc", and it is bounded at the north end by junction box P-3D. The northern-most vitrified pipe segment in an east-west trend extends to reinforced concrete pipe exiting the north side of the 183-D Building.

SubSite Code: 100-D-31:12

SubSite Name: 100-D-31:12, 183-D West Process Sewer Pipelines

Classification: Accepted

ReClassification:

Description: The 183-D west process sewer pipelines transported treated cooling water from eight process sewer pipelines exiting the west side of the 183-D Building. The pipeline subsite is bounded on the north end by junction box P-2D.

Site Code:	100-D-32	**Classification:**	Accepted
Site Names:	100-D-32, Minor Construction Burial Ground #6	**ReClassification:**	Interim Closed Out (12/10/2009
Site Type:	Burial Ground	**Start Date:**	1956
Site Status:	Inactive	**End Date:**	
Site Description:	The site has been evaluated and reclassified to interim closed out. It consisted of a small 3.0-meter (10-foot) by 3.0-meter (10-foot) burial ground. During the March 1999 visit, there was no evidence of the site.		
Waste Type:	Equipment		
Waste Description:	The burial ground was excavated to receive contaminated reactor and effluent system equipment. Potential contaminates include: Co-60, Ni-63, No-59, Sm-151, Pd-107, Sr-90, Ag-108, Am-241,Ba-133, C-14, H-3, Cs-137, Eu-152 and 154, Pu-238, 239 and 241, Ca-41, Cd-113, Kr-85, U-238, Tc-99, Zr-93, chromium, lead and mercury.		

Site Code:	100-D-33	**Classification:**	Accepted
Site Names:	100-D-33, Minor Construction Burial Ground #4 East Trench	**ReClassification:**	Rejected (3/20/2008)
Site Type:	Burial Ground	**Start Date:**	1954
Site Status:	Inactive	**End Date:**	
Site Description:	The site appeared as a vegetation-free, cobble-covered field. The trench was estimated to have been approximately 30 meters (100 feet) long by 15 meters (50 feet) wide. A Ground Penetrating Radar scan, done in 2004, did not identify any trench-like features.		
Waste Type:	Construction Debris		
Waste Description:	The site received low-level construction wastes from the reactors. Potential contaminates include: Co-60, Ni-63		

Site Code:	100-D-34	**Classification:**	Not Accepted (8/27/1997)
Site Names:	100-D-34, 100-D/DR Grounds Surrounding Deactivated Areas, Exclusion Area	**ReClassification:**	
Site Type:	Unplanned Release	**Start Date:**	
Site Status:	Inactive	**End Date:**	
Site Description:	The grounds within the 100-D/DR exclusion area that are not part of other waste sites.		

Site Code:	100-D-35	**Classification:**	Accepted
Site Names:	100-D-35, Minor Construction Burial Ground #4 East Trench	**ReClassification:**	Rejected (3/20/2008)
Site Type:	Burial Ground	**Start Date:**	1954

Site Status:	Inactive	**End Date:**	
Site Description:	During the March 31, 1999 site visit, no evidence of a trench was visible. The suspected site area appeared as a vegetation-free, cobble-covered field. A Ground Penetrating Radar scan, done in 2004, did not identify any trench like features.		
Waste Type:	Construction Debris		
Waste Description:	The site received low-level construction wastes from the reactors. Potential contaminates include: Co-60, Ni-63		

Site Code:	100-D-38	**Classification:**	Not Accepted (8/27/1997)
Site Names:	100-D-38, Suspect Septic Tank	**ReClassification:**	
Site Type:	Septic Tank	**Start Date:**	
Site Status:	Inactive	**End Date:**	
Site Description:	The site is a junction box and manhole associated with the 1607-D2 Septic System. The site is identifiable in the field by a steel lid on top of a circular brick base.		

Site Code:	100-D-41	**Classification:**	Accepted
Site Names:	100-D-41, Minor Construction Burial Ground #5 Trench, 118-18, 118-D-18	**ReClassification:**	Rejected (3/20/2008)
Site Type:	Burial Ground	**Start Date:**	1956
Site Status:	Inactive	**End Date:**	1956
Site Description:	During a 1999 walkdown, no evidence of the burial ground was observed. The area appeared as a vegaetation covered field.		
Waste Type:	Construction Debris		
Waste Description:	The waste is miscellaneous construction related solid wastes from the 100-D Reactors. Potential contaminates include: Co-60, Ni-63		

Site Code:	100-D-42	**Classification:**	Accepted
Site Names:	100-D-42, Buried VSR Thimble Site	**ReClassification:**	Interim Closed Out (5/13/2010)
Site Type:	Burial Ground	**Start Date:**	1955
Site Status:	Inactive	**End Date:**	1955
Site Description:	The site is a solid waste burial ground. The burial ground is east of the two 152-centimeter (60-inch) reactor effluent lines.		
Waste Type:	Equipment		
Waste Description:	The waste is a buried Vertical Safety Rod (VSR) thimble. The VSR thimbles were made of aluminum similar to that used in the process tubes and should contain similar isotopic composition. Sampling of process tubes was conducted in March 1967. The radionuclide levels, when decay corrected by Dorian and Richards to March 1977, were 5.9E+03 picocuries		

of manganese-54 per gram of aluminum and 2.5E+07 picocuries of cobalt-60 per gram of aluminum. When buried, the thimble's exterior surfaces would also have been contaminated with activated graphite products and potassium borate.

Site Code:	100-D-45	**Classification:**	Accepted
Site Names:	100-D-45, Buried VSR Thimble Site, Burial Ground 4B, 118-D-4B	**ReClassification:**	Interim Closed Out (5/13/2010)
Site Type:	Burial Ground	**Start Date:**	
Site Status:	Inactive	**End Date:**	

Site Description: The site is a solid waste burial ground. The burial ground is in close proximity to the (exhumed) 152-centimeter (60- inch) effluent lines.

Waste Type: Equipment

Waste Description: The waste is a buried Vertical Safety Rod (VSR) thimble. The VSR thimbles were made of aluminum similar to that used in the process tubes and should contain similar isotopic composition. Sampling of process tubes was conducted in March 1967. The radionuclide levels, when decay corrected by Dorian and Richards to March 1977, were 5.9E+03 picocuries of manganese-54 per gram of aluminum and 2.5E+07 picocuries of cobalt-60 per gram of aluminum. When buried, the thimble's exterior surfaces would also have been contaminated with activated graphite products and potassium borate. Potential contamination includes: Co-60, Ni-63

Site Code:	100-D-48	**Classification:**	Accepted
Site Names:	100-D-48, 100-D Reactor Cooling Water Effluent Underground Pipelines (See Subsites)	**ReClassification:**	Interim Closed Out (4/23/2001)
Site Type:	Radioactive Process Sewer	**Start Date:**	1944
Site Status:	Inactive	**End Date:**	1967

Site Description: All four subsites have been remediated and interim closed out.

The 100-D-48 site includes those underground pipelines that transported radioactive treated and untreated waste water from the 105-D Reactor Building to the 116-D-7 (107-D) Retention Basin and the 116-D-5 Outfall. The included pipeline components are listed below.

There are many small drain pipelines that leave from the east and south sides of the 105-D Reactor Building and terminate at the 132-D-3 (1608-D) Building site. The pipelines that run from the 105-D Reactor and the 132-D-3 (1608-D) Building to either the 116-D-1A Trench and 116-D-1B Trench or connect to the main cooling water effluent pipelines are part of this site.

The main cooling water effluent pipeline is a large 1.5-meter (60-inch) diameter reinforced concrete pipeline that exits the 105-D Reactor Building on the north side and continues north to the 116-D-7 (107-D) Retention Basin. A map in the Dorian and Richards document, UNI-946, indicates that some sections of the pipeline were replaced at least once (as does M-1904-D Sheet 8). The second (replacement) pipeline begins at a junction box south of the 116-D-7 (107-D) Retention Basin and runs parallel to the original pipeline up to the 116-D-7 (107-D) Retention Basin. Currently, a portion of the steel replacement pipeline remains in place above grade at the retention basin, and a soil berm indicates the location of the pipeline.

This pipeline system also includes a 1.5-meter (60-inch) diameter by 1.3-centimeter (0.5-inch) thick wall, carbon steel cross-tie pipeline to the 105-DR effluent pipelines that begins adjacent to the 103-D Building and connects at a junction box to the west 100-DR Reactor Cooling Water Effluent Pipeline (site 100-D-49).

This site includes a single pipeline that runs from the west end of the 116-D-7 (107-D) Retention Basin to the 116-DR-1 Trench and 116-DR-2 Trench and two pipelines from the west end of the 116-D-7 (107-D) Retention Basin to the 116-D-5 Outfall.

Because of their length, these pipelines have been broken into four subsites: 100-D-48:1, the pipelines from 116-D-7 to the outfalls; 100-D-48:2, the pipelines from D Avenue to 116-D-7; 100-D-48:3, the pipelines from D Avenue to the 105-D Reactor; and 100-D-48:4, the small cooling water effluent pipelines at the 105-D Reactor.

The site does not include the facilities where the pipelines terminate, or the pipelines (100-D-60) from the 116-D-5 Outfall to the bottom center of the Columbia River. The pipelines associated with (100-D-49) 100-DR Reactor Cooling Water Effluent Underground Pipelines or (100-D-50) 100-DR Reactor Process Sewer Underground Pipelines [pipelines that transported nonradioactive treated and untreated waste water from the 183-DR, 183-DR Clearwell area and the 105-DR Reactor Buildings to the 100-D-8 (1907-DR) Outfall] are not included in this site.

Waste Type: Process Effluent

Waste Description: The waste is contaminated steel piping, concrete, and soil. Chemical additives to reactor cooling water included aluminum sulfate (alum) with excess hydrated calcium oxide, sulfuric acid, chlorine, diatomaceous earth (a scouring agent), and sodium dichromate. Water pH was maintained at about 7.5, and free chlorine residual was about 0.2 milligrams per liter. Radionuclides discovered at the retention basin during sampling by Dorian and Richards (1978) included the following: plutonium-238, cesium-134, plutonium 239/240, cesium-137, strontium-90, hydrogen-3, uranium, europium-152, europium-154, europium-155, nickel-63, cobalt-60, and carbon-14.

SubSites:

SubSite Code: 100-D-48:1

SubSite Name: 100-D-48:1, North Pipelines from 116-D-7 to the Outfalls

Classification: Accepted

ReClassification: Interim Closed Out

Description: This subsite is the section of the pipelines that runs from the 116-D-7 Retention Basin to the Outfalls. These pipelines have been removed.

Remedial action at the 100-D-48:1/49:1 Pipelines site began on December 28, 1998. Excavation of the site involved removing the overburden materials, the contaminated structure, and underlying contaminated soil. Based on field screening, overburden materials identified as potentially clean were placed in stockpiles for potential use as backfill. Materials that were found to be contaminated were disposed of at ERDF. On July 24, 2000, the excavation reached the design limit.

Because remediation of the 100-D-48:1/49:1 Pipelines site required moving an active overhead power line, site remedial action and sampling were conducted in two phases. These

separate phases are reflected by the long time period between the start and finish dates for excavation.

The excavation design depth generally corresponded with the invert elevation of the pipelines. At the completion of remedial action and removal of the engineered structure, the excavation was approximately 15,504 square meters (166,800 square feet) in area with a maximum depth of approximately 6.0 meters (20 feet) below ground surface. Approximately 107,266 metric tons (118,241 tons) of material from the D Area pipelines site have been disposed of at the ERDF through July 2000. Cleanup verification sampling began on April 3, 2000, and was finished on August 8, 2000. The ground surface in the vicinity of the site varies with an average elevation of approximately 134.4 meters (441 feet).

The CVP demonstrated that remedial action at the 100-D-48:1/49:1 Pipelines site achieved the RAOs and corresponding RAGs established in the approved interim action ROD and RDR/RAWP. The remaining soils at the 100-D-48:1/49:1 Pipelines site have been sampled, analyzed, and modeled. The results of this effort indicate that the materials from the 100-D-48:1/49:1 Pipelines site containing COCs at concentrations exceeding the RAGs have been excavated and disposed of at the ERDF. Residual concentrations in the shallow zone will support future land uses that can be represented (or bounded) by a rural-residential scenario, and that residual COC concentrations throughout the site do not pose an unacceptable threat to groundwater or the Columbia River.

The acceptability of unrestricted direct exposure to deep zone soils has not been demonstrated; therefore, institutional controls to prevent uncontrolled drilling or excavation into the deep zone (i.e., below 4.6 meters [15 feet]) are required. The 100-D-48:1/49:1 Pipelines site (includes the 100-D-19 and UPR-100-D-4 sites) is verified to be remediated in accordance with the interim action ROD.

SubSite Code: 100-D-48:2

SubSite Name: 100-D-48:2, West Pipelines from D Avenue to 116-D-7

Classification: Accepted

ReClassification: Interim Closed Out

Description: This section of two parallel pipelines runs from D Avenue to the 116-D-7 Retention Basin.

Remedial action at the 100-D-48:2/49:2 Pipelines site began in July 1997. Excavation of the site involved removing the overburden materials, contaminated structure, and underlying contaminated soil. Based on field screening, overburden materials identified as potentially clean were placed in stockpiles for potential use as backfill. Materials that were found to be contaminated were disposed of at the ERDF. In August 1999, the excavation reached the design limit. The excavation design depth generally corresponded with the invert elevation of the pipelines.

At the completion of remedial action and removal of the engineered structure, the excavation was approximately 20,475 square meters (220,280 square feet) in area with a maximum depth of approximately 6 meters (20 feet) below ground surface. During the time of excavation and waste disposal (December 1998 through September 1999) at the 100-D-48:2/49:2 Pipelines site, approximately 57,106 metric tons (62,960 tons) of material from 100-DR-1 Operable Unit pipelines were disposed of at the ERDF. Cleanup verification sampling began on August 23, 1999, and was finished on October 20, 1999. Because of the length of the pipeline site, the top-of-excavation elevation ranges from 138 meters (453 feet) near the retention basins to 143 meters (469 feet) near D Avenue.

The CVP demonstrated that remedial action at the 100-D-48:2/49:2 Pipelines site has

achieved the RAOs and corresponding RAGs established in the approved interim action ROD (EPA 1995) and RDR/RAWP (DOE/RL-96-17). Materials from the 100-D-48:2/49:2 Pipelines site that contain COCs at concentrations exceeding the RAGs have been excavated and disposed of at the ERDF. The remaining soils, including pipeline overburden stockpiles, have been sampled, analyzed, and modeled to show that residual concentrations in the shallow zone will support future land uses that can be represented (or bounded) by a rural-residential scenario, and that residual concentrations throughout the site and in overburden soils pose no threat to groundwater or the Columbia River. The acceptability of unrestricted direct exposure to deep zone soils has not been demonstrated; therefore, institutional controls to prevent uncontrolled drilling or excavation into the deep zone (i.e., below 4.6 meters [15 feet]) are required. The 100-D-48:2/49:2 Pipelines site is verified to be remediated in accordance with the ROD and may be backfilled. The pipeline overburden is verified as suitable for use as backfill in accordance with the ROD.

SubSite Code: 100-D-48:3

SubSite Name: 100-D-48:3, Effluent Pipelines from D Avenue to 105-D Reactor

Classification: Accepted

ReClassification: Interim Closed Out

Description: This subsite is the last section of the 105-D Reactor effluent pipelines, extending south from D Avenue to about 1.5 meters (5 feet) from the wall of the reactor foundation. The Decontamination and Decommissioning project is responsible for the remaining stub as part of the foundation removal.

This subsite was remediated in conjunction with 100-D-49:3, 100-D-5, and 100-D-6. The entire remedial action for these sites is referred to as the 100-D-48:3/49:3 pipelines site. Remedial action at the 100-D-48:3/49:3 site began on October 28, 1999. Excavation of the site involved removing the overburden materials, the contaminated structure, and underlying contaminated soil. Based on field screening, overburden materials identified as potentially clean were placed in stockpiles for potential use as backfill. Materials that were found to be contaminated were disposed of at ERDF. On July 24, 2000, the excavation was completed. The excavation design depth generally corresponded with the invert elevation of the pipelines.

At the completion of remedial action and removal of the engineered structure, the excavation was approximately 24,574 square meters (264,517 square feet) in area with a maximum depth of approximately 5.7 meters (18.7 feet). Approximately 55,561 metric tons (61,245 tons) of material from the 100-D-48:4 and 100-D-48:3/49:3 pipeline sites combined were disposed of at ERDF. Overall, approximately 107,266 metric tons (118,241 tons) from all D Area pipeline sites were disposed of at the ERDF through July 2000. Cleanup verification sampling began on June 7, 2000 (for the overburden piles), and was finished on October 4, 2000 (in the excavation). The excavation is being backfilled with appropriate materials to match the surrounding surface grade (average elevation of 143.7 meters [471 feet]).

The CVP demonstrates that the remedial action at the 100-D-48:3/49:3 Pipelines site has achieved the RAOs and corresponding RAGs established in the approved Interim Action ROD (EPA 1995) and RDR/RAWP (DOE/RL-96-17). The remaining soils at the 100-D-48:3/49:3 Pipelines site and overburden have been sampled, analyzed, and modeled. The results of this effort indicate that the materials from the 100-D-48:3/ 49:3 site containing COCs at concentrations exceeding the RAGs have been excavated and disposed of at the ERDF. These results also indicate that residual concentrations in the overburden and shallow zone will support future land uses that can be represented (or bounded) by a rural-residential scenario, and that residual COC concentrations throughout the site do not pose an unacceptable threat to groundwater or the Columbia River.

The acceptability of unrestricted direct exposure to deep zone soils has not been demonstrated; therefore, institutional controls to prevent uncontrolled drilling or excavation into the deep zone (i.e., below 4.6 meters [15 feet]) are required. The 100-D-48:3/49:3 Pipelines site is verified to be remediated in accordance with the ROD.

SubSite Code: 100-D-48:4

SubSite Name: 100-D-48:4, Small Cooling Water Effluent Pipelines at 105-D Reactor

Classification: Accepted

ReClassification: Interim Closed Out

Description: This subsite has been remediated and reclassified to interim closed out. It includes the many small drain pipelines that leave from the east and south sides of the 105-D Reactor Building and terminate at the 132-D-3 (1608-D) Building site. The pipelines that run from the 105-D Reactor and the 132-D-3 (1608-D) Building to either the 116-D-1A Trench and 116-D-1B Trench or connect to the main cooling water effluent pipelines are also part of this subsite.

Remedial action at the 100-D-48:4 site began on October 28, 1999. Excavation of the site involved removing the overburden materials, the contaminated structure, and underlying contaminated soil. Based on field screening, overburden materials identified as potentially clean were placed in stockpiles for potential use as backfill. Materials that were found to be contaminated were disposed of at ERDF. On July 24, 2000, the excavation reached the design limit at El. 136 meters (446 feet).

At the completion of remedial action and removal of the engineered structure, the excavation was approximately 3,291 square meters (35,420 square feet) in area with a maximum depth of approximately 7 meters (23 feet). Approximately 27,738 metric tons (30,576 tons) of material from the site were disposed of at ERDF. Cleanup verification sampling began on September 11, 2000, and was completed on October 18, 2000. The excavation is to be backfilled with appropriate materials to the reference grade of El. 143 meters (469 feet).

The CVP demonstrates that remedial action at the 100-D-48:4 site has achieved the RAOs and corresponding RAGs established in the approved interim action ROD (EPA 1995) and RDR/RAWP (DOE/RL-96-17). The remaining soils at the 100-D-48:4 site have been sampled, analyzed, and modeled. The results of this effort indicate that the materials from the 100-D-48:4 site containing COCs at concentrations exceeding the RAGs have been excavated and disposed of at the ERDF, that residual concentrations in the shallow zone will support future land uses that can be represented (or bounded) by a rural-residential scenario, and that residual COC concentrations throughout the site do not pose an unacceptable threat to groundwater or the Columbia River.

The acceptability of unrestricted direct exposure to deep zone soils has not been demonstrated; therefore, institutional controls to prevent uncontrolled drilling or excavation into the deep zone (i.e., below 4.6 meters [15 feet]) are required.

Site Code:	100-D-49	**Classification:**	Accepted
Site Names:	100-D-49, 100-DR Reactor Cooling Water Effluent Underground Pipelines (See Subsites)	**ReClassification:**	Interim Closed Out (1/15/2004)
Site Type:	Radioactive Process Sewer	**Start Date:**	1950
Site Status:	Inactive	**End Date:**	1967

Site Description: There are four subsites associated with this site. The entire site includes those underground pipelines that transported radioactive treated and untreated waste water from the 105-DR Reactor Building, and the 132-DR-1 (1608-DR) Building to the 116-DR-9 (107-DR) (107-DR) Retention Basin and both of the 116-D-5 and 116-DR-5 Outfalls. The included pipeline components are listed below.

There are many small drain pipelines that originate on the east side of the 105-DR Reactor Building and terminate at the 132-DR-1 (1608-DR) Building site. The drain pipelines that run from the 132-DR-1 (1608-DR) to either the 116-DR-6 Trench or connect to the main cooling water effluent pipelines are part of this site.

The main cooling water effluent pipelines are two large 1.5-meter (60-inch) diameter by 1.3-centimeter (0.5-inch) thick wall carbon steel pipelines. The east pipeline exits the 105-DR Reactor Building on the south side and runs due east to the corner of the building and then heads northeast to a point about 75 meters (210 feet) east of the existing exclusionary fence and then north to the 116-DR-9 (107-DR) Retention Basin. The west pipeline exits the 105-DR Reactor Building on the north side and heads northeast to a point 55 meters (154 feet) east of the existing exclusionary fence and then north to the 116-DR-9 (107-DR) Retention Basin. The pipelines run parallel to each other and are separated by about 25 meters (70 feet).

This site also includes the discharge pipelines from the 116-DR-9 (107-DR) Retention Basin to the 116-DR-1 and 116-DR-2 Trench and both 116-D-5 and 116-DR-5 Outfalls. At the outlet of the 116-DR-9 (107-DR) Retention Basin, two 1.5-meter (60-inch) carbon steel pipelines are combined into a single 1.5-meter (60-inch) pipeline at a junction box. This pipeline then runs to the outfall structure. The outfall discharge pipeline is a 1.7-meter (66-inch) carbon steel pipeline that continues to the center of the Columbia River.

Because of its length, this site has been broken into four subsites: 100-D-49:1, the pipelines from 116-DR-9 to the Outfalls; 100-D-49:2, the pipelines from D Avenue to 116-DR-9; 100-D-49:3, the pipelines from D Avenue to the 105-D Reactor; and 100-D-49:4 the effluent pipelines within 60 meters of the reactor.

The facilities where these pipelines terminate are not included as part of this site.

The following pipelines are not included as part of this site (included as part of 100-D-48): Opposite the 105-D Reactor Building, the west 105-DR Reactor effluent pipeline is cross-tied to the 105-D Reactor 1.5-meter (60-inch) effluent pipeline by a 1.5-meter (60-inch) diameter by 1.3-centimeter (0.5-inch) thick wall, carbon steel pipeline. The underground pipelines (100-D-50) that transported nonradioactive treated and untreated waste water from the 183-DR, 183-DR Clearwell area, and the 105-DR Reactor Buildings to the 100-D-8 (1907-DR) outfall are not included in this site.

Waste Type: Process Effluent

Waste Description: The waste is contaminated steel piping, concrete, and soil. Chemical additives to reactor cooling water included aluminum sulfate (alum) with excess hydrated calcium oxide, sulfuric acid, chlorine, diatomaceous earth (a scouring agent), and sodium dichromate. Water pH was maintained at about 7.5, and free chlorine residual was about 0.2 milligrams per liter. Radionuclides discovered at the retention basin during sampling by Dorian and Richards (1978) for UNI-946, included: plutonium-238, cesium-134, plutonium 239/240, cesium-137, strontium-90, hydrogen-3, uranium, europium-152, europium-154, europium-155, nickel-63, cobalt-60, and carbon-14.

SubSites:

SubSite Code: 100-D-49:1

SubSite Name: 100-D-49:1, North Pipelines from 116-DR-9 to the Outfalls

Classification: Accepted

ReClassification: Interim Closed Out

Description: This subsite is the section of pipelines that run from the 116-DR-9 Retention Basin to the Outfalls. This section has been removed.

This subsite was remediated with subsite 100-D-48:1, 100-D-19 Sludge Trench, and UPR-100-D-4, and are referred to as the 100-D-48:1/49:1 Pipelines site. Remedial action at the 100-D-48:1/49:1 Pipelines site began on December 28, 1998. Excavation of the site involved removing the overburden materials, the contaminated structure, and underlying contaminated soil. Based on field screening, overburden materials identified as potentially clean were placed in stockpiles for potential use as backfill. Materials that were found to be contaminated were disposed of at ERDF. On July 24, 2000, the excavation reached the design limit. Because remediation of the 100-D-48:1/49:1 Pipelines site required moving an active overhead power line, site remedial action and sampling were conducted in two phases. These separate phases are reflected by the long time period between the start and finish dates for excavation.

The excavation design depth generally corresponded with the invert elevation of the pipelines. At the completion of remedial action and removal of the engineered structure, the excavation was approximately 15,504 square meters (166,800 square feet) in area with a maximum depth of approximately 6.0 meters (20 feet) below ground surface. Approximately 107,266 metric tons (118,241 tons) of material from the D Area pipelines site have been disposed of at the ERDF through July 2000. Cleanup verification sampling began on April 3, 2000, and was finished on August 8, 2000. The ground surface in the vicinity of the site varies with an average elevation of approximately 134.4 meters (441 feet).

The CVP demonstrated that remedial action at the 100-D-48:1/49:1 Pipelines site achieved the RAOs and corresponding RAGs established in the approved interim action ROD and RDR/RAWP. The remaining soils at the 100-D-48:1/49:1 Pipelines site have been sampled, analyzed, and modeled. The results of this effort indicate that the materials from the 100-D-48:1/49:1 Pipelines site containing COCs at concentrations exceeding the RAGs have been excavated and disposed of at the ERDF. Residual concentrations in the shallow zone will support future land uses that can be represented (or bounded) by a rural-residential scenario, and that residual COC concentrations throughout the site do not pose an unacceptable threat to groundwater or the Columbia River.

The acceptability of unrestricted direct exposure to deep zone soils has not been demonstrated; therefore, institutional controls to prevent uncontrolled drilling or excavation into the deep zone (i.e., below 4.6 meters [15 feet]) are required. The 100-D-48:1/49:1 Pipelines site (includes the 100-D-19 and UPR-100-D-4 sites) is verified to be remediated in accordance with the interim action ROD.

SubSite Code: 100-D-49:2

SubSite Name: 100-D-49:2, East Pipelines from D Avenue to 116-DR-9

Classification: Accepted

ReClassification: Interim Closed Out

Description: This section of two parallel pipelines runs from D Avenue to 116-DR-9.

Remedial action at the 100-D-48:2/49:2 Pipelines site began in July 1997. Excavation of the site involved removing the overburden materials, contaminated structure, and underlying contaminated soil. Based on field screening, overburden materials identified as potentially clean were placed in stockpiles for potential use as backfill. Materials that were found to be contaminated were disposed of at the ERDF. In August 1999, the excavation reached the design limit. The excavation design depth generally corresponded with the invert elevation of the pipelines. The pipeline excavation profiles are in the sample design calculation briefs in Appendix D.

At the completion of remedial action and removal of the engineered structure, the excavation was approximately 20,475 square meters (220,280 square feet) in area with a maximum depth of approximately 6 meters (20 feet) below ground surface. During the time of excavation and waste disposal (December 1998 through September 1999) at the 100-D-48:2/49:2 Pipelines site, approximately 57,106 metric tons (62,960 tons) of material from 100-DR-1 Operable Unit pipelines were disposed of at the ERDF. Cleanup verification sampling began on August 23, 1999, and was finished on October 20, 1999. Because of the length of the pipeline site, the top-of-excavation elevation ranges from 138 meters (453 feet) near the retention basins to 143 meters (469 feet) near D Avenue.

The CVP demonstrated that remedial action at the 100-D-48:2/49:2 Pipelines site has achieved the RAOs and corresponding RAGs established in the approved interim action ROD (EPA 1995) and RDR/RAWP (DOE/RL-96-17). Materials from the 100-D-48:2/49:2 Pipelines site that contain COCs at concentrations exceeding the RAGs have been excavated and disposed of at the ERDF. The remaining soils, including pipeline overburden stockpiles, have been sampled, analyzed, and modeled to show that residual concentrations in the shallow zone will support future land uses that can be represented (or bounded) by a rural-residential scenario, and that residual concentrations throughout the site and in overburden soils pose no threat to groundwater or the Columbia River. The acceptability of unrestricted direct exposure to deep zone soils has not been demonstrated; therefore, institutional controls to prevent uncontrolled drilling or excavation into the deep zone (i.e., below 4.6 meters [15 feet]) are required. The 100-D-48:2/49:2 Pipelines site is verified to be remediated in accordance with the ROD and may be backfilled. The pipeline overburden is verified as suitable for use as backfill in accordance with the ROD.

SubSite Code: 100-D-49:3

SubSite Name: 100-D-49:3, Effluent Pipelines from D Avenue to About 60 Meters from the 105-DR Reactor

Classification: Accepted

ReClassification: Interim Closed Out

Description: This subsite extends south from D Avenue to about 60 meters (200 feet) from the wall of the reactor foundation, longer for the east pipeline and shorter for the west pipeline. The Decontamination and Decommissioning project is responsible for the remaining pipelines as part of the foundation removal.

This subsite was remediated in conjunction with 100-D-48:3, 100-D-5, and 100-D-6. The entire remedial action for these sites is referred to as the 100-D-48:3/49:3 pipelines site. Remedial action at the 100-D-48:3/49:3 site began on October 28, 1999. Excavation of the site involved removing the overburden materials, the contaminated structure, and underlying contaminated soil. Based on field screening, overburden materials identified as potentially clean were placed in stockpiles for potential use as backfill. Materials that were found to be contaminated were disposed of at ERDF. On July 24, 2000, the excavation was completed. The excavation design depth generally corresponded with the invert elevation of the pipelines.

At the completion of remedial action and removal of the engineered structure, the excavation was approximately 24,574 square meters (264,517 square feet) in area with a maximum depth of approximately 5.7 meters (18.7 feet). Approximately 55,561 metric tons (61,245 tons) of material from the 100-D-48:4 and 100-D-48:3/49:3 pipeline sites combined were disposed of at ERDF. Overall, approximately 107,266 metric tons (118,241 tons) from all D Area pipeline sites were disposed of at the ERDF through July 2000. Cleanup verification sampling began on June 7, 2000, and was finished on October 4, 2000. The excavation will be backfilled in the near future with appropriate materials to match the surrounding surface grade (average elevation of 143.7 meters [471 feet]).

The CVP demonstrates that the remedial action at the 100-D-48:3/49:3 Pipelines site has achieved the RAOs and corresponding RAGs established in the approved Interim Action ROD and RDR/RAWP. The remaining soils at the 100-D-48:3/49:3 Pipelines site and overburden have been sampled, analyzed, and modeled. The results of this effort indicate that the materials from the 100-D-48:3/ 49:3 site containing COCs at concentrations exceeding the RAGs have been excavated and disposed of at the ERDF. These results also indicate that residual concentrations in the overburden and shallow zone will support future land uses that can be represented (or bounded) by a rural-residential scenario, and that residual COC concentrations throughout the site do not pose an unacceptable threat to groundwater or the Columbia River.

The acceptability of unrestricted direct exposure to deep zone soils has not been demonstrated; therefore, institutional controls to prevent uncontrolled drilling or excavation into the deep zone (i.e., below 4.6 meters [15 feet]) are required. The 100-D-48:3/49:3 Pipelines site is verified to be remediated in accordance with the ROD.

(Note: Figure 3 in the CVP is incorrect. It does not show the total length of the excavation at the south end. Refer to Attachment 3 of the CVP for a map of the entire excavation, including sampling locations.

SubSite Code: 100-D-49:4

SubSite Name: 100-D-49:4, 100-DR Effluent Pipelines Within About 60 Meters of the Reactor

Classification: Accepted

ReClassification: Interim Closed Out

Description: This section of the effluent pipelines was transferred from the Remedial Action (RA) group to Decontamination and Decommissioning (D&D) to allow D&D to continue their stabilization work on the DR Reactor. It contains the smaller effluent pipelines near the reactor, and the large main effluent pipelines (two adjacent pipes) extending from the reactor. The eastern main effluent pipe section is about 67 meters (220 feet) long; the western section is about 35 meters (115 feet) long.

The Cleanup verification package, (CVP-2003-00016), documents completion of removal action for this subsite in support of the 105-DR Reactor Interim Safe Storage Project. The 100-D-49:4 region consisted of the north effluent pipe tunnel, which has been removed. The soil beneath the floor and the side slopes were sampled for cleanup verification purposes

Waste site contaminants of concern (COCs) identified through process knowledge were identified in the Sampling and Analysis Plan for the 105-F and 105-DR Phase III Below Grade Structures and Underlying Soils (105-DR SAP) (DOE/RL-99-35). The 105-DR SAP classified the different areas and structures into affected media that were similar in characteristics and contaminants. The COCs included: americium-241, barium-133, carbon-14, cobalt-60, cesium-137, europium-152, europium-154, europium-155, nickel-63, plutonium 238, plutonium-239/240, strontium-90, technitium-99, uranium-234, uranium-235,

uranium-238, hexavalent chromium, lead, mercury and polychlorinated biphenyls.

An individual calculation of contaminated material removed for cleanup of the pipeline area was not provided in the CVP. A total of approximately 7,220 cubic meters (25,500 cubic feet) of contaminated materials were disposed at the ERDF. The results of this effort indicated that the materials from the site containing COCs at concentrations exceeding RAGs have been excavated and disposed at the ERDF.

These results also indicate that residual concentrations in the shallow zone will support future land uses that can be represented (or bounded) by a rural-residential scenario, and that residual concentrations throughout the site pose no threat to groundwater or the Columbia River. The site is verified to be remediated in accordance with the Action Memorandum (EPA et al. 1998) and can be backfilled.

Site Code:	100-D-50	**Classification:**	Accepted
Site Names:	100-D-50, 100-DR Water Treatment Facilities Underground Pipelines (See Subsites)	**ReClassification:**	
Site Type:	Process Sewer	**Start Date:**	1950
Site Status:	Inactive	**End Date:**	1965

Site Description: This site includes those underground pipelines that transported nonradioactive treated and untreated waste water from the 183-DR, 183-DR Clearwell area, and the 105-DR Reactor Buildings to the 100-D-8 (1907-DR) Outfall. It consists of 0.3-meter (12-inch) to 1.8-meter (72-inch) reinforced concrete piping located to the south of the facilities listed above.

Waste Type: Water

Waste Description: The waste is steel pipelines, concrete, and soil (if contaminants are present). Chemical additives to reactor cooling water included aluminum sulfate (alum) with excess hydrated calcium oxide, sulfuric acid, chlorine, and sodium dichromate. Water pH was maintained at about 7.5, free chlorine residual was about 0.2 milligrams/liter, and sodium dichromate was added at a rate of about 2 milligrams per liter. Water and chemical storage tank overflows and other drains discharged to this disposal system. Drawings indicate that it also received storm drainage from the 183-DR Tank Clearwell Basin.

Sodium dichromate was used to treat reactor cooling water to assist in the control of process tube corrosion. Sodium dichromate storage tanks may have discharged to this system and potentially act as a source of elevated chromium found in the 100-D groundwater. However, unless there was a deliberate discharge of sodium dichromate to the system, only very dilute discharges would have occurred.

SubSites:

SubSite Code: 100-D-50:1

SubSite Name: 100-D-50:1, Emergency Discharge Pipeline

Classification: Accepted

ReClassification:

Description: This subsite is a reinforced concrete pipeline to receive emergency discharges from the 105-DR Reactor and drainage from the 183-DR treatment basins and clearwells. The pipeline

ultimately discharged to the former outfall at the 100-D-8 Site.

SubSite Code: 100-D-50:2

SubSite Name: 100-D-50:2, Reactor Cooling Water Pipelines from 190-DR Pumphouse

Classification: Accepted

ReClassification:

Description: This subsite consists of steel piping used to deliver treated cooling water from the 190-DR Pumphouse to the 105-DR Reactor.

SubSite Code: 100-D-50:3

SubSite Name: 100-D-50:3, Reactor Cooling Water Pipelines from 190-D High Bay

Classification: Accepted

ReClassification:

Description: This subsite consists of steel piping designed to deliver treated cooling water from the 190-D High Bay to the 105-DR Reactor.

SubSite Code: 100-D-50:4

SubSite Name: 100-D-50:4, Gas Recirculation Pipelines (Unused)

Classification: Accepted

ReClassification:

Description: This subsite consists of the steel piping in the subsurface tunnel between the former 115-D Gas Recirculation Facility and the 105-DR Reactor. These pipelines may never have been used.

In a 4/19/2005 Remove, Treat, and Dispose Report based on a review of historical site information and analogous analytical data, it was cited that this subsite contains hazardous constituents at levels in accidence of RAGs. Remedial action was recommended for this site in accordance with the ROD (EPA, 1999).

SubSite Code: 100-D-50:5

SubSite Name: 100-D-50:5, 183-DR Sedimentation Basin Drain Pipelines

Classification: Accepted

ReClassification: No Action

Description: Results of the confirmatory sampling event conducted on November 7 and December 28, 2005 were used to make decisions for reclassification of the site. Evaluation of the confirmatory results has been documented in the Remaining Sites Verification Package (RSVP) 2006-025. The report indicated that the 100-D-50:5 subsite has met the remedial action objectives (RAOs) and the corresponding remedial action goals (RAGs) for No Action as established in the Remedial Design Report/Remedial Action Work Plan for the 100 Area (RDR/RAWP) and the Interim Action Record of Decision for the 100-BC-1, 100-BC-2, 100-DR-1, 100-DR-2, 100-FR-1, 100-FR-2, 100-HR-1, 100-HR-2, 100-KR-1, 100-KR-2, 100-IU-2, 100-IU-6, and 200-CW-3 Operable Units, (Remaining Sites ROD).

The subsite encompassed the southern process sewers for the 183-DR coagulation and sedimentation basins, The subsite consisted of approximately 200 meters (650 feet) of

pipeline: three 0.15-meters (6-inches) drain lines immediately south of the former 183-DR coagulation and sedimentation basins, which discharged to a 0.30-meter (12-inch) reinforced concrete collection line, trending generally north-south. A 0.30-meter (12-inch) feeder line also connected a runoff collection drain (catch basin U) to the collection line.

As part of the coolant water treatment facilities for the 105-DR Reactor, the 183-DR coagulation and sedimentation basins used physical and chemical treatment to condition raw river water for reactor use. The chemicals added at the 183-DR coagulation basins or at the upstream 183-DR Headhouse included: sulfuric acid, lime chlorine, and commercial coagulants containing primarily ferrous sulfate or alum. Sodium dichromate was also added to cooling water as a corrosion inhibitor, but was injected downstream of the sedimentation basins.

Located on the southern side of the 183-DR facility, these sewers were designed to provide underflow drainage for the 183-DR coagulation and sedimentation basins and possibly overflow drainage as well. Several surface runoff collection drains for the area south of the 183-DR facility also discharged to this sewer. The subsite process sewers discharged to the 100-D-50:1 process sewer collection line, which ultimately discharged to the Columbia River at the 100-D-8 outfall. Additional drainage for the 183-DR basins was also provided by higher capacity process sewers on the northern side of the 183-DR facility (100-D-50:7 subsite).

The COPC list identified in the 100 Area Remedial Action Sampling and Analysis Plan (SAP) for subsite included cobalt-60, cesium-137, europium-152, europium-154, strontium-90, lead, hexavalent chromium, and metals. While process knowledge of the subsite does not suggest historic discharge of radionuclides, cobalt-60, cesium-137, europium-152, europium-154, and strontium-90 were identified as COPCs for the 100-D-50 site in its entirety and retained for the 100-D-50:5 subsite. Polychlorinated biphenyls (PCBs) were also identified as COPCs for the process sewers based on the potential presence of rubber gaskets and other PCB-containing materials in the water treatment facilities serviced by the pipelines. At the request of the Washington Department of Ecology, total uranium evaluation by kinetic phosphorescence analysis (KPA) was also included in confirmatory analysis.

The laboratory-reported results for all constituents have been stored in the Environmental Restoration (ENRE) project-specific database prior to archiving in the Hanford Environmental Information System (HEIS) and were included in Appendix A of the RSVP. The results of confirmatory sampling confirmed that residual contaminant concentrations did not preclude any future uses (as bounded by the rural-residential scenario) and allowed for unrestricted use of shallow zone soils (i.e., surface to 4.6 meters [15 feet] deep). The results also demonstrated that residual contaminant concentrations were protective of groundwater and the Columbia River.

The subsite has been evaluated in accordance with the Remaining Sites ROD, and a no action decision is supported based on the confirmatory investigation and sampling results. The analytical results from the subsite pipe sediment and underlying soil samples were shown to meet the remedial action objectives for direct exposure, groundwater protection, and river protection. The subsite has no deep zone; therefore, no deep zone institutional controls are required.

SubSite Code: 100-D-50:6

SubSite Name: 100-D-50:6, 183-DR Clearwell Drain Pipelines

Classification: Accepted

ReClassification:

Description: This subsite includes three functional groups of piping at the 183-DR Clearwells: 1) process piping used to deliver water from the filter building to the clearwells, 2) process piping used to deliver water from the clearwells to 190-DR Pumphouse, and 3) drain piping servicing the clearwells and pumphouse floor drains and discharging to the 100-D-50:1 Emergency Discharge Pipeline.

SubSite Code: 100-D-50:7

SubSite Name: 100-D-50:7, 183-DR Head House Floor Drain and Catch Basins Pipelines

Classification: Accepted

ReClassification:

Description: This subsite includes the pipelines that provided drainage for the 183-DR Coagulation Basins, floor drains and catch basins at the 183-DR Head House, and mixing tanks in the vicinity of the 186-D Waste Acid Reservoir. These pipelines ultimately discharged to the 100-D Area process sewer systems.

SubSite Code: 100-D-50:8

SubSite Name: 100-D-50:8, 117-DR Condensate Drain Pipelines

Classification: Accepted

ReClassification:

Description: This subsite is an asbestos cement pipeline that connected the 117-DR HEPA Filter Building to the 116-DR-8 Seal Pit Crib.

SubSite Code: 100-D-50:9

SubSite Name: 100-D-50:9, 1607-DR3 Sanitary Sewer Pipelines

Classification: Accepted

ReClassification:

Description: The 100-D-50:9 site encompasses two functional pipeline groups: (1) the overflow drain line and (2) the residual sanitary sewer lines. The overflow drain line begins north of the 105-DR Reactor Building, travels south along the western side of the building, and then turns west to join the sanitary sewage system. The sanitary sewer cuts across the southeast corner of the 116-D-8 cask storage pad and was accessible through a manhole set in the concrete pad.

The Hanford Site Waste Management Units Report (DOE/RL-88-30) stated the pad was designed with a drain to facilitate pad decontamination and rain runoff, and the drain discharged into the 105-DR sewer (100-D-50:9). The residual sanitary sewer lines are located south and southeast of the 105-DR Reactor Building. Both pipeline functional groups discharged into the 100-D-13 septic tank. Although sections of the former sewer system have been removed under past Group 3 remedial efforts for coexistent sites (the 116-DR-6 Liquid Disposal Trench and the 100-D-48 Reactor Cooling Water Effluent Underground Pipelines), excavations for confirmatory sampling established that portions of the 100-D-50:9 pipelines still remain.

During remediation of 118-D-5 Burial Ground (CVP-2009-00008) a concrete junction vault located in the southern portion of the burial ground was opened prior to the start of the burial ground excavation and found to contain a breached 15-cm (6-in.) vitrified clay pipe. The pipeline was part of the 100-D-50:9, 1607-DR-3 Sanitary Sewer. The concrete junction vault and pipe located within the excavation were removed for disposal to ERDF.

SubSite Code: 100-D-50:10

SubSite Name: 100-D-50:10, Construction Camp Potable Water Supply Pipelines

Classification: Accepted

ReClassification: No Action

Description: This subsite consists of the residual cast iron pipelines used to supply potable water to the temporary construction camp southeast of the 105-DR Reactor. The exact operational period of the subsite is uncertain, but is believed to be limited to 1947 to 1949 when the construction camp was in use. The system was supplied with water via the fire protection loop piping, which in turn was supplied by the 100-D Area water treatment train at a point prior to any chemical treatment.

The 100 Area Remedial Action Sampling and Analysis Plan identifies contaminants of potential concern (COCs) for the 100-D-50 pipelines, but they were not applicable to this subsite given process knowledge of the operational history of the pipelines. Further, the same process knowledge provides no basis for the introduction of any hazardous or dangerous wastes to these pipelines. Therefore, no further evaluation or confirmatory sampling is necessary for this subsite.

The Remaining Sites Verification Package (RSVP) report demonstrates that the subsite meets the objectives for interim closure as established in the Remedial Design Report/Remedial Action Work Plan for the 100 Area and the Interim Action Record of Decision for the 100-BC-1, 100-BC-2, 100-DR-1, 100-DR-2, 100-FR-1, 100-FR-2, 100-HR-1, 100-HR-2, 100-KR-1, 100-KR-2, 100-IU-2, 100-IU-6, and 200-CW-3 Operable Units, Hanford Site, Benton County, Washington. The evaluation shows that there is no hazardous/dangerous materials present at the subsite and, accordingly, no residual contamination in the soil. Therefore, the current status of the subsite is protective of human health, groundwater, and the Columbia River, and no institutional controls are required.

Site Code: 100-D-52 **Classification:** Accepted

Site Names: 100-D-52, 105-D Downcomer Insulation Space Dry Well **ReClassification:** Interim Closed Out (11/8/2000)

Site Type: French Drain **Start Date:** 1955

Site Status: Inactive **End Date:**

Site Description: This site has been remediated and interim closed out.

The site consisted of a french drain (dry well). The 1-meter (3-foot) diameter dry well was filled with 2.2 meters (5 feet) of 2.5 to 5-centimeter (1 to 2-inch) gravel from the bottom at 6.9 meters (22 feet) below grade to the top at 5.2 meters (17 feet) below grade. The dry well was fed by a 10.2-centimeter (4-inch) steel drain pipe from Room 38A that entered the dry well at 5.8 meters (19 feet) below grade. The drain line discharged into the annulus between a vertical 25.4-centimeter (10-inch) diameter distributor pipe and vertical 10.2-centimeter (4-inch) diameter radiation monitor housing pipe in the center of the dry well. The monitor was used to ensure detection of radiation in the water (condensate or cooling water leakage) from Room 38A. (Room 38A of the 105-D Building is the concrete enclosure for the 105-D Downcomer.) The concentric distributor pipe and radiation monitoring housing pipe ended 30 centimeters (1 foot) above the bottom of the dry well. The radiation monitor pipe extended about 0.6 meters (2 feet) above grade with a valve on the upper end.

Waste Type: Water

Waste Description: No record could be found that indicated any radiological or chemical contamination data. Based on available information it was assumed that contamination would be limited to those radionuclides found in reactor effluent water that potentially leaked from the metal downcomer and collected nonradioactive condensate water. The COPCs for the remedial action were developed in the Sampling and Analysis Plan.

Site Code: 100-D-56 **Classification:** Accepted

Site Names: 100-D-56, 100-D Area Sodium Dichromate Underground Supply Lines (See Subsites) **ReClassification:**

Site Type: Product Piping **Start Date:**

Site Status: Inactive **End Date:**

Site Description: The site consists of two abandoned 7.6-centimeter (3-inch) underground sodium dichromate supply lines that transported concentrated liquid sodium dichromate between the 108-D, 185-D, 189-D, 190-D, 183-DR, and the 100-D Sodium Dichromate Transfer Station.

Waste Type: Equipment

Waste Description: The waste is abandoned 7.6-centimeter (3-inch) pipe contaminated with sodium dichromate.

SubSites:

SubSite Code: 100-D-56:1

SubSite Name: 100-D-56:1, Pipeline Exiting North Side of 185-D

Classification: Accepted

ReClassification:

Description: The pipelines exiting the north side of the 185-D Building were used during the initial dry material handling operations. The pipeline ran from 190-D to 108-D. The total length was approximately 272 meters (892 feet).

SubSite Code: 100-D-56:2

SubSite Name: 100-D-56:2, Pipelines Exiting South Side of 185-D

Classification: Accepted

ReClassification:

Description: The pipelines exited the south side of the 185-D Building to 100-D-12 and continued to the 183-DR building. This pipeline continued to be used after the transition to concentrated liquid sodium dichromate. The pipeline measured a total of 788 meters (2,585 feet).

Site Code: 100-D-57 **Classification:** Not Accepted (5/31/2001)

Site Names: 100-D-57, Earth Crib Near 107-DR **ReClassification:**

Site Type: Crib **Start Date:** 1955

Site Status: Inactive **End Date:**

Site Description: This site is a duplicate of 100-D-4, which has been excavated and closed out. Site 100-D-57 was initially identified from Drawing H-1-8630-DR, which shows an "Earth Crib" at an

unrecognizable, but short, distance off the southeast side of the 116-DR-9 Retention Basin. Through examination of Ground Penetrating Radar results, other documents, and excavations of the 116-DR-9, 100-D-4, and 100-D-49 sites, which effectively removed all soil and subsurface structures in this area, it has been determined that this site, 100-D-57, was created in error.

Site Code:	100-D-59	**Classification:**	Accepted
Site Names:	100-D-59 French Drain at the 183-D Acid Transfer Station	**ReClassification:**	Rejected (1/30/2003)
Site Type:	French Drain	**Start Date:**	
Site Status:	Inactive	**End Date:**	

Site Description: The site is an upright vitrified clay pipe adjacent to the acid transfer structure at the railroad tracks next to the 183-D Building. Pipes used to transfer the acids from the rail cars are still on the structure, but the pipe sending overflow to the french drain has been disconnected (part of the pipe has been removed).

The french drain is about 25 centimeters (10 inches) high, and 45 centimeters (18 inches) in diameter, with a steel cover and a 2.5-centimeter (1-inch) galvanized steel pipe rising up through the steel cover.

Waste Type: Chemical Release

Waste Description: The waste disposed to the french drain was overflow sulfuric acid from railroad car transfer operations. Any waste acid would be neutralized in the alkaline Hanford soils.

Site Code:	100-D-60	**Classification:**	Accepted
Site Names:	100-D-60, 100D/DR River Effluent Pipelines, 100D River Lines	**ReClassification:**	
Site Type:	Radioactive Process Sewer	**Start Date:**	
Site Status:	Inactive	**End Date:**	

Site Description: This site includes the river effluent pipelines (river lines) that extend from the two outfalls in the 100D/DR area into the main channel of the Columbia River.

Waste Type: Equipment

Waste Description: The waste includes the pipelines and the contaminated scale contained within them.

The contaminants of potential concern are based on those for the outfalls themselves. The contaminants of concern for all D/DR river effluent pipelines include C-14, Cs-137, Sr-90, U-235, -238, and Pu-239/240.

Site Code:	100-D-61	**Classification:**	Accepted
Site Names:	100-D-61, Utility Pole and Fixture Debris Piles	**ReClassification:**	Interim Closed Out (10/22/2009
Site Type:	Dumping Area	**Start Date:**	

Site Status:	Inactive	**End Date:**	
Site Description:	The site consisted of debris piles containing utility poles, lead-tipped bolts, railroad ties, light fixtures, scrap wire and cable, scrap construction wood, and other miscellaneous debris from tearing down electrical utility poles. The exact history of the site was unknown.		
Waste Type:	Misc. Trash and Debris		
Waste Description:	The waste includes creosote-treated wood poles and cross beams, wood pallets, metal debris, lead-tipped bolts and other debris.		

Site Code:	100-D-63	**Classification:**	Accepted
Site Names:	100-D-63, 100-D/DR Service Water Pipelines, 100-D/DR Clean Water Pipelines	**ReClassification:**	
Site Type:	Product Piping	**Start Date:**	
Site Status:	Inactive	**End Date:**	
Site Description:	The waste site is comprised of the 183-D acid addition facility. It includes a concrete trench that protected the service piping (air, steam, filtered water, lime slurry, sulfuric acid) and drained acid waste to the neutralization pit. The underground piping contained in the trench are part of the site with the exception of the filtered water line which is assigned to 100-D-63. The site also includes a dry well, two sumps (exterior to the trench), two storm drains, a storm sewer and an acid/silica supply line.		
Waste Type:	Water		
Waste Description:	The pipelines were the waste, they were associated with the raw water, filtered water, sanitary water, and fire water systems in the 100-D Area. Chemical treatment included pH adjustment (with sulfuric acid or lime), chlorination for algae control, the addition of flocculants, (primarily alum prepared at the 183-D Filter Plant (Head House component) with bauxite and sulfuric acid), and a commercial organic polymer flocculation/filtration aid. This site also includes the potable and fire water that was delivered to the 1700 (site service buildings) series buildings. Contaminants of potential concern include radiological contaminants.		

Site Code:	100-D-65	**Classification:**	Accepted
Site Names:	100-D-65, 1904D Spillway, 116-D-5 Outfall Spillway, 100-D-60:1 Flume	**ReClassification:**	
Site Type:	Outfall	**Start Date:**	
Site Status:	Inactive	**End Date:**	
Site Description:	The site consists of a concrete spillway (a.k.a. flume) that served as an alternate discharge point for the 1904-D Outfall Structure.		
Waste Type:	Construction Debris		
Waste Description:	No evidence has been found that the spillway was ever put into service, the COPCs for the 100-D-65 spillway would be the same as those for the 116-D-5 outfall structure. The contaminants of concern include carbon-14, cesium-137, strontium-90, uranium-235/238, and plutonium-239/240.		

Site Code:	100-D-66	**Classification:**	Accepted
Site Names:	100-D-66, 1904-DR Spillway, 116-DR-5 Outfall, 100-D-60:1 Flume	**ReClassification:**	
Site Type:	Outfall	**Start Date:**	
Site Status:	Inactive	**End Date:**	
Site Description:	The site consisted of a concrete spillway (also referred to as a flume).		
Waste Type:	Construction Debris		
Waste Description:	No evidence has been found that the spillway was ever put into service, the COPCs for the 100-D-66 spillway would be the same as those for the 116-DR-5 outfall structure. The contaminants of concern include carbon-14, cesium-137, strontium-90, uranium-235/238, and plutonium-239/240.		

Site Code:	100-D-67	**Classification:**	Accepted
Site Names:	100-D-67, D Island Contamination, D Island	**ReClassification:**	
Site Type:	Unplanned Release	**Start Date:**	
Site Status:	Inactive	**End Date:**	
Site Description:	The site consists of contamination spread from vent risers that extended from the buried river effluent pipelines (100-D-60).		

Site Code:	100-D-69	**Classification:**	Accepted
Site Names:	100-D-69, Sodium Dichromate Found Near Pacific Avenue and Paddock Street	**ReClassification:**	
Site Type:	Unplanned Release	**Start Date:**	
Site Status:	Inactive	**End Date:**	
Site Description:	The site consists of a stained concrete foundation and potentially contaminated soil.		
Waste Type:	Chemical Release		
Waste Description:	The waste is sodium dichromate contaminated concrete. Sodium dichromate was the only contaminant of potential concern.		

Site Code:	100-D-70	**Classification:**	Accepted
Site Names:	100-D-70, 184DA Steam Generating Plant Dry Well, 184-DA	**ReClassification:**	
Site Type:	French Drain	**Start Date:**	
Site Status:	Inactive	**End Date:**	

Site Description: The waste site consists of a 122 centimeter (48 inches) diameter drywell located on the south side of the 184-DA Building. It received steam separator discharge from equipment within the former 184-DA (demolished) Building. The pipeline from the building to the dry well is part of site 100-D-88.

Site Code: 100-D-71 **Classification:** Accepted

Site Names: 100-D-71, Vertical Safety Rod Tower Components **ReClassification:**

Site Type: Laboratory **Start Date:**

Site Status: Inactive **End Date:**

Site Description: The site currently consists of the following components: A 1.2 meters (4 feet) diameter by 2.2 meters (7 feet) deep concrete drywell, a below grade pit approximately 30.5 centimeters (12 inches) square, a 7.6 centimeters (3 inches) diameter, underground cast iron process waste pipe originating at the bottom of the tower's elevator shaft, and any potentially contaminated soil. It is unknown to whether the components are still at the site. The cast iron pipe extended underground from the pit on the north side of 195-D Building west about 12 meter (39 feet) to the drywell. Wastes generated in the tower collected in a floor pit located at the bottom of the tower's elevator, which then drained to a drywell.

Waste Type: Oil

Waste Description: Potential contaminants of concern (COPCs) would include oils and PCBs.
No testing with radiological materials was known to have occurred in the tower. A transformer bearing PCB oil was located inside the tower on the ground floor. Industrial chemicals and lubricating oils were used in the building. It is not known what, if any, dangerous or hazardous chemical wastes may have been discharged to the dry well.

Site Code: 100-D-72 **Classification:** Accepted

Site Names: 100-D-72, 183D Acid Facility **ReClassification:**

Site Type: Process Unit/Plant **Start Date:**

Site Status: Inactive **End Date:**

Site Description: The waste site is comprised of the 183-D acid addition facility. It includes a concrete trench that protected the service piping (air, steam, filtered water, lime slurry, sulfuric acid) and drained acid waste to the neutralization pit. The underground piping contained in the trench are part of the site with the exception of the filtered water line which is assigned to 100-D-63. The site also includes a dry well, two sumps (exterior to the trench), two storm drains, a storm sewer and an acid/silica supply line.

Waste Type: Soil

Waste Description: Contaminants of potential concern (COPCs) include lead and mercury. Sulfuric acid used at the head house may have contaminated impurities, such as lead and mercury.

The trench exits the south side of the 183-D Head House and continues toward the two sulfuric acid storage tanks. The trench is 0.76 m (2 ft 6 in) wide and depending on the location contains different piping. From the south side of the 183-D Building to the sulfuric acid pumps, the trench contains a 2.5 cm (1 in) steam line, a 5 cm (2 in) filtered water line, a 5 cm (2 in) lime slurry line and a 1.9 cm (0.75 in) air line. From the sulfuric acid pumps to the two sulfuric acid

storage tanks, the trench contains 1 steam line, a 5 cm (2 in) lime slurry line, a 5 cm (2 in) sulfuric acid line that goes to the storage tank, a 5 cm (2 in) sulfuric acid line that goes to the head tank, and 2-5 cm (2 in) PVC storage tank drains in the bottom of the trench.

Site Code:	100-D-73	**Classification:**	Accepted
Site Names:	100-D-73, 108-D Chemical Pump House	**ReClassification:**	
Site Type:	Process Unit/Plant	**Start Date:**	
Site Status:	Inactive	**End Date:**	
Site Description:	The site is the soil and possibly the demolition debris under the former 108-D Building. It was identified as part of the Orphan research for sodium dichromate investigation conducted for the D/DR Reactor area.		
Waste Type:	Chemicals		
Waste Description:	The waste is potentially contaminated soil because of the releases from the 108-D Building. There is a potential for sodium dichromate, oxalic acid, sodium silicate, and radionuclides under the existing below grade footprint of the 108-D Building. Soil samples collected in 1994 indicate the presence of radionuclide contamination that may include Carbon-14, Potassium K-40, radium Ra-226, Thorium-228, and Thorium-232 (DOE/RL-93-29). The possibility also exists for sodium dichromate. It is not known what would cause the presence of radionuclide contamination.		

Site Code:	100-D-74	**Classification:**	Accepted
Site Names:	100-D-74, Drywell Well	**ReClassification:**	
Site Type:	French Drain	**Start Date:**	
Site Status:	Inactive	**End Date:**	
Site Description:	The site is a drywell.		
Waste Type:	Steam Condensate		
Waste Description:	The site received steam condensate from the heating units inside the 105-DR Reactor.		

Site Code:	100-D-75	**Classification:**	Accepted
Site Names:	100-D-75, 151-D Primary Electrical Substation, 152-C1-D & 152-E1-D Secondary Electrical Substations (see subsites)	**ReClassification:**	
Site Type:	Electrical Substation	**Start Date:**	
Site Status:	Inactive	**End Date:**	
Site Description:	The waste site consists of three components: 100-D-75:1, 151-D Primary Electrical Substation, the area within the fence at the 151-D Primary Substation, 100-D-75:2, 152-E1-D Secondary Electrical Substation, Substation C4-S1 Secondary Electrical Substations, and 100-D-75:3, 152-C1-D Secondary Electrical Substation. During the WCH 2006 Orphan Site walkdown electrical		

substations were automatically categorized as New Discovery Sites because historically leaks and spills of PCBs from the electrical transformers, circuit breakers, and transfer systems during the early years of operation went unreported. An analogous site, the 151-H Primary Substation (100-H-24) was remediated in 2000, by removing and disposing of more than 21,000 tons of PCB-contaminated material. All three substations are inactive (not providing any electrical power to D Area), although live 230KV power lines will be routed across the 151-D switchyard for the foreseeable future.

Waste Type: Soil

Waste Description: PCB contamination of the soil surrounding the transformer and circuit breaker pads is the primary waste concern. PCB-contaminated soil could also exist along the railroad spur.

SubSites:

SubSite Code: 100-D-75:1

SubSite Name: 100-D-75:1, 151-D Primary Electrical Substation

Classification: Accepted

ReClassification:

Description: The substation consists of a fenced, gravel-bed yard measuring approximately 165 m (541 ft) on a side with the 151-D Switch House along the northern fence line. A railroad spur enters the yard from the east, and parallels the north fence line. Concrete pads of various sizes protruded from the crushed gravel bed throughout the yard, supporting a variety of electrical equipment, including transformers, circuit breakers, and power line towers and stands.

The 31,250 KVA transformers were originally located at N 151338, E 573515; and N 151338, E 573556. Sometime after 1956 a third very large ground transformer was added at N 151374, E 573516. The circuit breakers were located at N 151300, E 573494; N 151300, E 573536; and N 151300, E 573576.

ProcessDescription:
The Midway Station fed 230KV power to the 31,250KVA transformers located in the 151-D switchyard. From these transformers, power was transmitted via overhead and underground cables to secondary and distribution substations located throughout the 100-D/DR Area. Circuit breakers were also in service to support the switchyard operations.

PCB-containing oil was transferred, as needed, from a rail tanker on the railroad spur through over ground hoses and piping to transformers and oil circuit breakers in the yard.

An oil spill from one of the 151-D switchyard transformers was remediated in 1995 (100-D-27). This may not have been the extent of transformer leaks and spills, because such events were not consistently recorded before about 1985. And there is anecdotal information from power operators that transformer spills and leaks were not uncommon. Therefore, any transformer or circuit breaker pad and surrounding soil may have PCB contamination.

According to the Electrical Utilities Craft Supervisor, the equipment in the 151D yard is inactive. The only thing energized is the overhead lines going through the yard. Because there is a section of energized 230kV buswork that runs through the substation yard, the yard is off-limits to all except qualified T&D system workers. Most of the equipment within the substation has already been drained of oil.

The circuit breakers stored in the northeast corner of the switchyard are disconnected and

drained. These circuit breakers could not have been in use at this location. When in service the circuit breakers would have to be put on a concrete pad and bolted to the overhead bus.

Two smaller transformers that were added at the switchyard are old 181D transformers (100-D-75:2). Both PCBContaminated Transformers were drained on 7/12/2005. This action stopped the 5-year TSCA time requirement. Based on the available aerial photography it is evident that the two smaller transformers were added to the switchyard sometime between April 2008 and August 2009.

The switch house was used as a regulatory component to the switchyard. Historically, there are no processes that indicate any type of contamination to be associated with this structure.

LocationDescription:
The 151-D Building and associated switchyard are located approximately 350 m (107 ft) southwest of the 105-D Reactor building and 235 m (72 ft) northwest of the 105-DR Reactor building, with the center point of the yard at N 151328, E 573542.

AssociatedStructures:
The 151-D Primary Substation distributed 13.8KV power to transformers located at the 151-D Switch House, 181-D River Pump House, 182 Head Houses, 183 Filter Houses, 184-D Power House, 186-D Water Treatment Plant, 190 Pump Houses, and 105-D/DR Reactors, which in turn distributed power to associated facilities.

SubSite Code: 100-D-75:2

SubSite Name: 100-D-75:2, 152-E1-D Secondary Electrical Substation, Substation C4-S1

Classification: Accepted

ReClassification:

Description: The secondary substation consists of a small fenced area with concrete pads for the former transformers and inactive electrical components.

ProcessDescription:
The Midway Station fed 230KV power to the 31,250KVA transformers located in the 151-D switchyard. From these transformers, power was transmitted via overhead and underground cables to secondary and distribution substations located throughout the 100-D/DR Area. The smaller transformers at the secondary and distribution substations were filled with PCB-containing oil via over ground hoses from oil trucks.

Based on the historical photograph (P-4479) originally the two transformers existed behind the power poles. According to the D-Area, National Code Inspector, two concrete pads that are currently located at this secondary substation is suspected to have housed two smaller transformers after downsizing to provide power for 181D Pump House. The transformers have since been removed, but the concrete pads remain. The transformers were added to the 151-D switchyard (100-D-75:1). The transformers were drained of PCB-containing oil on 7/12/2005. This action stopped the 5-year TSCA time requirement. Based on the available aerial photography it is evident that the two smaller transformers were added to the switchyard sometime between April 2008 and August 2009.

LocationDescription:
The 152-E1-D Secondary Electrical Substation, centered at (N 151692.84, E 572833.69), is near the 181-D Pump House.

The shape of the 152-E1-D Secondary Electrical Substation is rectangular and has a perimeter of 478.9 m (1571.2 ft). Its length is 137.6 m (451.44 ft), width 91.25 m (299.38 ft),

Square Area 12959.5 m2 (139494.9 ft)

SubSite Code: 100-D-75:3

SubSite Name: 100-D-75:3, 152-C1-D Secondary Electrical Substation

Classification: Accepted

ReClassification:

Description: Three transformers were located at this substation, but have since been removed; leaving the three concrete pads that supported the transformers.

Process Description:
The Midway Station fed 230KV power to the 31,250KVA transformers located in the 151-D switchyard. From these transformers, power was transmitted via overhead and underground cables to secondary and distribution substations located throughout the 100-D/DR Area. The smaller transformers at the secondary and distribution substations were filled with PCB-containing oil via over ground hoses from oil trucks.

A portion of the 100-D-31:9 pipeline was located directly beneath the 152-C1-D Secondary Electrical Substation. During the remediation of the 100-D-31:9 waste site the three concrete pads at the 152-C1-D Secondary Electrical Substation and portions of the surrounding soil were removed and disposed of at the Environmental Restoration Disposal Facility (ERDF). Additional surrounding soil was collected as part of the overburden for the 100-D-31:9 waste site.

LocationDescription:
The 152-C1-D Secondary Electrical Substation, centered at (N 151584, E 573369), is near the 183-D Filter Building.

The 152-C1-D Secondary Electrical Substation has a rectangular perimeter of 42.3 m (138.8 ft).Length 8.60 m (28.22 ft), width 13.6 m (44.62 ft)

Site Code:	100-D-76	**Classification:**	Accepted
Site Names:	100-D-76, Potential Crib Next to 108D, Potential Former 116-D-3 Crib	**ReClassification:**	
Site Type:	Crib	**Start Date:**	1951
Site Status:	Inactive	**End Date:**	2967

Site Description: The site is possible crib located near the former 108D building. It was identified during a geophysical investigation. The waste site is either a french drain or crib. It may be the crib formerly known as 116-D-3. Historical documentation, a construction drawing, and GPR results indicate that waste site 116-D-3 probably remains near the southeast corner of the 108-D Building.

Waste Type: Process Effluent

Waste Description: Due to the confusion of the location of the crib, the same historical documentation may apply to waste sites 116-D-3 and 116-D-4. Historical information suggests the crib may have received low level fission product wastes from the contaminated maintenance shop and cask decontamination pad in the 108-D Building. The crib received 0.08180 curies of Cs-134 and 30,000 liters. (7,920 gallons) of liquids. The contaminants of potential concern are assumed to be the same for 116-D-4 that were uranium-238 and hexavalent chromium.

Site Code:	100-D-78	**Classification:**	Accepted
Site Names:	100-D-78, 100D Yellow Stained Soils	**ReClassification:**	
Site Type:	Dumping Area	**Start Date:**	
Site Status:	Inactive	**End Date:**	

Site Description: The site consists of four locations of contaminated soil between the 183-D and 186-D Buildings. The staining for these locations is yellowish in color with some areas of white crusty material. Stain one and two are in the area where the acid trench was located and may parallel nearly the entire length of the west wall of the186-D Building. Stain three is near the southwest corner of the Waste Acid Trench (120-D-2). Stain four is southwest of the Waste Acid Reservoir.

Waste Type: Soil

Waste Description: The 186-D Waste Acid Reservoir has been identified as a site requiring remediation as stated in the interim ROD for the 100-DR-1, 100-DR-2 Operable Units, so the waste is potentially contaminated soil.

Contaminants of Potential Concern indicated by sample data are asbestos, ICP metals, mercury, PCB, herbicide, pesticide, and hexavalent chromium were present.

Site Code:	100-D-79	**Classification:**	Accepted
Site Names:	100-D-79, 100D Posted Soil Contamination Areas, SCA Area 1, SCA Area 2	**ReClassification:**	Rejected (9/15/2010)
Site Type:	Dumping Area	**Start Date:**	
Site Status:	Inactive	**End Date:**	

Site Description: This site consists of two posted radiological soil contamination areas (SCA). Area 1 is an SCA that was found during the 2006 Orphan Site Evaluation (OSE) field investigation. The SCA is posted and is in an area of previously disturbed soils. Area 2 is also an SCA that was identified during the 100-D Orphan Site field investigation in 2006.

Site Code:	100-D-80	**Classification:**	Accepted
Site Names:	100-D-80, 100D Tar Stained Soils & Miscellaneous Debris	**ReClassification:**	
Site Type:	Dumping Area	**Start Date:**	
Site Status:	Inactive	**End Date:**	

Site Description: The site consists of four areas that were discovered during the 2006 Orphan Site's Evaluation (OSE) field investigation (EL-1583-6). The areas contain a broken light bulb, tar like material, oil staining and a valve box. The site has been divided into two subsites as follows: 100-D-80:1 Tar Stained Soil & Miscellaneous Debris (Areas 1, 2 and 3) and 100-D-80:2 100-D-80:2, Valve Box with Possible Asbestos Insulation (Area 4).

SubSites:

SubSite Code: 100-D-80:1

SubSite Name: 100-D-80:1, Tar Stained Soil & Miscellaneous Debris (Areas 1, 2 and 3)

Classification: Accepted

ReClassification:

Description: This subsite consists of three areas identified during the 2006 100-D Area Orphan Site Evaluation (OSR-2006-0001). These areas are not associated with any particular process other than by proximity. Area 1 was identified on April 10, 2006. Area 2 was identified on April 11, 2006. Area 3 was identified on May 8, 2006.

Area 1 was identified as a single broken light bulb (Orphan Site ID# D48),located approximately 100 m (328 ft) south of the 118-D-1 waste site. Area 1 is centered at coordinates E 573068.8, N 151491.248. The bulb had a metal base, a clear glass cover, and two internal fluorescent-type bulbs. The bulb was approximately 6.4 cm (2.5 in.) in diameter and 0.61 m (2 ft) in length. Fixtures were not associated with this bulb, and the bulb may have been an early intrinsically safe bulb with hand-blown glass. During a site visit on November 4, 2009, no evidence of a light bulb was found at this location.

Area 2 contained a tar-like material with a fiber matrix that appeared to have been dumped (Orphan Site ID# D49). The area lies within the 118-D-3 Burial Ground sorting cells and has been previously removed during 118-D-3 remediation activities. Area 2 was located approximately 260 m (853 ft) southeast of the 100-DR Reactor and 110 m (387 ft) northwest of the 100-D-17 waste site and centered at coordinates E 574022.38, N 151103.16. A 1948 photo indicates that the site was east of construction support buildings and apparent lay down areas.

Area 3 is classified as a tar-and oil-stained area (Orphan Site ID# D65),located approximately 50 m (164 ft) south of the southwest corner of the 182-D Reservoir. Area 3 is centered at coordinates E 573757.9, N 150857.4. The site is vegetated with native grasses. Area 3 appears to be a possible oil changing location. Confirmatory sampling was performed on this portion of the waste site in August 2010.

SubSite Code: 100-D-80:2

SubSite Name: 100-D-80:2, Valve Box with Possible Asbestos Insulation (Area 4)

Classification: Accepted

ReClassification:

Description: Subsite two consists of Area 4, located south of the 182-D Reservoir and northwest of the 183-DR Head House. Area 4 is centered at coordinates E 573111.347, N 151295.8. This area contained a small wooden structure, which contained piping (Orphan Site ID# D76). This structure is believed to be a valve box cover, possibly to prevent freezing pipes during the winter months. A raw water pipeline was known to have existed in the area. The area dimensions are 1 m (3 ft) by 1 m (3 ft). The proximity of the valve box to the 91 cm (36 in) raw water pipeline would suggest that it is associated with the 100-D-63 pipelines. Due to the presence of friable asbestos, this structure will be recommended for remediation without further confirmatory evaluation.

Site Code: 100-D-81 **Classification:** Accepted

Site Names: 100-D-81, 100D Burn Areas and Other Stained Areas **ReClassification:**

Site Type: Dumping Area **Start Date:**

Site Status: Inactive **End Date:**

Site Description: During the 4/26/06 Orphans Sites field walk down a total of eight soil areas were identified as either stained soil or a burn area.

Site Code: 100-D-82 **Classification:** Accepted

Site Names: 100-D-82, 100D Garnet Sand Sites **ReClassification:**

Site Type: Dumping Area **Start Date:**

Site Status: Inactive **End Date:**

Site Description: This site consists of three areas of garnet sand observed during the 100-D area orphan sites walkdown.

Waste Type: Soil

Waste Description: Garnet sand was recorded as waste sites due to its potential to contain contaminants.

Site Code: 100-D-83 **Classification:** Accepted

Site Names: 100-D-83, 100D Treated Water Pipelines (See Subsites) **ReClassification:**

Site Type: Product Piping **Start Date:**

Site Status: Inactive **End Date:**

Site Description: The site includes 56 additional treated water pipe segments that were not previously identified within an existing waste site. The pipelines supported the pre-reactor non-radioactive cooling water processing facilities. The pipelines were used to transfer chemical products to the water treatment building and treated cooling water to the reactor and laboratory facilities. The additional pipeline segments also include any associated manholes (with associated drains), catch basins, junction boxes, valve control systems or any other below surface related feature. The site has been divided into four subsites as follows:

100-D-83:1 183-DR Acid Addition Pipelines
100-D-83:2 183-DR Filter Backwash Connection
100-D-83:3 108-D Acid Addition Facility Pipelines
100-D-83:4 Additional Treated Water Pipelines
100-D-83:5 186-D Acid Neutralizing System Pipelines

SubSites:

SubSite Code: 100-D-83:1

SubSite Name: 100-D-83:1, 183-DR Acid Addition Pipelines

Classification: Accepted

ReClassification:

Description: This subsite consists of the pipeline segments associated with the 100-D-77 (183-DR Acid Facility) and includes low pressure steam, sulfuric acid, and lime slurry. The facility was located on the north side of the 183-DR Head House. The majority of the pipeline segments were contained in the acid pipe trench. The compressed air lines and the above ground piping at the acid storage tanks were excluded. A filtered water line is also present in the trench but

was assigned to site 100-D-63.

Sulfuric acid was received by railroad car and stored in two outside aboveground acid storage tanks. The acid was fed by gravity to the 183-DR Head House by maintaining the supply in the Acid Head Tank. The piping between the head tank and the 183-DR Head House was all above grade. Sulfuric Acid was added to the raw water supply before coagulation and filtration to reduce the pH below 7.5 and to aid in the suspension of solids. After filtration, lime was added to the water to raise the pH to between 7.5 and 7.8 (BHI-01771). Lime slurry was returned to the acid trench for neutralization of the waste acid. The sulfuric acid was reportedly purchased from a mining company and contained mercury and lead.

SubSite Code: 100-D-83:2

SubSite Name: 100-D-83:2, 183-DR Filter Backwash Connection

Classification: Accepted

ReClassification:

Description: This subsite consists of the 183-DR water reducing valve pit and three pipeline segments located 20 m (65.6 feet) northeast of the 183-DR Filter Building.

The backwash water for the 183-DR filters is supplied from the 183-D Pump Room via a 76.2 cm (30 in) carbon steel cross-tie line (100-D-63) to the 183-DR pipe gallery. This line is also used to supplement the 183-DR water requirements including make-up water for the DR Reactor cooling water system (HW-74094, Vol3). A redundant supply of filtered water is provided via a 40.6 cm (16 in) pipeline (100-D-63) from the 105-D filtered water supply. These two lines laid parallel to each other and were joined in the water reducing valve pit. The water reducing valve pit had two drain lines (H-1-9660-DR). One was connected to the cross-tie between the backwash and filtered water lines. It received intermittent discharges during pressure surges between the lines. The other drain line collected water in the bottom of the valve pit from leaking valves or pipe repairs. Both drain lines discharged to the process sewer (100-D-50:7).

SubSite Code: 100-D-83:3

SubSite Name: 100-D-83:3, 100-D-83:3 108-D Acid Addition Facility Pipelines

Classification: Accepted

ReClassification:

Description: This subsite consists of the pipeline segments associated with the 108-D Acid Addition Facility (100-D-101) and includes the sulfuric acid pipeline and a process sewer. The facility (100-D-101) was located approximately 10 m (32.8 ft) west of the 108-D Chemical Pump House.

Sulfuric acid was added to the cooling water upstream of the reactor to lower the pH. The acid was received by railroad tank cars and stored in two above ground storage tanks just west of 108-D. The acid was fed to the 105-D building through a 5.08 cm (2 in) steel pipeline by gravity. The acid neutralization pit was used to balance the pH of the waste acid. The pit drained to the process sewer (100-D-31:3) through a 15.24 cm (6 in) vitrified clay pipe.

SubSite Code: 100-D-83:4

SubSite Name: 100-D-83:4, Additional Treated Water Pipelines

Classification: Accepted

ReClassification:

Description: This subsite consists of the treated water pipeline segments that were not addressed by 100-D-83:1, 100-D-83:2 and 100-D-83:3. They include piping associated with the 186-D Acid Neutralizing System, sulfuric acid and sodium silicate supply lines to the 190-D building, reused water return lines at the 190-D building and an elevated storage tank drain line south of the 105-DR Reactor Building.

The sulfuric acid and sodium silicate supply tanks are located just outside the southwest corner of the 190-D Building. Another sulfuric acid line runs between the 108-D Acid Storage Tanks and the 105-D Reactor. The reused water return lines are on the southside of the 190-D Building. The 187-DR elevated storage tank is located on the southeast side of the 105-DR Reactor.

SubSite Code: 100-D-83:5

SubSite Name: 100-D-83:5 186-D Acid Neutralizing System Pipelines

Classification: Accepted

ReClassification:

Description: This subsite consists of the treated water pipeline segments that were associated with the 186-D Acid Neutralizing System.

The lime neutralization plant (186-D Acid Neutralizing System) is located on the southwest side of the 186-D Demineralization Plant.

Site Code: 100-D-84 **Classification:** Accepted

Site Names: 100-D-84, 100D Sanitary Sewer Pipelines (See Subsites) **ReClassification:**

Site Type: Sanitary Sewer **Start Date:**

Site Status: Inactive **End Date:**

Site Description: The site consist of numerous sanitary sewer pipe segments discovered during the Orphan Site Evaluation process that were not previously identified or addressed within current WIDS site database. The entire site includes underground sanitary sewer connections including associated manholes (and associated drains), catch basins, junction boxes and valve control systems or any other below surface associated feature not previously identified. The sanitary sewer pipelines are service connections supporting ancillary and temporary construction facilities and discharge to associated septic systems. The site has been divided into two subsites as follows:
- 100-D-84:1, Sanitary Sewer Pipelines - Areas 1 and 2
- 100-D-84:2, Sanitary Sewer Pipelines - Areas 3 and 4

Waste Type: Sanitary Sewage

Waste Description: The waste consists of pipelines and any contaminated soil associated with leaks from the pipelines. The contaminants of potential concern (COPCs) are unknown.

SubSites:

SubSite Code: 100-D-84:1

SubSite Name: 100-D-84:1, Sanitary Sewer Pipelines - Areas 1, 2

Classification: Accepted

ReClassification:

Description: This subsite consists of piping from two areas (Areas 1 and 2) as defined in the Confirmatory Work Instruction (0100D-WI-G0092). Area 1 includes 15 pipeline segments south of the 105-DR Reactor Building. Area 2 includes one pipeline segment and two manholes northwest of the 105-D Reactor Building.

Process Description:
The pipelines in Area 1 were the result of temporary construction that was put into place to support 1947 modification of 100-D Area Buildings and facilities and provide a water supply for the existing 105-D Pile Building (water supply unrelated to 100-D-84:1) (HW-24800-34). At the completion of the construction program, all temporary construction was removed with the exception of the Atkinson-Jones and G.E. Warehouses, a sewage disposal system, and the Atkinson-Jones (A.J.) Superintendent's Building. It is believed that all of area 1 piping drained to the 100-D-50:9 piping system. Confirmatory sampling was conducted at this area in August 2010.

The pipelines in Area 2 were service lines that carried waste from various buildings north of the 105-D reactor to the sanitary sewer main. These buildings included 190-D, 1703-D, 1717-D, 1725-D, 1726-D, 1727-D, 1728-D, and 1729-D. A number of these pipelines were previously removed during remediation of 100-D-31:4 or have been recommended for remove, treat, and dispose (RTD) along with other portions of the 100-D-84:2 subsite. The service line for the 1725-D trailer ran parallel to the 100-D-63 pipelines, and underwent confirmatory sampling in August 2010.

Location Description:
Area 1 is located approximately 121 m (400 ft) southeast of the 105-DR Reactor. Area 2 is located approximately 150 m (500 ft) northwest of the 105-D Reactor.

Associated Structures:
The site was related to ancillary support and temporary construction facilities

Site Comment:
Area 5 was originally included in 100-D-84:1 but was moved to 100-D-31:11 on December 9, 2010 since it was part of the same pipeline system. The pipeline in Area 5 was shown on drawing H-1-26378. It was a sanitary sewer that serviced the 183-D building and was relocated in 1956 during Reactor Plant modifications involving piping at 182-D. The pipeline was incorrectly mapped into GIS using this drawing. The pipeline actually existed 31 meters to the north of its present location. More than half of this pipeline has already been identified as 100-D-31:11. The GIS mapped location for this pipeline was corrected on 11/23/2010. The portions of the pipeline already mapped as 100-D-31:11 were excluded from the Area 5 pipeline.

For detailed dimensions of each pipeline segment see 0100D-WI-G0092 document.

SubSite Code: 100-D-84:2

SubSite Name: 100-D-84:2, Sanitary Sewer Pipelines - Areas 3 and 4

Classification: Accepted

ReClassification:

Description: This subsite consists of piping from two areas (Areas 3 and 4) as defined in the Confirmatory Work Instruction (0100D-WI-G0092). Area 3 includes one pipeline segment adjacent to the

107-DR retention basin. Area 4 includes one pipeline segment south of the 181-D River Pump House.

Process Description:
The pipeline in Area 3 was associated with the 1607-D2 Septic Tank. It carried waste from the septic tank to the drainfield. Most (if not all) of the pipeline was likely removed in 1950 when the 107-DR Retention Basin was built. The pipeline in Area 4 was the sanitary sewer line that carried waste from the 181-D River Pump House to the 1607-D5 Septic Tank.

Location Description:
Area 3 is located partially within the post-remediation footprint of the 116-DR-9 (107-DR) Retention Basin and protrudes approximately 40 m (132 ft) southwest from this waste site. Area 4 is east of the 181-D River Pump House.

Dimensions:
This 87.56 m (287.27 ft) long cylindrical pipeline is a 20.32 cm (8 in) vitrified clay pipe identified by the OSE as segment D-292. This pipeline carried waste from the septic tank (1607-D2:4) to the drain field (1607-D2:1). The pipeline has been grouped in Area 3.

The 40.13 m (131.66 ft)long cylindrical pipeline is a 15.24 cm (6 in) vitrified clay pipe that carried sanitary waste from the 181-D River Pump House to the septic tank (1607-D5). The pipeline has been grouped in Area 4.

Site Code:	100-D-85	**Classification:**	Accepted
Site Names:	100-D-85, 100D Reactor Effluent Pipelines (See Subsites)	**ReClassification:**	
Site Type:	Radioactive Process Sewer	**Start Date:**	
Site Status:	Inactive	**End Date:**	

Site Description: The site consists of those underground pipelines that transported radioactive treated and untreated waste water from the 105-DR Reactor Building, and the 1608-DR (132-DR-1) Building to the 107-DR (116-DR-9) Retention Basin. The pipelines are divided into two subsites containing seventeen reactor effluent pipe segments that were not previously identified within an existing WIDS site. Subsite one consists of Additional 107-DR Effluent Pipeline and subsite two consists of Additional 105-DR Reactor Effluent Pipelines. Pipelines that were presumed to have been removed in their entirety because they were located within an existing cleanup verification package (CVP) footprint were excluded. Also included are below grade features associated with the pipeline segment (i.e. manholes, catch basins, junction boxes and valve boxes) not already assigned to another waste site.

Waste Type: Process Effluent

Waste Description: Waste site contaminants of concern (COCs) identified through process knowledge were identified in the Sampling and Analysis Plan for the 105-F and 105-DR Phase III Below Grade Structures and Underlying Soils (SAP), (DOE/RL-99-35). The 105-DR SAP classified the different areas and structures into affected media that were similar in characteristics and contaminants. The COCs included: americium-241, barium-133, carbon-14, cobalt-60, cesium - 137, europium-152, europium-154, europium-155, nickel-63, plutonium 238, plutonium-239/240, strontium-90, technitium-99, uranium-234, uranium-235, uranium-238, hexavalent chromium, lead, mercury and polychlorinated biphenyls.

The waste consisted of contaminated steel piping, concrete, and soil. Chemical additives to reactor cooling water included aluminum sulfate (alum) with excess hydrated calcium oxide,

sulfuric acid, chlorine, diatomaceous earth (a scouring agent), and sodium dichromate. Water pH was maintained at about 7.5, and free chlorine residual was about 0.2 milligrams per liter. Radionuclides discovered at the retention basin during sampling by Dorian and Richards (UNI-946), included: plutonium-238, cesium-134, plutonium 239/240, cesium-137, strontium-90, 155, nickel-63, cobalt-60, and carbon-14.

Post Reactor cooling water effluent had anti corrosive chemical additives including pH adjustment and was radioactive.

SubSites:

SubSite Code: 100-D-85:1

SubSite Name: 100-D-85:1, Additional 107-DR Effluent Pipeline

Classification: Accepted

ReClassification:

Description: Subsite one pipeline segment connected the influent lines (100-D-48:2 and 100-D-49:2) between the 107-D and 107-DR Retention Basins. The effluent pipelines were used to transport radioactive cooling and waste water from the reactor facility to the retention basins. The diameter and pipe type were unknown.

The pipe segment was identified during the Orphan Site Evaluation (OSE). The pipe was found on a single construction drawing (H-1-8348DR) for the relocation of a nearby septic tank and drainfield. The drawing shows a dashed linear (presumably representing a process sewer) that ran east and west between the influent lines for the retention basins. The drawing does not indicate the size, depth or material of construction for the pipe. The pipeline was located adjacent to the southwest corner of the 107-DR retention basin.

SubSite Code: 100-D-85:2

SubSite Name: 100-D-85:2, Additional 105-DR Reactor Effluent Pipelines

Classification: Accepted

ReClassification:

Description: Subsite two consists of sixteen additional reactor effluent pipe segments that were identified during the WCH D Area Orphan Site Evaluation (OSE). They are located on the east side of the 105-DR reactor. The segments are associated with the 105-DR Reactor that discharged to the 1608-DR Waste Water Pump House. These segments have not been associated as part of an existing WIDS site. There was insufficient information to account for their removal during nearby remedial actions (i.e. 118-DR-2:2 and 100-D-49:4; see CVP-2003-00016).

The pipelines carried process water and steam condensate collected from sumps, floor drains, sinks and steam traps on the eastern half of the 105-DR building. The processes water drained by gravity to the 1608-DR Waste Water Pumping House (132-DR-1) where it was pumped to the main effluent pipeline (100-D-49:3). Many of the 100-D-85:2 pipelines were found to be leaking in 1958 (HW-56911 and HW-57840). Repairs were made and the steam condensate drains were disconnected from the sewers (100-D-85:2) on the north end of the building (HW-58360).

The pipelines consists of various sizes of cast iron pipe and black steel pipe.

Site Code: 100-D-86 **Classification:** Accepted

Site Names: 100-D-86, 100D Process Sewer Pipelines (See Subsites) **ReClassification:**

Site Type: Process Sewer **Start Date:**

Site Status: Inactive **End Date:**

Site Description: The site consists of two subsites that encompass 32 process sewer pipelines that were not previously identified within an existing WIDS site. Subsite one is 100-D-86:1 105-D Gas Recirculation Pipelines and subsite two is 100-D-86:2 Additional Process Sewer Pipelines.

Pipelines that were presumed to have been removed in their entirety because they were located within an existing cleanup verification package (CVP) footprint were excluded. The entire site includes those underground pipelines that transported non-radioactive waste streams from water treatment, reactor, and laboratory facilities. The site includes any other below grade feature associated with the pipeline segment (i.e. manholes, catch basins, junction boxes and valve boxes) not already assigned to another waste site.

Waste Type: Equipment

Waste Description: Minor amounts of radionuclide, chemical, and mercury contamination may be present in process sewer lines from the 185-D and 189-D/190-D complex as a result of laboratories once located in these now demolished facilities.

The waste consists of steel piping, concrete, and soil (if contaminants are present). The water supply and process sewer drain pipelines at the 100-D and DR Areas provided for the supply and disposal of non-radioactive streams generated in water treatment and water treatment laboratories facilities and powerhouse operations. Known chemical additions to reactor cooling water included aluminum sulfate (alum) with excess hydrated calcium oxide, sulfuric acid, chlorine, and sodium dichromate. Water pH was maintained near 7.5, free chlorine residual at about 0.2 milligrams per liter, and sodium dichromate was added at a rate of about 2 milligrams per liter. Sodium chloride was also used to regenerate water softeners in both water treatment and powerhouse
operations.

SubSites:

SubSite Code: 100-D-86:1

SubSite Name: 100-D-86:1 105-D Gas Recirculation Pipelines

Classification: Accepted

ReClassification:

Description: Subsite one consists of the steel gas recirculation piping in the subsurface tunnel between the former 115-D Gas Recirculation Facility and the 105-D Reactor. Features of the subsite include a pipeline described as a 41 cm (16 in) steel pipe that carried reactor atmosphere to and from the 115-D/DR Gas Recirculation Facility. The second feature is a 320 square meter (3,444 sq ft) pipe tunnel between the 115-D/DR Gas Recirculation Facility and the 105-D Reactor. The tunnel was 2.0 m (6.5 ft) tall with the floor being 3.4 m (11 ft) below the 1st floor of the 115-D/DR Building. It includes the vacuum and pressure seal pit, located north of the 1608-D Lift Station.

Startup of the 105-D Reactor occurred on December 17, 1944. The 105-D Reactor was provided with an inert, non-radioactive gas environment (reactor atmosphere) to remove moisture and foreign gases. The reactor atmosphere was a mixture of helium and carbon dioxide (HW-74094). The initial and make-up reactor atmosphere was supplied from storage

tanks (110-D) located west of 115-D/DR Gas Recirculation Facility. The reactor atmosphere was purified in the 115-D/DR Building and returned to the 105-D Reactor. Parallel 41 cm (16 in) steel pipes carried the reactor atmosphere to and from the 115-D/DR Building inside an underground reinforced concrete pipe tunnel (W-73950). Connected to and part of the 105-D tunnel was the vacuum and pressure seal pit, which contained two vacuum seal tanks filled with oil (UNI-4281, W-74375). The tunnel also formed part of the 1608-D Lift Station (132-D -3).

The 115-D/DR Recirculation Facility was also used to purify the reactor atmosphere for 105-DR between 1950 and 1964. The piping contained in the 105-DR pipe tunnel was assigned to the 100-D-50:4 waste site. The 115-D/DR Recirculation Facility and the underground pipe tunnels were no longer used after the 105-D Reactor was shut down on June 26, 1967.

The 115-D/DR Gas Recirculation Facility and adjoining tunnels were decommissioned by UNC Nuclear Industries in 1985 and 1986 using the Allowable Residual Contamination Levels (ARCL) methodology in conjunction with the in situ decommissioning alternative. The vacuum and pressure seal tanks were removed and disposed of as radioactive waste. The tunnel piping and valves were not removed. The tunnel roof was collapsed from the 115¬D/DR Building up to but not including the 1608-D Building. The void was filled with rubble and clean fill. Based on survey data and pre-demolition dose assessment, the tunnel piping/valves met in situ decommissioning criteria (UNI¬4281).

Characterization of analogous pipelines in the gas recirculation wing of the 105-H Reactor revealed the accumulation of soil sludge containing multiple radionuclides at levels above remedial action goals (CCN 120410). Consequently the two 41 cm (16 in) circulation lines between the 115-D and 105-D buildings were added to the 100-D-86 waste site on October 19, 2008.

SubSite Code: 100-D-86:2

SubSite Name: 100-D-86:2, Additional Process Sewer Pipelines

Classification: Accepted

ReClassification:

Description: Subsite two consists of an additional 30 process sewer pipelines associated with the 105-D, 105-DR and 190-DR buildings. The pipelines were identified on historical drawings during the 100-D Orphan Site Evaluation (OSE).
Process drainage piping was provided throughout the 105-D Building to carry water from floor drains, steam traps, sumps and trenches to the process sewer (W-71186, W-71617). The process sewer (100-D-31:3) on the west side of 105-D was rerouted when the 190-D Annex was constructed in 1956. A catch basin located outside the northeast corner of the 190-D Annex emptied into the process sewer (100-D-31:3). Other areas of the building included the control room, fan house, valve pit, work area, storage basin, various offices and equipment storage rooms.

105-DR Fan Room Condensate and Floor Drains room housed the main blowers, heaters and air-filters (HAN-10970 Vol. 3). Air was supplied to the 105 Building by two separate supply systems. These supply systems conditioned the air and distributed it to a particular section of the building. The ventilation air supplied to the building spaces outside the confinement zone was exhausted to the atmosphere through roof ventilators. The ventilation air supplied to spaces in the confinement zone was collected by exhaust ducts which discharged into the exhaust tunnel (HW-74094 Vol. 3). The air in the exhaust tunnel flowed to the exhaust fans in the fan room. At the exhaust fans, the exhaust air became pressurized and was exhausted through an aboveground concrete duct which ran to the base of the 200-foot exhaust stack (116¬DR). Originally the ventilation air was released directly to the 116-DR stack. In 1960,

air filtering systems (117-DR) were added to minimize the release of radioactive matter (WHC-SD-EN-TI-181).

190-DR Main Process Water Pump House contained two rooms with four pumps in each room. They supplied primary cooling water to the 105-DR Reactor (HW-74094 Vol.3). The filtered water used for cooling was stored in four large steel storage tanks outside of the 190-DR building. The water was treated with sodium dichromate at the 183-DR Building following filtration prior to entering the storage tanks.

Site Code:	100-D-87	**Classification:**	Accepted
Site Names:	100-D-87, Spill Near Railroad Car Spot	**ReClassification:**	
Site Type:	Dumping Area	**Start Date:**	
Site Status:	Inactive	**End Date:**	

Site Description: The waste site consists of a surface liquid spill near the acid railroad car spot.

The spill was photographed on January 1, 1945, liquid was present on the surface of the ground north of the railroad car spot on track "B".

The only documentation identifying the spill were construction drawings H-1-281, W-74157 and W71800. The drawings indicate that a 45 centimeters (18 inches) tile is buried in the ground at the car spot. The car spot contained two transfer pumps and two 7.6 centimeters (3 inches) diameter pipelines. The pipelines transported acid to the acid tanks at the 186-D and 185-D Buildings. There were six acid tanks on the west side of the 186-D Building and two on the south side of the 185-D Building.

Waste Type: Chemical Release

Waste Description: The spill was probably acid associated with the car spot unloading facility. The contaminant of potential concern was acid.

Site Code:	100-D-88	**Classification:**	Accepted
Site Names:	100-D-88, 100D Miscellaneous Pipelines	**ReClassification:**	
Site Type:	Product Piping	**Start Date:**	
Site Status:	Inactive	**End Date:**	

Site Description: The site consists of 27 underground pipeline segments observed during the WCH Orphan Site's Evaluation. The additional pipeline segments include associated manholes (with associated drains), catch basins, junction boxes, valve control systems or any other below surface related feature.

Site Code:	100-D-89	**Classification:**	Not Accepted (10/29/2008)
Site Names:	100-D-89, Power Pole and Junction Box Debris	**ReClassification:**	
Site Type:	Dumping Area	**Start Date:**	
Site Status:	Inactive	**End Date:**	

Site Description:	This site consists of two surface debris areas containing abandoned electrical components.
Waste Type:	Equipment
Waste Description:	No contaminants of potential concern were noted. This electrical box was used as a junction box and should not have contained PCB's.

Site Code:	100-D-90	**Classification:**	Accepted
Site Names:	100-D-90, 100-D/DR Out of Service Transformers	**ReClassification:**	
Site Type:	Unplanned Release	**Start Date:**	
Site Status:	Inactive	**End Date:**	
Site Description:	The site consists of the soil located below two transformers sitting on railroad ties.		
Waste Type:	Soil		
Waste Description:	The transformers contained oil with <499 ppm of PCBs (per Fluor Electrical Utilities). The site has the potential to contain PCBs. However, there was no evidence of staining associated with this site, therefore, there are no contaminants of potential concern.		

Site Code:	100-D-91	**Classification:**	Not Accepted (10/29/2008)
Site Names:	100-D-91, 100-D/DR Electrical Components Debris	**ReClassification:**	
Site Type:	Dumping Area	**Start Date:**	
Site Status:	Inactive	**End Date:**	
Site Description:	The site consists of a flat gravel area where pallets of electrical components once were staged.		
Waste Type:	Equipment		
Waste Description:	There are no contaminants of concern.		

Site Code:	100-D-92	**Classification:**	Accepted
Site Names:	100-D-92, Second Potential UST Near Dichromate Station	**ReClassification:**	Rejected (2/11/2010)
Site Type:	Storage Tank	**Start Date:**	
Site Status:	Inactive	**End Date:**	
Site Description:	This site consists of an underground concrete utility encasement for freshwater pipelines and the underlying soil located below a rail line. The site was originally reported, in a geophysical investigation, as a potential underground storage tank (UST). A detailed spatial analysis was conducted and determined that the feature was a known piping encasement located below the railroad tracks.		
Waste Type:	Process Effluent		

Waste Description: The encasement contains a portion of the 100-D-56 pipeline. WIDS 100-D-56 states "Historical review, geophysical surveys and a site visit in 2005 concluded that the site appeared to contain hazardous constituents (i.e. hexavalent chromium) at levels in exceedance of remedial action goals"

Potential Contaminants of Concern:
As stated in the Site Comment, the encasement location consists of a portion of the 100-D-56 pipeline. WIDS 100-D-56 states "Historical review, geophysical surveys and a site visit in 2005 concluded that the site appeared to contain hazardous constituents (i.e. hexavalent chromium) at levels in exceedance of remedial action goals".

Site Code:	100-D-93	**Classification:**	Accepted
Site Names:	100-D-93, Potential UST Near Dichromate Station	**ReClassification:**	Rejected (5/20/2010)
Site Type:	Storage Tank	**Start Date:**	
Site Status:	Inactive	**End Date:**	

Site Description: This site consists of an underground concrete utility encasement for freshwater pipelines and the underlying soil located below a rail line. The site was originally reported, during a geophysical investigation, as a potential underground storage tank (UST). A detailed spatial analysis was conducted and determined that the feature was a known piping encasement located below the railroad tracks.

Waste Type: Process Effluent

Waste Description: The encasement contains a portion of the 100-D-56 pipeline. WIDS 100-D-56 states "Historical review, geophysical surveys and a site visit in 2005 concluded that the site appeared to contain hazardous constituents (i.e. hexavalent chromium) at levels in exceedance of remedial action goals"

Site Code:	100-D-95	**Classification:**	Accepted
Site Names:	100-D-95, 100-D/DR Unnumbered Septic Tanks and Tile Field	**ReClassification:**	Rejected (11/10/2010)
Site Type:	Septic Tank	**Start Date:**	
Site Status:	Inactive	**End Date:**	

Site Description: The site was thought to consist of two septic tanks and a tile field. Gravel and rabbit brush were observed on the surface of the site.

Waste Type: Sanitary Sewage

Waste Description: Transfer of non-radioactive liquid sanitary sewage waste.

Site Code:	100-D-96	**Classification:**	Accepted
Site Names:	100-D-96, 100-D/DR Additional French Drains	**ReClassification:**	
Site Type:	French Drain	**Start Date:**	

Site Status:	Inactive	**End Date:**	
Site Description:	The site consists of eight components (seven 100-D and 100-DR area French Drains and one dry well) and their underlying soils. These French Drains received steam condensate from non-radioactive buildings.		

Site Code:	100-D-97	**Classification:**	Accepted
Site Names:	100-D-97, 184-DA 500-Gallon Fuel Tank, 184DA	**ReClassification:**	
Site Type:	Storage Tank	**Start Date:**	
Site Status:	Inactive	**End Date:**	
Site Description:	This site consisted of an underground storage tank (UST), associated fuel oil supply (FOS), fuel oil return (FOR) piping [1.27 centimeter (1.5 inch) diameter] and the underlying soil. It is believed that these items were removed in 1985/1986 as part of the 100-D/DR general demolition efforts. The area now appears as a cobble-covered field with vegetation.		

Site Code:	100-D-98	**Classification:**	Accepted
Site Names:	100-D-98, 152D Substations	**ReClassification:**	
Site Type:	Electrical Substation	**Start Date:**	
Site Status:	Inactive	**End Date:**	
Site Description:	This site consists of two active (C4S17 and 152-D1-D) and nine former electrical substations and underlying soil. During the Orphan Sites Evaluation (OSE) no staining or evidence of a substation was observed at the mapped locations of the nine former substations. They each had a primary voltage of 13.8 KV and a secondary voltage ranging from 110 V to 2300 KV. Each was an open, wooden pole structure surrounded by a picket fence and contained transformers at or near ground level, set on concrete pads. Excluded from the site were an additional six distribution substations known to have been associated with buildings 107-D, 108-D, 115-D, 183-D, 1717-D, and 1720-D. These six could not be located during the OSE field investigation. Each was constructed identical to secondary substations. All had a primary voltage of 2.4 KV, and a secondary voltage ranging from 110 V to 480 V. Information on the exact location of these substations is extremely limited. There was no physical evidence of transformer pads or staining on the ground near the suspect locations. It is assumed that the distribution substations were removed during demolition of the buildings.		
Waste Type:	Transformer		
Waste Description:	The two active substations (C4S17 and 152-D1-D) will be evaluated upon termination of operations. There was no documented waste information found during the OSE historical evaluation. There were no contaminants of potential concern assigned to the sites discovered during historical evaluation.		

Site Code:	100-D-99	**Classification:**	Accepted
Site Names:	100-D-99, Two Suspect Features Identified	**ReClassification:**	

	by Ground Penetrating Radar		
Site Type:	Septic Tank	**Start Date:**	
Site Status:	Inactive	**End Date:**	
Site Description:	The site consists of a septic system and the underlying soils.		
Waste Type:	Sanitary Sewage		
Waste Description:	Transfer of non-radioactive liquid sanitary sewage waste.		

Site Code:	100-D-101	**Classification:**	Accepted
Site Names:	100-D-101, Miscellaneous Structures, 108-D Acid Pit and Sump, 108-D Sodium Silicate Sump, 108-D Storage Tanks, 108-D Car Spot	**ReClassification:**	
Site Type:	Sump	**Start Date:**	
Site Status:	Inactive	**End Date:**	
Site Description:	The site consists of four chemical storage tanks, an acid neutralization pit/sump, a sodium silicate sump, two sets of pumps, and a car spot. All located to the west of the 108-D building. Two chemicals were stored near 108-D, sulfuric acid and sodium silicate, which each had its own set of two large storage tanks. Additionally, each chemical had a set of two pumps for unloading solution out of railroad tank cars. An acid neutralization pit/sump was located underneath the acid storage tanks, while another sump was placed near the sodium silicate tanks. A car spot and railroad line passed through the site for delivering the solutions.		
Waste Type:	Soil		
Waste Description:	Site contaminants of potential concern include mercury, lead, sodium silicate, and sodium dichromate. It is possible that contaminants leaked into the soil during the lifetime of the sulfuric acid storage tanks and the associated components, particularly prior to 1954 when there was no sump. Resulting in potentially high concentrations of heavy metals such as mercury and lead. In addition, during the process of filling the tanks or pumping it into the 108-D building, acid may have spilled into the soil elsewhere in the site footprint. Near the southern portion of the site boundary, sodium dichromate may have been released as it was being unloaded in the nearby car spot, which is included in the adjacent waste site 100-D-73.		

Site Code:	100-D-102	**Classification:**	Accepted
Site Names:	100-D-102, Suspect Effluent Leak Adjacent to 107-DR Basin	**ReClassification:**	
Site Type:	Unplanned Release	**Start Date:**	
Site Status:	Inactive	**End Date:**	
Site Description:	The site was an irregular shaped feature visible in a 1962 aerial photograph (10974-PHOTO). The surface of the site has been re-graded many times and is no longer discernible from the surrounding area.		

Waste Type: Process Effluent

Waste Description: Contaminants of potential concern (COPCs) include: Co-60, Cs-134, Cs-137, Eu-152, Eu-154, Eu-155, H-3, Pu-238, Pu-239, Pu-241, Sr-90, U-238, Am-241, Sr-90, arsenic, chromium, lead, and zinc and should be the same as those for the 107-D/DR Retention Basins. The waste is contaminated soil from an unplanned release of process effluent.

Site Code: 100-D-103 **Classification:** Accepted

Site Names: 100-D-103, Suspected Trench and French Drain from 116-D-8 Cask Pad **ReClassification:**

Site Type: French Drain **Start Date:**

Site Status: Inactive **End Date:**

Site Description: WCH investigation identified a surface feature resembling a trench, it is visible in a December 1949 aerial photograph running south from the 116-D-8 Cask Pad.

Site Code: 100-D-104 **Classification:** Accepted

Site Names: 100-D-104, Unplanned Release near 185-D Sodium Dichromate Storage Tank and Acid Neutralization French Drain **ReClassification:**

Site Type: Unplanned Release **Start Date:**

Site Status: Inactive **End Date:**

Site Description: This site consists of stained soil near the former sodium dichromate storage tank and acid french drain outside of building 185-D. The stain encompasses an area of 910 square meters (9,792 square feet). The site geometry was established by drawing an arbitrary polygon around an existing excavation to a depth of 6.0 m (19.6 ft) that contained stained soil with an elevated concentration of hexavalent chromium.

Site Code: 116-D-1A **Classification:** Accepted

Site Names: 116-D-1A, 105-D Storage Basin Trench #1 **ReClassification:** Interim Closed Out (3/5/2001)

Site Type: Trench **Start Date:** 1947

Site Status: Inactive **End Date:** 1952

Site Description: The site has been remediated and closed out.

Waste Type: Process Effluent

Waste Description: The site received contaminated water and sludge from 118-D-6 Fuel Storage Basin. Records also show approximately 1,000 kilograms (1.1 tons) of sodium dichromate was disposed in this trench.

Site Code: 116-D-1B **Classification:** Accepted

Site Names: 116-D-1B, 105-D Storage Basin Trench #2 **ReClassification:** Interim Closed Out (3/5/2001)

Site Type: Trench **Start Date:** 1953

Site Status:	Inactive	**End Date:**	1967
Site Description:	The site has been remediated and closed out.		
Waste Type:	Process Effluent		
Waste Description:	The site received contaminated water and sludge from 105-D Fuel Storage Basin and liquid waste from the decontamination of fuel spacers and reactor hardware. Records show approximately 700 kilograms (0.8 tons) of sodium dichromate, 2000 kilograms (2.2 tons) of sodium oxylate and 2000 kilograms (2.2 tons) of sodium sulfate were also disposed in this trench.		

Site Code:	116-D-2	**Classification:**	Accepted
Site Names:	116-D-2, 105-D Pluto Crib, 116-D-2A	**ReClassification:**	Interim Closed Out (10/23/2000
Site Type:	Crib	**Start Date:**	1950
Site Status:	Inactive	**End Date:**	1956
Site Description:	This site has been closed out. The crib was a 3 meter (10 feet) by 3 meter (10 feet) crib, 3 meters (10 feet) deep. The unit had been shored with railroad ties and filled with sand.		
Waste Type:	Process Effluent		
Waste Description:	The site received effluent water from isolated tubes containing ruptured fuel elements.		

Site Code:	116-D-3	**Classification:**	Accepted
Site Names:	116-D-3, 108-D Crib #1	**ReClassification:**	No Action (1/30/2003)
Site Type:	Crib	**Start Date:**	1951
Site Status:	Inactive	**End Date:**	1967
Site Description:	Based on excavations, the review of site drawings, and ground penetrating radar, it has been determined that the 116-D-3 Crib is a duplicate number for site 116-D-4.		
Waste Type:	Process Effluent		
Waste Description:	The site (a duplicate number for the 116-D-4 Crib) is a crib containing contaminated soil and rock. The site received low-level fission product wastes in contaminated wash water from the 108-D Shipping Cask Handling Facility.		

Site Code:	116-D-4	**Classification:**	Accepted
Site Names:	116-D-4, 108-D Crib #2	**ReClassification:**	Interim Closed Out (10/23/2000
Site Type:	Crib	**Start Date:**	1951
Site Status:	Inactive	**End Date:**	1967
Site Description:	This unit has been remediated and closed out.		

The site was a 2.4 by 2.4-meter (8 by 8-foot) crib, 5 meters (16 feet) deep.

Site 116-D-3 is an alias for this crib.

Waste Type: Process Effluent

Waste Description: The site was a crib containing contaminated soil and rock. The site received low-level fission product wastes from contaminated maintenance shops in the 108 buildings. Assuming that H-1-3091 represents the correct information, the crib received wash water from the 108-D Shipping Cask Handling Facility.

Site Code:	116-D-5	**Classification:**	Accepted
Site Names:	116-D-5, 1904-D Outfall Structure	**ReClassification:**	
Site Type:	Outfall	**Start Date:**	1944
Site Status:	Inactive	**End Date:**	1975

Site Description: The outfall structure was demolished and backfilled with soil in 1998. The outfall structure had been an open, reinforced, compartmentalized concrete outfall structure.

Waste Type: Construction Debris

Waste Description: This unit received reactor coolant water from the 107-D & 107-DR Retention Basins and waste water from the 100-D Water Support Facilities including 183-D and 190-D.

The contaminants of concern include C-14, Cs-137, Sr-90, U-235, -238, and Pu-239/240.

Site Code:	116-D-6	**Classification:**	Accepted
Site Names:	116-D-6, 105-D Cushion Corridor French Drain	**ReClassification:**	Interim Closed Out (11/8/2000)
Site Type:	French Drain	**Start Date:**	1953
Site Status:	Inactive	**End Date:**	1967

Site Description: This site has been remediated and closed out.

The waste site was a 1-meter (3.3-foot) diameter french drain, 1 meter (3.3 feet) deep covered by approximately 1 meter (3.3 feet) of gravel and soil.

Waste Type: Water

Waste Description: The site received domestic water from the changing room and water from the mask decontamination station. The site may have received chemical decontamination wastes and solvents.

Site Code:	116-D-7	**Classification:**	Accepted
Site Names:	116-D-7, 107-D Retention Basin, 107-D	**ReClassification:**	Interim Closed Out (8/15/2000)
Site Type:	Retention Basin	**Start Date:**	1944

Site Status:	Inactive	**End Date:**	1967
Site Description:	The unit was an open concrete basin with a vertical concrete baffle constructed lengthwise in the middle of the basin. The floor consisted of concrete slabs, with joints originally closed with neoprene water seals. The walls sloped from the floor to a point 3 meters (10 feet) above the floor level with the remaining wall (approximately 3.0 meters [10 feet]) being vertical. The sloping wall sections were 10 centimeters (4 inches), and the vertical walls were reinforced construction with a minimum thickness of 0.3 meters (1 foot) at the top and 1.75 meters (5.75 feet) at the bottom.		
Waste Type:	Process Effluent		
Waste Description:	This site retained cooling water effluent from the 105-D Reactor for radioactive decay and thermal cooling prior to release to the Columbia River. Total radionuclide inventories in the vicinity of the basin ranged from 5 curies to over 400 curies. Seventy percent of the total radionuclide inventory was contained within the soil adjacent to the unit. Approximately 10 curies had leached into the concrete floor and walls.		

Site Code:	116-D-9	**Classification:**	Accepted
Site Names:	116-D-9, 117-D Crib, 117-D Seal Pit Crib	**ReClassification:**	Interim Closed Out (3/19/2001)
Site Type:	Crib	**Start Date:**	1960
Site Status:	Inactive	**End Date:**	1967
Site Description:	This site has been remediated and closed out. The waste site and associated piping was excavated. Site remediation began in 1999 and ended in 2000. The site was a crib and pipeline filled with gravel and covered to grade with clean soil. The surface was covered with cobbles, and a large steel vent cap was located in the center.		
Waste Type:	Process Effluent		
Waste Description:	The site received drainage from the confinement system 117 Building seal pits.		

Site Code:	116-D-10	**Classification:**	Accepted
Site Names:	116-D-10, 105-D Fuel Storage Basin Cleanout Percolation Pit, 105-D Fuel Storage Discharge Ponds, 105-D Ponds	**ReClassification:**	
Site Type:	Pond	**Start Date:**	1984
Site Status:	Inactive	**End Date:**	1984
Site Description:	The unit consists of two open excavated pits with a crossover channel connecting them. The west excavation was 10.7 meters (35 feet) long, 6.7 meters (22 feet) wide, and 0.9 meters (3 feet) deep. The east excavation was 15.2 meters (50 feet) long, 7.3 meters (24 feet) wide, and 1.2 meters (4 feet) deep. Both pits have been back filled and graded to resemble the natural terrain.		
Waste Type:	Water		
Waste Description:	The unit received processed water from the 105-D Fuel Storage Basin. During the cleanout of this basin, the radiologically contaminated shielding water was processed through ion exchange		

columns. Before discharging the water to the unit, composite samples were taken to ensure that radionuclide concentrations were below release criteria in Table II of DOE Order 5480.1. No known hazardous substances were present in the water, however chemical analysis was not a standard practice during that period and there is no evidence that analyses were performed. It should be noted that water removed from the 1608-D is believed to be comparable to the storage basin water, and EP-TOX testing results for the 1608-D water were negative.

Site Code:	118-D-6	**Classification:**	Accepted
Site Names:	118-D-6, 105-D Reactor Building (See Subsites)	**ReClassification:**	
Site Type:	Reactor	**Start Date:**	1944
Site Status:	Inactive	**End Date:**	1967

Site Description: The unit consists of: 1) a reactor block, which includes the graphite moderator stack, biological and thermal shields, pressure tubes, and the safety and control systems; 2) Ancillary Support Areas, Below-Grade Structures and Underlying Soils the irradiated fuel storage basin; and 3) 118-D-6:3, Fuel Storage Basin and Underlying Soils and 4) 105-D Fuel Storage Basin Side Slope Soils.

Waste Type: Equipment

Waste Description: This unit contained an estimated 21,500 curies of radionuclides, 85,000 kilograms (94 tons) of lead, and 2.8 cubic meters (100 cubic feet) of asbestos. The primary source of contamination at the 105-D site was reactor coolant water and water in the FSB (118-D-6:3) that became contaminated through contact with irradiated and ruptured fuel elements and components from the reactor cooling system. The water was believed to have contaminated the concrete surfaces of the FSB. No documentation of basin water leakage into the underlying soils was discovered during the cleanup activities .

SubSites:

SubSite Code: 118-D-6:1

SubSite Name: 118-D-6:1, 105-D Reactor Core and ISS Project

Classification: Accepted

ReClassification:

Description: The safe storage enclosure (SSE) consists of the area within the shield walls, included the reactor block; the front-face work area; the elevator; the rear-face work area; and miscellaneous areas 113a, 115a, and 254. This part of the reactor building will remain in place to act as temporary storage for the reactor block. As much as was practical, all objects and surface contamination were removed. A new roof was added as part of the interim safe storage (ISS) effort. All doors were permanently sealed except for one door that remains locked and is welded shut. The only planned entrance to this structure is for surveillance and maintenance activities that occur approximately every 5 years.

The original footprint area of the 105-D Reactor Building was approximately 4,994 meters squared (53,750 square feet). The final ground-level footprint area of the safe storage enclosure (SSE) is 999 meters squared (10,750 square feet). The areas of the reactor building that have been removed to ERDF represent 80% of the original footprint of the reactor building.

SubSite Code: 118-D-6:2

SubSite Name: 118-D-6:2, 105-D Reactor Ancillary Support Areas, 105-D Below-Grade Structures and Underlying Soils

Classification: Accepted

ReClassification: Interim Closed Out

Description: The Cleanup Verification Package (CVP) for the 118-D-6:2, 105-D Reactor Ancillary Support Areas, Below-Grade Structures, and Underlying Soils; the 118-D-6:3, 105-D Reactor Fuel Storage Basin and Underlying Soils; and the 132-D-4, 105-D Reactor Exhaust Stack Foundation (CVP) demonstrated that removal action at the 105-D Reactor subsites 118-D-6:2, 118 D-6:3, and 132-D-4 has achieved the removal action objectives established in the applicable action memorandums and has achieved the corresponding RAGs established in the Removal Action Work Plan for 105-D and 105-H Building Interim Safe Storage Projects and Ancillary Buildings, the Sampling and Analysis Plan for Interim Closure of the 105-D and 105 H Reactor Below-Grade Structures and Underlying Soils (SAP), and the Remedial Design Report/Remedial Action Work Plan for the 100 Area (RDR/RAWP).

These areas were surveyed, and local contamination was removed in preparation for clean demolition. All structures in this zone were removed due to surface contamination being present. Sampling of underlying soils was not required because structures in this zone were not subjected to standing contaminated water and there was no mechanism for residual surface contamination to penetrate into the concrete and the underlying soil. The above- and below-grade structures were demolished and the demolition debris sent to ERDF. A section of 100 D-48:4 effluent pipeline remains buried under what was room 210. This section of pipeline will be considered separately from demolition zone 1 and deferred to the Remedial Action Project.

The 105-D Reactor subsites 118-D-6:2, 118-D-6:3, and 132-D-4 have been verified to be remediated in accordance with the applicable action memorandums and can be interim closed. The CVP does not demonstrate the acceptability of unrestricted access to deep zone soils (i.e., below 4.6 meters [15 feet]); therefore, institutional controls to prevent uncontrolled drilling or excavation into deep zone soils are required

SubSite Code: 118-D-6:3

SubSite Name: 118-D-6:3, 105-D Reactor Fuel Storage Basin and Underlying Soils, 100-D FSB

Classification: Accepted

ReClassification: Interim Closed Out

Description: The FSB water level was lowered upon closure of the reactor and further cleaned out during 1984. Ruptured fuel elements had caused the shielding water to become highly contaminated. The remaining water was processed and released to 116-D-10 pond. Then an asphalt emulsion was applied to the floors and walls of the basin to fix loose contamination. The remaining basin hardware, perfs, buckets, and sludge were packaged and disposed of as low-level radioactive waste in the 200 Area burial grounds.

During demolition, as documented in the CVP-2005-00003, this subsite, located on the east side of the original reactor building, was known as demolition zone 4. At ground level the zone consisted of the 400 FSB; the 411 wash pad; the 413, 413a, and 413b transfer bay areas; the 414a valve control room; and miscellaneous rooms 414 and 415. The areas were surveyed, and local contamination was removed in preparation for clean demolition. With the exception of the FSB walls and floor below 4.6 meters (15 feet), all structures in this zone were removed due to surface contamination being present. Sampling of underlying soils was

not required for structures in this zone. Structures other than the FSB were not subjected to standing contaminated water and had no mechanism for residual surface contamination to penetrate into the concrete and the underlying soil. The above- and below-grade nonwater-bearing structures in this zone were demolished and the demolition debris sent to ERDF.

It was determined in the Sampling and Analysis Plan for Interim Closure of the 105-D and 105-H Reactor Below-Grade Structures and Underlying Soils that the 105-D FSB would not be cored to sample the underlying soils because this FSB was not known to have leaked (water level variations were consistent with evaporation), coring was very difficult and potentially unsafe, and the soils beneath the 100-C and 105-DR FSBs were found to be clean. The 100-D Reactor Site Technical Baseline Report suggests that all of the FSBs had leaked. However, this statement is not supported by the process history of the 105-D FSB, and sampling of the underlying soils at the 105-C and 105-DR FSBs showed that they had not leaked. The FSB concrete floors from all of the previously decommissioned reactors were found to have various types of contamination that penetrated only a maximum of a few millimeters into the concrete. Sampling showed the contamination had not penetrated through the 0.3 to 0.6 meters (1 to 2 feet) of concrete in the FSB floors.

The CVP does not demonstrate the acceptability of unrestricted access to deep zone soils (i.e., below 4.6 meters [15 feet]); therefore, institutional controls to prevent uncontrolled drilling or excavation into deep zone soils are required

SubSite Code: 118-D-6:4

SubSite Name: 118-D-6:4, 105-D Fuel Storage Basin Side Slope Soils

Classification: Accepted

ReClassification:

Description: The FSB side slopes were located just outside of the remaining structure of the 105-D FSB on the east side of the original reactor building. An effluent pipeline was removed from along the east side of the FSB during a previous remedial action. The contamination from the pipeline was not fully remediated during that remedial action because of interferences with D&D activities and the potential to cause structural problems for the foundation of the reactor. Subsequent characterization by D&D identified a contamination plume in adjacent soil. The 105-D FSB side slopes were therefore deferred to the Remedial Action Project (Ecology and DOE RL 2003). The FSB side slopes were not addressed in the CVP-2005-00003.

The decontamination areas consisted of two pads that were located on the north and south sides of the reactor for the purpose of equipment decontamination during D&D. The two areas were considered together during variance and verification sampling. During field screening and sampling, the area of the north decontamination pad was found to be larger than addressed for the sample design. Also, the north decontamination pad area was adjacent to a remaining section of the 100-D-48:4 effluent pipeline beneath room 210 that could not be removed earlier due to ongoing D&D activities. Both the remaining effluent pipeline segment and the remaining area for the north decontamination pad were included in the 118-D-6:4 subsite and deferred to the Remedial Action Project for remediation and cleanup verification.

Site Code:	120-D-1	**Classification:**	Accepted
Site Names:	120-D-1, 100-D Ponds	**ReClassification:**	Closed Out (8/27/1999)
Site Type:	Pond	**Start Date:**	1977

Site Status:	Inactive	**End Date:**	1994
Site Description:	The site was modified in 1979 to form a two-compartment pond, one overflowing to the other. The north pond was a percolation pond and the south pond was a settling pond.		
Waste Type:	Process Effluent		
Waste Description:	This site received nonhazardous 183-D Sandfilter backwash, small quantities of filtered, chlorinated water from hydraulic test loops, and fuel discharge trampoline tests. The estimated flow rate was 1.7E+05 liters/day (45,000 gallons/day). Corrosive demineralizer recharge effluent from two sources was released at intervals of once every 2 to 3 years for one regenerate source and once every 6 years for the other. Sampling indicates the potential for mercury and polychlorinated biphenyl (PCB) contamination.		

Site Code:	120-D-2	**Classification:**	Accepted
Site Names:	120-D-2, 186-D Waste Acid Reservoir	**ReClassification:**	Interim Closed Out (7/28/2009)
Site Type:	Surface Impoundment	**Start Date:**	
Site Status:	Inactive	**End Date:**	1979
Site Description:	The waste site consisted only of the 186-D waste acid reservoir and associated soils. The unit was constructed of acid-proof brick, 3-ply waterproof membrane, vitrified pipe, #8 lead flashing, and gunnite. The sides of the reservoir were sloped 2:1 from 1.5 meters (5 feet) below grade level to the bottom. As of June 21, 1991 the site area was covered with gravel and annual weeds. No evidence remained on the surface of the building structure.		
Waste Type:	Chemicals		
Waste Description:	This unit was never used for waste acid storage. No records have been found documenting the disposal of waste of any kind in this facility. No written documentation has been found concerning the disposal of the lead flashing that was used in the construction of the waste acid reservoir; however, it is assumed that the lead flashing was disposed in-situ during the demolition of the 186-D Facility.		

Site Code:	126-D-1	**Classification:**	Accepted
Site Names:	126-D-1, 184-D Powerhouse Ash Pit, 188-D Ash Disposal Area, 100-D Ash Disposal Basin	**ReClassification:**	Rejected (6/25/1998)
Site Type:	Coal Ash Pit	**Start Date:**	1950
Site Status:	Inactive	**End Date:**	1960
Site Description:	The 126-D-1 site is a large ash disposal area. The site was originally a large excavated basin approximately 60 meters (200 feet) long, 60 meters (200 feet) wide, and 3 meters (10 feet) deep. The extent of the original basin obscured by ash piles.		
Waste Type:	Ash		
Waste Description:	This site received an unknown amount of coal ash that was sluiced to pits with raw river water from the 184-D Powerhouse. The ash has been determined by testing in accordance with WAC 173-303 to be nonextraction process (EP) toxic.		

Site Code:	126-D-2	**Classification:**	Accepted
Site Names:	126-D-2, 184-D Coal Pit, Inert Landfill	**ReClassification:**	Interim Closed Out (10/14/2010
Site Type:	Inert/Demolition Landfill	**Start Date:**	1943
Site Status:	Inactive	**End Date:**	1986

Site Description: The site is an excavated pit that was originally used to store coal for the 184-D Power House and later used as a demolition and inert waste landfill. This unit is full of debris. It has been covered with about 0.3 meters (1 foot) of pit run backfill material and graded to conform with the natural terrain. Numerous surface depressions are visible, indicating a potential cave-in hazard.

Waste Type: Demolition and Inert Waste

Waste Description: The unit contains demolition and inert waste from demolished facilities in and around 100-D. This includes debris from 184-D (including stacks), 108-D, released portions of the 115-D/DR, and 186-D. The site is suspected to contain some radioactively contaminated solid wastes. Potential contaminates include: Chromate, lead, mercury, undetermined organic and inorganic chemicals.

Waste Type: Chemicals

Waste Description: The site is known to contain paint cans and paint wastes, solvents, acids, dry chemicals, photo chemicals, and herbicide cans.

Waste Type: Asbestos (friable)

Waste Description: Asbestos containing waste has been disposed of at this site.

Site Code:	126-D-3	**Classification:**	Accepted
Site Names:	126-D-3, D Area Brine and Salt Dilution Pits, 184-D Salt Dissolving Pit and Brine Pump House	**ReClassification:**	Rejected (10/2/1997)
Site Type:	Sump	**Start Date:**	
Site Status:	Inactive	**End Date:**	

Site Description: The salt dissolving pits and brine pump pit were part of a single below-grade concrete structure that provided brine for the 184-D Powerhouse. The structure has been demolished and buried in situ. No evidence of the site remains at the surface.

The two salt dissolving pits each had inner dimensions of 4.3 meters (14 feet) long by 2.4 meters (8 feet) wide by 2.8 meters (9.25 feet) tall. They had a design high water line 2.4 meters (7.75 feet) from the pit bottom. An overflow slot connecting the two dissolving pits was located 0.3 meters (1 foot) above the high water line. The bottom of each pit was filled with a 12.7 centimeter (5 inch layer) of 1.3 to 2.6 centimeter (1/2 to 1 inch) gravel topped by a 17.8 centimeter (7 inch) layer of 0.3 to 0.6 centimeter (1/8 to 1/4 inch) gravel. The dissolving pits each had a 2.4 meter (8 foot) by 0.9 meter (3 feet) opening at the top for receiving salt. Each pit had a capacity of 23,600 kilograms (52,000 pounds) of salt.

The brine pump pit is located adjacent to the two salt dissolving pits. The pit was 3.3 meters (10.67 feet) long by 2.2 meters (7.33 feet) wide by 2.1 meters (7 feet) deep. It held two pumps and associated piping (all brass) for the brine system. The floor of the pump pit sloped toward a

46 by 46 by 46 centimeter (18 by 18 by 18 inch) sump in a corner.

Waste Type: Demolition and Inert Waste

Waste Description: The structure was demolished and buried in situ.

Site Code: 128-D-2 **Classification:** Accepted

Site Names: 128-D-2, 128-D-2 Burn Pit **ReClassification:**

Site Type: Burn Pit **Start Date:**

Site Status: Inactive **End Date:**

Site Description: The site is a large landfill area that shows evidence of surface burning and has no definite boundaries. The site is marked with signs of plant stress, depressions, and berms. Concrete and metallic debris exposed on the surface indicate the possibility that this site was also used as a solid waste landfill. The following were also noted during the March 31, 1999, visit: rigging equipment, bricks, and unidentified white powder that may be ash, and a north-south running trench. The site has been used as a disposal site for compacted tumbleweeds collected from area fences. Knapweed was noted during the March 1999, walkdown.

Waste Type: Misc. Trash and Debris

Waste Description: Some pieces of non-contaminated reactor hardware and graphite blocks were found at the site.

Site Code: 130-D-1 **Classification:** Accepted

Site Names: 130-D-1, 1716-D Gasoline Storage Tank, 1706-D Gasoline Storage Tank **ReClassification:**

Site Type: Storage Tank **Start Date:** 1944

Site Status: Inactive **End Date:** 1968

Site Description: The site appears as a cobble-covered field. The site had been a steel underground storage tank with a capacity of 15,140 liters (4000 gallons).

Waste Type: Oil

Waste Description: The unit was used for storage of leaded gasoline (product).

Site Code: 132-D-1 **Classification:** Accepted

Site Names: 132-D-1, 115-D/DR Gas Recirculating Facility **ReClassification:**

Site Type: Process Unit/Plant **Start Date:** 1944

Site Status: Inactive **End Date:** 1967

Site Description: Presently, the site looks like a gravel parking lot and is free of debris. The unit consisted of the building, the vacuum and pressure seal pit, and tunnels. The building was a single-story, reinforced concrete structure, 6.1 meters (20 feet) high, with a basement. At ground level, an operating gallery ran the length of the building and was flanked on either side by cells that contained the gas processing equipment. The cells, including walls, ceilings and floors, were

constructed of reinforced concrete slabs with composition surfaces. At right angles to the operating gallery and extending across the full width of the building's end, the fan room was constructed of concrete block and contained the ventilation fan, air compressor, office, locker room, etc. At each end of the basement, a tunnel containing the gas recirculating piping lead to the reactors. The tunnel to 105-D was 3.7 meters (12 feet) wide by 2 meters (6.5 feet) high. The tunnel to 105-DR was 1.5 meters (5 feet) wide. Connected to and part of the 105-D tunnel was the vacuum and pressure seal pit. The tunnel also formed part of the 1608-D Lift Station.

Waste Type: Demolition and Inert Waste

Waste Description: The resident radionuclides are tritium, carbon-14, cobalt-60, strontium-90, cesium-137, europium-152, and plutonium-239.

Site Code:	132-D-2	**Classification:**	Accepted
Site Names:	132-D-2, 117-D Filter Building	**ReClassification:**	Interim Closed Out (5/9/2006)
Site Type:	Process Unit/Plant	**Start Date:**	1961
Site Status:	Inactive	**End Date:**	1967

Site Description: The building has been remediated and interim closed out.

Included in this site were the 117-D Building, the intake ventilation duct from the 105-D Reactor Building, and the exhaust ventilation ducts to the 116-D Reactor Exhaust Stack. The stack housed blowers and particulate filters used to treat the ventilation exhausted from the 105-D Reactor Building. The building and ducts were demolished in place and the site now resembles a gravel parking lot.

Waste Type: Demolition and Inert Waste

Waste Description: The site contained radiological contamination from 105-D Reactor ventilation exhaust. Total radionuclide inventory in the 117-D building was estimated to be 3.9E-03 curies. The radionuclides comprising this figure were tritium, carbon-14, cobalt-60, strontium-90, cesium-137, europium-152, and plutonium-239.

Site Code:	132-D-3	**Classification:**	Accepted
Site Names:	132-D-3, 1608-D Waste Water Pumping Station, 1608-D Effluent Pumping Station	**ReClassification:**	Interim Closed Out (5/9/2006)
Site Type:	Pump Station	**Start Date:**	1944
Site Status:	Inactive	**End Date:**	1965

Site Description: The site consisted of the effluent pumping station facility which was decommissioned and demolished in 1986. The area was backfilled to grade and gravel added, it now resembles a gravel parking lot. As documented in the Remaining Sites Verification package RSVP-2005-033, the site meets the objectives for interim closure.

Prior to decommissioning, the structure extended 1.2 meters (4 feet) above grade and 9.8 meters (32 feet) below grade. The walls and floor were constructed of reinforced concrete and the roof was constructed of a wood frame with composition surface. The facility consisted of an accumulation sump, which supplied three separate sumps.

Waste Type: Process Effluent

Waste Type: Process Effluent

Waste Description: This unit received water from reactor building drains containing trace amounts of low-level radionuclides and decontamination chemicals. Radionuclides were primarily miscellaneous fission and activation products. The decontamination chemicals consisted of sodium fluoride, oxalic acid, and citric acid.

Waste Type: Demolition and Inert Waste

Waste Description:

Site Code: 132-D-4 **Classification:** Accepted

Site Names: 132-D-4, 105-D Reactor Exhaust Stack, 116-D Reactor Exhaust Stack **ReClassification:** Interim Closed Out (7/27/2005)

Site Type: Stack **Start Date:** 1944

Site Status: Inactive **End Date:** 1967

Site Description: The site has been remediated and interim closed out.

Waste Type: Demolition and Inert Waste

Waste Description: This unit was used to exhaust confinement air that originated from the work areas in the 105-D Reactor Building. The interior of the stack contains an unknown quantity of low-level radioactive materials.

Site Code: 1607-D2 **Classification:** Accepted

Site Names: 1607-D2, 1607-D2 Septic Tank and Associated Drain Fields, 124-D-2, 1607-D2 Sanitary Sewer System, 1607-D2 Septic Tank (See Subsites) **ReClassification:**

Site Type: Septic Tank **Start Date:** 1944

Site Status: Active **End Date:** 1996

Site Description: The 1607-D2 Septic System has been divided into five sub-sites: The 1607-D2:1 Abandoned Tile Field; 1607-D2:2 Replacement Tile Field, 1607-D2:3 Septic Pipelines, 1607-D2:4 Septic Tank, and 1607-D2:5 Inlet Pipe to Replacement System Tile Field. This site was broken into sub-sites to allow for close out of each part as remediation progressed in the area.

Waste Type: Sanitary Sewage

Waste Description: This unit received sanitary waste from office, maintenance services, and process water pumping buildings (190-DA, 189-D, 185-D, 182-D, 183-D, 170-D, and 105-D). The flow rate to this unit was estimated at 4,640 liters/day (1,225 gallons/day). There were several clay brick access manholes associated with this septic system located throughout the 100-D Area. Potential contaminants include Eu-152, U-235, U-238, Cs-137, C0-60, chromium, mercury and lead.

SubSites:

SubSite Code: 1607-D2:1

SubSite Name: 1607-D2:1, Original 1607-D2 Tile Field, Eastern 1607-D2 Tile Field

Classification: Accepted

ReClassification: Interim Closed Out

Description: The 1607-D2:1 Abandoned Tile Field is a sub-site associated with the 100-D Area sanitary sewage system. The tile field consisted of a clay pipe drain field positioned approximately 1 to 2 meters (3.3 to 6.6 feet) below surrounding grade. A thick layer of aggregate and native sandy gravel soils were placed around the clay pipes. The 1607-D2:1 site was created in 1944, and sewage liquid from the 553-person-capacity 1607-D2 septic tank discharged to the tile field from 1944 to 1950. The septic tank was designed to capture the solids, and decant liquid effluent which was transported to the tile field. Solids and sludge were retained in the 91,500-liter (24,160-gallon) septic tank (the septic tank is subsite 1607-D2:4).

In 1950 the tile field was partially demolished for the construction of the 116-DR-9 Liquid Effluent Retention Basin, and a replacement tile field (subsite 1607-D2:2) was constructed north of the retention basins. The name "abandoned tile field" was assigned to the infrastructure remaining and adjacent to the 116-DR-9 retention basin. The approximate area of the abandoned tile field sub-site is approximately 1,203 square meters (12,949 square feet). The septic pipelines for this system are subsite 1607-D2:3.

Part of the original tile field was removed during the construction of the retention basin. In December 1997 and January 1998, the remaining tiles of the eastern tile field (subsite 1607-D2:1) were removed and disposed of in the Environmental Restoration Disposal Facility along with the sludge trenches (100-D-4 and 100-D-22).

Excavation of the 1607-D2:1 site began on January 8, 1998, by removing the overburden materials, contaminated soil, and the engineered structure (i.e., clay tiles and aggregate). This first excavation effort removed approximately the top 2 meters (6.6 feet) of soil. All overburden material was found to be contaminated based on field screening results and was disposed at the ERDF with other contaminated material. Contamination was encountered at the base of the first excavation (i.e., below the engineered structure elevation) based on field screening results. A second excavation effort was initiated on January 9, 1998, and was completed on February 4, 1998. The site was judged to be clean based on field screening results. Cleanup verification sampling was initiated at the final excavation elevation of 131.6 meters (431.8 feet).

Based on the sample results from investigation of the 1607-D2 septic tank contents and the immediately adjacent 107-D1 Sludge Pit, the waste site contaminants of concern (COCs) included the following: europium-152, uranium-235, uranium-238, hexavalent chromium, lead, mercury, bis (2-ethylhexyl) phthalate, and polychlorinated biphenyls (PCBs).

During excavation of the overburden materials, field screening was used to distinguish between potentially clean materials and contaminated materials for disposal at the ERDF. The field screening results indicated that all removed overburden material did not meet direct exposure RAGs. The overburden material was disposed of at the ERDF.

At the completion of the remedial action, the area of the excavation was approximately 1,203 square meters (12,949 square feet) at a depth of 3.4 meters (11 feet), and approximately 10,040 metric tons (11,064 tons) of material from the site were disposed at the ERDF. The excavation will be backfilled in the near future with clean fill materials to the reference grade of El. 135 meters (443 feet). Clean backfill will be taken from Borrow Pit 21, which is located due south of the 1607-D2:1 site. The material in the borrow pit has been surveyed in accordance with the SAP and is appropriate for use as backfill.

Institutional control (IC) information has been revised as directed by the U. S. DOE letter, 05-AMRC-0078, 1/4/05, following a review of the Institutional Controls (ICs) in the WIDS. For some sites, including this one, both the CVP/reclassification forms and WIDS had indicated that IC restrictions were needed. However, these sites were remediated only with the more restrictive shallow zone criteria; deep zone criteria were not used. Therefore, no institutional controls to prevent uncontrolled drilling or excavation into the deep zone (i.e., below 4.6 m [15 feet]) are required.

SubSite Code: 1607-D2:2

SubSite Name: 1607-D2:2, Replacement 1607-D2 Tile Field, Northern Tile Field

Classification: Accepted

ReClassification: Interim Closed Out

Description: The cleanup verification package (CVP-2009-00006) has documented that the 1607-D2:2 site has achieved the remedial action objectives (RAOs) and corresponding remedial action goals (RAGs) as established in the Interim Action Record of Decision for the (ROD) (EPA, 1999) and the Remedial Design Report/Remedial Action Work Plan for the 100 Area (RDR/RAWP) (DOE/RL-96-17, Rev. 6). The subsite was also included in the Explanation of Significant Differences for the Remaining Sites ROD (EPA 2009).

This drain field replaced the original drain field in 1950 when the 116-DR-9 Retention Basin was built partially over the top of the original drain field. The replacement drain Field serviced buildings in the 100-D Area until 1996 when a new underground septic system was installed to support facilities associated with the 100-D waste sites remediation. Buildings serviced by the replacement drain field included the 189-0 Storage Yard and Mechanical Development Laboratory, 185-D Thermal-Hydraulics Laboratory, 182-D Reservoir and Pump House, 183-D Water Filter Plant, 1700-D Administration and Services Building, and the 105-D Reactor Building.

Remedial action at the subsite began on April 7, 2008, and concluded on April 23, 2008 with approximately 3,471 bank cubic meters of material removed and disposed to ERDF. The excavation was approximately 100 m (330 ft) long, 60 m (200 ft) wide, and ranges from 1.8 m (6 ft) to 3.1 m (10ft) deep.

During remediation, the inlet pipeline to the drain field was located in the sidewall of the excavation at Washington State Plane Coordinates N 151445, E 573808. A review of the excavation footprint for the 1607-D2:3 subsite (CVP-2000-00004) indicated that a portion of the pipeline north of the perimeter road had not been removed. It was also observed that the active 100-D Area Pump-and-Treat Project pipelines run directly over the ground surface in this location. Therefore, due to the proximity of the pump-and-treat pipelines, this remaining pipeline has been administratively identified as the 1607 -D2:5 subsite and will be remediated at a future date.

A geophysical survey conducted in February 2008 to locate electrical utilities in the vicinity of the 1607-D2:2 Replacement Drain Field, identified surface electrical lines from a nearby pump-and-treat operation. Piping and electrical lines from the pump-and treat operation precluded the excavation of a section of the inlet piping to the replacement drain field. This small section was administratively placed in to the 1607-D2:5 subsite to ensure the section of pipe will be remediated at a later date. Other than the surface electrical lines, the geophysical investigation did not find anything in the data to indicate other structures or hazards at the 1607-D2:2 subsite.

Final cleanup verification samples were initially collected between October 7, 2008 and

December 16, 2008. A laboratory error resulted in rejection of most of the mercury data. To mitigate this, the project recollected samples on May 4, 2009 for mercury only. The initial mercury data set is not used for closeout calculations or decisions. Both the initial data set and the replacement mercury data set are presented within the data tables found attached to the 95% UCL calculation in Appendix A of the CVP. The laboratory-reported data results for all constituents were stored in the Environmental Restoration (ENRE) project-specific database prior to archival in the Hanford Environmental Information System (HEIS) and were presented as part of the 95% UCL calculation in Appendix A of the CVP.

The results of verification sampling show that residual contaminant concentrations do not preclude any future uses (as bounded by the rural-residential scenario) and allow for unrestricted use of shallow zone soils (i.e., surface to 4.6 m [15 ft] deep). The results also demonstrate that residual contaminant concentrations are protective of groundwater and the Columbia River.

SubSite Code: 1607-D2:3

SubSite Name: 1607-D2:3, 1607-D2 Septic Pipelines

Classification: Accepted

ReClassification: Interim Closed Out

Description: This section of the sanitary sewer pipelines runs from Manhole S-250, through the 1607-D2 Septic Tank, and from there to the D Area North Perimeter Road. It has been removed.

The final COCs for the 1607-D2 septic pipelines are: cesium-137, cobalt-60, europium-152, total chromium, hexavalent chromium, mercury, and lead.

Remedial action at the 1607-D2:3 pipeline site began on August 20, 1999. Excavation of the site involved removing the overburden materials, the contaminated structure, and the underlying contaminated soil. Based on field screening, overburden materials identified as potentially clean were placed in stockpiles for potential use as backfill. Materials that were found to be contaminated were disposed of at the ERDF. On August 30, 1999, the excavation reached the design limit at El. 131 meters (430 feet).

At the completion of remedial action and removal of the engineered structure, the shallow zone excavation was approximately 1,780 square meters (19,200 square feet) in area with a maximum depth of approximately 4.6 meters (15 feet). The overburden area was approximately 1,850 square meters (19,900 square feet). Cleanup verification sampling was conducted on December 9, 1999. The excavation has been backfilled to the reference grade of El. 136 meters (445 feet). Backfill was taken from the clean stockpile and/or from other sources of clean material surveyed in accordance with the SAP and that are appropriate for use as backfill.

Institutional control (IC) information has been revised as directed by the U. S. DOE letter, 05-AMRC-0078, 1/4/05, following a review of the Institutional Controls (ICs) in the WIDS. For some sites, including this one, both the CVP/reclassification forms and WIDS had indicated that IC restrictions were needed. However, these sites were remediated only with the more restrictive shallow zone criteria; deep zone criteria were not used. Therefore, no institutional controls to prevent uncontrolled drilling or excavation into the deep zone (i.e., below 4.6 m [15 feet]) are required.

SubSite Code: 1607-D2:4

SubSite Name: 1607-D2:4, 1607-D2 Septic Tank

Classification: Accepted

ReClassification: Interim Closed Out

Description: Excavation of the 1607-D2:4 Septic Tank began on July 17, 1998, by removing the soil surrounding the septic tank and breaking in place the cover and sides of the tank prior to drying and sampling sludge. The tank cover, side walls, and excavated soil were contaminated and disposed at ERDF. The sludge was tested for free liquids using the paint filter test. The second phase of the excavation continued in late October 1998, with additional soil being disposed of at ERDF. Approximately 2,041 metric tons (2,250 tons) of material from the site were disposed at ERDF.

Based on the sample results from investigation of the 1607-D2 septic tank contents, the waste site contaminants of concern are europium-152, total chromium, lead, mercury, and bis (2-ethylhexyl) phthalate.

Institutional control (IC) information has been revised as directed by the U. S. DOE letter, 05-AMRC-0078, 1/4/05, following a review of the Institutional Controls (ICs) in the WIDS. For some sites, including this one, WIDS had shown IC restrictions but the sites were remediated to shallow zone criteria so that no ICs were required. The ICs for this site have been revised accordingly.

SubSite Code: 1607-D2:5

SubSite Name: 1607-D2:5, 1607-D2 Inlet Pipe to Replacement System Tile Field

Classification: Accepted

ReClassification:

Description: This subsite consists of approximately 14 meters (46 feet) of sanitary sewer pipeline extending from a manhole to the replacement tile field. The pipeline was used to pass treated septage to the tile field. The site runs from just past a manhole, and from there to the D Area North Perimeter Road and into the replacement tile field (1607-D2:2).

This site was related to the 1607-D2 Replacement Tile Field (Subsite 1607-D2:2), the 1607-D2 Septic Tank (Subsite 1607-D2:4), and the 1707-D2 Septic Pipelines (Subsite 1607-D2:3).

Site Code:	1607-D4	**Classification:**	Accepted
Site Names:	1607-D4, 1607-D4 Septic Tank and Associated Drain Field, 124-D-4, 1607-D4 Sanitary Sewer System, 1607-D4 Septic Tank	**ReClassification:**	Interim Closed Out (2/23/2006)
Site Type:	Septic Tank	**Start Date:**	1944
Site Status:	Inactive	**End Date:**	1968

Site Description: The site has been remediated and interim closed out. The site consisted of a small septic tank and drain field.

The unit was a septic tank and tile field. The tank was 2.5 meters (8 feet 4 inches) deep, constructed of reinforced concrete, and had a 6-person capacity [130 liters (35 gallons) per capita] with an average detention period of 24 hours. The walls were 20 centimeters (8 inches) thick, and the floor was 15 centimeters (6 inches) thick. The tile field was constructed of 10-centimeter (4-inch) vitrified pipe, concrete pipe, or drain tile with a minimum of 2.4 meters (8 feet) per capita. The laterals were open jointed and spaced 2.4 meters (8 feet) apart.

Waste Type: Sanitary Sewage

Waste Description: This unit received an unknown amount of sanitary waste from the 115-D Gas Recirculation Building.

Site Code: 1607-D5 **Classification:** Accepted

Site Names: 1607-D5, 1607-D5 Septic Tank and Associated Drain Field, 124-D-5, 1607-D5 Sanitary Sewer System, 1607-D5 Septic Tank **ReClassification:**

Site Type: Septic Tank **Start Date:** 1944

Site Status: Inactive **End Date:**

Site Description: The site resembles a gravel covered parking area. There are no signs designating the septic and tile field areas.

Waste Type: Sanitary Sewage

Waste Description: This unit received sanitary waste from the 181-D Pumphouse. The flow rate to this unit was estimated at 35 gallons per day (130 Liters per day).

Site Code: 116-DR-1&2 **Classification:** Accepted

Site Names: 116-DR-1&2, 107-DR Liquid Waste Disposal Trench #1, 107-DR Liquid Waste Disposal Trench #2, 116-DR-1, 116-DR-2, Emergency Crib Trench **ReClassification:** Interim Closed Out (9/26/2000)

Site Type: Trench **Start Date:** 1950

Site Status: Inactive **End Date:** 1967

Site Description: The site has been remediated and closed out. It is no longer marked or posted.

The site was constructed of two trenches that were later joined together to form a single trench.

Waste Type: Water

Waste Description: The site received effluent from the 107-D and 107-DR Retention Basins when cooling water was contaminated due to ruptured fuel elements. In addition to the 4.0E+07 liters (1.06E+07 gallons) of effluent from ruptured fuel elements listed in PNL-6456 (Stenner et al), the site also received 3.87E+08 liters (1.02E+08 gallons) of cooling effluent daily during the four month test.

Waste site COCs identified through process knowledge are listed in the 100 Area Remedial Action Sampling and Analysis Plan (DOE-RL 1998a). The COCs identified for this site are: americium-241, cobalt-60, cesium-137, europium-152, europium-154, europium-155, nickel-63, plutonium-238, plutonium-239/240, strontium-90, and hexavalent chromium.

Site Code: 116-DR-5 **Classification:** Accepted

Site Names: 116-DR-5, 1904-DR Outfall Structure, **ReClassification:**

	1904-DR		
Site Type:	Outfall	**Start Date:**	1956
Site Status:	Inactive	**End Date:**	1967
Site Description:	The site consists of an open, reinforced, compartmentalized concrete outfall structure that routinely discharged effluent to the Columbia River via the river effluent pipelines (100-D-60). When the river pipelines were blocked, damaged or undergoing maintenance, the flow was diverted to a concrete overflow spillway (flume) (100-D-66).		
Waste Type:	Construction Debris		
Waste Description:	This unit received reactor coolant from the 107-D and 107-DR Retention Basins. The contaminants of concern include C-14, Cs-137, Sr-90, U-235, -238, and Pu-239/240.		

Site Code:	116-DR-9	**Classification:**	Accepted
Site Names:	116-DR-9, 107-DR Retention Basin, 107-DR	**ReClassification:**	Interim Closed Out (1/6/2000)
Site Type:	Retention Basin	**Start Date:**	1950
Site Status:	Inactive	**End Date:**	1967
Site Description:	This site has been remediated and closed out.		
Waste Type:	Process Effluent		
Waste Description:	This site received cooling water effluent from the 105-DR Reactor for radioactive decay and thermal cooling prior to release to the Columbia River. Total radionuclide inventories in the vicinity of the basin ranged from 5 curies to over 400 curies. Seventy percent of the total radionuclide inventory is contained within the soil adjacent to the unit. Approximately 10 curies have leached into the concrete floor and walls. The basin was known to have leaked on several occasions.		

Site Code:	628-3	**Classification:**	Accepted
Site Names:	628-3, 628-3 Burn Pit	**ReClassification:**	
Site Type:	Burn Pit	**Start Date:**	
Site Status:	Inactive	**End Date:**	
Site Description:	The site is roughly oval. The center is distinguished by a 1.2-meter (4-foot) depression. The depression shows signs of severe plant stress and soil discoloration. The depression, as well as the area around it, is littered with debris. It appears that at one time cat tractors bulldozed some of the surrounding soil.		
Waste Type:	Misc. Trash and Debris		
Waste Description:	Debris, consisting mostly of burnt wood, nails, metal pipes, rebar, and glass, is scattered over the area. In some spots, the site also contains what looks like friable and nonfriable asbestos. The site could not definitely be found in 1992 surveys of the area.		

Site Code:	UPR-100-D-1	**Classification:**	Accepted
Site Names:	UPR-100-D-1, Oil Soaked Soil	**ReClassification:**	No Action (4/13/2005)
Site Type:	Unplanned Release	**Start Date:**	
Site Status:	Inactive	**End Date:**	
Site Description:	The site was an unplanned release that appeared as a small depression surrounded by oil contaminated soil. During the March 1999 visit, a buried pipe was observed to the south of the stained soil.		
Waste Type:	Oil		
Waste Description:	The source of the oil could not be determined. However, the volume appeared to be small.		

Site Code:	UPR-100-D-2	**Classification:**	Accepted
Site Names:	UPR-100-D-2, Effluent Line Leak #1	**ReClassification:**	Interim Closed Out (9/26/2000)
Site Type:	Unplanned Release	**Start Date:**	1951
Site Status:	Inactive	**End Date:**	
Site Description:	This release was remediated with the source pipelines (100-D-48 and 100-D-49) and closed out on September 26, 2000.		
Waste Type:	Water		
Waste Description:	The site received radioactively contaminated water from the 107-D/DR Retention Basins.		

Site Code:	UPR-100-D-3	**Classification:**	Accepted
Site Names:	UPR-100-D-3, Effluent Line Leak #3	**ReClassification:**	Interim Closed Out (9/26/2000)
Site Type:	Unplanned Release	**Start Date:**	1951
Site Status:	Inactive	**End Date:**	
Site Description:	This site was remediated with the source pipelines and closed out on September 26, 2000,		
Waste Type:	Water		
Waste Description:	The site was soaked with radioactively contaminated reactor cooling water from the 107-DR Basin.		

Site Code:	UPR-100-D-4	**Classification:**	Accepted
Site Names:	UPR-100-D-4, Unplanned Release: 107-D Basin Leaks	**ReClassification:**	Interim Closed Out (3/26/2001)
Site Type:	Unplanned Release	**Start Date:**	1950
Site Status:	Inactive	**End Date:**	
Site Description:	The site was on the north side of the 107-D Basin, between the basin and the river.		

Waste Type:	Water
Waste Description:	The site was soaked with radioactively contaminated reactor cooling water effluent.

Site Code:	UPR-100-D-5	**Classification:**	Accepted
Site Names:	UPR-100-D-5, Effluent Line Leak #4	**ReClassification:**	No Action (10/14/2010)
Site Type:	Unplanned Release	**Start Date:**	1951
Site Status:	Inactive	**End Date:**	
Site Description:	In 1951, the area was marked with a rope fence and posted as a radiation area. Today the area can not be separately distinguished in the gravel retention basin area.		

Waste Type:	Water
Waste Description:	The release consisted of radioactively contaminated effluent from reactor cooling water. Pipeline leaks contaminated the soil around the effluent lines. Potential contaminants include Co-60, Cs-134, Cs-137, Eu-152,154,155; H-3, Pu-238, 239, 240; Am-241, Sr-90 and U-235.

100-DR-2

Site Code:	100-D-11	**Classification:**	Not Accepted (8/27/1997)
Site Names:	100-D-11, Temporary Garage and Gasoline Dispensing Station, Temporary Garage TC-21	**ReClassification:**	
Site Type:	Unplanned Release	**Start Date:**	
Site Status:	Inactive	**End Date:**	1950
Site Description:			
Waste Type:	Oil		
Waste Description:	This site has the potential for soil contamination from gasoline, oil, and engine coolant.		

Site Code:	100-D-12	**Classification:**	Accepted
Site Names:	100-D-12, Sodium Dichromate/Acid Railcar and Truck Unload Station and Associated French Drain, Undocumented Liquid Waste Site	**ReClassification:**	Interim Closed Out (10/23/2000
Site Type:	Pump Station	**Start Date:**	
Site Status:	Inactive	**End Date:**	
Site Description:	The site has been remediated and was interim closed out on October 23, 2000. It is no longer marked or posted. An underground line allowed solutions to be pumped to storage tanks. Before remediation, the site appeared as a small concrete pad with an adjacent 0.9 meters (3 feet) diameter concrete pipe french drain that supported the flushing and draining of lines that were connected to railroad tank cars.		
Waste Type:	Chemical Release		
Waste Description:	Wastes consisted of sodium dichromate and sulfuric acid.		

Site Code:	100-D-13	**Classification:**	Accepted
Site Names:	100-D-13, Unnumbered Septic System A, Septic Tank D-13, 100DR Area Sewage Disposal Unit, 124-DR-3, 1607-DR3	**ReClassification:**	
Site Type:	Septic Tank	**Start Date:**	1947
Site Status:	Inactive	**End Date:**	1949
Site Description:	The site is a septic system installed for use during the construction of the 105-DR Reactor. The system consisted of an IMHOFF tank, a chlorination house, a dosing tank, a filter bed, and associated piping. Most of the system remains in place, except for the chlorination house which has been removed. The septic tank is surrounded by a steel pipe fence. The filter bed is distinguishable as a rock-filled depression with distribution piping visible on the surface.		

The IMHOFF tank is a reinforced concrete structure with overall dimensions of 7.9 meters (25.9 feet) long, 3.8 meters (12.3 feet) wide, and 7.3 meters (24 feet) deep. The tank is divided lengthwise into three equally sized chambers. A single 15-centimeter (6-inch) pipe passes through the bottom of the partitions that separate the chambers. An influent flume connected to the first chamber controls and distributes flow from the incoming 30-centimeter (12-inch) line. An effluent flume connected to the third chamber controls flow into the 20-centimeter (8-inch) discharge line. A small line from a nearby chlorination house entered at the effluent flume and chlorinated the waste prior to discharge from the tank.

The dosing tank is connected to the IMHOFF tank by the 20-centimeter (8-inch) discharge line. The dosing tank is constructed of reinforced concrete. It has surface dimensions of 3.1 meters (10.25 feet) long by 1.7 meters (5.67 feet) wide. It controlled the flow of waste into the adjacent filter bed.

The filter bed is a 3.0-meter (10-foot) deep excavation measuring 21.3 meters (70 feet) by 21.3 meters (70 feet) at the surface and 12.2 meters (40 feet) by 12.2 meters (40 feet) at the base. The excavation was filled with 2.5 to 5-centimeter (1 to 2-inch) gravel. A main discharge line with six laterals (three on each side) lies on top of the gravel fill. Sprinkler heads that were tapped into the laterals distributed the treated sewage across the surface of the filter bed.

Waste Type: Sanitary Sewage

Waste Description: The tank received sanitary waste from temporary construction facilities at 105-DR. The 100-D Area Technical Baseline Report indicates that the tank also received overflow from the high tanks (water towers) at 105-DR, but no drawings could be found to verify this. The tank may have also received waste from the 105-DR Reactor (see Site Comment), so radioactive contamination may be present.

Site Code: 100-D-14 **Classification:** Accepted

Site Names: 100-D-14, Unnumbered Septic Tank #2, Unnumbered Septic System (b) **ReClassification:**

Site Type: Septic Tank **Start Date:**

Site Status: Inactive **End Date:**

Site Description: The site appears as a vegetation-covered field. A small depression may indicate the presence of the tank. A 10-centimeter (4-inch) cement pipe is likely to be a vent pipe to the drain field. The site is adjacent to a small soil pile.

Waste Type: Sanitary Sewage

Waste Description: The unit received sanitary wastes.

Site Code: 100-D-15 **Classification:** Accepted

Site Names: 100-D-15, Debris North of 100-D Area Perimeter Road and Debris South of 100-D Perimeter Road Within 100-D-55, Gravel Pit #2, Pit 21 **ReClassification:** Interim Closed Out (9/16/2010)

Site Type: Dumping Area **Start Date:**

Site Status: Inactive **End Date:**

Site Description: The site consists of two separate areas containing debris. The northern pit has been mostly backfilled with construction-type debris. The southern pit (inside Gravel Pit 21) has been partially backfilled and contoured.

Waste Type: Construction Debris

Waste Description: The southern pit contains construction debris including concrete, metal, asphalt, and other debris. Asbestos may be present. The exact contents of the debris are unknown. In August 1994, Kaiser Engineers Hanford (KEH) removed sediments from the 182-D River Water Basins and deposited the material in the east end of the pit over part of the existing waste site. This disposal option was chosen rather than the demolition landfill option because the sediment did not meet the demolition landfill acceptance criteria. In a September 1997 memo, it was determined that the material classified as "clean soils or clean dredge soils" as defined in Washington Administrative Code (WAC) 173-304 definition that "Clean soils or clean dredge soils" means soils which are not dangerous waste or problem wastes. This classification excludes material from regulation and requires no specific management or disposal requirements. Therefore, there is no requirement to dispose of the material in any type of permitted landfill.

Waste Type: Barrels/Drums/Buckets/Cans

Waste Description: The northern pit is assumed to be the older of the two pits. The pit has been reported to have been used as a disposal site for empty cans collected from army sites located northeast of the 100-D Area. Army wastes could include oil cans, solvent cans, and other miscellaneous solid wastes. Asbestos may be present. The exact contents of the debris is unknown.

Site Code: 100-D-17 **Classification:** Accepted

Site Names: 100-D-17, Burn Pit, Undocumented Solid Waste Site **ReClassification:** Rejected (8/27/1997)

Site Type: Burn Pit **Start Date:**

Site Status: Inactive **End Date:**

Site Description: The site is a burn pit that is visible in 1948 photos (#901 and #922). The site now appears as a large, vegetation covered field. There are no features that clearly identify the site.

Waste Type: Construction Debris

Waste Description: The site likely contains burned construction debris.

Site Code: 100-D-23 **Classification:** Accepted

Site Names: 100-D-23, 119-DR Sample Building Drywell **ReClassification:** Interim Closed Out (3/4/2004)

Site Type: French Drain **Start Date:** 1959

Site Status: Inactive **End Date:**

Site Description: The site has been remediated and interim closed out. The site was a drywell that received drainage from a floor drain in the 119-DR Sample Building.

Waste Type: Process Effluent

Waste Description: The drain received effluent from the building's evaporative cooler. It is likely that the drain also received sample waste and janitorial waste since the building had no other drains or connections to the process sewer system.

Site Code: 100-D-27 **Classification:** Accepted

Site Names: 100-D-27, 151-D Substation UPR, A-2 Substation Transformer #A401C Leak **ReClassification:** Closed Out (8/4/2005)

Site Type: Unplanned Release **Start Date:**

Site Status: Inactive **End Date:**

Site Description: The site has been reclassified to Closed Out. The site consisted of an unplanned release within the 151-D Substation.

Waste Type: Oil

Waste Description: The release was less than 100 gallons (380 L) of non-PCB mineral oil. According to a transformer inventory, oil in the #A401C transformer contains 42.0 parts per million PCBs.

Site Code: 100-D-28 **Classification:** Accepted

Site Names: 100-D-28, 190-DR Building Septic System (See Subsites) **ReClassification:**

Site Type: Septic Tank **Start Date:**

Site Status: Inactive **End Date:**

Site Description: The site consists of two septic systems, the original septic and the replacement. See the subsites for more detail.

Waste Type: Sanitary Sewage

Waste Description: The system received sanitary wastes.

SubSites:

SubSite Code: 100-D-28:1

SubSite Name: 100-D-28:1, Replacement Septic System

Classification: Accepted

ReClassification:

Description: The 100-D-28:1 site consists of a septic tank and drain field located approximately 25-meters (82-feet) southwest of the 190-DR Building. The septic system includes a 2,730 liters (720-gallons) steel tank and a vitrified clay pipe drain field due west of the septic tank used in association with the 190-DR Building.

The 190-DR Annex constructed in 1955 added approximately 21.3 m (70 ft) to the east side of the 190-DR Building. The 190-DR Annex is approximately 3 m (10 ft) below grade. Photographs from 1955 (see attachment) show the depth and amount of disturbance for the excavation of the annex. It does not appear that this septic tank and tile field could have survived the construction of the 190-DR Annex. Likely a new septic system (100-D-28:1)

was installed per drawing H-9923 southwest of the 190-DR as a replacement system.

SubSite Code: 100-D-28:2

SubSite Name: 100-D-28:2, Original Septic System

Classification: Accepted

ReClassification: Rejected

Description: Reclass number 2005-015,
The 100-D-28:2 site consisted of a septic tank and drain field located approximately 15.2-meters (50-feet) from the northeast side of the original 190-DR Pump House. The tank capacity was 2,839-liters (750-gallons). The 190-DR Annex constructed in 1955 added approximately 21.3-meters (70-feet) to the east side of the 190-DR Building. It does not appear that the 100-D-28:2 septic tank and tile field could have survived the construction of the 190-DR Annex. The 100-D-28:1 septic system was installed per drawing H-9933-DR on the southwest side of the 190-DR Building as a replacement system.

The 190-DR Annex constructed in 1955 added approximately 21.3 meters (70 feet) to the east side of the 190-DR Building. The 190-DR Annex is approximately 3 meters (10 feet) below grade. Photographs from 1955 (see attachment) show the depth and amount of disturbance for the excavation of the annex. It does not appear that this septic tank and tile field could have survived the construction of the 190-DR Annex. Likely a new septic system (100-D-28:1) was installed per drawing H-9923, southwest of the 190-DR as a replacement system.

Based on the historical documentation, the 100-D-28:2 septic system has not existed or been used in over 50 years. A reclassification status of rejected has been assigned for the 100-D-28:2 septic system. The site achieved the remedial action objectives and the corresponding remedial action goals established in the Remedial Design Report/Remedial Action Work Plan for the 100 Area and the Interim Action Record of Decision for the 100-BC-1, 100-BC-2, 100-DR-1, 100-DR-2, 100-FR-1, 100-FR-2, 100-HR-1, 100-HR-2, 100-KR-1, 100-KR-2, 100-IU-6, and 200-CW-3 Operable Units, Hanford Site, Benton County, Washington. The site will support future unrestricted land uses that can be represented (or bounded) by a rural-residential scenario and no institutional controls are required.

Site Code: 100-D-36 **Classification:** Not Accepted (8/27/1997)

Site Names: 100-D-36, Undocumented Concrete Pad, Monitoring Station 1614-D-1, 100-N-20 **ReClassification:**

Site Type: Foundation **Start Date:**

Site Status: Inactive **End Date:**

Site Description: The site is a 1.8 meter by 1.8 meter (6 foot by 6 foot) concrete pad with anchor bolts set in the surrounding edges.

Site Code: 100-D-37 **Classification:** Not Accepted (8/27/1997)

Site Names: 100-D-37, Undocumented Concrete Pad, 1614-D-3 Monitoring Station **ReClassification:**

Site Type: Foundation **Start Date:**

Site Status: Inactive **End Date:**

Site Description: The site is a 1.8 meter by 1.8 meter (6 foot by 6 foot) concrete pad with anchor bolts set in around the outer edges.

Site Code: 100-D-40 **Classification:** Accepted

Site Names: 100-D-40, Minor Construction Burial Ground #5 Hole **ReClassification:** Rejected (3/20/2008)

Site Type: Burial Ground **Start Date:**

Site Status: Inactive **End Date:**

Site Description: The burial ground area appeared as a vegetation covered area. A 2004 Ground Penetrating Radar scan, did not identify any trench like features.

Waste Type: Equipment

Waste Description: The burial ground was dug to receive contaminated material and equipment from the 105-D Reactor Building. Potential contaminates included: Co-60, Ni-63

Site Code: 100-D-43 **Classification:** Accepted

Site Names: 100-D-43, Buried VSR Thimble Site, Burial Ground 4C, 118-D-4C **ReClassification:** Interim Closed Out (5/13/2010)

Site Type: Burial Ground **Start Date:**

Site Status: Inactive **End Date:**

Site Description: The site is a solid waste burial ground. The burial ground is in very close proximity to the (exhumed) 152-centimeter (60-inch) effluent lines.

Waste Type: Equipment

Waste Description: The waste is a buried Vertical Safety Rod (VSR) thimble. The VSR thimbles were made of aluminum similar to the that used in the process tubes and should contain similar isotopic composition. Sampling of process tubes was conducted in March 1967. The radionuclide levels, when decay corrected by Dorian and Richards to March 1977, were 5.9E+03 picocuries of manganese-54 per gram of aluminum and 2.5E+07 picocuries of cobalt-60 per gram of aluminum. When buried, the thimble's exterior surfaces would also have been contaminated with activated graphite products and potassium borate.

Site Code: 100-D-46 **Classification:** Accepted

Site Names: 100-D-46, Burial Ground 4A, 118-D-4A **ReClassification:** Interim Closed Out (3/1/2001)

Site Type: Burial Ground **Start Date:**

Site Status: Inactive **End Date:**

Site Description: This site has been remediated and interim closed out as part of the excavation for the 116-D-1A and 116-D-1B Trenches. The site was a 19 by 59-meter (62 by 195-foot) construction burial ground. Both of the referenced drawings refer to the site as Burial Ground No. 4A.

Waste Type: Construction Debris

Waste Description: Potential contaminates include: Co-60, Ni-63

Site Code: 100-D-47 **Classification:** Accepted

Site Names: 100-D-47, Construction C.G. 558-Rod Burial, Burial Ground 4E, 118-D-4E **ReClassification:** Interim Closed Out (1/15/2010)

Site Type: Burial Ground **Start Date:**

Site Status: Inactive **End Date:**

Site Description: 100-D-47 is located within the 118-D-4 cobble field, but is not separately marked.

Waste Type: Equipment

Waste Description: The site is described as a rod burial site. The type and quantity of rods disposed of at this site is not known. Potential contaminates include: C-14, Co-60, Ni-63, H-3, Nb-94, Ni-59, Pd-102, Sm-151, Tc-99, Am-241, Ag-108m, Ba-133, Cs-137, Eu-152 and 154, Pu-238, 239 and 241, Ca-41, Cd-113m, Kr-85, Zr-93, cadmium, lead.

Site Code: 100-D-53 **Classification:** Accepted

Site Names: 100-D-53, 117-DR Filter Building, 117-DR HEPA Filter Building **ReClassification:** Interim Closed Out (3/4/2004)

Site Type: Process Unit/Plant **Start Date:** 1960

Site Status: Inactive **End Date:**

Site Description: The site has been remediated and interim closed out.

The ventilation exhaust filter building housed blowers and particulate filters used to treat the ventilation exhausted from the 105-DR Reactor Building. Included in this site were the 117-DR Building, the intake ventilation duct from the 105-DR Reactor Building, and the exhaust ventilation duct to the 116-DR Reactor Exhaust Stack. The building and below-grade duct work were made of reinforced concrete 0.3 to 0.6 meters (1 to 2 feet) thick. Above grade ducts were constructed of 10 gauge black steel. The building was approximately 20.7 meters (68 feet) long, 11.9 meters (39 feet) wide, and 10.4 meters (34 feet) high with 2.4 meters (8 feet) above grade. A soil berm was built up around the building from grade level to the top of the structure.

The building was divided into two large filter cells with a smaller operating area between them. The filter cells each could hold six filter frames (two wide and three deep). The filter frames were designed to hold twenty-four filters that were 0.6 meters (2 feet) square by 0.3 meters (1 foot) thick. There are spaces between the frames to allow access for filter maintenance. The operating area between the two cells was divided into two levels. The upper level, called the access gallery had ten doors that led from it. Four doors opened into each of the filter cells and the other two doors provided access to the intake and exhaust ducts. The operating gallery was located below the access gallery. A sump was located at each end of the operating gallery to collect incidental drainage from above. A large open area extended the full length of the structure above the access gallery and the filter cells. It ranged in height between 2.5 and 2.4 meters (8.1 and 7.8 feet), due to the structure's sloping roof. The space provided access to the cement cover blocks that were positioned over each of the filter frames.

Waste Type: Equipment

Waste Description: The site contained radiologically contaminated surfaces and contamination from 105-DR Reactor ventilation exhaust. Hazardous residue from the Large Sodium Fire Facility is accounted for within that site (122-DR-1).

Site Code: 100-D-54 **Classification:** Accepted

Site Names: 100-D-54, Drywell Near Fire Facility Gravel Scrubber **ReClassification:** Interim Closed Out (3/4/2004)

Site Type: French Drain **Start Date:**

Site Status: Inactive **End Date:**

Site Description: The site has been remediated and interim closed out. The site was a 56-centimeter (28-inch) drywell. The unit was constructed of concrete pipe and had a steel cover. When opened during a field visit, the drywell was found to be approximately 1.5 meters (4.9 feet) deep with a 5-centimeter (2-inch) pipe entering it near the bottom on the east side.

Site Code: 100-D-55 **Classification:** Not Accepted (5/31/2001)

Site Names: 100-D-55, Gravel Pit #21, Pit 21 **ReClassification:**

Site Type: Depression/Pit (nonspecific) **Start Date:**

Site Status: Active **End Date:**

Site Description: The site is a large excavation containing another waste site, 100-D-15, which is debris in the east end of the pit. The debris is marked with post and chain and labeled as a separate waste site. The remainder of the pit is available to use as clean fill material (Gravel Pit #21). There is no other waste material in the pit. The soil is sandy.

Waste Type: Demolition and Inert Waste

Waste Description: There is an area of discarded debris located in the east end of this gravel pit. The debris is a separate waste site known as 100-D-15. In 1994, Kaiser Hanford removed sediments from the 182-D basins and deposited them inside this gravel pit, partially over top of the previously discarded debris. The sediment was determined to be "clean dredge soil" as defined in Washington Administrative Code 173-304-100. The total content of the discarded debris is unknown.

Site Code: 100-D-58 **Classification:** Accepted

Site Names: 100-D-58, 100-DR Area On-Site Sewage System for MO-980 & 4-Closet Restroom Facility, 100-DR OSS **ReClassification:**

Site Type: Septic Tank **Start Date:** 1998

Site Status: Active **End Date:**

Site Description: The septic tank portion of the site is surrounded by yellow steel posts and the drain field is surrounded with light duty chain and steel fence posts. The drainfield area is covered with tumbleweeds. The septic tank is a 5,678 liter (1,000 gallon), two compartment tank. The tank can be accessed through 0.765 meter (30 inch) diameter ribbed PVC risers that extend to grade and are covered by fiberglass lids that are bolted in place. The risers are centered over 0.609 meter (24 inch) diameter openings through the concrete lid.

Waste Type: Sanitary Sewage

Waste Description:

Site Code:	100-D-62	**Classification:**	Accepted
Site Names:	100-D-62, 183-DR Headhouse Septic Tank	**ReClassification:**	
Site Type:	Septic Tank	**Start Date:**	
Site Status:	Inactive	**End Date:**	

Site Description: The septic system received sanitary sewage from the 183-DR headhouse. The entire 183-DR water treatment facility is a nonradiological area; therefore, the 100-D-62 septic system waste site is not considered radiologically contaminated. This system was designed for the use of 6 people with a 2,271 L (600 gal) capacity.

Waste Type: Sanitary Sewage

Waste Description: The waste is the remaining septic system (tank and piping) and any remaining septage.

The Contaminants of potential concern (COPCs) for the 100-D-62 waste site were identified based on existing historical information for the 183-DR water treatment facility and contaminants associated with previously sampled septic systems. The COPCs for the 100-D-62 septic system include constituents associated with the chemicals used in the 183-DR headhouse: chromium, hexavalent chromium, mercury, lead, and anions. Although not COPCs, arsenic, antimony, barium, beryllium, boron, cadmium, cobalt, copper, manganese, molybdenum, nickel, selenium, silver, vanadium, and zinc concentrations will be evaluated by performing the expanded inductively coupled plasma metals analytical list. Based on findings from other septic systems in the 100-D Area, semivolatile organic compounds, pesticides, and polychlorinated biphenyls are also considered COPCs. Additional COPCs may be identified as part of planning for remedial actions.

Radionuclides are not COPCs for this site. However, the presence of radiological contaminants should be evaluated using field radiological survey instrumentation (capable of detecting alpha, beta, and gamma radiation) during remediation of the septic system. If radiological activity is detected during remediation, the verification sampling work instruction will incorporate specific requirements for radionuclide analysis.

Site Code:	100-D-64	**Classification:**	Accepted
Site Names:	100-D-64, 119-DR, 119-DR Sample Building, 105-DR Reactor Exhaust Stack Sampling Building	**ReClassification:**	Interim Closed Out (3/4/2004)
Site Type:	Laboratory	**Start Date:**	
Site Status:	Inactive	**End Date:**	

Site Description: The site has been remediated and closed-out.

The site consisted of a single-story 33.4 meters squared (360 square feet), pre-fabricated metal structure on a concrete slab.

Site Code:	100-D-68	**Classification:**	Accepted
Site Names:	100-D-68, 190-DR Process Water Pump House	**ReClassification:**	No Action (7/25/2005)
Site Type:	Process Unit/Plant	**Start Date:**	
Site Status:	Inactive	**End Date:**	
Site Description:	The facility has been demolished to 1 meter (3 feet) below-grade and backfilled. Before demolition the building included a basement, pipe gallery operating floor, suction tunnel and hot well bay, process tunnels, and two valve houses.		
Waste Type:	Construction Debris		
Waste Description:	Prior to demolition, above-grade wastes included polychlorinated biphenyls (PCBs), asbestos (roofing, siding, pipe trays, and thermal piping insulation), mercury (installed in instrumentation and control systems), lead (lead-based paint and lead washers), and oils/greases. Since the above-grade structure was completely removed during demolition, the only remaining waste was the below-grade structure. The waste in the basement included water, sludge and potentially contaminated concrete.		

Site Code:	100-D-77	**Classification:**	Accepted
Site Names:	100-D-77, DR Reactor Water Treatment Facility, Acid Facility, 183-DR Head House, 183-DR Filter Building, Sodium Dichromate Systems, 183-DR Flocculation Basins, 183-DR Sedimentation Basins	**ReClassification:**	
Site Type:	Process Unit/Plant	**Start Date:**	
Site Status:	Inactive	**End Date:**	
Site Description:	The entire water treatment system was demolished to grade. The flocculation and sedimentation basins remain below grade and were demolished in situ. The site includes the sodium dichromate systems that were located within the 183-DR Head House and 183-DR Filter Building, Acid Facility, the six 183-DR Flocculation Basins, and the six 183-DR Sedimentation Basins, all of which were components of the cooling water treatment system to support the 105-DR Reactor.		
Waste Type:	Demolition and Inert Waste		
Waste Description:	The waste form would be contaminated soil from leaks and spills during operation, and contaminated fill material from the demolition of the two buildings. Sodium dichromate, lead, and mercury may be present under the site footprint and in the flocculation and sedimentation basins.		

Site Code:	100-D-94	**Classification:**	Accepted
Site Names:	100-D-94, Dichromate Contaminated Pit Associated with 187-DR	**ReClassification:**	
Site Type:	Depression/Pit (nonspecific)	**Start Date:**	
Site Status:	Inactive	**End Date:**	

Site Description: The site consists of an area of chromium observed in a pit under the DR water tower. This area was identified during the D Area orphan site evaluation.

Waste Type: Process Effluent

Waste Description: Potential Contaminant of Concern, Chromium.

Site Code: 100-D-100 **Classification:** Accepted

Site Names: 100-D-100, Sodium Dichromate Near Southern Portion of 100-D-56 **ReClassification:**

Site Type: Unplanned Release **Start Date:**

Site Status: Inactive **End Date:**

Site Description: The site consists of chromate contaminated stained soil near the former sodium dichromate/ acid railcar and truck unloading station (100-D-12).

Waste Type: Process Effluent

Waste Description: The waste consists of hexavalent contaminated soil. The potential contaminant of concern is hexavalent chromium.

Site Code: 116-D-8 **Classification:** Accepted

Site Names: 116-D-8, 100-D Cask Storage Pad **ReClassification:**

Site Type: Storage **Start Date:** 1946

Site Status: Inactive **End Date:** 1975

Site Description: The site is a rectangular pad covered with gray grout (shotcrete). It is surrounded with Underground Radioactive Material signs. It had also been posted with Cave-in Potential signs, but the Cave-in potential signs were removed in November 1999.

Waste Type: Chemicals

Waste Description: This site contains trace amounts of radionuclides and decontamination chemicals.

Site Code: 118-D-1 **Classification:** Accepted

Site Names: 118-D-1, 100-D Burial Ground No. 1 **ReClassification:**

Site Type: Burial Ground **Start Date:** 1944

Site Status: Inactive **End Date:** 1967

Site Description: This unit contains many trenches running north and south. Typically, the trenches are 90 meters (300 feet) long by 6 meter (20 feet) wide and 6 meters (20 feet) deep with a 6 meters (20 feet) of space between them. Several trenches are greater than 6 meters (20 feet) deep. A 106 centimeter (42 inch) diameter, reinforced concrete water pipe runs through the northwest corner of the burial ground boundary, but not through any of the waste trenches (see WIDS sitecode 100-D-50).

Waste Type: Equipment

Waste Description: The unit was used for the disposal of irradiated dummies, thimbles, rods, gun barrels, and other contaminated solid waste. It may contain spent nuclear fuel elements. Potential contaminates include: H-3, C-14, Co-60, Ni-63, Sr-90, Ag-108m, Cs-137, Eu-152, Eu-154, am-241, Pu-238,239 and 241, Sm-151, Se-79, Tc-99, U-235 and 238, Kr-85, Zr-93, cadmium, lead, mercury. Historical research identified some specific buried items that include a one ton Aimer track cut into 12 pieces, mattress plate extensions, poison pieces, vertical safety rods, rod guides and tips, shield plugs and contaminated soil.

Site Code:	118-D-2	**Classification:**	Accepted
Site Names:	118-D-2, 100-D Burial Ground No. 2	**ReClassification:**	
Site Type:	Burial Ground	**Start Date:**	1949
Site Status:	Inactive	**End Date:**	1970

Site Description: The unit contained many trenches running east to west and 5 pairs of disposal pits. The trenches are 20 meters (66 feet) wide at the surface, 6.1 meters (20 feet) wide at the bottom, and 6.1 meters (20 feet) deep. Each pair of pits was constructed by stacking railroad ties, creating two spaces with interior dimensions of approximately 1.8 by 1.8 meter (6 by 6 feet) that shared a common wall. The structures were built within an excavation 7.3 meters (24 feet) wide by 7.3 meters (24 feet) deep. All were covered with 1.8 meters (6 feet) of soil.

Waste Type: Equipment

Waste Description: The unit was used for miscellaneous contaminated solid waste such as irradiated dummies, splines, vertical safety rods, thimbles, and gun barrels. Waste includes 16,329 kg of aluminum tubes, 36287 kg of aluminum spacers, 89,040 kg of lead poison slugs, 3719 kg of cadmium poison slugs, 5987 kg of aluminum poison slugs, 54 kg of lead and 16,329 kg of miscellaneous metallic waste. This burial ground has the potential to contain spent nuclear fuel rods. Beginning in April 1966, 100-N Area solid wastes were also buried here. A large fire in this burial ground in March 1958. The large volumes of water that were required to extinguish the fire could have potentially washed contaminants into the soil column beneath the burial ground. Potential contaminants include H-3, carbon-14, cobalt-60, Ni-63, Sr-90, Ag-108, Ba-133, Cs-137, Eu-152 and 154, Pu-238, 239 and 241, Ca-41, Cd-113, Kr-85 and Zr-93.

Site Code:	118-D-3	**Classification:**	Accepted
Site Names:	118-D-3, 100-D Burial Ground No. 3 (See Subsites)	**ReClassification:**	
Site Type:	Burial Ground	**Start Date:**	1956
Site Status:	Inactive	**End Date:**	1973

Site Description: The site encompasses the 100-D Burial Ground Number 3 which consists of two subsites. Subsite one contains multiple (6 to 8) trenches running east and west. Subsite two contains the fuel characterization area and the anomaly characterization area.

Waste Type: Equipment

Waste Description: The unit contains miscellaneous contaminated solid wastes and irradiated dummies, splines, rods, thimbles, and gun barrels. This burial ground has the potential to contain spent nuclear fuel rods. It was also used for disposal of 100-N solid wastes. Potential contaminates include: H-3, C-14, Co-60, Ni-63, Sr-90, Ag-108m, Cs-137, Eu-152, Eu-154, Kr-85, Zr-93, Cd-113, Se-

79, Tc-99, Sm-151, Am-241, Pu-238, 239 and 241, U-235 and 238, Ba-133, cadmium, lead, and mercury.

Waste Type: Equipment

Waste Description: The waste site received 23.8 tons of lead, 97 tons of aluminum, 137.7 tons of Pb/Cd, 1 ton of boron, and 0.06 tons of graphite.

SubSites:

SubSite Code: 118-D-3:1

SubSite Name: 118-D-3:1,100-D Burial Ground No. 3 and Process Cells

Classification: Accepted

ReClassification:

Description: The subsite consists of multiple trenches in the burial ground, they were oriented east and west. Typically, trenches were 61 m (200 ft) long by 6.1 m (20 ft) wide at the bottom and 6.1 m (20 ft) deep. The spacing between trenches was not uniform. The subsite also includes the process (sorting) cells used to determine the presence of suspect spent nuclear fuel and the north anomaly storage area.

The burial ground was the primary disposal site for 105-DR Reactor operations waste, including irradiated dummies, splines, rods, thimbles, and gun barrels. The burial ground has the potential to contain spent nuclear fuel elements. The site also contained a burn pit used to dispose of low-level radioactive combustible materials. The eastern boundary was used for the disposal of 100-N solid wastes.

The burial ground is located 106.7 m (350 ft) east of the 105-DR Building. The sorting cells are 137 meters (449 feet) south of the burial ground. The centroid of the two sorting cells is N 151139.7 m, E 573966.5 m and N151109.0 m, E 573967.1 m. The north anomaly storage area covers a portion of the burial ground along the north side. The centroid of the north anomaly storage area is N 151348.2 m, E 574047.3 m.

SubSite Code: 118-D-3:2

SubSite Name: 118-D-3:2, Fuel and Anomaly Characterization Areas

Classification: Accepted

ReClassification:

Description: The subsite includes two areas (fuel characterization and anomaly characterization). The fuel characterization area was used to investigate suspect spent nuclear fuel and confirm presence of spent nuclear fuel pieces. The anomaly characterization area was used to characterize anomalous materials found at 100-D.

The site is located 321 meters (1053 feet) southeast of the 105-DR building.

Site Code: 118-D-4 **Classification:** Accepted

Site Names: 118-D-4, Construction Burial Ground, Burial Ground 4F, 118-D-4F **ReClassification:** Interim Closed Out (10/14/2010

Site Type: Burial Ground **Start Date:** 1956

Site Status:	Inactive	**End Date:**	1967
Site Description:	The site appears as a gravel and cobble field.		
Waste Type:	Equipment		
Waste Description:	This unit contains contaminated material generated during Project CG-558. The contaminated material consisted mainly of reactor components and hardware. Potential contaminates include: C-14, Co-60, Ni-63, H-3, Nb-94, Ni-59, Pd-102, Sm-151, Tc-99, Am-241, Ag-108m, Ba-133, Cs-137, Eu-152 and 154, Pu-238, 239 and 241, Ca-41, Cd-113m, Kr-85, Zr-93, cadmium, lead.		

Site Code:	118-D-5	**Classification:**	Accepted
Site Names:	118-D-5, Minor Construction Burial Ground Number 3, Ball 3X Burial Ground, Burial Ground 4G, 118-D-4G, Minor Construction Burial Ground Number 5	**ReClassification:**	Interim Closed Out (2/1/2010)
Site Type:	Burial Ground	**Start Date:**	1954
Site Status:	Inactive	**End Date:**	1954
Site Description:	The unit consists of two burial trenches located parallel to each other. Each trench is 12.2 meters (40 feet) long by 6.1 meters (20 feet) wide, however, the exact location is unknown.		
Waste Type:	Equipment		
Waste Description:	This site received thimbles removed from the 105-DR Reactor during the Ball 3X work in 1954. Potential contaminates include: Co-60, Ni-63, Ag-108, Ba-133, Cs-137, Eu-152 and 154, Pu-238, 239 and 241, Ca-41, Cd-113, Kr-85, Zr-93, cadmium, lead.		

Site Code:	128-D-1	**Classification:**	Accepted
Site Names:	128-D-1, 100 D/DR Burning Pit	**ReClassification:**	No Action (4/12/2004)
Site Type:	Burn Pit	**Start Date:**	1944
Site Status:	Inactive	**End Date:**	1967
Site Description:	Documentation in the Calculation Brief (0100D-CA-V0126) demonstrated that this site is a duplication (misidentified location) of 128-D-2 or 628-3.		
Waste Type:	Misc. Trash and Debris		
Waste Description:	The site was used for the disposal of nonradioactive, combustible materials, such as paint waste, office waste, and chemical solvents. The exact location of this waste site is unknown, although evidence of burning and waste materials were found at the site. On September 29, 1951, contaminated materials were found in the burning pit (Radiation incident: Class 1 #180). All contaminated materials were removed to the radioactive burial ground for proper disposal.		

Site Code:	1607-D1	**Classification:**	Accepted
Site Names:	1607-D1, 1607-D1 Septic Tank and Associated Drain Field, 124-D-1, 1607-D1	**ReClassification:**	

	Sanitary Sewer System, 1607-D1 Septic Tank		
Site Type:	Septic Tank	**Start Date:**	1944
Site Status:	Inactive	**End Date:**	1965
Site Description:	The site is a septic tank and associated drain field. The tank is 3.4 meters (11 feet) deep, constructed of reinforced concrete, and has a 125-person capacity (130 liters [35 gallons] per capita) with an average detention period of 24 hours. The walls and floor are 25 centimeters (10 inches) thick. The tile field is constructed of 10-centimeter (4-inch) vitrified pipe, concrete pipe, or drain tile with a minimum of 2.4 meters (8 feet) per capita. The laterals are open jointed and spaced 2.4 meters (8 feet) apart.		
Waste Type:	Sanitary Sewage		
Waste Description:	This unit received an unknown amount of sanitary waste from the 1701-D Badgehouse (security check point) and the 1709-D Patrol Change Room and Offices.		

Site Code:	1607-D3	**Classification:**	Accepted
Site Names:	1607-D3, 1607-D3 Septic Tank and Associated Drain Field, 1607-D3 Sanitary Sewer System, 1607-D3 Septic Tank	**ReClassification:**	Closed Out (2/23/2001)
Site Type:	Septic Tank	**Start Date:**	1944
Site Status:	Inactive	**End Date:**	2000
Site Description:	The site is an inactive septic system associated with the 151-D Substation. A sign stating "Abandoned Septic Tank per WAC 246-272-1850 DynCorp Environmental" is posted at the site. The tank has been abandoned per WAC 246-272-18501 and as of August 2000 is indistinguishable in a dirt and cobble field. The reinforced concrete tank is 1.8 meters (6 feet) long, 0.9 meters (3 feet wide), and 3 meters (9 feet 10 inches) deep (inner dimensions). The tank had a design capacity of 1325 liters (350 gallons) based on a user capacity of 10 persons, a flow of 132 liters (35 gallons) of sewage per capita per day, and an average detention time of 1 day. The walls are 20 centimeters (8 inches) thick. The floor is 15 centimeters (6 inches) thick. The tile field was constructed of 10 centimeter (4 inch) vitrified or concrete pipe, or drain tile with a minimum of 2.4 meter (8 foot) per capita. The laterals are open jointed and spaced 2.4 meters (8 feet) apart. Prior to decommissioning, the septic tank was surrounded by light posts and chain.		
Waste Type:	Sanitary Sewage		
Waste Description:	This unit received sanitary waste from the 151-D Electrical Distribution Substation. The flow rate to this unit was estimated at 3,970 Liters (1,050 gallons) per day.		

Site Code:	116-DR-3	**Classification:**	Accepted
Site Names:	116-DR-3, 105-DR Storage Basin Trench	**ReClassification:**	
Site Type:	Trench	**Start Date:**	1955
Site Status:	Inactive	**End Date:**	1955

Site Description: The site appears as a vegetation-free, cobble and soil-covered field within a larger area bounded by permanent concrete markers posted with Underground Radioactive Material warning signs. The trench is approximately 15 meters (50 feet) long.

Waste Type: Sludge

Waste Description: The site received contaminated sludge and water removed from 105-DR Fuel Storage Basin.

Site Code: 116-DR-4 **Classification:** Accepted

Site Names: 116-DR-4, 105-DR Pluto Crib **ReClassification:** Interim Closed Out (10/23/2000

Site Type: Crib **Start Date:** 1950

Site Status: Inactive **End Date:** 1956

Site Description: The crib has been remediated and closed out. It is no longer marked or posted.

Waste Type: Process Effluent

Waste Description: The site received liquid wastes from isolated tubes containing ruptured fuel elements in the 105-DR Fuel Storage Basin. The site may have also received excess "ink" (liquid boron solution) used in the 3X safety system.

Site Code: 116-DR-6 **Classification:** Accepted

Site Names: 116-DR-6, 1608-DR Liquid Disposal Trench, Wash Pad Liquid Waste Site 3C **ReClassification:** Interim Closed Out (10/23/2000

Site Type: Trench **Start Date:** 1953

Site Status: Inactive **End Date:** 1965

Site Description: The site has been remediated and was closed out on October 23, 2000. It is no longer marked or posted.

Waste Type: Process Effluent

Waste Description: The site received diverted coolant during the Ball 3X upgrade. It also received diverted water when maintenance was necessary on the effluent system during a reactor shutdown. It is reported that the volume of liquids disposed of at this unit would cause it to overflow, and a solvent odor was present at the site on very hot days.

Site Code: 116-DR-7 **Classification:** Accepted

Site Names: 116-DR-7, 105-DR Inkwell Crib **ReClassification:** Interim Closed Out (9/26/2000)

Site Type: Crib **Start Date:** 1953

Site Status: Inactive **End Date:** 1953

Site Description: The site was remediated in December 1999 by removing the structure and associated contaminated soil. As of September 2000, the excavation was still open, but is to be backfilled in the near future to a reference grade of elevation 142.0 meters (466 feet).

Waste Type: Process Effluent

Waste Type: Process Effluent

Waste Description: Liquid potassium borate solution was drained from the 3X System prior to the Ball 3X System upgrade.

Site Code:	116-DR-8	**Classification:**	Accepted
Site Names:	116-DR-8, 117-DR Crib, 117-DR Seal Pit Crib (CERCLA)	**ReClassification:**	Interim Closed Out (9/20/2010)
Site Type:	Crib	**Start Date:**	1960
Site Status:	Inactive	**End Date:**	1964

Site Description: The 117-DR Seal Pit Crib is documented in WIDS as two separate sites. The first site, 122-DR-1:6, which is part of the Large Sodium Fire Facility, a RCRA TSD, and has been closed for hazardous/dangerous constituents. The second site, 116-DR-8, which represents the radioactive constituents remaining at the site will be addressed under CERCLA .

Note: this information on the pipeline in the Current Site Description was entered on March 14, 2001. If the remedial design has already been completed for this site and it does not include the feed pipeline, the pipeline will be added to another pipeline site for remediation.

Waste Type: Process Effluent

Waste Description: The site received drainage from the 117-DR Building seal pits.

Site Code:	116-DR-10	**Classification:**	Accepted
Site Names:	116-DR-10, 105-DR Fuel Storage Basin Cleanout Percolation, 105-DR Fuel Storage Discharge Pond, 105-DR Pond	**ReClassification:**	
Site Type:	Pond	**Start Date:**	1984
Site Status:	Inactive	**End Date:**	1984

Site Description: The unit is an open excavated pit located in a natural depression. The excavation has been backfilled and graded to match the natural terrain. The original natural depression remains.

Waste Type: Water

Waste Description: The unit received processed water from the 105-DR Fuel Storage Basin. During the cleanout of this basin, the radiologically contaminated shielding water was processed through a system using ion exchange columns. Before discharging the water to the unit, composite samples were taken to ensure that radionuclide concentrations were below release criteria in Table II of DOE Order 5480.1. Although the water was cleaned to applicable release limits, minute quantities (below release limits) of radionuclides remaining in the water accumulated in the soil at some low points in the floor. No known hazardous substances were present in the water; however, chemical analysis was not a standard practice during that period, and there is no evidence that one was performed. It should be noted that water removed from the 1608-DR is believed to be comparable to the storage basin water, and EP-TOX testing results for the 1608-DR water were negative.

Site Code:	118-DR-1	**Classification:**	Accepted

Site Names:	118-DR-1, 105-DR Gas Loop Burial Ground	**ReClassification:**	Interim Closed Out (6/10/2010)
Site Type:	Burial Ground	**Start Date:**	1963
Site Status:	Inactive	**End Date:**	1964
Site Description:	The site contains a gunite-lined trench running north and south that was water-filled and used for the sectioning and examinations performed on test assemblies removed from the 105-DR Reactor.		
Waste Type:	Equipment		
Waste Description:	This unit contains irradiated metal assemblies from the 105-DR Gas Loop.		

Site Code:	118-DR-2	**Classification:**	Accepted
Site Names:	118-DR-2, 105-DR Reactor Building, 105-DR (See Subsites)	**ReClassification:**	
Site Type:	Reactor	**Start Date:**	1950
Site Status:	Inactive	**End Date:**	1964
Site Description:	The unit consists of: 1) a reactor block, which includes the graphite moderator stack, biological and thermal shields, pressure tubes, and the safety and control systems; 2) 105-DR Reactor below-grade structures and underlying soil.		
Waste Type:	Equipment		
Waste Description:	This unit contained radiation levels estimated at 13,500 curies, 85,300 kilograms (94 tons) of lead, 2.8 cubic meters (100 cubic feet) of asbestos, and 230 kilograms (500 pounds) of cadmium.		

SubSites:

SubSite Code:	118-DR-2:1
SubSite Name:	118-DR-2:1, 105-DR Reactor Core and ISS Project
Classification:	Accepted
ReClassification:	
Description:	Deactivation of the reactor was completed in early 1971. Subsequently the 105-DR ISS Project was completed in January 2003. This process is designed to safely contain the reactor for up to 75 years. The final footprint was reduced by 78% after the safe storage enclosure project was completed.
SubSite Code:	118-DR-2:2
SubSite Name:	118-DR-2:2, 105-DR Reactor Below-Grade Structures and Soil
Classification:	Accepted
ReClassification:	Interim Closed Out
Description:	The Cleanup verification package, (CVP-2003-00016), documents completion of removal action for this subsite in support of the 105-DR Reactor Interim Safe Storage Project. Waste site contaminants of concern (COCs) identified through process knowledge were

identified in the Sampling and Analysis Plan for the 105-F and 105-DR Phase III Below Grade Structures and Underlying Soils (105-DR SAP) (DOE-RL 2000). The 105-DR SAP (DOE-RL 2000) classified the different areas and structures into affected media that were similar in characteristics and contaminants. The COCs for subsite two included: americium-241, barium-133, carbon-14, cesium-137, cobalt-60, europium-152, europium-154, europium-155, nickel-63, plutonium-238, plutonium-239/240, strontium-90, technetium-99, tritium, uranium 233/234, uranium 235, and uranium 238. For cleanup verification the different areas were designated as "zones," based on the type of deposition, depth, and/or type of use. Refer to Appendix A of the CVP-2003-00016 for sample numbers and results.

Zone 1 consisted of the Fuel Storage Basin (FSB), storage and transfer area, storage area, and the transfer bay; and the soils underlying the FSB, collectively referred to as the FSB area. The FSB area was located on the east side of the 105 DR Reactor building and served as an underwater collection, storage, and transfer facility for the irradiated fuel elements discharged from the reactor. This zone was located entirely within the deep zone.

Zone 2 consisted of the valve pit that received wastewater from the reactor building. During the cleanup verification sampling, high levels of hexavalent chromium and polychlorinated biphenyls (PCBs) were discovered on the valve pit concrete floor. Therefore, the floor was removed and disposed of at the ERDF, then the valve pit walls and soil underneath the concrete floor were sampled and analyzed for hexavalent chromium and PCBs for verification purposes. Zone 2 was entirely within the deep zone.

Zone 3 consisted of the solids feed area, the north water tunnel, and the trench under the accumulator room. The below-grade rooms, tunnel, and trench have been wetted by isolated spills and standing rainwater that may have acted as a hydraulic driver for potential contamination. Only concrete floors were sampled and analyzed for these areas, as the walls are expected to contain little or no contamination. Ceilings were removed and disposed of at the ERDF. Zone 3 was within the shallow zone

Zone 4 consisted of the gas tunnel, exhaust plenum, gas recirculation tunnel, and the instrument room. Similar to Zone 3, these rooms and tunnels would have been wetted by isolated spills and standing rainwater, which may have acted as a hydraulic driver for potential contamination. Therefore, only the concrete floors were sampled and analyzed. Zone 4 was entirely within the deep zone.

Zone 5 consisted of the side slope soils around the FSB, the south effluent pipeline, and the soil under the slab. The soils adjacent to the 105-DR FSB were sampled to verify that shallow zone soil cleanup levels would be met if the walls of the FSB were removed. The soils beneath the slab were sampled for mercury because of the potential for mercury contamination from a floor drain in the slab.

Also included in Zone 5 was a section of 105-DR process effluent pipeline located adjacent to the south side of the FSB that was removed and the soil was sampled as part of the adjacent soils beneath the FSB. The concrete was removed from this location and the soil was sampled for verification purposes. This area was included in Zone 5 because of its proximity to the side slopes of the FSB. Zone 5 was within the shallow zone.

The three decon areas were located around the reactor for the purpose of equipment decontamination. The northwest decon area was approximately 8.0 meters by 8.8 meters (26 feet by 29 feet). The northeast decon area was approximately 12 meters by 9.8 meters (39 feet by 32 feet), and the south decon area was approximately 16 meters by 17 meters (52 feet by 56 feet).

Approximately 7,220 cubic meters (25,500 cubic feet) of contaminated materials were

disposed at the ERDF. The results of this effort indicated that the materials from the site containing COCs at concentrations exceeding RAGs have been excavated and disposed at the ERDF. These results also indicate that residual concentrations in the shallow zone will support future land uses that can be represented (or bounded) by a rural-residential scenario, and that residual concentrations throughout the site pose no threat to groundwater or the Columbia River. The site is verified to be remediated in accordance with the Action Memorandum (EPA et al. 1998a) and can be backfilled.

Site Code:	122-DR-1	**Classification:**	Accepted
Site Names:	122-DR-1, 105-DR Sodium Fire Facility, 105-DR Large Sodium Fire Facility, 100-D-51 (See Subsites)	**ReClassification:**	Closed Out (7/1/2004)
Site Type:	Laboratory	**Start Date:**	1972
Site Status:	Inactive	**End Date:**	1986

Site Description: The 105-DR Large Sodium Fire Facility (LSFF) was established to study fire fighting and safety aspects associated with large sodium or other metal alkali fires in the Liquid Metal Fast Breeder Reactor (LMFBR) facilities. The LSFF occupies the former supply fan room of the 105-DR Reactor Facility and covers approximately 1,400 square meters (15,000 square feet) of floor space. The facility closure plan divides the facility into seven areas for sampling and closure purposes. The seven areas are described as subsites.

The site classification shall remain as "accepted" until a Certification of Closure Acceptance Letter, signed by Ecology, is issued to document completion of the RCRA TSD closure.

Waste Type: Chemicals

Waste Description: Wastes consisted of sodium, lithium, sodium-potassium alloy, lithium-lead alloy, and their oxidation products.

SubSites:

SubSite Code: 122-DR-1:1

SubSite Name: 122-DR-1:1, 122-DR-1 Area 1, Testing, Storage, and Office Area, 100-D-51, 105-DR 90-Day Waste Accumulation Area

Classification: Accepted

ReClassification: Closed Out

Description: Area 1 consists of the exhaust fan room, small fire room, large fire room, sodium handling room, and an office area.

The exhaust fan room is 6.2 meters (20.5) feet wide, 8.2 meters (27 feet) long, and 6.4 meters (21 feet) high. In this room, waste alkali metals from various sources, including residuals from tests, failed equipment, and drum heels, were reacted at atmospheric pressure. The burn pans and equipment were cleaned periodically using water and the rinsate was collected in a sump. The wash water was pumped from the sump to a seal pit where it was neutralized prior to discharge.

The small fire room is 6.2 meters (20.5 feet) wide, 8.2 meters (27 feet) long, and 6.4 meters (21 feet) high. It contains one steel cylindrical pressure vessel with a dished top. The vessel has a volume of approximately 14 cubic meters (500 cubic feet). When in use, the vessel

could be purged with nitrogen or argon to maintain a controlled atmosphere. This vessel was the only one used to burn lithium-lead alloy waste.

The large fire room is 6.2 meters (20.5 feet) wide, 8.2 meters (27 feet) long, and 6.4 meters (21 feet) high. It contains the Large Test Cell which is a steel cubicle 110 cubic meters (3,700 cubic feet) in volume. The cell could be purged with nitrogen or argon to maintain a controlled atmosphere.

The sodium handling room contained drum melters and a 3,400 liter (900 gallon) type-304 stainless-steel sodium batch tank which provided sodium to the Large Test Cell. The tank was resupplied from sodium drums that were heated to liquefy the sodium, which was then discharged into the tank with inert gas.

The office area provided space for office work and storage of nondangerous materials.

During cleanup activities equipment was removed from the rooms, decontaminated and stockpiled for either recycling or reuse. The interiors of the Large Test Cell and the pressure vessel were decontaminated with a high pressure water blast to remove lead and carbonate contamination. The rooms were washed down using a pressure washer and a mildly acidic solution to remove visible residue. All penetrations into the reactor exhaust tunnels were sealed to isolate the area and prevent recontamination.

A 90-day waste accumulation area was set up at the north end of the office area for use during clean up activities. The accumulation area was enclosed within a wire cage. When the waste was removed, the unit was closed. This unit had been identified as a separate Waste Information Data System (WIDS) site (100-D-51).

The area was clean closed.

SubSite Code: 122-DR-1:2

SubSite Name: 122-DR-1:2, 122-DR-1 Area 2, Exhaust Tunnels

Classification: Accepted

ReClassification: Closed Out

Description: Area 2 consisted of the upper and lower exhaust tunnel, the blower that moved Large Sodium Fire Facility (LSFF) exhaust from the lower to the upper tunnel, the exterior underground tunnel to the 117-DR HEPA Filter Building, and the ducts to the submerged gravel scrubber. Steel barricades at the north end of the tunnels blocked air flow to and from the reactor. The tunnel had low, but measurable radioactivity when sampled in 1987 (see DOE/RL-90-25, Rev 2, Appendix A for sampling information). This area is part of the 105-DR Reactor Building and is also included in its Waste Information Data System (WIDS) site (118-DR-2).

Remedial or removal objectives and goals for the pre-filter exhaust tunnel 122-DR-1:2 a component of the LSFF TSD unit, were obtained from the Action Memorandum, USDOE Hanford 100 Area National Priorities List (NPL) 105-F and 105 DR Reactor Buildings and Ancillary Facilities (Action Memorandum). The objectives and goals were also included in the Phase III SAP (DOE-RL-99-35) and the Remedial Design Report/Remedial Action Work Plan for the 100 Area (RDR/RAWP) (DOE/RL-96-17), which was referenced in the Action Memorandum.

Based on consideration of the requirements of CERCLA and detailed analysis of alternatives, the Tri-Parties have selected the remove/dispose alternative under a rural-residential land use scenario for the 117-DR facilities site. The objective for the structures included the removal of the structure to a minimum of 0.9 meters (3 feet) below surface grade. Excavation was

driven by remedial action objectives for direct exposure, protection of groundwater, and protection of the Columbia River.

For the respective points of compliance, remedial action goals (RAGs) were established to identify radionuclide and nonradionuclide contaminants of concern (COCs) and contaminants of potential concern. Waste site COCs for the 117 DR facilities site were identified through process knowledge and are specified in the Phase III SAP (DOE/RL-99-35). The COC list was further refined and amended with the 117 DR Exhaust Filter Building Proposed Additional Soil Sampling and 1720-HA Arsenal Removal/ Disposal Summary (CNN 106839). The COCs consist of the following: americium-241, arsenic, carbon-14, barium, cesium-137, cadmium, cobalt-60, total chromium, europium-152, hexavalent chromium, europium-154, lead, europium-155, lithium, ninel-63, mercury, plutonium-238, selenium, plutonium-239/240, silver, strontium-90, sodium, uranium-234, uranium-235 and uranium-238.

Cleanup verification samples, including QA/QC samples were collected and analyzed for the established COCs on August 8, 2003. The results of the six shallow zone samples have been reported with HEIS sample numbers J00WJ0 to J00WJ3, J00WJ7 and J00WJ9. Five deep zone samples were report with HEIS sample numbers J00WJ4 to J00WJ6, J00WJ8 and J00WK0.

At the completion of the remedial action, the total excavation was approximately 1,010 meters squared (10,872 square feet) in area with an approximate depth of 5 meters (16.4 feet). Approximately 14,011 metric tons (15,412 tons) of material from the site were disposed of at the Environmental Restoration Disposal Facility.

Results of the cleanup verification effort indicated that residual concentrations will support future land uses that can be represented (or bounded) by a rural-residential scenario and that residual concentrations throughout the site are protective of groundwater and the Columbia River.

However, the deep zone data are not typically assessed against direct exposure criteria. Therefore, the acceptability of unrestricted direct exposure to deep zone soils has not been demonstrated, and institutional controls are required to prevent uncontrolled drilling or excavation into the deep zone (i.e., below 4.6 meters [15 feet]). The 117-DR facilities site is verified to be remediated in accordance with the RAOs and RAGs of the Action Memorandum and the Remaining Sites ROD and may be backfilled.

In addition, demonstration that remedial action at the 117-DR facilities site has achieved the RAOs and corresponding RAGs established in the Action Memorandum and the Remaining Sites ROD meets the RCRA closure requirements for the underlying soils. Final RCRA TSD certification of closure is pending.

SubSite Code: 122-DR-1:3

SubSite Name: 122-DR-1:3, 122-DR-1 Area 3, Gravel Scrubber

Classification: Accepted

ReClassification: Closed Out

Description: Area 3 consists of a submerged gravel scrubber and ducts that were installed in 1982 as part of a filter development program. Installation of the gravel scrubber allowed the offgas from tests or burning to bypass the 117-DR HEPA Filter Building. The scrubber water was confirmed to be within pH tolerances (2.0 to 12.5) and discharged to the 116-DR-8 Crib. Two gravel samples numbered BOG9F6 and BOG9F7 were taken from the gravel scrubber. Based on evaluation of the sample data, the gravel did not designate as a Dangerous Waste

(see WHC-SD-EN-EV-034, Rev. 1 for sample results). The gravel that had been removed from the unit was made available for reuse. The associated ductwork was removed. The area was clean closed.

SubSite Code: 122-DR-1:4

SubSite Name: 122-DR-1:4, 122-DR-1 Area 4, 117-DR HEPA Filter Building

Classification: Accepted

ReClassification: Closed Out

Description: Area 4 consisted of the 117-DR HEPA Filter Building and the downstream tunnel to the reactor stack. The filter building housed the exhaust air filters. The building was about 18 meters (59 feet) long, 12 meters (39 feet) wide, and 11 meters (35 feet) high. The Filter Building was connected by underground concrete ductwork to the 116-DR exhaust stack. The filter building contained the HEPA filters, which were installed in four filter frames (24 filters per frame). In 1972, the original HEPA filters from the 105-DR Reactor were replaced before Large Sodium Fire Facility (LSFF) operations began. However, remnant radioactivity from the exhaust tunnels or filter holders had probably been picked up by the new filters. The 117-DR Filter Building was also a separate Waste Information Data System (WIDS) site (100-D-53).

Remedial or removal objectives and goals for the components of the LSFF TSD unit the 117-DR Exhaust Filter Building [100-D-53/122-DR-1:4] were obtained from the Action Memorandum, USDOE Hanford 100 Area National Priorities List (NPL) 105-F and 105 DR Reactor Buildings and Ancillary Facilities (Action Memorandum). The objectives and goals were also included in the Phase III SAP (DOE-RL 2000) and the Remedial Design Report/Remedial Action Work Plan for the 100 Area (RDR/RAWP) (DOE-RL-96-17), which was referenced in the Action Memorandum.

Based on consideration of the requirements of CERCLA and detailed analysis of alternatives, the Tri-Parties have selected the remove/dispose alternative under a rural-residential land use scenario for the 117-DR facilities site.

The objective for the structures included the removal of the structure to a minimum of 0.9 meters (3 feet) below surface grade. Excavation was driven by remedial action objectives for direct exposure, protection of groundwater, and protection of the Columbia River. For the respective points of compliance, remedial action goals (RAGs) were established to identify radionuclide and nonradionuclide contaminants of concern (COCs) and contaminants of potential concern. Waste site COCs for the 117 DR facilities site were identified through process knowledge and are specified in the Phase III SAP (DOE RL 2000). The COC list was further refined and amended with the 117 DR Exhaust Filter Building Proposed Additional Soil Sampling and 1720-HA Arsenal Removal/ Disposal Summary (CNN 106939). The COCs consist of the following: americium-241, arsenic, carbon-14, barium, cesium-137, cadmium, cobalt-60, total chromium, europium-152, hexavalent chromium, europium-154, lead, europium-155, lithium, ninel-63, mercury, plutonium-238, selenium, plutonium-239/240, silver, strontium-90, sodium, uranium-234, uranium-235 and uranium-238.

Cleanup verification samples, including QA/QC samples were collected and analyzed for the established COCs on August 8, 2003. The results of the six shallow zone samples have been reported with HEIS sample numbers J00WJ0 to J00WJ3, J00WJ7 and J00WJ9. Five deep zone samples were report with HEIS sample numbers J00WJ4 to J00WJ6, J00WJ8 and J00WK0.

At the completion of the remedial action, the total excavation was approximately 1,010

meters squared (10,872 square feet) in area with an approximate depth of 5 meters (16.4 feet). Approximately 14,011 metric tons (15,412 tons) of material from the site were disposed of at the Environmental Restoration Disposal Facility.

Results of the cleanup verification effort indicated that residual concentrations will support future land uses that can be represented (or bounded) by a rural-residential scenario and that residual concentrations throughout the site are protective of groundwater and the Columbia River.

However, the deep zone data are not typically assessed against direct exposure criteria. Therefore, the acceptability of unrestricted direct exposure to deep zone soils has not been demonstrated, and institutional controls are required to prevent uncontrolled drilling or excavation into the deep zone (i.e., below 4.6 meters [15 feet]). The 117-DR facilities site is verified to be remediated in accordance with the RAOs and RAGs of the Action Memorandum and the Remaining Sites ROD and may be backfilled.

In addition, demonstration that remedial action at the 117-DR facilities site has achieved the RAOs and corresponding RAGs established in the Action Memorandum and the Remaining Sites ROD meets the RCRA closure requirements for the underlying soils. Final RCRA TSD certification of closure is pending.

SubSite Code: 122-DR-1:5

SubSite Name: 122-DR-1:5, 122-DR-1 Area 5, 116DR Reactor Exhaust Stack

Classification: Accepted

ReClassification: Closed Out

Description: Area 5 consisted of the reactor exhaust stack. Over the life of the Large Sodium Fire Facility (LSFF) there were two routes for exhaust to take before entering the reactor exhaust stack. The first route was through the HEPA filters which had a 99.95 percent efficiency rating. The second route was through the submerged gravel scrubber which had an efficiency rating of approximately 99 percent. It was expected that there were no measurable deposits of residue from LSFF operation within the stack. The 116-DR Reactor Exhaust Stack also has a separate Waste Information Data System (WIDS) site (132-DR-2).

Remedial or removal objectives and goals for the components of the LSFF TSD unit (132 DR 2/122-DR-1:5) were obtained from the Action Memorandum, USDOE Hanford 100 Area National Priorities List (NPL) 105-F and 105 DR Reactor Buildings and Ancillary Facilities (Action Memorandum). The objectives and goals were also included in the Phase III SAP (DOE/RL-99-35) and the Remedial Design Report/Remedial Action Work Plan for the 100 Area (RDR/RAWP) (DOE/RL-96-17), which was referenced in the Action Memorandum.

Based on consideration of the requirements of CERCLA and detailed analysis of alternatives, the Tri-Parties have selected the remove/dispose alternative under a rural-residential land use scenario for the 117-DR facilities site.

The objective for the structures included the removal of the structure to a minimum of 0.9 meters (3 feet) below surface grade. Excavation was driven by remedial action objectives for direct exposure, protection of groundwater, and protection of the Columbia River. For the respective points of compliance, remedial action goals (RAGs) were established to identify radionuclide and nonradionuclide contaminants of concern (COCs) and contaminants of potential concern.

Waste site COCs for the 117 DR facilities site were identified through process knowledge and are specified in the Phase III SAP (DOE/RL-99-35). The COC list was further refined

and amended with the 117 DR Exhaust Filter Building Proposed Additional Soil Sampling and 1720-HA Arsenal Removal/ Disposal Summary (CNN 106839). The COCs consist of the following: americium-241, arsenic, carbon-14, barium, cesium-137, cadmium, cobalt-60, total chromium, europium-152, hexavalent chromium, europium-154, lead, europium-155, lithium, ninel-63, mercury, plutonium-238, selenium, plutonium-239/240, silver, strontium-90, sodium, uranium-234, uranium-235 and uranium-238.

Cleanup verification samples, including QA/QC samples were collected and analyzed for the established COCs on August 8, 2003. The results of the six shallow zone samples have been reported with HEIS sample numbers J00WJ0 to J00WJ3, J00WJ7 and J00WJ9. Five deep zone samples were report with HEIS sample numbers J00WJ4 to J00WJ6, J00WJ8 and J00WK0.

At the completion of the remedial action, the total excavation was approximately 1,010 meters squared (10,872 square feet) in area with an approximate depth of 5 meters (16.4 feet). Approximately 14,011 metric tons (15,412 tons) of material from the site were disposed of at the Environmental Restoration Disposal Facility.

Results of the cleanup verification effort indicated that residual concentrations will support future land uses that can be represented (or bounded) by a rural-residential scenario and that residual concentrations throughout the site are protective of groundwater and the Columbia River.

However, the deep zone data are not typically assessed against direct exposure criteria. Therefore, the acceptability of unrestricted direct exposure to deep zone soils has not been demonstrated, and institutional controls are required to prevent uncontrolled drilling or excavation into the deep zone (i.e., below 4.6 meters [15 feet]). The 117-DR facilities site is verified to be remediated in accordance with the RAOs and RAGs of the Action Memorandum and the Remaining Sites ROD and may be backfilled.

In addition, demonstration that remedial action at the 117-DR facilities site has achieved the RAOs and corresponding RAGs established in the Action Memorandum and the Remaining Sites ROD meets the RCRA closure requirements for the underlying soils. Final RCRA TSD certification of closure is pending.

SubSite Code: 122-DR-1:6

SubSite Name: 122-DR-1:6, 122-DR-1 Area 6, 116-DR-8 Crib (RCRA Action)

Classification: Accepted

ReClassification: Closed Out

Description: Area 6 consists of the 116-DR-8 Crib meeting RCRA requirements. The crib was originally used from 1960 to 1964 to percolate low-level waste drainage from the 117-DR Building seal pits. When used for the Large Sodium Fire Facility (LSFF), the 116-DR-8 Crib received only water reported not to have been corrosive (the pH level was less than 12.5). This area is considered closed for the purposes of Washington Administrative Code (WAC) 173-303-610. Any contamination associated with Area 6 will be remediated in accordance with the 100-HR-3 RFI/CMS process.

The 117-DR Seal Pit Crib is documented in WIDS as two separate sites. The first site, 122-DR-1:6, which is part of the Large Sodium Fire Facility, a RCRA TSD, and has been closed for hazardous/dangerous constituents. The second site, 116-DR-8, which represents the radioactive constituents remaining at the site will be addressed under CERCLA .

SubSite Code: 122-DR-1:7

SubSite Name: 122-DR-1:7, 122-DR-1 Area 7, Outdoor Storage Area

Classification: Accepted

ReClassification: Closed Out

Description: Area 7 consists of the area to the north and west of the 117-DR HEPA filter building. The burn pans used in the alkali metal fires were sometimes stored in this area. Six soil samples, three random and three authoritative, were collected for this site. The samples were number BOG979 through BOG984. All samples were well below the Hanford Site background 95% thresholds for both lithium and sodium in soil (see WHC-SD-EN-TI-307 for sample results). The area was clean closed.

Site Code: 126-DR-1 **Classification:** Accepted

Site Names: 126-DR-1, 190-DR Clearwell Tank Pit, 100-DR Clearwells **ReClassification:** Interim Closed Out (4/23/2009)

Site Type: Dumping Area **Start Date:** 1975

Site Status: Active **End Date:**

Site Description: The site has been remediated and interim closed out.

The unit is an excavated area between the 183-DR and 190-DR that contained four 1.42E+07 liter (3.75E+06-gallon) steel water storage tanks. The four tanks were removed, but the concrete slab foundations remained. In the northwest section of the pit, approximately 25% of the concrete slab area contained a layer of waste 1.5 to 3 meter (5 to 10 feet) deep that is covered with pit run backfill. The southern section was posted as an asbestos area.

Waste Type: Misc. Trash and Debris

Waste Description: The unit contains demolition and inert waste from demolished facilities, including rubble from released portions of the 115-D/DR, and some rubble from 183-DR. In 1989, small amounts of friable asbestos were found scattered throughout the southern sector. The asbestos is believed to be the result of salvage operations during the 1970's. This site may contain chromates in both the soil and underground piping as a result of its association with water treatment. Because of this potential, it is closed to waste disposal. There is potential for chemical and radioactive contamination similar to that found in the 126-D-2 Burial Ground as uncontrolled dumping reportedly occurred at the site, but it is thought to be in much smaller volumes. Potential contaminates include: Chromate, lead, undetermined organic and inorganic chemicals

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Site Code: 132-DR-1 **Classification:** Accepted

Site Names: 132-DR-1, 1608-DR Waste Water Pumping Station, 1608-DR Effluent Pumping Station **ReClassification:** Interim Closed Out (9/22/2005)

Site Type: Pump Station **Start Date:** 1950

Site Status: Inactive **End Date:** 1964

Site Description: The site has been remediated and interim closed out.

The unit consisted of: 1) an above ground section constructed of concrete block walls, a reinforced concrete floor, and a reinforced concrete roof with a composition surface; 2) a below-

grade section constructed of reinforced concrete. The facility contained an operating level, which consisted of pumping equipment, and an accumulation inlet chamber, in the northern section, which fed three discharge sump chambers.

Waste Type: Water

Waste Description: This site received water from reactor building drains containing trace amounts of low-level radionuclides and decontamination chemicals. Radionuclides were primarily miscellaneous fission and activation products. The decontamination chemicals consisted of sodium fluoride, oxalic acid, and citric acid. Water was pumped from the reactor collection pits into the reactor effluent lines near the reactor building and became part of the 107-DR effluent that was discharged to the Columbia River.

Site Code:	132-DR-2	**Classification:**	Accepted
Site Names:	132-DR-2, 116-DR Reactor Exhaust Stack	**ReClassification:**	Interim Closed Out (3/4/2004)
Site Type:	Stack	**Start Date:**	1950
Site Status:	Inactive	**End Date:**	1986

Site Description: The stack has been demolished. The unit was a monolithic, reinforced concrete structure with a maximum wall thickness of 0.46 meter (1.5 feet) at the base. It rested on a double octagon-shaped base that extended 5.3 meters (17.5 feet) below grade. An opening at the base provided access to its interior portion. This opening was fitted with a steel door.

Waste Type: Chemicals

Waste Description: Until 1964 the unit discharged exhaust air from the 105-DR Building. Since 1972, the unit was used to support operations relating to the 105-DR Large Sodium Fire Facility (122-DR-1). The interior of the unit contains an unknown quantity of low-level radioactive materials.

Site Code:	600-30	**Classification:**	Accepted
Site Names:	600-30, 100-DR Construction Lay-down Area	**ReClassification:**	
Site Type:	Dumping Area	**Start Date:**	
Site Status:	Inactive	**End Date:**	

Site Description: The unit is a 4 hectare (10 acre) site covered with scattered construction related debris. Based on physical and photograph evidence, it appears to have been a lay-down yard during construction of 105-DR. Vegetation at the site includes grasses and rabbit brush. There are numerous areas that show signs of plant stress ranging from reduced to no vegetation. There is also evidence of burning throughout the unit.

Waste Type: Construction Debris

Waste Description: Waste consists of broken sheet asbestos, buckets of tar, steel, galvanized pipe, rebar, angle iron, deteriorated keg of nails, burned and crushed drums, steel plate, chain, wire rope, bolts, metal hinges, shovels, gas and oil cans, welding rod cans, evidence of concrete blocks, metal tubing, and broken shipping boxes.

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Site Code:	141-C	**Classification:**	Accepted
Site Names:	141-C, 141-C Animal Barn, Large Animal Barn & Biology Laboratory, Hog Barn	**ReClassification:**	Interim Closed Out (5/24/2006)
Site Type:	Laboratory	**Start Date:**	1945
Site Status:	Inactive	**End Date:**	1976

Site Description: After the site was remediated, the verification sampling results supported a reclassification to interim closed out.

The 141-C Building provided facilities for the long-term housing and care of research animals.

Waste Type: Water

Waste Description: Wash down water may have included the radionuclides used in the animal studies (iodine-131, strontium-90, cesium-137, and plutonium-239).

Site Code:	100-F-4	**Classification:**	Accepted
Site Names:	100-F-4, 108-F Building 12-Inch French Drain	**ReClassification:**	Interim Closed Out (7/25/2002)
Site Type:	French Drain	**Start Date:**	
Site Status:	Inactive	**End Date:**	

Site Description: The site has been remediated and closed out.

The french drain was constructed of 30-centimeter (12-inch) vitrified clay pipe, or similar material and was filled with gravel. A 1.3-centimeter (0.5-inch) steel pipe entered the drain from the 108-F Building. The drain was visible on Hanford photograph 106669-90-CN. Documentation suggests that the drain was likely removed as part of the layback zone of the 108-F Building excavation.

Waste Type: Water

Waste Description: The types and quantities of waste the unit received are unknown.

Site Code:	100-F-5	**Classification:**	Accepted
Site Names:	100-F-5, 1717-F Building Drywell	**ReClassification:**	Rejected (7/29/1997)
Site Type:	French Drain	**Start Date:**	
Site Status:	Inactive	**End Date:**	

Site Description: The site is a 1.2 meters (48 inches) diameter french drain (drywell). The drywell was constructed per Hanford Standard AC-5-3 and was surrounded by steel post and chain barrier. The purpose of the site was to receive boiler steam condensate from blowdown valves. A 10 centimeter (4 inches) pipeline connected the boilers (2) of the 1717-F Building to the drywell.

Waste Type: Steam Condensate

Waste Description: The unit received steam condensate from automatic blowdown valves connected to the boilers. The steam generation system for 1717-F was a once through system. The condensate would have received some residual salt (sodium chloride) from water softeners. Backflush from the water softeners went to the sanitary sewer system. Review of the drawings shows no indication of any additional chemical treatment during water softening. Steam condensate was not recycled to the boiler system. Drawing H-1-14566, Steam Generating Equipment Installation Piping Diagrams, shows the steam generation equipment including, the boilers, automatic blow down valves, piping to the drywell, and the drywell.

Site Code:	100-F-6	**Classification:**	Not Accepted (7/29/1997)
Site Names:	100-F-6, 1716 FA Fuel Tank and Pump	**ReClassification:**	
Site Type:	Storage Tank	**Start Date:**	
Site Status:	Inactive	**End Date:**	1945

Site Description: The site is the 1716-FA Automotive Repair Shop gas tanks and gas pumps. Hanford Drawing M-2938 shows the location of the shop and gas tanks.

During the April 1999 visit, a survey grade GPS was used to locate the site based on its mapped coordinates. The surrounding area was covered with cobbles and rocks with sparse vegetation, primarily rabbitbrush and grasses. Some debris was visible, including metal, concrete chunks and fragments of automobile headlights or taillights. An approximately 3.7 meter (12 foot) tall pile of soil and rock was visible to the south and appeared to be old borrow material.

Waste Type: Oil

Waste Description:

Site Code:	100-F-7	**Classification:**	Accepted
Site Names:	100-F-7, Underground Fuel Tank - 1705-F Building	**ReClassification:**	No Action (2/15/2005)
Site Type:	Storage Tank	**Start Date:**	1948
Site Status:	Inactive	**End Date:**	

Site Description: The site is not distinguishable from the surrounding terrain of vegetation and scattered rocks and has been reclassified to No Action.

Site Code:	100-F-8	**Classification:**	Accepted
Site Names:	100-F-8, French Drains Near 105-F Gate	**ReClassification:**	Rejected (7/29/1997)
Site Type:	French Drain	**Start Date:**	
Site Status:	Inactive	**End Date:**	

Site Description: The two french drains are constructed of 91 centimeter (36 inch) concrete pipe of unknown length buried to a depth which places their upper surfaces a few inches above grade.

Waste Type: Water

Waste Description:

Site Code: 100-F-9 **Classification:** Accepted

Site Names: 100-F-9, French Drain at East End of 105-F Storage Room (Northeast Corner) **ReClassification:** No Action (2/15/2005)

Site Type: French Drain **Start Date:**

Site Status: Inactive **End Date:**

Site Description: No remnants of this french drain have been identified , indicating that it was likely removed during the 105-F Reactor decommissioning project. The site has been reclassified to No Action.

Waste Type: Water

Waste Description:

Site Code: 100-F-10 **Classification:** Accepted

Site Names: 100-F-10, French Drain at East End of 105-F Storage Room (Southeast Corner) **ReClassification:** Interim Closed Out (5/6/2004)

Site Type: French Drain **Start Date:**

Site Status: Inactive **End Date:**

Site Description: The site has been remediated and interim closed out.

The site consisted of a 91-centimeter (36-inch) concrete pipe buried to an unknown depth. The upper surface was a few inches above grade and was cobble-filled. The unit was fed by one or more 2.5-centimeter (1-inch) steel pipes coming from the 105-F Building. Only one pipe was visible. A 1.9-centimeter (0.75-inch) pipe also entered the top of the drain.

Waste Type: Water

Waste Description:

Site Code: 100-F-11 **Classification:** Accepted

Site Names: 100-F-11, 108-F Building 18-Inch French Drain **ReClassification:** Interim Closed Out (7/25/2002)

Site Type: French Drain **Start Date:**

Site Status: Inactive **End Date:**

Site Description: The site has been remediated and closed out.

The french drain was constructed of 46-centimeter (18-inch) concrete pipe of unknown length. The unit had no cover and was filled with gravel. A 2.5-centimeter (1-inch) steel pipeline entered the drain from the 108-F Building. The drain was visible on Hanford photograph 106669-90-CN.

Documentation suggests that the french drain was likely removed with the layback zone of the 108-F Building.

Waste Type: Water

Waste Description:

Site Code: 100-F-12 **Classification:** Accepted

Site Names: 100-F-12, 36-Inch French Drain at 105-F Building **ReClassification:** No Action (2/15/2005)

Site Type: French Drain **Start Date:**

Site Status: Inactive **End Date:**

Site Description: The site is currently a flat, cobble-covered area.

Waste Type: Water

Waste Description:

Site Code: 100-F-16 **Classification:** Accepted

Site Names: 100-F-16, 108-F Building 30-Inch French Drain **ReClassification:** Interim Closed Out (7/25/2002)

Site Type: French Drain **Start Date:**

Site Status: Inactive **End Date:**

Site Description: The site has been remediated and closed out.

The french drain was constructed of steel pipe, filled with gravel, and covered with a steel lid. The drain extended 18 centimeters (7 inches) above grade and was 76 centimeters (30 inches) in diameter. Documentation suggests that the drain was likely removed with the layback zone of the 108-F Building excavation.

Waste Type: Water

Waste Description: The dates of operation and type and quantity of waste are unknown.

Site Code: 100-F-17 **Classification:** Not Accepted (7/29/1997)

Site Names: 100-F-17, 108-F Chemical Pump House, Chemical Storage Tanks at 108-F, Chemicals Used at 108-F Building **ReClassification:**

Site Type: Storage Tank **Start Date:**

Site Status: Inactive **End Date:**

Site Description: The Pump House and storage tanks have been removed.

The site was a four story steel framed building with concrete block walls, concrete foundation and floors, and a concrete tile roof with a tar and gravel surface. The entire building was in poor condition. The chemical storage tanks that were originally located on the west side of the building have been removed. A loading dock extends from the south end of the east wall. A gas dock is attached to the south end of the building. Abandoned equipment and debris is scattered

around the southwest corner of the building.

Waste Type: Asbestos (friable)

Waste Description:

Site Code:	100-F-18	**Classification:**	Accepted
Site Names:	100-F-18, 105-F Condensate Drain Field, Underground Tank at 105-F Building	**ReClassification:**	No Action (2/15/2005)
Site Type:	Drain/Tile Field	**Start Date:**	
Site Status:	Inactive	**End Date:**	

Site Description: The site was demolished during the 105-F Reactor Interim Safe Storage Project.

Waste Type: Water

Waste Description:

Site Code:	100-F-19	**Classification:**	Accepted
Site Names:	100-F-19, 100-F Reactor Cooling Water Effluent Underground Pipelines, Contaminated Underground Lines, Effluent Water System, 1904-F Process Sewer (See Subsites)	**ReClassification:**	Interim Closed Out (9/15/2003)
Site Type:	Radioactive Process Sewer	**Start Date:**	1945
Site Status:	Inactive	**End Date:**	1965

Site Description: This site contained the 100-F Reactor cooling water effluent lines which have been divided into a small pipeline or trench and three subsites. The three subsites have been remediated and Interim Closed Out. Only the 116-F-2 trench section remains to be remediated. See cleanup activities field and each subsite for documentation of the remediation and closure.

Subsite 19:1 contained a line that was constructed of steel (152 centimeters [60 inches] in diameter, 235 meters [770 feet] long) and concrete (182 centimeters [72 inches] in diameter, 280 meters [920 feet] long) from the basin to the 1904-F Outfall Structure.

Subsite 19:2 consisted of effluent lines that transported 105-F Reactor cooling water from the reactor core to the 107-F Retention Basin (three lines - one measuring 106-centimeters [42-inches] in diameter and 635 meters [2,080 feet] long, a second measuring 152 centimeters [60 inches] in diameter and 283 meters [930 feet] long and the third measuring 105 centimeters [41 inches] in diameter and 238 meters [781 feet] long). The large effluent lines running between the 105-F Reactor Building and the 107-F Retention Basin were underground for the western section of the lines and above ground for the remainder. The above ground portions of each line have been removed, cut into sections, and placed in the retention basin where they are currently covered with a layer of soil.

Subsite 19:3 consisted of the effluent line that ran from the 105-F Reactor and the 182-F and 183-F Buildings to the 116-F-1 Lewis Canal. It also included all associated expansion and valve boxes, but excluded the retention basin, outfall structure, and those effluent lines that were within

the confines of the 105-F Reactor Building. Other excluded lines were all the clean water pipelines that were upstream of the reactor building, all underground lines that were unique to the Experimental Animal Farm, and the smaller reactor effluent lines on the southwest side of the reactor.

The underground process sewers show little evidence of their location at the surface. Effluent pipe ends are exposed on the east side of the 100-F Area entrance road.

Waste Type: Process Effluent

Waste Description: The waste was radioactively contaminated steel piping, concrete and soil. Reactor cooling water became radioactively contaminated as it passed through the reactor core. Activation products created in the water included calcium-41, chromium-51, and zinc-65. Activation products from the reactor core that were picked up and transported by the cooling water included tritium, carbon-14, cobalt-60, nickel-63, and europium-152/154/155. Fuel element fission products such as strontium-90, and cesium-137, as well as transuranics such as plutonium-239/240 were introduced into cooling water due to fuel cladding failures. Concentrations of radionuclides in cooling water during normal reactor operations were approximately 0.2 microcuries/liter. Concentrations of radionuclides have built up in rust flakes and scale on the inner surfaces of the pipelines and in sludge in the diversion and junction boxes. Average beta-gamma concentrations for the effluent line scale and junction/diversion boxes are 83,000 and 120,000 picocuries/liter, respectively. Average plutonium-239/240 concentrations are 66 picocuries/gram for the effluent line scale and 720 picocuries/gram for the sludge at the bottom of the diversion and junction boxes. Direct readings of the bottom of the effluent lines averaged approximately 40,000 counts/minute with a Geiger-Mueller probe. Additional chemicals were added to the effluent for purposes of water treatment. These included aluminum sulfate (alum), with excess hydrated calcium oxide, sulfuric acid, chlorine, and sodium dichromate. Water pH was maintained at about 7.5, and the free chlorine residual was approximately 0.2 milligrams/liter.

SubSites:

SubSite Code: 100-F-19:1

SubSite Name: 100-F-19:1,100-F Reactor Cooling Water Effluent Underground Pipelines (North Group)

Classification: Accepted

ReClassification: Interim Closed Out

Description: The 100-F-19:1 North Pipelines subsite included piping that ran north-northwest from the north side of the 116-F-14 Retention Basin to the 116-F-8 Outfall Structure and also included a second underground effluent pipeline that extended northwest from the 116-F-14 Retention Basin to a junction box and to the 116-F-16 Outfall Structure.

The pipelines in this area have been removed including miscellaneous co-located pipelines that were within the excavation boundary. The 100-F-19:1 North Pipelines, 100-F-19:3 West Pipelines, 100-F-34 Biology Facility French Drain, and the 116-F-12 French Drain were remediated as a group in CVP-2001-00002. These sites meet the cleanup standards specified in the Amendment to the Interim Action Record of Decision for the 100-BC-1, 100-DR-1, and 100-HR-1 Operable Units, U.S. Environmental Protection Agency, Region 10, Seattle, Washington.

Remedial actions were performed so as to allow rural-residential use of shallow zone soils (i.e., surface to 4.6 meters [15 feet] deep) and to protect groundwater and the Columbia River. The basis for reclassification is described in detail in the Cleanup Verification

Package for the 100-F-19:1 North Pipelines, 100-F-19:3 West Pipelines, 100-F-34 Biology Facility French Drain, and 116-F-12 French Drain (CVP-2001-00002).

The cleanup verification package does not demonstrate the acceptability of unrestricted access to deep zone soils (i.e., below 4.6 meters [15 feet]); therefore, institutional controls to prevent uncontrolled drilling or excavation into deep zone soils are required.

SubSite Code: 100-F-19:2

SubSite Name: 100-F-19:2, 100-F Reactor Cooling Water Effluent Underground Pipelines (South Group)

Classification: Accepted

ReClassification: Interim Closed Out

Description: The 100-F-19:2 Reactor Cooling Water Effluent Pipeline and co-located sites, (116-F-11 Cushion Corridor French Drain, UPR-100-F-1 Sewer Line Leak, and the 100-F-29 Experimental Animal Farm Pipelines), were remediated as a group and documented in CVP-2001-00003.

This group of effluent lines exited the reactor building, extending to the east and to the north where they discharged to the 107-F Retention Basin. A portion of these pipelines were above ground before emptying into the retention basin. Another section of pipe in this subsite ran from the north side of the reactor and emptied into Lewis Canal. See 126-F-1 for information on cleanup of leaks from the 100-F-19:2 above-ground pipelines.

Remedial Action ran from August 2001 until December 2002. Verification sampling was conducted in January 2003. Remedial actions were performed so as to allow rural-residential use of shallow zone soils (i.e., surface to 4.6 meters [15 feet] deep) and to protect groundwater and the Columbia River. Contaminants of concern (COCs) were C-14, Cs-137, Co-60, Eu-152, Eu-154, Eu-155, Ni-63, and Sr-90..

Remedial actions were performed so as to allow rural-residential use of shallow zone soils (i.e., surface to 4.6 meters [15 feet] deep) and to protect groundwater and the Columbia River. The basis for reclassification was described in detail in the Cleanup Verification Package 2001-00003.

The cleanup verification package does not demonstrate the acceptability of unrestricted access to deep zone soils (i.e., below 4.6 meters [15 feet]); therefore, institutional controls to prevent uncontrolled drilling or excavation into deep zone soils are required

SubSite Code: 100-F-19:3

SubSite Name: 100-F-19:3, 100-F Reactor Cooling Water Effluent Underground Pipelines (West Group)

Classification: Accepted

ReClassification: Interim Closed Out

Description: The 100-F-19:3 West Pipelines subsite included sections of effluent pipelines located north of the reactor running west from the 182-F Reservoir and the 126-F-12 (183-F) Clearwell to the 116-F-1 Lewis Canal. This subsite also included piping running in a north-south direction between the 182-F Reservoir and the 126-F-12 (183-F) Clearwell. The site contaminants of concern included C-14, Co-60, Cs-137, Eu-152, Eu-154, Eu-155, Ni-63, Sr-90, hexavalent chromium.

The 100-F-19:1 North Pipelines, 100-F-19:3 West Pipelines, 100-F-34 Biology Facility French Drain, and the 116-F-12 French Drain were remediated as a group in CVP-2001-

00002. These sites meet the cleanup standards specified in the Amendment to the Interim Action Record of Decision for the 100-BC-1, 100-DR-1, and 100-HR-1 Operable Units, U.S. Environmental Protection Agency, Region 10, Seattle, Washington.

The site remedial action began on August 7, 2001. Excavation of the site involved removing overburden materials, pipelines, french drain structures, and contaminated soil. Cleanup verification sampling began on September 7, 2001, and was finished on September 25, 2001. The results showed that the materials from the 100-F-19:3 subsite containing COCs at concentrations exceeding RAGs have been excavated and disposed of.

Remedial actions were performed so as to allow rural-residential use of shallow zone soils (i.e., surface to 4.6 meters [15 feet] deep) and to protect groundwater and the Columbia River. All cleanup verification samples for the 100-F-19:3, 100-F-34 and 116-F-12 sites are listed under 100-F-19:1.

The cleanup verification package does not demonstrate the acceptability of unrestricted access to deep zone soils (i.e., below 4.6 meters [15 feet]); therefore, institutional controls to prevent uncontrolled drilling or excavation into deep zone soils are required.

Site Code:	100-F-21	**Classification:**	Not Accepted (7/29/1997)
Site Names:	100-F-21, Grounds Surrounding Deactivated Areas, Exclusion Area	**ReClassification:**	
Site Type:	Unplanned Release	**Start Date:**	
Site Status:	Inactive	**End Date:**	
Site Description:	The grounds within the 100-F exclusion area that are not part of other waste sites.		

Site Code:	100-F-23	**Classification:**	Accepted
Site Names:	100-F-23, 141-C Drywell	**ReClassification:**	Interim Closed Out (8/14/2003)
Site Type:	French Drain	**Start Date:**	
Site Status:	Inactive	**End Date:**	
Site Description:	The site has been remediated and closed out. The site was a drywell (a.k.a. french drain.). The 141-C Building included a dry well at its southwest corner that drained a loading dock at the facility's southwest end.		
Waste Type:	Animal Waste		
Waste Description:			

Site Code:	100-F-24	**Classification:**	Accepted
Site Names:	100-F-24, 145-F Drywell	**ReClassification:**	Interim Closed Out (8/12/2003)
Site Type:	French Drain	**Start Date:**	
Site Status:	Inactive	**End Date:**	

Site Description: The site has been remediated and closed out.

Waste Type: Animal Waste

Waste Description:

Site Code: 100-F-25 **Classification:** Accepted

Site Names: 100-F-25, 146-FR Drywells **ReClassification:** Interim Closed Out (8/14/2003)

Site Type: French Drain **Start Date:** 1956

Site Status: Inactive **End Date:** 1975

Site Description: The site has been remediated and closed out.

The 100-F-25,146-FR Drywells, were a pair of french drains associated with the 146-F and 146-FR Aquatic Biology and Fish Ponds Laboratories, which both housed research on the effects of ionizing radiation on fish.

Waste Type: Steam Condensate

Waste Description:

Site Code: 100-F-26 **Classification:** Accepted

Site Names: 100-F-26, 100-F Water Treatment Facility Underground Pipelines (See Subsites) **ReClassification:**

Site Type: Process Sewer **Start Date:** 1945

Site Status: Inactive **End Date:** 1965

Site Description: The site encompasses the upstream (pre-reactor) process sewers for the 100-F Area, including all underground water lines used to transport reactor cooling water between water treatment facilities and the 105-F Reactor Building. These include potentially contaminated underground lines running between buildings and those that run to drainage facilities.

Excluded lines consist of those located within buildings, lines downstream of the reactor building, (100-F-19 i.e., those lines that carry cooling water from the reactor to the retention basin, trench, and/or the river outfall) some of the underground lines associated with the Experimental Animal Farm (100-F-29 and 100-F-33) and clean water pipelines (100-F-41). For evaluation purposes, the site has been divided into 16 subsites based on design purpose (e.g., sanitary sewer or process water), expected sources of contamination, and potential remedial actions.

The 16 subsites are as follows:
- 100-F-26:1 North process sewer collection pipelines
- 100-F-26:2 Process water pipelines to the aquatic biology and strontium gardens
- 100-F-26:3 184-F Powerhouse pipelines
- 100-F-26:4 South process pipelines
- 100-F-26:5 190-F bypass pipelines
- 100-F-26:6 190-F Reservoir pipelines
- 100-F-26:7 Sodium dichromate and sodium silicate pipelines
- 100-F-26:8 1607-F1 sanitary sewer pipelines

- 100-F-26:9 1607-F2 sanitary sewer pipelines
- 100-F-26:10 1607-F3 sanitary sewer pipelines
- 100-F-26:11 1607-F4 sanitary sewer pipelines
- 100-F-26:12 1.8-m (72-in.) main process sewer pipeline
- 100-F-26:13 108-F drain pipelines
- 100-F-26:14 116-F-5 influent pipelines
- 100-F-26:15 Miscellaneous pipelines associated with the 1608-F sump
- 100-F-26:16 Reactor cooling water pipelines.

Waste Type: Water

Waste Description: The waste consists of contaminated pipelines made of various materials (i.e. steel piping, concrete and soil). Chemical additives to the reactor cooling water included aluminum sulfate (alum) with excess hydrated calcium oxide, sulfuric acid, chlorine, and sodium dichromate. Water pH was maintained at about 7.5, and the free chlorine residual was approximately 0.2 milligrams/liter.

SubSites:

SubSite Code: 100-F-26:1

SubSite Name: 100-F-26:1, North Process Sewer Collection Pipelines

Classification: Accepted

ReClassification: No Action

Description: The Remaining Sites Verification Package (RSVP). 2005-008, has documented that the subsite has achieved the remedial action objectives (RAOs) and the corresponding remedial action goals (RAGs) as established in the Remedial Design Report/Remedial Action Work Plan for the 100 Area and the Interim Action Record of Decision for the 100-BC-1, 100-BC-2, 100-DR-1, 100-DR-2, 100-FR-1, 100-FR-2, 100-HR-1, 100-HR-2, 100-KR-1, 100 KR-2, 100-IU-2, 100-IU-6, and 200-CW-3 Operable Units, ROD).

The 100-F-26:1 subsite pipelines were stratified into five service areas based on the contributing discharges to pipeline segments from each of the two facilities. Confirmatory sampling of the subsite was conducted between December 1, 2004, and January 10, 2005. A stratified sampling design with focused sampling of pipeline sediment/scale and underlying soil was implemented in each of the five service areas. In each service area, a test pit was excavated and a section of the pipeline was removed. The inverts of the pipelines were identified at depths of 4 to 4.9 m (13 to 16 ft) below ground surface (bgs) at the locations excavated, with the exception of the sewer line southwest of the 182-F Reservoir, for which a junction box was located at 1.5 m (5 ft) bgs. Soil samples beneath the pipe and samples of the scale/sediment inside the pipe were collected.

The contaminants of potential concern (COPCs) are cobalt 60, cesium-137, europium-152, europium-154, strontium-90, silver, barium, cadmium, chromium (total), mercury, lead, selenium, arsenic, hexavalent chromium and
polychlorinated biphenyls (PCBs).

The confirmatory sampling results supported a reclassification of this site to no action. The results demonstrated that residual contaminant concentrations supported future unrestricted land use that can be represented (or bounded) by the rural-residential scenario. These results also indicated that contaminant levels remaining in the soil were protective of groundwater and the Columbia River. This subsite does not have a deep zone; therefore, no deep zone institutional controls are required.

SubSite Code: 100-F-26:2

SubSite Name: 100-F-26:2, Process Water Pipelines to the Aquatic Biology and Strontium Gardens

Classification: Accepted

ReClassification: No Action

Description: The Remaining Sites Verification Package for 100-F-26:2, RSVP-2005-005, has documented that the subsite has achieved the remedial action objectives (RAOs) and the remedial action goals (RAGs) for a no action reclassification. The RAOs/RAGs were established in the Remedial Design Report/Remedial Action Work Plan for the 100 Area (RDR/RAWP) and the Interim Action Record of Decision for the 100-BC-I, 100-BC-2, 100-DR-1, 100-DR-2, 100-FR-1, I00-FR-2, 100-HR-1, 100-HR-2, 100-KR-1, 100-KR-2, 100-IU-2, 100-IU-6, and 200-CW-3 Operable Units, Hanford Sit (Remaining Sites ROD).

According to the Work Instruction for 100-F-26:2 Process Water Pipelines to the Aquatic Biology Fish Ponds and Strontium Gardens, the subsite consisted of a 5.1-centimeter (2-inch) diameter carbon steel pipeline that exited the east side of the 190-F Pumphouse, then split and conveyed flow to both the Aquatic Biology Fish Ponds and the Strontium Gardens. However, field excavation of test pits and exploratory trenches did not reveal the pipeline to the Strontium Gardens, nor did it reveal any indication that the Strontium Gardens pipeline split from the Aquatic Biology pipeline. The Aquatic Biology pipeline was opened and found to contain enough residual scale/sediment for the collection of one sample.

Contaminants of potential concern (COPCs) for the 100-F-26 underground pipeline waste site included strontium-90, cesium-137, cobalt-60, europium-152, europium-154, hexavalent chromium, arsenic, barium, cadmium, total chromium, lead, mercury, selenium, and silver. Historical information and process knowledge for the 190-F Pumphouse was used to further develop the COPCs, resulting in the inclusion of polychlorinated biphenyls (PCBs). In addition, as a precautionary measure, gross-alpha samples were collected to determine if alpha emitters were present at levels above background.

Confirmatory sampling of the subsite was conducted from November 17 through 18, 2004, in accordance with the site work instruction. Since no manholes or junction boxes were indicated on site drawings, three test pits were excavated in search of the two 5.1 cm (2 in) process water pipelines conveying flow to the Aquatic Biology Fish Ponds and the Strontium Gardens. According to historical information discussed in the work instruction, the pipeline split at the location of test pit 1, and one 5.1 cm (2 in) pipe traveled southwest to the Strontium Gardens while the other 5.1 cm (2 in) carbon steel pipe traveled northeast to the Aquatic Biology Fish Ponds.

However, excavation of test pits and exploratory trenches at the locations of test pit 1 and test pit 3 did not reveal the pipeline to the Strontium Gardens, nor did they reveal any indication that there was ever a pipeline to the Strontium Gardens that split from the Aquatic Biology pipeline at the location of Test Pit 1. Further excavation of exploratory test trenches in the vicinity of test pits 1 and 3, between test pits 1 and 3, and between test pit 1 and the 190-F Pumphouse also did not reveal any indication that the Strontium Gardens pipeline split from the Aquatic Biology pipeline, nor that it exists in its presumed location. Consequently, as it could not be located, no confirmatory samples from the Strontium Garden pipeline were collected.

The purpose of excavating test pit 1 was to collect a sample of pipe scale from the pipe at the location where it split and formed two separate pipelines. As previously discussed, field excavation did not locate a split in the Aquatic Biology pipeline at or in the vicinity of test pit 1; therefore, it was determined by the field sampling task lead that test pit 1 was no longer a defensible focused sampling location. Since test pit 2 was located at a 90 degree bend in the

pipeline, and no other pipelines contributed flow upstream or downstream of test pit 2, it was determined that residual contamination at test pit 2 was representative of the residual contamination throughout the pipeline. Therefore, test pit 2 was identified as a defensible worst case focused sampling location for the Aquatic Biology pipeline. Confirmatory samples of the residual scale/sediment in the 5.1 cm (2 in) carbon steel pipe and soil beneath the pipe were collected at the 90 degree elbow in the pipe at test pit 2.

The no action decision for the 100-F-26:2 subsite is supported based on current reviews of the site history and confirmatory sampling results. The analytical results from soil samples collected were shown to meet the cleanup objectives for direct exposure, groundwater protection, and river protection. The sampling results were stored in the Environmental Restoration (ENRE) project-specific database prior to archiving in the Hanford Environmental Information System (HEIS). They were also included in Appendix A of the RSVP.

These results indicated that residual soil concentrations support future land uses that can be represented (or bounded) by a rural-residential scenario. The results also demonstrated that residual contaminant concentrations support unrestricted future land uses of shallow zone soil (i.e., surface to 4.6 meters [15 feet]) and that contaminant levels remaining in the soil are protective of groundwater and the Columbia River. The subsite does not have a deep zone; therefore, no deep zone institutional controls were required.

SubSite Code: 100-F-26:3

SubSite Name: 100-F-26:3, 184-F Powerhouse Pipelines

Classification: Accepted

ReClassification: No Action

Description: The selected action for this subsite involved evaluation of the 100-B-14:6 pipeline subsite RSVP and data, evaluation of process knowledge for the 100-F-26:3 pipeline subsite, and proposal of no further action. The 100-F-26:3 pipeline subsite consisted of a network of process sewer pipelines that serviced the 184-F power house and 188-F ash disposal basin. The 184-F power house was primarily a boiler house, containing four boilers and one small turbine generator for emergency power generation. The 188-F ash disposal basin was an open rectangular-shaped pit used for the disposal of ashes from the 184-F Power House. Ash from the power house was combined with raw river water and pumped directly from the sluice pit in the power house to the ash disposal basin. Contaminants of Concern were ICP metals, mercury, hexavalent chromium, PCBs.

This site is analogous to the 100-B-14:6 subsite (184-B Power House pipelines, Waste Site Reclassification Form Control Number 2004-010, dated 5/10/2004).

Analytical results obtained from confirmatory sampling at the analogous 100-B-14:6 subsite indicated that the 100-F-26:3 subsite had also met the Remedial Action Objectives specified in the Remaining Sites ROD. The 100-B-14:6 site evaluation showed that there were no hazardous/dangerous materials present at the site and, accordingly, no residual contamination in the soil. The basis for reclassification of the subsite was supported, based on reviews of the processes associated with steam boilers, site history, and confirmatory sampling at the analogous subsite which was determined to meet the cleanup criteria. The remaining contaminant levels were protective of human health, groundwater and the Columbia River.

SubSite Code: 100-F-26:4

SubSite Name: 100-F-26:4, South Process Pipelines

Classification: Accepted

ReClassification:

Description: This subsite is a network of process sewer pipelines that received flow from the 105-F Reactor, the 190-F Pumphouse, the 1717-F Combined Shops Buildings and the 108-F Biology Laboratory in the 100-F Areas.

The contaminated cast-iron pipe found during the February 2002 excavation of the 108-F building was not located during this remedial action. Therefore, an additional test pit was excavated on November 29, 2005, in an attempt to locate the contaminated 15-centimeter (6-inch)-diameter cast-iron pipe. The additional excavation was unsuccessful, and the excavated material was placed back in the pit. Additional efforts in July 2006 to locate the contaminated pipe using a metal detector were also unsuccessful. However, the contaminated 15-centimeter (6- inch)-diameter cast-iron pipe (100-F-26:4) was found during test pitting activities in December 2006. The contaminated pipe was associated with the 100-F-26:4 pipeline site and was not a part of the 116-F-15 sump as previously indicated. Remediation and sampling activities for the 100-F-26:4 pipeline site will be included in a future work instruction and verification package.

SubSite Code: 100-F-26:5

SubSite Name: 100-F-26:5, 190-F Bypass Process Sewer Pipelines

Classification: Accepted

ReClassification: No Action

Description: The Remaining Sites Verification Package, RSVP-2005-007 demonstrates that the 100-F-26:5 subsite has met the objectives for no action as established in the Remedial Design Report/Remedial Action Work Plan for the 100 Area (RDR/RAWP) (DOE RL 2005b) and the Interim Action Record of Decision for the 100-BC-1, 100-BC-2, 100-DR-1, 100-DR-2, 100-FR-1, 100-FR-2, 100-HR-1, 100-HR-2, 100-KR-1, 100-KR-2, 100-IU-2, 100-IU-6, and 200-CW-3 Operable Units, (ROD).

The subsite included the underground pipelines that serviced the 185-F Building and the 190-F Pumphouse Building, they were composed of 1.2-meter (48-inch) reinforced concrete pipe (RCP) and 0.46-meter (18-inch) vitrified clay pipe (VCP). The historic design flow direction consisted of discharges from the 185-F and 190-F Facilities traveling generally south before the pipeline turned west to discharge to one of the 100-F-19:3 [100-F Reactor Cooling Water Effluent Underground Pipelines (West Group)]. A discrepancy as to the termination point of the 100-F-26:5 pipeline was found, the CVP for the 100-F-19:3 waste site indicated that the 100-F-26:5 pipeline was approximately 63 meters (207 feet) longer at the southwest end of the subsite than was shown on Drawing 0100F-DD-C0189.

Contaminants of potential concern (COPCs) for the subsite included strontium-90, cesium-137, cobalt-60, europium-152, europium-154, hexavalent chromium, arsenic, barium, cadmium, total chromium, lead, mercury, selenium, silver, and polychlorinated biphenyls (PCBs).

A total of 10 samples were collected between November 2004 and January 2005 from the service areas consisting of soil under the pipes, sediment inside of the pipes or manholes, one field duplicate, and an equipment blank. Samples (J022P0 through J022P6, J026X4, J02D79, J02D80 and J022M5) were collected and analyzed for the established COPCs. The samples and results have been reported to the HEIS database.

Mercury levels in test pit 2 (805 milligrams/kilograms) were significantly higher than the

direct exposure remedial action goal (RAG) of 24 milligrams/kilograms. However, the sample that contained the high mercury concentration was taken at a depth of 5.5 meters (18 feet) below ground surface in the deep zone, and therefore direct exposure RAGs were not applicable.

The results demonstrated that residual contaminant concentrations support future land use that can be represented (or bounded) by the rural-residential scenario. These results also showed that contaminant levels remaining in the soil are protective of groundwater and the Columbia River. However, because mercury concentrations in deep vadose zone soil exceed direct exposure, institutional controls are required for the 100-F-26:5 waste site to prevent excavation or drilling into the deep vadose zone soils.

SubSite Code: 100-F-26:6

SubSite Name: 100-F-26:6, 190-F Reservoir Pipelines

Classification: Accepted

ReClassification: No Action

Description: The 100-F-26:6 pipeline subsite has been determined to meet the Remedial Action Objectives (RAOs) and Remedial Action Goals (RAGs) as established by the Interim Action Record of Decision for the 100-BC-1, 100-BC-2, 100-DR-1, 100-DR-2, 100-FR-1, 100-FR-2, 100-HR-1, 100-HR-2, 100-KR-1, 100-KR-2, 100-IU-2, 100-IU-6, and 200-CW-3 Operable Units, (ROD). The selected action for this subsite involved (1) evaluation of the analogous 100-B-14:7 subsite's RSVP and data, (2) evaluation of process knowledge, and (3) proposal of no further action.

The subsite received flow via a cast iron pipeline (CIP) with lead joints, from the re-use water reservoir portion of the 190-F Pumphouse. Waste water from the steam jet condensers was collected in the re-use water reservoir and pumped back to the main reservoir (182-F Building) during the winter months to maintain the temperature of the process water. The 190-F re-use water reservoir and pipeline are analogous to the 190-B Sump and Pipelines (100-B-14:7), as they had a similar source of water and supported a similar process.

The lead contained in the pipeline did not present a direct exposure risk to human health, no exposure pathway to groundwater existed. There was no history of radiological contamination associated with the 190-F Reservoir Pipelines and no radiological contamination was detected during decommissioning of the 190-F complex. There were no known process incidents at 105-F Reactor that would have introduced radiological contamination from the reactor into the 190-F Reservoir Pipelines.

The 100-B-14:7 pipeline subsite was determined to meet the cleanup criteria, consequently the 100-F-26:6 subsite also has met the cleanup criteria and the remaining contaminant levels were protective of human health, groundwater and the Columbia River. The site has been reclassified to No Action.

SubSite Code: 100-F-26:7

SubSite Name: 100-F-26:7, Sodium Dichromate and Sodium Silicate Pipelines

Classification: Accepted

ReClassification:

Description: Note from the WIDS Administrator: After this reclassification form was approved, the pipeline was cut through as part of a different waste site remediation. Sodium dichromate was still present in the pipeline. Plans are being developed to remove/remediate the entire

pipeline. The reclassification status listed on this form is no longer valid. The reclassification status for this subsite was cleared in WIDS on 6/10/2010.

The subsite consisted of two parallel, 0.07 meter (3 inch) steel pipelines that conveyed sodium dichromate and sodium silicate, respectively, from the 108-F Chemical Pumping Building to the 190-F Water Treatment Building.

The 100-F-26:7 waste site is a pair of 7.6-centimeter (3-inch) steel pipelines that conveyed sodium dichromate and sodium silicate, respectively, from the 108-F Chemical Pumping Building to the 190-F Water Treatment Building. The pipelines ran from the 108-F Chemical Pumping Building to the 190-F Water Treatment Building.

Based on historical information, the sodium silicate pipeline conveyed only chemicals with low inherent toxicity or that readily degrade to compounds of low inherent toxicity, and therefore is not considered hazardous/dangerous or to present a risk to human health or the environment.

Because the sodium silicate pipeline was within 0.8 m (2 ft) of the sodium dichromate pipeline along their entire lengths, the two were treated as twin pipelines for confirmatory sampling. Samples were taken of the soil beneath a 90-degree bend in the sodium dichromate pipeline and from a section of the pipe. The maximum detected results from the soil and pipe samples were used to support site reclassification. The samples met the cleanup criteria so the pipes were left in place. A waste site reclassification to interim closed out was approved (120708).

During overburden removal of the 100-F-26:9 pipeline on February 14, 2007, WCH unearthed, broke open, spilled and cleaned up 1 to 2 gallons of liquid from the 100-F-26:7 interim closed out pipeline where it crossed diagonally over the top of the 100-F-26:9 pipeline. Conclusions from the soil sample results affected by the spill were that concentrations of total and hexavalent chromium were above cleanup standards. The waste site reclassification for 100-F-26:7 was withdrawn and the site was referred for remove, treat and disposal (135297).

SubSite Code: 100-F-26:8

SubSite Name: 100-F-26:8, 1607-F1 Sanitary Sewer Pipelines

Classification: Accepted

ReClassification: Interim Closed Out

Description: The sanitary sewer pipelines consisted of 200 meters (660 feet) of 0.2 meters (8 inches.) diameter vitrified clay pipe. The Remaining Sites Verification Package (RSVP) for the 1607-F1 sanitary sewer system and 100-F-26:8 sanitary sewer pipelines waste sites has documented that they have met the Remedial Action Objectives (RAOs) and the corresponding Remedial Action Goals (RAGs) as established in the Remedial Design Report/Remedial Action Work Plan for the 100 Area (RDR/RAWP) and the Interim Action Record of Decision for the 100-BC-1, 100-BC-2, 100-DR-1, 100-DR-2, 100-FR-1, 100-FR-2, 100-HR-1, 100-HR-2, 100-KR-1, 100-KR-2, 100-IU-2, 100-IU-6, and 200-CW-3 Operable Units, (ROD) for interim closure.

Remediation of the 1607-F1 and 100-F-26:8 waste sites were performed from January 8 to April 3, 2007 and documented as one RSVP. Both sites were excavated to approximately 3.4 meters (11 feet) below grade resulting in a combined volume of approximately 464 cubic meters (607 cubic yards) of material stockpiled for disposal at the Environmental Restoration Disposal Facility (ERDF). Approximately 266 meters (872 feet) of pipeline were removed during remediation. There were no anomalies or stained soil discovered during remediation.

During pipeline excavation, a french drain was discovered on the west side of the former 1709-F facility. Although this french drain was independent of the pipelines, it was removed.

The COCs/COPCs were established using the confirmatory sampling analytical results. Based on these results, the COC/COPCs for the 1607-F1 and 100-F-26:8 waste sites verification sampling design were the metals barium, lead, and zinc; pesticides (dichlorodiphenyl-dichloroethane [DDD], dichlorodiphenyl-dichloroethylene [DDE], dichlorodiphenyl-trichloroethane [DDT]); SVOCs (benzo(a)pyrene, benzo(k)fluoranthene, and chrysene); and PCBs (aroclor-1260). Petroleum hydrocarbons and mercury were added as COCs/COPCs based on the discovery of the 1709-F french drain during remediation of the 100-F-26:8 pipelines. These additions were based on the assumption that the probable sources of effluent in the french drain were from hose drying and truck washing activities. Therefore, potential contaminants in the effluent were from motor oil leaks and broken mercury switches.

Verification sampling for the remediated 1607-F1 and the 100 F 26:8 waste sites was performed in September and October 2007. Evaluation of the verification sampling results shows that all direct exposure cleanup levels were met for the four decision units of the 1607-F1 and 100-F-26:8 waste sites: the 1607-F1 septic tank and 100-F-26:8 pipelines excavation footprint, 1709-F french drain, road crossing areas, and overburden stockpiles.

The results of verification sampling show that residual contaminant concentrations do not preclude any future uses (as bounded by the rural-residential scenario) and allow for unrestricted use of shallow-zone soils (i.e., surface to 4.6 meters [15 feet] deep). The results also demonstrate that residual contaminant concentrations are protective of groundwater and the Columbia River. No institutional controls are required for this site to prevent uncontrolled drilling or excavation into deep zone [i.e., below 4.6 m (15 ft)].

SubSite Code: 100-F-26:9

SubSite Name: 100-F-26:9, 1607-F2 Sanitary Sewer Pipelines

Classification: Accepted

ReClassification: Interim Closed Out

Description: In accordance with the Remaining Sites Verification Package, (RSVP-2008-029), the confirmatory and verification sampling results support a reclassification to Interim Closed Out. The current site conditions have achieved the remedial action objectives (RAOs) and the corresponding remedial action goals (RAGs) as established in the Remedial Design Report/Remedial Action Work Plan for the 100 Area (RDR) and the Interim Action Record of Decision for the 100-BC-1, I00-BC-2, 100-DR-1, 100-DR-2, 100-FR-1, 100-FR-2, 100-HR-1, 100-HR-2, 100-KR-1, 100-KR-2, 100-IU-2, 100-IU-6, and 200-CW-3 Operable Units (ROD).

The 100 F 26:9 subsite consisted of underground pipelines of the 1607-F2 sanitary sewers servicing the 105-F, 108-F, 184-F, 185-F, and 190-F buildings, and the 1700 F administration and service buildings (1704-F, 1707-F, 1707-FA, 1713-F, 1717-F, 1719 F, and 1722-F). According to documentation the 1607-F2 septic tank, which was Interim Closed Out in CVP-2002-00005, was posted as an underground radioactive material area. No evidence was found to substantiate the posting.

Twelve test pits were excavated and sampled in the 100-F-26:9 pipeline subsite. The contaminants at seven of the service areas (1, 3, 4, 5, 6, 7 and 8) were found to be at concentrations protective of human health, groundwater, and the Columbia River. A remedial action requirement was determined for service areas 2, 9, and 10. Service Area 11 was

remediated because it was downstream of service areas 2 and 10.

Remediation of these service areas was performed from February 8 through October 30, 2007. The site was excavated to a depth of approximately 3.7 m (12 ft) below grade, resulting in approximately 1,360 bank cubic meters (BCM) (1,780 bank cubic yards [BCY]) of material disposed of at the Environmental Restoration Disposal Facility. Approximately 6,340 BCM (8,290 BCY) of overburden and layback soil was removed and stockpiled for use as clean backfill. Verification sampling for the 100-F-26:9 service areas 2, 9, 10, and 11 pipeline site was performed between February 2007 and February 2008.

The contaminants of concern for verification sampling were identified in the 100-F-26:9, 1607-F2 Sanitary Sewer Pipelines Verification Work Instruction (0100F-WI-G0024) as gamma-emitting radionuclides by gamma energy analysis, alpha emitting radionuclides by gross alpha proportional counting; beta-emitting radionuclides by gross beta proportional counting and for inductively coupled plasma metals, mercury, hexavalent chromium, TPH, semivolatile organic compounds, and PCBs.

The results of sampling show that residual contaminant concentrations do not preclude any future uses (as bounded by the rural-residential scenario) and allow for unrestricted use of shallow zone soils (i.e., surface to 4.6 m [15 ft] deep). The results also demonstrate that residual contaminant concentrations are protective of groundwater and the Columbia River. The site does not have a deep zone or residual contaminant concentrations that would require any institutional controls.

SubSite Code: 100-F-26:10

SubSite Name: 100-F-26:10, 1607-F3 Sanitary Sewer Pipelines

Classification: Accepted

ReClassification: Interim Closed Out

Description: The 100-F-26:10 underground pipeline subsite consisted of underground sanitary sewer pipelines that received effluent from the 182-F, 183-F, and 151-F Buildings and discharged to the 1607-F3 septic system. The Remaining Sites Verification Package (RSVP), 2007-028, has documented that the subsite achieved the remedial action objectives and the corresponding remedial action goals as established in the Remedial Design Report/Remedial Action Work Plan for the 100 Area (RDR/RAWP) and the Interim Action Record of Decision for the 100-BC-1, 100-BC-2, 100-DR-1, 100-DR-2, 100-FR-1, 100-FR-2, 100-HR-1, 100-HR-2, 100-KR-1, 100-KR-2, 100-IU-2, 100-IU-6, and 200-CW-3 Operable Units, (Remaining Sites ROD).

In preparation for the site remediation, two road crossings were excavated, sampled, and immediately backfilled in January 2007. Remedial action was performed from March 7 through March 12, 2007. The site was excavated between 2.4 meters (8 feet) and 4.3 meters (14 feet) below grade, resulting in approximately 1,900 bank cubic meters (BCM) (2,500 bank cubic yards [BCY]) of material disposed at the Environmental Restoration Disposal Facility, including removal of approximately 600 meters (1,970 feet) of pipeline. Approximately 4,200 BCM (5,500 BCY) of overburden soil was removed and stockpiled for use as clean backfill.

According to documentation, a portion of the north-south vitrified clay pipeline (VCP) line that serviced the 182-F Pump Station and a portion of the 183-F Water Treatment Plant VCP line were removed during decommissioning of the buildings, leaving two separate sections of pipeline. The 1607-F3 septic tank, drain field, and associated contaminated soil were removed in September 2005. Remedial action objectives for the 1607-F3 waste site were met after the additional excavation of contaminated soil in 2006 and were addressed in RSVP-

2006-047.

The Contaminants of Concern/Contaminants of Potential Concern (COCs/COPCs) for verification sampling were determined based on the confirmatory sampling results from the 100-F-26:10 waste site. The COCs/COPCs were identified in the verification work instruction (0100F WI G0064) as cesium-137, europium-152, arsenic, barium, boron, cadmium, total chromium, cobalt, copper, lead, manganese, molybdenum, nickel, vanadium, zinc, hexavalent chromium, gamma-chlordane, SVOCs, and aroclor-1260.

The verification samples were analyzed by gamma energy analysis and for pesticides, SVOCs, PCBs, metals by inductively coupled plasma analysis, mercury and hexavalent chromium, which included all of the COCs/COPCs listed in the verification work instruction. The road crossing samples were additionally analyzed for nickel-63 and total strontium.

Verification sampling for the site was performed in January and August 2007. The site was divided into three decision units for verification sampling. The first decision unit consisted of the excavation footprint of the pipeline, the second decision unit consisted of the overburden stockpiles, and the third decision unit consisted of the pipeline excavations underlying the haul road (road-crossing area) and the overburden stockpiles used to backfill in the road crossings. Statistical and judgmental sampling to verify the completeness of remediation was performed, and analytical results were shown to meet the cleanup objectives for direct exposure, groundwater protection, and river protection.

The samples were analyzed using U.S. Environmental Protection Agency-approved analytical methods. The laboratory-reported data results for all constituents were stored in the Environmental Restoration (ENRE) System project-specific database prior to submission for archival in the Hanford Environmental Information System (HEIS) site-wide database. The results were also included in Appendix D of the RSVP.

The results of verification sampling indicated that residual contaminant concentrations did not preclude any future uses (as bounded by the rural-residential scenario) and allow for unrestricted use of shallow-zone soils (i.e., surface to 4.6 meters [15 feet] deep). The results also demonstrated that residual contaminant concentrations were protective of groundwater and the Columbia River. Site contamination did not extend into the deep zone soils; therefore, institutional controls to prevent uncontrolled drilling or excavation into the deep zone are not required.

SubSite Code: 100-F-26:11

SubSite Name: 100-F-26:11, 1607-F4 Sanitary Sewer Pipelines

Classification: Accepted

ReClassification: No Action

Description: The Remaining Sites Verification Package for 100-F-26:11, RSVP-2005-003, has documented that the subsite has achieved the remedial action objectives (RAOs) and the corresponding remedial action goals (RAGs) for a no action reclassification. The RAOs and RAGs were established in the Remedial Design Report/Remedial Action Work Plan for the 100 Area and the Interim Action Record of Decision for the 100-BC-I, 100-BC-2, 100-DR-1, 100-DR-2, 100-FR-1, I00-FR-2, 100-HR-1, 100-HR-2, 100-KR-1, 100-KR-2, 100-IU-2, 100-IU-6, and 200-CW-3 Operable Units (ROD).

The subsite was located approximately 139 meters (456 feet) west of the 105-F Reactor Building. The subsite consisted of a 0.15-meter (6-inch) diameter vitrified clay pipe (VCP) that received effluent from the 115-F Gas Recirculation Building. The VCP originated at the southwest corner of the 115-F Gas Recirculation Building and carried flow west

approximately 53.6 meters (178 feet). The pipeline terminated at the inlet to the 1607-F4 septic tank.

Contaminants of concern (COCs) for the underground pipeline waste site included americium-241, strontium-90; cesium-137, cobalt-60, europium-152, europium-154, europium-155, hexavalent chromium, arsenic, barium, cadmium, total chromium, lead, mercury, selenium, silver, pesticides, polychlorinated biphenyls (PCBs), and semivolatile organic compounds.

Confirmatory sampling of the subsite was conducted on November 22, 2004, in accordance with the WCH work instructions. A focused sampling approach was selected using the probable worst-case locations for sampling. Confirmatory samples of the 0.15-m (6-in.) influent VCP were collected via excavation of two test pits, one at either side of the pipeline. Samples were taken of the pipeline interior scale and the soil underneath the pipe. The samples were analyzed using analytical methods approved by the U.S. Environmental Protection Agency. The results were stored in the WCH Environmental Restoration (ENRE) project-specific database prior to archiving in the Hanford Environmental Information System (HEIS) and were included in Appendix A of the RSVP.

Analytical results of pipe scale and underlying soil samples for the subsite were shown to meet the cleanup objectives for direct exposure, groundwater protection, and river protection, excluding the soil sample for lead and the pipe scale sample for aroclor-1260.

The results also demonstrated that residual contaminant concentrations support unrestricted future land uses of shallow zone soil (i.e., surface to 4.6 meter [15 feet]) and that contaminant levels remaining in the soil were protective of groundwater and the Columbia River. This site does not have a deep zone; therefore, no deep zone institutional controls were required.

SubSite Code: 100-F-26:12

SubSite Name: 100-F-26:12, 72-inch Main Process Sewer Pipeline

Classification: Accepted

ReClassification: Interim Closed Out

Description: The current site conditions as documented in the Remaining Sites Verification Package (RSVP-2007-034) have achieved the remedial action objectives (RAO) and the corresponding remedial action goals (RAG) as established in the Remedial Design Report/Remedial Action Work Plan for the 100 Area and the Interim Action Record of Decision for the 100-BC-1,100-BC-2, 100-DR-1, 100-DR-2, 100-FR-1, 100-FR-2, 100-HR-1, 100-HR -2 , 100-KR-1, 100-KR -2,100-IU-2, 1OO-IU-6, and 200-C W-3 Operable Units, (ROD).

The 100-F-26: 12 underground pipeline subsite consisted of an approximately 308-m (1,011-ft)-long, 1.8 m (72 in.) east west-trending reinforced concrete pipe that joined the North Process Sewer Pipelines (100-F-26: 1) and the South Process Pipelines (100-F-26:4) with the 1.8-m (72-in.) reactor cooling water effluent pipeline (100-F-19).

Radiological field measurements and staining discovered during excavation of the 100-F-19 pipeline in August 2001 indicated that contamination was present within the 100-F-26: 12 sewer pipe and its surrounding soils. The site was referred for remedial action without requiring additional confirmatory sampling (WCH-CCN-117910).

Remediation of the pipeline subsite was performed from January 11 through October 4, 2007. The subsite was excavated between 4.0 m (13 ft) and 6.0 m (20 ft) below grade, resulting in approximately 2,900 bank cubic meters (BCM) (3,800 bank cubic yards [BCY])

of material disposed of at the Environmental Restoration Disposal Facility, including removal of approximately 308 m (1,0 11 ft) of pipeline. Approximately 23,340 BCM (30,530 BCY) of overburden was removed and stockpiled for use as clean backfill.

The COC/COPCs for verification sampling were identified in BHI-CCN 117910 as carbon-14, cesium- 137, cobalt-60, europium- 152, europium- 154, europium-155, nickel-63, strontium-90, hexavalent chromium, arsenic, barium, cadmium, total chromium, lead, mercury, selenium, and silver. Contingencies were provided for adding to the COPC list if anomalies were discovered during confirmatory sampling. No suspected asbestos-containing material or petroleum-stained soil was observed during sampling; therefore, asbestos and total petroleum hydrocarbon analyses were not requested. Field screening for volatile organic compounds (VOCs) was performed and none were detected during sampling; therefore, laboratory analysis for VOCs was not requested.

The entire pipeline was constructed of steel-reinforced concrete. The portion of the pipeline that ran beneath the railroad crossing (near the coal conveyor structure) was encased in concrete to support the additional load. The pipeline encased in concrete was removed, but the large concrete monolith associated with the coal conveyor was abandoned in place. The coal conveyor structure was evaluated and found to be absent of hydraulic systems. No anomalies or stained soil were discovered during remediation.

Verification sampling to verify the completeness of remediation was performed in September and October 2007, and analytical results for the three decision units (shallow zone excavation footprint, overburden stockpiles, and BCL stockpiles) were shown to meet the cleanup objectives for direct exposure, groundwater protection, and river protection.

Verification samples were analyzed using U.S. Environmental Protection Agency-approved analytical methods. The laboratory-reported data results for all constituents were stored in the WCH Environmental Restoration (ENRE) project- specific database prior to submission for archival in the Hanford Environmental Information System (HEIS) site-wide database and are summarized in Appendix D of the RSVP. The verification sampling results support a reclassification of this site to Interim Closed Out.

The results of verification sampling show that residual contaminant concentrations do not preclude any future uses (as bounded by the rural-residential scenario) and allow for unrestricted use of shallow-zone soils (i.e., surface to 4.6 m [15 ft] deep).

SubSite Code: 100-F-26:13

SubSite Name: 100-F-26:13, 108-F Drain Pipelines

Classification: Accepted

ReClassification: Interim Closed Out

Description: The 100-F-26:13 subsite consisted of one 0.15 meter (6 inch), two 0.2 meter (8 inch), and one 0.31 meter (12 inch) diameter vitrified clay pipe (VCP) segments encased in concrete. The pipelines discharged effluent from the former 108-F Biological Laboratory, which was originally built in 1944 to support treatment of cooling water for use in the 105-F Reactor, to the 188-D Ash Disposal Area (126-F-1). In 1949, the 108-F Building was completely remodeled for use in life-science studies to test the effects of radiation and contamination on plant and animal life. In 1999, the 108-F Building was decontaminated, demolished, and removed; however, the 100-F-26:13 pipeline segments were left in place.

The Remaining Sites Verification Package for 100-F-26:13, RSVP-2005-011 has documented that the subsite has achieved the remedial action objectives (RAOs) and the corresponding remedial action goals (RAGs) objectives for interim closure as established in

the Remedial Design Report/Remedial Action Work Plan for the 100 Area (RDR/RAWP) and the Interim Action Record of Decision for the 100-BC-1, 100-BC-2, 100-DR-1, 100-DR-2, 100-FR-1, 100-FR-2, 100-HR-1, 100-HR-2, 100-KR-1, 100-KR-2, 100-IU-2, 100-IU-6, and 200-CW-3 Operable Units (ROD).

Remediation of this subsite was performed in two stages because a portion of the pipelines were located under the main access road to the 100-F Area. The first stage was performed between February 5 and March 27, 2007, and consisted of excavating and removing all pipeline segments except the portion underlying the main access road. The second stage included excavation and removal of the pipeline segment under the access road and was performed on August 24, 2007.

Approximately 580 bank cubic meters (BCM) [(760 bank cubic yards (BCY)] of pipeline material and suspect contaminated adjacent and underlying soils were removed and stockpiled in the staged waste area for later disposal to ERDF. The staged waste area footprint will be addressed with the 100-F-26:9 subsite. Excavation depths at the subsite ranged from 4.3 meters to 5.2 meters (14 feet to 17 feet) below ground surface.

The contaminants of potential concern (COPCs) were identified in the 100 Area Remedial Action Sampling and Analysis Plan (DOE/RL-96-22, rev. 4). Contaminants of potential concern (COPCs) are identified in the 100 Area Remedial Action Sampling and Analysis Plan (DOE/RL -96-22, Revision 4). The COPCs include cobalt-60, cesium-137, europium-152, europium -154, strontium-90, silver, barium, cadmium, chromium (total), mercury, lead, selenium, arsenic, and hexavalent chromium.

Historical information and process knowledge for the 108-F Biology Laboratory was used to further develop the COPCs for the 100-F-26:13 underground pipeline subsite. As a result, uranium-234, uranium-235, uranium-238, americium-241, plutonium-238, plutonium 239/240, and polychlorinated biphenyls (PCBs) were included as COPCs. Sulfuric acid was used at the 108-F facilities; however, samples will not require anion analysis because the groundwater protection value for sulfate is large (25,000 mg/kg) compared to other potential contaminants.

Verification sampling was performed in July and August 2007, the analytical results indicated that the residual concentrations of COCs/COPCs at this site have met the cleanup objectives for direct exposure, groundwater protection, and river protection. In accordance with this evaluation, the verification sampling results support a reclassification to Interim Closed Out. The laboratory-reported data results for all constituents were stored in the WCH Environmental Restoration (ENRE) project-specific database prior to archival in the Hanford Environmental Information System (HEIS) and are presented in Appendix B of the RSVP.

The results of verification sampling illustrate that residual contaminant concentrations do not preclude any future uses (as bounded by the rural-residential scenario) and allow for unrestricted use of shallow-zone soils (i.e., surface to 4.6 meters [15 feet] deep). The results also demonstrate that residual contaminant concentrations are protective of groundwater and the Columbia River. Excavation depths include both shallow-zone and deep-zone components. However, the excavation area was considered as one decision unit and was interim closed out using the more restrictive shallow-zone criteria; therefore, institutional controls to prevent uncontrolled drilling or excavation into the deep zone are not required.

SubSite Code: 100-F-26:14

SubSite Name: 100-F-26:14, 116-F-5 Influent Pipelines

Classification: Accepted

ReClassification: Interim Closed Out

Description: The Remaining Sites Verification Package (RSVP) 2007-029 for 100-F-26:14 documents that the subsite has achieved the remedial action objectives and the corresponding remedial action goals as established in the Remedial Design Report/Remedial Action Work Plan for the 100 Area (RDR/RAWP) and the Interim Action Record of Decision for the 100-BC-1, 100-BC-2, 100-DR-1, 100-DR-2, 100-FR-1, 100-FR-2, 100-HR-1, 100-HR-2, 100-KR-1, 100-KR-2, 100-IU-2, 100-IU-6, and 200-CW-3 Operable Units,(ROD).

The subsite consisted of underground pipelines located southwest of the 105-F Building (a 10.2-centimeter (4- inch) influent pipeline that ran from the 105-F Reactor Building to the 116-F-5 ball washer crib, two process pipelines (30.48- centimeter [12- inch] and 15.24-centimeter [6- inch]) that connected to a previously remediated process pipeline (100-F-19:2); and a short 15.24- centimeter [6- inch] cast-iron pipe). These pipelines were associated with the 116-F-5 Ball Washer Crib and remnants of process pipelines on the west side of the 105-F Building.

Remediation of this subsite was performed from February 1 through April 24, 2007. The excavation cut through the middle of the 118-F-8:4 which had been remediated. The total depth of the 118-F-8:4 (8 meters [26 feet] below ground surface) was below the deepest (6 meters [20 feet]) segment of the 100-F-26:14 pipeline.

Approximately 700 BCM (916 BCY) of contaminated soil was disposed at the Environmental Restoration Disposal Facility and 900 BCM (1,177 BCY) of overburden and layback soil were stockpiled for use as clean backfill.

The COCs/COPCs for verification sampling were strontium-90, cesium-137, cobalt-60, europium-152, europium-154, nickel-63, hexavalent chromium, arsenic, barium, cadmium, total chromium, lead, mercury, selenium, and silver.

Verification sampling was performed on August 8, 9, and 21, 2007, to determine if the RAGs had been met. The laboratory-reported data results for all constituents are stored in the WCH Environmental Remediation System (ENRE) project-specific database prior to submission for archival in the Hanford Environmental Information System (HEIS) site-wide database and were summarized in Appendix C of the RSVP.

The results of verification sampling show that residual contaminant concentrations do not preclude any future uses (as bounded by the rural-residential scenario) and allow for unrestricted use of shallow-zone soils (i.e., surface to 4.6 meters [15 feet] deep). The results also demonstrate that residual contaminant concentrations are protective of groundwater and the Columbia River. Site contamination did not extend into the deep-zone soils; therefore, institutional controls to prevent uncontrolled drilling or excavation into the deep zone are not required.

SubSite Code: 100-F-26:15

SubSite Name: 100-F-26:15, Miscellaneous Pipelines Associated with 1608-F Sump

Classification: Accepted

ReClassification: Interim Closed Out

Description: The Remaining Sites Verification Package (RSVP) 2007-031, has documented that the subsite conditions have achieved the remedial action objectives (RAOs) and the corresponding remedial action goals (RAGs) as established in the Remedial Design Report/Remedial Action Work Plan for the 100 Area (RDR/RAWP) and the Interim Action Record of Decision for the 100-BC-1, 100-BC-2, 100-DR-1, 100-DR-2, 100-FR-1, 100-FR-

2, 100-HR-1, 100-HR-2, 100-KR-1, 100-KR-2, 100-IU-2, 100-IU-6, and 200-CW-3 Operable Units, (Remaining Sites ROD). The RSVP supports a reclassification of this site to interim closed out.

The 100-F-26:15 subsite was remediated from January 29 through January 31, 2007. Two distinct areas were excavated resulting in disposal of approximately 82 cubic meters (107 cubic yards) of contaminated materials to the Environmental Restoration Disposal Facility. Only 3 of the 16 pipeline segments (numbers 2, 4, and 15 in Table 1 of the RSVP [CCN 138712]) were found during the excavation. Excavations for the remaining pipeline segments were performed to native soil to verify their previous removal. Eight of the pipeline segments (numbers 7, 8, 9, 10, 11, 12, 14 and 16) were associated with the remediation of the 100-F-19:2, reactor cooling water effluent pipelines, in 2002 (CVP-2001-00003, CCN 133565). The five remaining pipeline segments (numbers 1, 3, 5, 6, and 13) were not discovered during either of the pipeline removal activities in 2002 and 2007. These were most likely removed during previous D&D activities or historical pipeline replacement projects.

For the five pipeline segments that were not found during either remediation (numbers 1, 3, 5, 6, and 13), excavations at the locations shown on historical drawings were performed until native soil was encountered to verify their previous removal. Additional verification was available for pipeline segments 1 and 6 as these were associated with the 1608-F building. The below grade portion of the 1608-F building is present in the subsurface and was used as a guide to verify these pipeline segments were no longer present. Excavation was performed next to the 1608-F building for pipeline segments 1 and 6 and continued until the bottom of the structure was reached, thereby verifying the pipeline segments were no longer present.

The subsite contaminants of potential concern (COPCs) are described in the verification work instruction (0100F-WI-G0059). COPCs for verification sampling included ICP metals, hexavalent chromium, and mercury. Gross alpha, gross beta, and gamma energy analysis (GEA) were used to detect radioactivity with isotope specific analyses performed for those samples with results greater than background. Americium-241, cesium-137, cobalt-60, europium-152, europium-154, and europium 155 were analyzed by gamma energy analysis (GEA).

Two samples (J14D62 and J14D63) were collected on January 30, 2007, in the primary excavation adjacent to the 105-F Building foundation to allow for an early backfill. The early backfill was necessary to secure the foundation from damage due to undermining. Note that in Table 2 of the RSVP (CCN 138712) these two samples were inadvertently omitted from the summary list of the verification samples, but they (and their results) are listed in Appendix A Attachment 1 "100-F-26:15 Verification Sampling Results."

The laboratory-reported data results for all constituents were stored in the Environmental Restoration (ENRE) project-specific database prior to archival in the Hanford Environmental Information System (HEIS) and were presented in Appendix A of the RSVP.

The sampling results illustrated that residual soil concentrations support future land uses that can be represented (or bounded) by a rural-residential scenario. The results also demonstrated that residual contaminant concentrations support unrestricted future use of shallow zone soil (i.e., surface to 4.6 meters [15 feet]) and contaminant levels remaining in the soil were protective of groundwater and the Columbia River. This site does not have a deep zone; therefore, no deep zone institutional controls are required.

SubSite Code: 100-F-26:16

SubSite Name: 100-F-26:16, Reactor Cooling Water Pipelines

Classification: Accepted

ReClassification: No Action

Description: The 100-F-26:16 subsite consisted of pipelines inside the Cooling Water Pipe Tunnels that ran between the 190-F Pumphouse and the 105-F Reactor. Evaluation of this site indicated that the remedial action objectives and goals have been met as established by the Interim Action Record of Decision for the 100-BC-1, 100-BC-2, 100-DR-1, 100-DR-2, 100-FR-1, 100-FR-2, 100-HR-1, 100-HR-2, 100-KR-1, 100-KR-2, 100-IU-2, 100-1U-6, and 200-CW-3 Operable Units, Hanford Site, (Remaining Sites ROD). The selected action for the 100-F-26:16 site involved using historical information and analogous confirmatory sampling data to support proposal of no action.

Originally, the process water piping was contained inside concrete tunnels. As part of decommissioning activities during 1987, the process water tunnels were filled to grade with clean soil (WHC-EP-0478). This document indicates that the pipelines inside the tunnels were removed and salvaged at the time of decommissioning of the water tunnels.

There was no history of radiological contamination associated with the 100-F Cooling Water Tunnels and no known process incidents at 105-F Reactor that would have introduced contamination from the reactor into the tunnels. Historical sampling of concrete and soil underlying the 105-C Cooling Water Tunnels (BHI-01050) and pipe scale sampling inside the cooling water pipelines at the 100-B Reactor valve pit indicate that residual contamination associated with the 105-B and 105-C Cooling Water Tunnels meets the cleanup criteria.

Given that (1) the 105 F Reactor pipelines are believed to be removed, (2) the tunnels have been back-filled, and (3) the 105-B and 105-C Reactor Cooling Water Tunnels have been determined to meet the cleanup criteria and through evaluation the 100-F-26:16 Reactor Cooling Water Pipelines are analogous to the 105-B and 105-C Reactor Cooling Water Tunnels, the 100-F-26: 16 Reactor Cooling Water Tunnels meet the cleanup criteria and the residual contaminant levels are protective of human health, groundwater and the Columbia River.

Site Code:	100-F-29	**Classification:**	Accepted
Site Names:	100-F-29, 100-F Experimental Animal Farm Process Sewer Pipelines	**ReClassification:**	Interim Closed Out (9/15/2003)
Site Type:	Radioactive Process Sewer	**Start Date:**	1945
Site Status:	Inactive	**End Date:**	1976

Site Description: The site has been remediated and interim closed out.

The site consisted of contaminated pipelines that existed at the 100-F Experimental Animal Farm (EAF) site.

Excluded were the 105-F Reactor effluent disposal pipelines (100-F-19), the 100-F water treatment underground pipelines (100-F-26) to the west, and the clean water pipelines (100-F-41), which included the raw, sanitary, and fire water pipelines at the 100-F Area.

Waste Type: Water

Waste Description: The waste is mixed (chemically and radiologically) contaminated piping (concrete, steel and vitrified clay) and contaminated soil. Several radioisotopes were used in varying

concentrations. These included iodine-131, strontium-90, cesium-137, and isotopes of plutonium and uranium. All such research generated contaminated urine and feces. Other wastes resulted from cleaning contaminated pens and cages with water.

Site Code:	100-F-30	**Classification:**	Not Accepted (7/29/1997)
Site Names:	100-F-30, 144-F Drywell	**ReClassification:**	
Site Type:	French Drain	**Start Date:**	
Site Status:	Inactive	**End Date:**	

Site Description: The site is a drywell that was observed on drawing H-1-14123 on the south side of 144-F. During a site investigation on 1/2/97, no evidence of a drywell was visible. During the April 1999 visit, a survey grade GPS was used to locate the site based on its mapped coordinates. No evidence of the site was found at this point. The area is sparsely covered with rabbitbrush and grasses.

Waste Type: Stormwater Runoff

Waste Description: The drywell received stormwater from the roof of the 144-F building.

Site Code:	100-F-31	**Classification:**	Accepted
Site Names:	100-F-31, 144-F Sanitary Sewer System	**ReClassification:**	Interim Closed Out (8/24/2006)
Site Type:	Septic Tank	**Start Date:**	
Site Status:	Inactive	**End Date:**	1977

Site Description: The site has been remediated and interim closed.

The site consisted of a septic tank and drain field. The area has been restored to match the surrounding terrain.

Waste Type: Sanitary Sewage

Waste Description: It is unclear from the drawings H-1-14122, Grading Plan Facilities for Radioactive Inhalation Studies and H-1-14123, Plumbing & Details-Facilities for Radioactive Inhalation Studies, whether the site received animal waste as well as human sanitary waste. Since the site serviced the 144-F Building, there is the potential to have received hazardous contaminants.

Site Code:	100-F-32	**Classification:**	Not Accepted (7/29/1997)
Site Names:	100-F-32, 1717-F Underground Fuel Oil Tanks	**ReClassification:**	
Site Type:	Storage Tank	**Start Date:**	
Site Status:	Inactive	**End Date:**	

Site Description: The site is three underground fuel oil storage tanks. Each tank had a capacity of 94,625 liters (25,000 gallons). Each tank was 10.7 meters (35 feet) long and 2.4 meters (8 feet) in diameter. Pipelines ran to the 1717-F Building (Combined Shops) though a pump pit immediately east of the tanks.

Site Code:	100-F-33	**Classification:**	Accepted
Site Names:	100-F-33, 146-F Aquatic Biology Fish Ponds	**ReClassification:**	Interim Closed Out (8/25/2006)
Site Type:	Unplanned Release	**Start Date:**	
Site Status:	Inactive	**End Date:**	

Site Description: The site has been remediated and interim closed.

The waste site, also referred to as the 146-F Aquatic Biology Fishponds and the fish laboratory, was designed to conduct tests on fish. The ponds were removed in 1975, no visual evidence remains of their original location. The fish ponds were constructed of unlined reinforced concrete. Originally, there were 6 divided small ponds, 1 circular pond and 1 rectangular pond. The site is an area where unplanned releases likely occurred from the fish ponds.

Waste Type: Water

Waste Description: If the fish ponds or supporting pipelines had leaked, the waste would contain the same contaminants as the radioactive process effluent. A pipeline containing radioactive process effluent came from the reactor to this site. The waste was the pipelines and contaminated soil.

Contaminants of potential concern were Co-60, Ce-137, Eur-152, Eu-154, Eu-155, Pu-238, Pu-239/240, Sr-90, U-234, U-235, Cr6. Hg, Pb, and polycyclic aromatic hydrocarbons (PAHs).

Site Code:	100-F-34	**Classification:**	Accepted
Site Names:	100-F-34, Biology Facility French Drain	**ReClassification:**	Interim Closed Out (5/22/2002)
Site Type:	French Drain	**Start Date:**	
Site Status:	Inactive	**End Date:**	

Site Description: The site has been remediated and closed out.

The french drain was removed during the 100-F Area cooling water effluent pipeline remediation activity in 2002 (100-F-19:1).

Site Code:	100-F-36	**Classification:**	Accepted
Site Names:	100-F-36, 108-F Chemical Pump House, 108-F Biological Laboratory	**ReClassification:**	No Action (5/24/2007)
Site Type:	Laboratory	**Start Date:**	1944
Site Status:	Inactive	**End Date:**	1973

Site Description: The site has been remediated and reclassified to No Action.

The site consisted of a building that was demolished in August of 1999. Most of the building debris and foundations were removed. All exposed piping was cut at the edge of the excavation; the piping trench, sump, and french drain 100-F-15 were removed (the pipe remains at the site); all disturbed areas were graded smooth, and the facility footprint soils were fixed in place with soil cement.

Waste Type: Soil

Waste Type: Soil

Waste Description: Friable asbestos insulation, asbestos cement, pipe wrapping and suspected asbestos-containing floor tiles were in the building before demolition.

The 108-F closeout report reported contaminants of concern as mercury, PCBs, lead, asbestos, sodium dichromate, and miscellaneous low radiological contamination.

Waste Type: Equipment

Waste Description: On the first floor there are exposed sheets of lead, approximately 0.64 centimeters (0.25 inches) thick under the wallboard. All paint within the facility is suspected to contain lead.

Waste Type: Oil

Waste Description: Oil in the elevator motor, compressor motors,water coolant system and hoist equipment was suspected to contain polychlorinated biphenyl (PCB) and Resource Conservation and Recovery Act of 1976 (RCRA) metals.

Waste Type: Equipment

Waste Description: The main drain trench and sump were posted as a radiological contamination area. Potential contaminants of concern for this facility were plutonium-238, strontium-90, cobalt-60, and cesium-137.

Site Code: 100-F-37 **Classification:** Accepted

Site Names: 100-F-37, French Drain Discovered Near Hydrant F-2 **ReClassification:** No Action (8/11/2004)

Site Type: French Drain **Start Date:**

Site Status: Inactive **End Date:**

Site Description: The site consisted of an abandoned french drain.

Waste Type: Soil

Waste Description: The analytical results showed a high level of lead at 214 ppm.

Site Code: 100-F-38 **Classification:** Accepted

Site Names: 100-F-38, Yellow Stained Soil Near Hydrant F-2 **ReClassification:** Interim Closed Out (3/13/2006)

Site Type: Unplanned Release **Start Date:**

Site Status: Inactive **End Date:**

Site Description: The site has been remediated and interim closed out.

The waste site consisted of yellow soil discovered during the excavation of a trench for electrical conduit in November 2000. The trench ran diagonally through the parking lot from the subcontractor trailer to Hydrant F-2.

Waste Type: Soil

Waste Description: The stained soil showed high levels of chromium and lead. No radioactivity was detected with field instruments.

Site Code: 100-F-39 **Classification:** Accepted

Site Names: 100-F-39, 100F River Effluent Pipelines, 100F River Lines **ReClassification:**

Site Type: Radioactive Process Sewer **Start Date:**

Site Status: Inactive **End Date:**

Site Description: This site consists of the river effluent pipelines (river lines) that extend from 1904-F outfall (116-F-8) in the 100F area into the main channel of the Columbia River.

Waste Type: Process Effluent

Waste Description: The waste includes the pipelines and the contaminated scale and sediment which may be contained within them.

Contaminants of concern/potential concern are based on those for 116-F-8 Outfall Structure. Contaminants of concern include cobalt-60, europium-152, europium-154, europium-155, and hexavalent chromium.

Contaminants of potential concern include carbon-14, cesium-137, nickel-63, and strontium-90.

Site Code: 100-F-40 **Classification:** Accepted

Site Names: 100-F-40, Animal Farm Surface Impoundment **ReClassification:** Rejected (2/28/2002)

Site Type: Surface Impoundment **Start Date:**

Site Status: Inactive **End Date:**

Site Description: This site, a pair of impoundments and the associated ditches, is no longer visible in the field. It was discovered on aerial photos from 1965, and consisted of two surface impoundments, one covered with tumbleweeds and the other new and unvegetated. The older impoundment has a slightly meandering ditch coming to its northern end from the animal farm buildings. This ditch was dry in the September 1965 photo. A straight ditch, with water in it in the September 1965 photo, runs to the northern side of the northern impoundment, also coming from the same animal farm buildings.

Waste Type: Animal Waste

Waste Description: Samples collected in April 2001 determined the surface ponds held only uncontaminated animal waste resulting from pen cleaning.

Site Code: 100-F-41 **Classification:** Accepted

Site Names: 100-F-41, 100-F Service Water Pipelines, 100-F Clean Water Pipelines (See Subsites) **ReClassification:** Rejected (2/8/2007)

Site Type: Product Piping **Start Date:**

Site Status: Inactive **End Date:**

Site Description: The site and all four subsites have been reclassified to Rejected.

The site included underground pipelines used to transport raw, fire, export, filtered, and sanitary water from the river pump house, to 100-F Area facilities, including the water treatment facilities and fire hydrants. This site does not include lines within buildings, process or septic sewer lines, chemical transfer pipelines, pipelines that carried water treated with sodium dichromate, or pipelines that were downstream from the reactor building, i.e., those lines that carried cooling water from the reactor to the retention basin, Lewis Canal and/or the river.

A total of four (4) major pipelines and (43) smaller pipelines were identified as being associated with the 100-F-41 Service Water Pipelines site.

Waste Type: Equipment

Waste Description: The waste is the old buried pipes from the clean water pipeline system.

No Contaminants of Potential Concern (COPC's) are identified for underground water service lines. Asbestos-containing wrapping on underground water lines were determined to be neither a hazardous nor a dangerous material of construction (Unit Managers Meeting Minutes for July 2005).

SubSites:

SubSite Code: 100-F-41:1

SubSite Name: 100-F-41:1, North/South 4-Inch Steel Pipeline North of 183-F

Classification: Accepted

ReClassification: Rejected

Description: The subsite has been reclassified to Rejected.

The subsite consisted of a north-south oriented; 10 centimeter (4 inch) steel pipeline segment of unknown length approximately 0.6 meters (2 feet) below ground surface. It was identified during an excavation for confirmatory sampling. The segment was north of the 183-F Filter Building and south of the 182-F Reservoir, and is defined by the following coordinates: N148161 E580436, N148152 E580436, N148152 E580483, and N148112 E580483. The line was broken, when sampling was completed the steel pipe was returned to the test pit prior to backfilling with original material. The pipe had no insulation or wrapping of any kind. No samples were collected of the pipe or pipe interior. Drawing H-1-12436 shows a north-south 10 centimeter (4 inch) diameter Fire & Sanitary Water Line.

SubSite Code: 100-F-41:2

SubSite Name: 100-F-41:2, East/West 2-Foot Steel Pipeline Connected to 190-F

Classification: Accepted

ReClassification: Rejected

Description: The subsite has been reclassified to rejected.

The subsite consisted of an east-west oriented, 0.6 meter (2 feet) steel pipeline segment identified as approximately 1.8 meters (6 feet) below ground surface during an excavation for confirmatory sampling at 100-F-26:4. The pipe had no insulation or wrapping of any type, it

was connected to the 190-F building foundation on the east at coordinates N147736 E580503, and continued to N147736 E580611, N148162 E580610, and N148162 E580482. No samples were taken. This pipe was later identified on drawings H-1-12436 and H-1-12377 as a raw water line. The caption to a photo taken 12/15/04 indicates two diameters, [0.6 meters (24 inches) diameter cast iron raw water pipeline.

SubSite Code: 100-F-41:3

SubSite Name: 100-F-41:3, North/South 4-Inch Pipeline East of 1704-F

Classification: Accepted

ReClassification: Rejected

Description: The subsite has been reclassified to rejected.

During excavation at the 100-F-26:9 sanitary sewers for collection of confirmatory samples, a north-south oriented, 10 centimeter (4 inch) pipeline was discovered approximately 1.2 meters (4 feet) below ground surface. The pipeline was located east of the south corner of the 1704-F building, it was intact and had no insulation or wrapping.

Construction drawing H-1-14562 showed a 7.6 centimeter (3 inch) sanitary water line trending south to north 3 meters west of the junction box sampling location. No depth was indicated on the drawing. The 1.1 centimeter (3 inch) sanitary water line shown on the construction drawing was within 1meter of the estimated location of the discovered pipe. No reference to pipe diameter was documented to explain the size discrepancy indicated between logbook and the drawing. The discrepancy in pipeline size between the historic drawing and field observations was attributed to erroneous field measurements or the use of a larger diameter pipeline during construction.

SubSite Code: 100-F-41:4

SubSite Name: 100-F-41:4, East/West 4-Inch Steel Pipeline at West End of 115-F

Classification: Accepted

ReClassification: Rejected

Description: The subsite consists of an east-west oriented, 10 centimeter (4 inch) steel pipeline approximately 1 meter (3 feet) below ground surface. The segment was identified during an excavation for confirmatory sampling. It is located at the west end of the 115-F Building beginning at N147582 E580314, and continuing to N147582 E580299 and N147643 E580299. The steel pipe appeared to have no insulation or wrapping of any type. No samples were taken from the pipe. The pipe was left intact and the test pit was backfilled with the removed material.

Construction drawing H-1-12367 shows a cast iron (CI) fire and sanitary water line near the location of the discovered pipeline; and BHI-01504 indicates a 10 centimeter (4 inch) cast iron service water pipe exits the west side of the 115-F Building.

Site Code: 100-F-42 **Classification:** Accepted

Site Names: 100-F-42, 1904-F Spillway, 100-F-39:1 Flume **ReClassification:** Interim Closed Out (9/26/2006)

Site Type: Outfall **Start Date:**

Site Status: Inactive **End Date:**

Site Description: The site has been remediated and interim closed.

The site consisted of a reinforced concrete spillway (also referred to as a flume). The spillway extended from the 116-F-8 Outfall to the Columbia River shoreline and into the river.

Waste Type: Construction Debris

Waste Description: If ever put into service, the COPCs for the 100-F-42 spillway would be the same as those for the 116-F-8 outfall structure. The contaminants of concern include Cobalt-60, Europium-152/154/155, and hexavalent chromium.

Site Code: 100-F-43 **Classification:** Accepted

Site Names: 100-F-43, Spillway for PNL Outfall, 116-F-16 PNL Outfall, 100-F-39:1 **ReClassification:** Interim Closed Out (9/14/2006)

Site Type: Outfall **Start Date:**

Site Status: Inactive **End Date:**

Site Description: The site has been remediated and interim closed.

The 100-F-43 spillway (also referred to as a "flume") was constructed of reinforced concrete, and extended from the 116-F-16 PNL Outfall to the Columbia River shoreline and into the river. An engineered erosion barrier composed of heavy riprap was constructed at the discharge end of the concrete structure.

Waste Type: Animal Waste

Waste Description: The unit received animal sewage, 107-F Retention Basin water from fish studies, and low-level contamination resulting from various 100-F EAF projects.

If ever put into service, the COPCs for the 100-F-42 spillway would be the same as those for the 116-F-16 outfall structure, and include Plutonium-239/240, Strontium-90, Cesium-137, Lead, and hexavalent chromium.

Site Code: 100-F-44 **Classification:** Accepted

Site Names: 100-F-44, 100-F Miscellaneous Pipelines (See Subsites) **ReClassification:**

Site Type: Process Sewer **Start Date:**

Site Status: Inactive **End Date:**

Site Description: The site consists of a compilation of pipeline segments not previously addressed in any closure documents. The various pipelines may require remedial action. See the subsite summaries for specific information.

SubSites:

SubSite Code: 100-F-44:1

SubSite Name: 100-F-44:1, Discovery Pipeline Near 182-F Reservoir

Classification: Accepted

ReClassification: No Action

Description: The 100-F-44:1 pipeline site was discovered during confirmatory sampling at test pit 5 of the 100-F-26: l pipelines site. The test pit contained a junction box with two 76 centimeters (30-inches) reinforced concrete pipes and a previously unidentified 20-centimeter (8-inch) carbon steel pipe. The smaller pipe was just west of the 182-F Reservoir and ran north from the junction box an undetermined distance at a depth of (7 feet) below the ground surface. The only building in the vicinity was the former 182-FA Pump Test Stand. Drawing H-1-11253 shows a 20-centimeter (8-inch) pipe between the 182-FA building and the junction box where two 76- centimeter (30-inch) reinforced concrete pipes met.

The Pump Test Stand was built in 1959 to test new designs for impellers and prototype pumps for future use at the 190 Pumphouse. It was located west of the 182-F reservoir. The pumps, instrument panels and suction piping were housed inside an army surplus prefabricated building. Apparently the project was of a short duration, therefore sanitary and steam utilities were not constructed. The only underground piping installed from the pump test stand was between the 182-F reservoir and the process sewer. Water from the 182-F reservoir was recirculated through a suppression tank with constant makeup and bleed to control temperature rise.

The maximum detected results for all COPCs in pipeline scale/sediment and underlying soil samples were less than background or applicable RAGs and therefore meet the RAOs. Based on these results, no remedial action is required for this segment of pipeline. As documented in the Remaining Site Verification Package for 100-F-26:1 North Process Sewer Collection Pipelines (Attachment to Waste Site Reclassification Form 2005-008), the process sewer that joined the 182-FA discharge pipe at the junction box was sampled as part of confirmatory sampling for the 100-F-26:1 pipelines site.

Evaluation of the confirmatory sample results for the 100-F-26:1 satisfied the remedial action objectives and the site was reclassified to "No Action". The water carried by the 100-F-44:1 pipeline was essentially the same water as that carried by the 100-F-26:1 pipeline, therefore no remedial action for the 100-F-44:1 subsite was needed and it may be reclassified.

SubSite Code: 100-F-44:2

SubSite Name: 100-F-44:2, Discovery Pipeline Near 108-F Building

Classification: Accepted

ReClassification: No Action

Description: The current subsite conditions as documented in the Remaining Sites Verification Package 2007-006, have achieved the remedial action objectives and the corresponding remedial action goals as established in the Remedial Design Report/Remedial Action Work Plan for the 100 Area and the Interim Action Record of Decision for the 100-BC-1, 100-BC-2, 100-DR-1, 100-DR-2, 100-FR-1, 100-FR-2, 100-HR-1, 100-HR-2, 100-KR-1, 100-KR-2, 100-IU-2, 100-IU-6, and 200-CW-3 Operable Units, (Remaining Sites ROD).

A geophysical survey of the 100-F-44:2 subsite was conducted in January 2007 (Geophysical Site Investigation Summary form CCN 0574490) using ground-penetrating radar. Two east-westerly trending linears were identified that appear to originate or pass through the former junction box location. The linear that extends to the east is consistent with the location and depth of the 100-F-26:4 pipeline. The linear that extends to the west is consistent with the location and orientation of the pipeline of interest (100-F-44:2). The assumed 100-F-44:2 pipeline linear is interpreted to be between 1 and 1.5 m (3 and 5 ft) deep.

Confirmatory sampling at the 100-F-44:2 subsite was performed on January 16. A test pit

was excavated to a depth of approximately 2 meters (7 feet) where the pipeline was located (Washington State Plane Coordinates N 147619, E 580539). The pipe was located and uncovered eastward toward the 100-F-26:4 excavation boundary. The pipe was cut open at coordinates N 14618, E 580542. No interior pipe sample could be taken because there was no sediment or scale inside the pipe.

The results of confirmatory sampling illustrated that contaminant concentrations do not preclude any future uses (as bounded by the rural-residential scenario) and allow for unrestricted use of shallow zone soils (i.e., surface to 4.6 m [15 ft] deep). The results also demonstrate that contaminant concentrations were protective of groundwater and the Columbia River. Site contamination did not extend into the deep zone soils; therefore, no institutional controls to prevent uncontrolled drilling or excavation into the deep zone are required.

The laboratory-reported data results for all constituents were stored in the Environmental Restoration project-specific database prior to submission for archival in the Hanford Environmental Information System site-wide database and are summarized in Appendix B of the RSVP.

SubSite Code: 100-F-44:3

SubSite Name: 100-F-44:3, 1607-F3 Sewer System Pipeline

Classification: Accepted

ReClassification: Rejected

Description: The 100-F-44:3 subsite was identified as a 30.1 cm (12 in) diameter steel or cast iron pipeline. During confirmatory sampling of the 100-F-26:10 test pit #2, in 2004 a pipeline was reported to be within a manhole. The manhole was located at the Washington State Plane coordinates of E580259, N148001. The pipeline was observed at the bottom of the manhole, estimated at a depth of approximately 6.4 m (21 ft). Based on the observation of the pipeline as recorded in the sampling logbook EL 1578-4 page 43, the pipeline was listed as a discovery site, and added as the Site 100-F-44:3 subsite. The logbook is the only source of information for this site.

No other pipeline was encountered during the excavation. There was no evidence to support the existence of the 100-F-44:3, 0.3-meter (1-foot)-diameter steel or cast iron pipe within the manhole at the 100-F-26:10 test pit #2. Therefore, 100-F-44:3 was reclassified as Rejected from consideration as a waste site. The 100-F-44:3 subsite does not pose a risk to human health or the environment and will support future unrestricted land uses that can be represented (or bounded) by a rural-residential scenario, and no institutional controls are required.

The subsite was originally identified, by visual observation during confirmatory sampling within the manhole at 100-F-26:10 test pit #2. However, it has been determined, through the excavation of the 100-F-26:10 pipelines in 2007, that the visual observation of the 100-F-44:3, 0.3-meter (1-foot)-diameter steel or cast iron pipe was erroneous. The entire manhole was removed during the 100-F-26:10 remediation, as was a volume of the soil beneath and surrounding the manhole. The 100-F-26:10 vitrified clay pipelines intersecting with the manhole location were removed, and the excavated site will be closed out following completion of the selected remedial action per the Interim Action Record of Decision for the 100-BC-1, 100-BC-2, 100-DR-1, 100-DR-2, 100-FR-1, 100-FR-2, 100-HR-1, 100-HR-2, 100-KR-1, 100-KR-2, 100-IU-2, 100-IU-6, and 200-CW-3 Operable Units.

The purpose of the pipeline was unknown, although a 0.3 m (1 ft) process sewer pipeline entering a manhole containing septic pipelines is certainly not a standard procedure. The test

pit was located at coordinates E580259, N148001 and east of the 183-D Filter Plant.

Therefore, 100-F-44:3 was reclassified as "rejected" from consideration as a waste site. The subsite does not pose a risk to human health or the environment and will support future unrestricted land uses that can be represented (or bounded) by a rural-residential scenario, and no institutional controls are required.

SubSite Code: 100-F-44:4

SubSite Name: 100-F-44:4, Discovery Pipeline in Silica Gel Pit

Classification: Accepted

ReClassification: No Action

Description: The Remaining Sites Verification Package 2008-030, documented that the 100-F-44:4 subsite has met the remedial action objectives and goals as established in the Remedial Design Report/Remedial Action Work Plan for the 100 Area and the Interim Action Record of Decision for the 100-BC-1, 100-BC-2, 100-DR-1, 100-DR-2, 100-FR-1, 100-FR-2, 100-HR-1, 100-HR-2, 100-KR-1, 100-KR-2, 100-IU-2, 100-IU-6, and 200-CW-3 Operable Units, Hanford Site. (Remaining Sites ROD)

A phased approach was used to evaluate the pipeline and collect samples in support of the sampling objectives. Confirmatory sampling began on February 13, 2008 (EL-1601-2 pp. 38, 49, 50). An exploratory test trench approximately 5 to 6 m (15 to 20 ft) long was excavated. However, the pipe was not found at that location. On February 21, 2008, another trench was dug approximately 6 m (20 ft) due east of the first trench and of approximately the same length. This time the pipe was found and observed to be approximately 5 cm (2 in.) in diameter and 0.9 m (3 ft) below grade. The pipe length was determined to be 6 m (20 ft).

The visual evidence indicated this pipe was a piece of electrical conduit debris and not a process pipeline or sewer pipeline. Though the pipe was identified as non-hazardous conduit debris, part of the confirmatory samples planned for the waste site was collected. On February 25, 2008 the pipe was cut and a sample of about 250 ml of soil was taken from inside the pipe.

Evaluation of the results from confirmatory investigative sampling indicates that all contaminants of potential concern (COPCs) listed are less than the direct exposure cleanup level. In addition, the vadose zone underlying the pipe is approximately 7.8 m (25 ft) thick. Therefore, residual concentrations of these contaminants are predicted to be protective of groundwater and the Columbia River. The laboratory-reported data results for all constituents were stored in the Environmental Restoration project-specific database prior to submission for archival in the Hanford Environmental Information System site-wide database and were summarized in Appendix A of the RSVP.

Residual contaminant concentrations do not preclude any future uses (as bounded by the rural-residential scenario) and allow for unrestricted use of shallow zone soils (i.e., surface to 4.6 meters [15 feet] deep). The results also demonstrated that residual contaminant concentrations were protective of groundwater and the Columbia River. No residual contamination existed within the deep zone; therefore, no deep zone institutional controls are required.

The 100-F-44:4 subsite consisted of a steel pipe discovered October 17, 2004, during trenching to locate the 118-F-4 Silica Gel Pit. The 110-F Gas Storage Tanks consisted of two low-pressure (carbon dioxide) storage tanks, 33 high-pressure (helium) storage tanks, an unloading platform, and a rail tank-car spot. The area is believed to have remained essentially unchanged from the time of the reactor's construction in 1944 until the demolition of nearby

structures [i.e., 132-F-3 (115-F Gas Recirculation Facility)] in 1984. There were no pipelines indicated on historical drawings for the area. Water, sewer, fire, and steam lines were all north of the 110-F structure and entered the northwest corner of 132-F-3.

The nearest waste site was the 118-F-4 Silica Gel Pit. According to historical records silica gel was deposited once in 1949. No installation of pipelines was involved.

SubSite Code: 100-F-44:5

SubSite Name: 100-F-44:5, Process Sewer Pipelines

Classification: Accepted

ReClassification: No Action

Description: The 100-F-44:5 subsite consisted of a network of reinforced concrete and steel pipelines that received process flow from the 190-F Building and discharged to a 1.07 m (42-in.) diameter pipeline associated with the 100-F-19:3 Reactor cooling water effluent pipelines that have been remediated. It is located directly north of the 105-F Reactor and south of the 190-F Building Annex.

The Remaining Sites Verification Package for the 100-F-44:5 (RSVP-2008-016) documents that the subsite has met the objectives for reclassification to No Action. The remedial action objectives (RAOs) and the corresponding remedial action goals (RAGs) as established in the Remedial Design Report/Remedial Action Work Plan for the 100 Area (RDR/RAWP) and the Interim Action Record of Decision for the 100-BC-1, 100-BC-2, 100-DR-1, 100-DR-2, 100-FR-1, 100-FR-2, 100-HR-1, 100-HR-2, 100-KR-1, 100-KR-2, 100-IU-2, 100-IU-6, and 200-CW-3 Operable Units,(Remaining Sites ROD) have also been met.

Confirmatory sampling at the site was conducted on January 17, 2008. Samples of soil underlying the below-grade concrete floor of the pump room that previously contained the 100-F-44:5 pipelines were collected. The two 0.9 m (36-in.) diameter reinforced concrete pipe, 14 m (46-ft) long process sewer pipelines were not in the pump room; however, it was confirmed that the location was consistent with the design drawing (H-1-26685). Evidence to that effect included two portals in the south vertical wall and two portals in the north vertical wall. The sampling logbook (WCH EL-1601) documents that the excavator operator confirmed a low spot in the floor that may have indicated a sump between the walls. A section of the floor was rubblized and removed, and the excavator collected soil from beneath the floor location as soil sample material.

Historical process knowledge of the subsite and similar sites were used to develop the site-specific confirmatory sample design and include nickel-63, uranium-238, and polychlorinated biphenyls as COPCs. Because the subsite was an extension of the 190-F bypass process water pipelines that were associated with the 100-F-26 waste site, the COPCs for the 100-F-26 (strontium-90, cesium-137, cobalt-60, europium-152, europium-154, hexavalent chromium, arsenic, barium, cadmium, total chromium, lead, mercury, selenium, and silver) waste site were included.

The complete laboratory results are stored in the WCH Environmental Restoration project-specific database prior to submitting to the Hanford Environmental Information System for archiving and were provided in Appendix B of the RSVP.

Site contamination did not extend into the deep zone soils; therefore, no institutional controls to prevent uncontrolled drilling or excavation into the deep zone at the waste site are required.

SubSite Code: 100-F-44:6

SubSite Name: 100-F-44:6, 189-F Refrigeration Pipeline

Classification: Accepted

ReClassification: Rejected

Description: A 76- centimeter (30- inch) pipe entering the foundation of the 189-F Refrigeration Building was discovered during excavation of a test pit for confirmatory sampling at 100-F-26:4 (South Process Sewer Pipeline) on December 17, 2004. The pipe has been identified as a raw water pipeline that supplied water to the condenser units in the 189-F Refrigeration Building. The pipeline also supplied backup raw water to the 182-F and 183-F facilities. It varied in diameter from 76 centimeters (30 inches) to 107 centimeters (42 inches) and is 908 meters (2,979 feet) in total length, including laterals. The subsite has been reclassified as Rejected based on the absence of potential chemical or radionuclide contamination associated with service water pipelines.

The origin of the pipeline was investigated as part of the 100-F Orphan Sites Evaluation task. Initially, the pipeline was thought to be an abandoned 107-centimeter (42-inch)-diameter raw water line for the 189-F Refrigeration Building. As such, the pipeline was assigned to waste site 100-F-41 (100-F Service Water Pipelines, 100-F Clean Water Pipelines) and designated as subsite 2. Because its former use was uncertain, the pipeline was reassigned to 100-F-44 (Miscellaneous Pipelines) and designated subsite 6.

As a result of the thorough review of engineering drawings and historical records performed to identify the pipeline, it was determined to be a raw water pipeline that supplied water to the condenser units in the 189-F Refrigeration Building. The pipeline also supplied backup raw water to the 182-F and 183-F facilities. The information discovered during the review substantiated the initial finding that the pipeline was the abandoned 107- centimeter (42-inch) raw water line for the 189-F Refrigeration Building.

The subsite has been reclassified as Rejected based on the absence of potential chemical or radionuclide contamination associated with service water pipelines.

SubSite Code: 100-F-44:7

SubSite Name: 100-F-44:7, 1717-F Blowdown Pipeline

Classification: Accepted

ReClassification: Rejected

Description: The reclassification form number 2007-012 and documentation states that the subsite has been reclassified to Rejected. The reclassification was based on the absence of potential chemical or radionuclide contamination within the pipelines.

The DS-100F-008 pipeline segment was a 10 centimeter (4 inch) cast iron blowdown pipeline, 27 meters (88 feet) in length. The pipeline discharged into WIDS Site 100-F-5, 1717-F Building Drywell. Conflicting construction drawings indicated there may be a drain line of identical size and length running in parallel to this line. The segment consisted of one or two pipelines extending 23 meters (76 feet) from N147757 E580622 to N147757 E580645.

The two 10 centimeter (4 inch) diameter pipelines were identified, in historical construction drawings, on the west side of the former 1717-F Maintenance Shop. The two pipelines had been used to connect the 1717-F auxiliary boiler system to the 105-F, 1717-F Building Drywell for safety reasons. As a rule the blowdown valve on a boiler was plumbed into a dedicated pipeline or drain.

The existence of the pipelines was confirmed by geophysical methods. Both pipelines

connected from an auxiliary boiler system in the 1717-F Building to the 100-F-5, 1717-F Building Drywell. Water carried in the pipelines consisted of sanitary (potable) water. The Blowdown pipe served to prevent an explosion if the boiler pressure got too high, hot liquids and vapors would not be able to backflow, and possibly damage other locations or personnel in or around the boiler system. Having a dedicated pipeline also ensured that the carrying capacity of that pipeline would not become restricted over time due to incidental use. Therefore, each of the boilers in the heating system required a separate dedicated blowdown pipeline.

Steam condensate, from the heating systems serviced by the 1717-F auxiliary boiler system, was not returned to the boiler system for reuse. Therefore, water would not have contained chemical or radiological contaminants from the laboratories or other facilities serviced by the 1717-F auxiliary boiler (heating) system. Only unregulated concentrations of water treatment chemicals, used to produce potable water, would be present in the boiler system and, therefore, in the water carried by the pipelines.

During decommissioning and demolition of the 1717 F Maintenance Shop structure in 1983, short sections of both pipelines were removed.

SubSite Code: 100-F-44:8

SubSite Name: 100-F-44:8, 1717-F Fuel Oil Supply and Return Pipelines

Classification: Accepted

ReClassification:

Description: DS-100F-009 The segment is the 3.8 centimeter (1.5 inch) black steel, 36 meters (118 feet) long and consisted of two pipelines extending 36 meters (118 feet) from N147753 E580610 to N147753 E580637 to N147756 E580645. fuel oil supply and return pipelines that serviced the three underground fuel oil tanks (WIDS site 100-F-32) and the 1717-F building. Evidence was found that the tanks were offered for sale and photographs showed a disturbance where the tanks were previously located. It is unknown if these pipelines were removed as part of the tank removal.

SubSite Code: 100-F-44:9

SubSite Name: 100-F-44:9, 105-F Process Sewer Pipeline

Classification: Accepted

ReClassification:

Description: DS-100F-013 The segment is a 46 centimeter (18 inch) steel process sewer pipeline approximately 41 meters (135 feet) in length. The pipeline was 42.5 meters (140 feet) long, extending from N147620 E580460 to N147620 E580473 to N147618 E580475, and ending at N147591 E580475.

SubSite Code: 100-F-44:10

SubSite Name: 100-F-44:10, 141-C Sewer Pipelines

Classification: Accepted

ReClassification: Rejected

Description: The basis for reclassification to rejection of subsite 100-F-44:10 (DS-100F-017) is supported by historical review, associated site information, exploratory trenching, and geophysical data. The subsite consisted of two 20.3-centimeters (8-inch)-diameter sewer pipeline segments exiting the 141-C building. It has been determined through the excavation results that there is

no evidence to support the existence of the site. The pipelines were likely removed during earlier D&D activities. The subsite does not pose a risk to human health or the environment and will support future unrestricted land uses that can be represented (or bounded) by a rural-residential scenario, and no institutional controls are required.

Historical review determined that during Decontamination and Decommissioning (D&D) activities of the 141-C Building (between August and December 1979), the building, concrete pad, foundation and contaminated soils were removed. The only remaining structure was a temporary steel post that marked the location of a 6-inch gate valve. The valve and 36.5 meters (120 feet) of potentially contaminated 20-centimeter (8-inch) steel pipe that extended from the valve to the decommissioned waste lift station (141-N) was capped and abandoned in place.

Documentation in the Cleanup Verification Package-2001-0003 for sites 100-F-19:2, 116-F-11, 100-F-29, and UPR-100-F-1 stated that pipelines were excavated on March 22, 2002 that extended from just east of the former 141-C Building to the former 141-N waste lift station. A geophysical survey was performed in April 2004 to locate and map any buried remains from the demolished 141-C Building. The geophysical survey narrative stated that the entire site appeared to have been disturbed from operational or D&D activities. There were no obvious anomalous features detected that had the characteristics of remnants of the infrastructure from the original site (e.g., foundation footings, buried debris, pipelines, utilities).

In August 2005 during the 141-C Building remediation, exploratory trenches were dug to confirm that the sewer lines formerly servicing the 141-C Building had been removed during previous D&D activities. No sewer lines were located by these excavations and field instrumentation did not detect any beta-gamma or alpha activity above background levels. There was no evidence to support the existence of the pipe segments in the vicinity of the 141-C Building.

Site Code:	100-F-45	**Classification:**	Accepted
Site Names:	100-F-45, Buried River Effluent Pipelines	**ReClassification:**	
Site Type:	Radioactive Process Sewer	**Start Date:**	
Site Status:	Inactive	**End Date:**	
Site Description:	The site consists of a piece of pipeline that was buried in the river bank after it floated loose from the river effluent pipeline.		
Waste Type:	Equipment		
Waste Description:	Contaminants of concern/potential concern are based on those for the 1904-F outfall (116-F-8). Contaminants of concern include Co-60, Eu-152, Eu-154, Eu-155, and Cr+6. Contaminants of potential concern include C-14, Cs-137, Ni-63, and Sr-90.		

Site Code:	100-F-46	**Classification:**	Accepted
Site Names:	100-F-46, 119-F Stack Sampling French Drain	**ReClassification:**	No Action (8/8/2008)
Site Type:	French Drain	**Start Date:**	
Site Status:	Inactive	**End Date:**	

Site Description: The site consisted of the 119-F french drain, a gravel-filled vertical pipe, and the pipeline from the 119-F Stack Sampling Building to the french drain.

Waste Type: Equipment

Waste Description: The site may contain contaminated soil from condensate entering the french drain. The waste includes the french drain and the pipelines. It is likely that these structures no longer exist. However, remediation of these structures is not documented in a cleanup verification package.

The condensate from the 116-F stack potentially contained the same contaminants of concern identified for the 116-F stack during the characterization sampling performed for the allowable residual contamination level (ARCL) evaluation completed in 1985. Low levels of tritium-3, carbon-14, strontium-90, cobalt-60, cesium-13, europium-152, and plutonuium-239 were reported for the 116-F stack.

Potential Contaminants of Concern: Low levels of tritium-3, carbon-14, strontium-90, cobalt-60, cesium-13, europium-152, and plutonuium-239 were reported for the 116-F stack.

Site Code:	100-F-47	**Classification:**	Accepted
Site Names:	100-F-47, 151-F Substation	**ReClassification:**	
Site Type:	Electrical Substation	**Start Date:**	1945
Site Status:	Inactive	**End Date:**	1965

Site Description: The substation consisted of a fenced, gravel-bed yard measuring 92.4 meters (303 feet) by 137.2 meters (450 feet), with the 151-F Switch House along the eastern fence line. A railroad spur entered the yard from the south and paralleled the east fence line.

Waste Type: Soil

Waste Description: There have been no reported unplanned discharges of oil containing PCBs. Since leak/spill reporting is inconsistent for the entire period of operation of the substation, it is prudent to assume unplanned discharges of oil may have occurred at locations where transformers or oil circuit breakers were positioned, or where the railroad tanker was located. Confirmatory sampling around these locations should be considered.

There may be more than 2,744 meters (9,000 feet) of underground electrical cable, generally housed in fiber or transite conduit, and encased in at least 7.6 centimeters (3 inches) of concrete. It is suspected that much of this copper cabling is encased in an asbestos wrap and an outer lead sheath. Also, depending on the extent of unplanned releases, these lines may be contaminated by PCB-containing oil. This same cabling may also still remain in the cable pit of the 151-F Building.

Potential Contaminants of Concern: PCBs, lead, and asbestos.

Site Code:	100-F-48	**Classification:**	Accepted
Site Names:	100-F-48, 184-F Coal Pit Debris	**ReClassification:**	
Site Type:	Dumping Area	**Start Date:**	
Site Status:	Inactive	**End Date:**	

Site Description:	The site consists of an area of debris that was identified in an aerial photograph and a historical literature search.

Site Code:	100-F-49	**Classification:**	Accepted
Site Names:	100-F-49, 1716-F Maintenance Garage Lubrication Pit	**ReClassification:**	
Site Type:	Foundation	**Start Date:**	
Site Status:	Inactive	**End Date:**	

Site Description:	The site consists of components of the 1716-F Maintenance Garage, including the foundation, the lubrication pit, and the contaminated drain(s).
Waste Type:	Soil
Waste Description:	There may have been oil spills in the lubrication pit and battery acid spills in the high bay area. The Geophysical team identified this area as a potential new waste site due to the probable oil spills (polychlorinated biphenyls [PCBs], total petroleum hydrocarbons [TPH]) in the lube pit, potential battery acid in the high bay area, potential unknown pipelines, and the potential asbestos shake siding debris.

Site Code:	100-F-51	**Classification:**	Accepted
Site Names:	100-F-51, 146-F Fish Laboratory Soil	**ReClassification:**	
Site Type:	Unplanned Release	**Start Date:**	
Site Status:	Inactive	**End Date:**	

Site Description:	The site is the soil under and around the former 146-F Fish Laboratory.
Waste Type:	Soil
Waste Description:	No reports were found of unplanned discharges to the soil from this building. However, because of the open-trough operations within the building it is prudent to assume such discharges may have occurred. A partial geophysical survey of the area recorded mixed subsurface debris that could be a portion of the original foundation. Contaminants of concern/potential concern are based on those for the 1904-F Outfall (116-F-8). Contaminants of concern include cobalt 60, europium 152, europium 154, europium 155, and hexavalent chromium. Contaminants of potential concern include carbon 14, cesium 137, nickel 63, and strontium 90.

Site Code:	100-F-52	**Classification:**	Accepted
Site Names:	100-F-52, 146-FR Radioecology/Aquatic Biology Laboratory Soil	**ReClassification:**	No Action (6/27/2008)
Site Type:	Unplanned Release	**Start Date:**	
Site Status:	Inactive	**End Date:**	

Site Description: The site consisted of the soil under and around the former 146-FR Radioecology and Aquatic Biology Laboratory. After remediation, the site was level to grade with no visual indication of the former facility.

Waste Type: Soil

Waste Description: During research of the site history, no reports were found of unplanned discharges to the soil from this building. However, because of the open-pond operations within the building, it is prudent to assume such discharges may have occurred. Confirmatory sampling should be considered.

Contaminants of concern/potential concern are based on those for the 1904-F Outfall (116-F-8). Contaminants of concern include cobalt 60, europium 152, europium 154, europium 155, and hexavalent chromium. Contaminants of potential concern include carbon 14, cesium 137, nickel 63, and strontium 90.

Site Code: 100-F-53 **Classification:** Accepted

Site Names: 100-F-53, 108-F Septic System **ReClassification:** No Action (6/26/2009)

Site Type: Septic Tank **Start Date:**

Site Status: Inactive **End Date:**

Site Description: The site potentially consisted of pipelines, a septic tank, the drain field and any contaminated soil around them. The site represented what was thought to be a septic system. It was unknown if an engineered liquid waste disposal facility existed at the site, either as a septic system or a crib system.

Waste Type: Soil

Waste Description: The waste potentially consists of the pipelines, the septic tank, the drain field and any contaminated soil around them. Geophysical measurements were inconclusive. No clear evidence was found of a septic tank, a septic line, or a drain field.

Since the septic system (if it existed) would have been associated with 108-F Building and the activities within the building (before 1949 and the addition of the biology facilities to 108-F), the contaminants of potential concern may have been hexavalent chromium or mercury.

Site Code: 100-F-54 **Classification:** Accepted

Site Names: 100-F-54, 100-F Animal Farm Pastures **ReClassification:** No Action (4/17/2008)

Site Type: Unplanned Release **Start Date:**

Site Status: Inactive **End Date:**

Site Description: The site consists of the soil associated with the former pastures for holding contaminated domestic farm animals used in experimental toxicology studies. This site consisted of the remaining soil associated with the former pastures. A major portion of the animal farm activities were conducted in the segregated complex northeast of the reactor building and near the outfalls.

Waste Type: Soil

Waste Description:	Animals were pastured in these areas, their waste would have discharged to the ground and may have contaminated the soil. Historical documents indicated strontium-90, iodide-131, isotopes of plutonium, cesium-137, and other radioisotopes were used in the animal exposure studies.

Site Code:	100-F-55	**Classification:**	Accepted
Site Names:	100-F-55, 1607-F7 Contaminated Ash Layer	**ReClassification:**	
Site Type:	Unplanned Release	**Start Date:**	
Site Status:	Inactive	**End Date:**	
Site Description:	The site consists of a contaminated layer of ash.		
Waste Type:	Soil		
Waste Description:	The waste is a contaminated ash layer. The only known contaminant of potential concern is hexavalent chromium.		

Site Code:	100-F-56	**Classification:**	Accepted
Site Names:	100-F-56, 100-F Surface Debris/Stains	**ReClassification:**	
Site Type:	Dumping Area	**Start Date:**	
Site Status:	Inactive	**End Date:**	
Site Description:	The site consists of scattered surface debris located throughout the 100-F Area.		
Waste Type:	Misc. Trash and Debris		
Waste Description:	The solid waste types addressed here are typically transite, lead battery residues, and treated wood including isolated railroad ties, treated power pole, and wood posts. Railroad ties in railroad beds are not addressed here. The contaminants of potential concern relate to waste characterization for disposal of the debris. There are no significant environmental contaminants of concern for this site since the debris is expected to leave no residue during removal.		

Site Code:	100-F-57	**Classification:**	Accepted
Site Names:	100-F-57, 190-F Process Water Pump House Debris	**ReClassification:**	
Site Type:	Foundation	**Start Date:**	
Site Status:	Inactive	**End Date:**	
Site Description:	The site consists of the remaining foundation of the demolished 190-F Process Water Pump House.		
Waste Type:	Soil		

Waste Description: Concrete foundations, demolition debris, and surrounding soil is potentially contaminated by hexavalent chromium.

Site Code: 100-F-58 **Classification:** Accepted

Site Names: 100-F-58, 100-F Surface Debris Potentially Containing Asbestos **ReClassification:**

Site Type: Dumping Area **Start Date:**

Site Status: Inactive **End Date:**

Site Description: This site is miscellaneous potentially asbestos containing waste that has been discarded/abandoned in the 100-F Area. Various sizes and forms of hazardous (CERCLA) and/or dangerous (MTCA) surface debris waste materials were left during the construction, operation, decontamination and decommissioning (D&D), and remedial action (RA) activities at the 100-F Area. During fiscal year 2005, a field walkdown of the area was conducted as a site closure screening activity. Surface debris identified as potential dangerous/CERCLA waste was precisely located and recorded using Global Positioning Satellite technology and a field logbook. For some features, additional information was obtained using digital photography. Subsequent evaluation of the collected data yielded four generic groupings of wastes: potentially asbestos containing material, lead, oil filters/oil stains, garnet (sand blasting material), and treated wood. Originally, there were five categores of waste that were part of 100-F-56. At the request of the Remaining Sites Project, the potential asbestos containing material was moved to its own site, 100-F-58.

Waste Type: Misc. Trash and Debris

Waste Description: The solid waste consists of scattered debris mainly in the form of transite. The debris is thought to potentially contain asbestos.

Site Code: 100-F-59 **Classification:** Accepted

Site Names: 100-F-59, Riparian Area Contamination Originating from 128-F-2 **ReClassification:**

Site Type: Burn Pit **Start Date:**

Site Status: Inactive **End Date:**

Site Description: The site consists of two areas known to contain contaminants above soil remedial action goals (RAGs). The first area was originally part of the 128-F-2 Burning Pit waste site located adjacent to the Columbia River. This portion of the site was remediated to an elevation below the ordinary high water mark (OHWM) of the river but sampling showed that metal contamination in excess of soil RAGs was present.

The second area was located in riparian areas east and southeast of the 128-F-2 waste site. In January 2008, sampling of riparian areas surrounding the 128-F-2 waste site was conducted to determine the nature and extent of contamination. This area was sampled in accordance with WCH-227.

Waste Type: Soil

Waste Description: Contaminated soil, The contaminants of concern are ICP metals, mercury, hexavalent chromium, polychlorinated biphenyl (PCBs), and pesticides.

Site Code:	100-F-60	**Classification:**	Accepted
Site Names:	100-F-60, Cast Iron Pipe	**ReClassification:**	
Site Type:	Product Piping	**Start Date:**	
Site Status:	Inactive	**End Date:**	
Site Description:	The site consists of a 10 cm (4 in) diameter cast iron pipe that was discovered on December 29, 2004 while excavating a test pit for 100-F-26:9. The pipe could not be correlated with previously documented pipelines in the area.		

Site Code:	100-F-61	**Classification:**	Accepted
Site Names:	100-F-61, Stained Soil near 100-F-12	**ReClassification:**	
Site Type:	Unplanned Release	**Start Date:**	
Site Status:	Inactive	**End Date:**	
Site Description:	The site consist of an area of stained soil discovered while excavating a french drain near 105-F.		

Site Code:	100-F-62	**Classification:**	Accepted
Site Names:	100-F-62, Animal Farm Septic Lines	**ReClassification:**	
Site Type:	Sanitary Sewer	**Start Date:**	
Site Status:	Inactive	**End Date:**	
Site Description:	The site includes influent pipes at two locations in the 100-F Experimental Animal Farm (EAF). One location is the influent piping from the 141-M Building to the 1607-F7 septic tank and drain field. The other location is the influent piping from the 144-F Building to the 100-F-31 septic tank and drain field.		

Site Code:	100-F-63	**Classification:**	Accepted
Site Names:	100-F-63, Animal Farm Radioactive Effluent Lines	**ReClassification:**	
Site Type:	Radioactive Process Sewer	**Start Date:**	
Site Status:	Inactive	**End Date:**	
Site Description:	The site includes radioactive effluent piping and process sewers at the north end of the Experimental Animal Farm (EAF).		

Site Code:	116-F-1	**Classification:**	Accepted
Site Names:	116-F-1, Lewis Canal	**ReClassification:**	Interim Closed Out (11/3/2003)
Site Type:	Trench	**Start Date:**	1953
Site Status:	Inactive	**End Date:**	1965
Site Description:	The site has been remediated and closed out.		

Waste Type: Water

Waste Description: The site received liquid wastes from the 105-F, 182-F, 183-F, and 190-F Buildings and decontamination wastes from the 189-F Building. Reference RHO-CD-827 lists a calculated contaminated soil volume of 2.066E+05 cubic meters (7.3E+06 cubic feet) for the 914-meter (3000-foot) length of Lewis Canal (the length described in most of the documentation for the site). Estimated radionuclide inventories are available in Stenner (1988). Soil sample results are available in Dorian and Richards (1978). The hazardous chemical inventory included sodium dichromate and sulfamic acid. Surface soil and vegetation samples were collected from the areas adjacent to 116-F-1, analyzed for radionuclide concentrations (cobalt-60, strontium-90, cesium-137, plutonium-238, plutonium-239/240), and compared with the results from 1981 through 1986 (Jacques 1986).

Site Code: 116-F-2 **Classification:** Accepted

Site Names: 116-F-2, 107-F Liquid Waste Disposal Trench **ReClassification:** Interim Closed Out (3/12/2003)

Site Type: Trench **Start Date:** 1950

Site Status: Inactive **End Date:** 1965

Site Description: The site was an open liquid waste trench. A 15-centimeter (6-inch), 12-gauge steel distribution pipe ran from the north end of the 107-F Basin to the north end of the trench. The length of piping inside the trench was unknown since piping was added as the trench was used and later backfilled.

This site was also fed by two emergency bypass ditches that connected the 116-F-2 trench to the effluent line connected to the south end of the 107-F Basin. The first emergency bypass ditch, about 90 meters (295 feet) long, ran from the west center side of the 116-F-2 Trench to the gate valve on the 1.7 meter (5.6 feet) pipeline that ran to the 107-F Basin Inlet Distribution Box at the south end of the 107-F Retention Basin. A second emergency ditch bypass trench connected the 116-F-2 trench to a valve on the 107-centimeter (42-inch) diameter 105-F effluent pipeline. These ditches are also considered to be part of 116-F -2. The trench is shown on Hanford drawings H-1-70185, H-1-1522 and H-1-1540. The liquid waste and bypass trenches are visible in Hanford aerial photo 91062128-8.

Waste Type: Process Effluent

Waste Description: The site received cooling water effluent from the 107-F Retention Basin during reactor outages due to fuel ruptures. During deactivation of the 105-F Reactor, the unit received overflow water from the 105-F Storage Basin via the retention basin. RHO-CD-827 lists the calculated volume of contaminated soil to be 2.5E+05 cubic meters (9E+06 cubic feet). Radionuclide inventory for 116-F-2 from Stenner (1988) lists, 0.37 curies of tritium, 0.8 curies of cobalt-60, 0.07 curies of strontium-90, 0.76 of cesium-137, 0.007 curies of plutonium-239, and 6.05 curies of europium-152. The site also has a hazardous chemical inventory that includes 60,000 kilograms (1.3E+05 pounds) of sodium dichromate. The results of four soil sample sites in the trench and four samples taken in the connecting ditch can be found in Dorian and Richards (1978).

Site Code: 116-F-3 **Classification:** Accepted

Site Names: 116-F-3, 105-F Storage Basin Trench **ReClassification:** Interim Closed Out (6/16/2003)

Site Type: Trench **Start Date:** 1947

Site Status:	Inactive	**End Date:**	1951

Site Description: The site has been remediated and closed out.

The contaminated soils have been excavated, but the site has not yet been backfilled. When active, the site had been an east-west oriented open excavation. After deactivation in 1951, the basin was backfilled with soil and cobbles. It was left unmarked and was not visually discernible. No vent pipes or other appurtenances were visible.

Waste Type: Process Effluent

Waste Description: The site received reactor effluent from the 105-F Reactor Building during an early fuel failure outage. In 1951, the site received sludge from the 105-F Storage Basin. During test pit activities in 1993, a buried pipe measuring 150 millimeters (6 inches) in diameter was found buried in the trench at approximately 1.8 meters (6 feet) below surface grade. The pipe was radiologically contaminated reading 500 counts per minute (5000 disintegrations per minute). The contaminates of concern (COC) for this site consist of Europium-152, Europium-154 and Hexavalent chromium.

Site Code:	116-F-4	**Classification:**	Accepted
Site Names:	116-F-4, 105-F Pluto Crib	**ReClassification:**	Interim Closed Out (11/8/2001)
Site Type:	Crib	**Start Date:**	1950
Site Status:	Inactive	**End Date:**	1952

Site Description: The site has been remediated and closed out.

The unit consisted of a french drain-type distribution system. A 0.61-meter (2-foot) riser was attached to a bottomless 208-liter (55-gallon) drum that drained into a cobble leach field.

Waste Type: Process Effluent

Waste Description: The site received coolant water from pressure tubes containing ruptured fuel elements. It was estimated that 280 curies of fission products were discharged to the crib during its operation (Dorian and Richards 1978). It was also assumed that the contaminated soil occupied a volume of 6 by 6 by 7.6 meters (20 by 20 by 25 feet).

Site Code:	116-F-5	**Classification:**	Accepted
Site Names:	116-F-5, Ball Washer Crib	**ReClassification:**	Interim Closed Out (8/16/2001)
Site Type:	Crib	**Start Date:**	1954
Site Status:	Inactive	**End Date:**	1964

Site Description: The site has been remediated and closed out. The 116-F-5 Crib has been fully backfilled and appears today as an unmarked, gravel-covered field. No vent pipes or other appurtenances remain.

The crib was fed by a 76-meter (250 foot) long vitrified clay pipeline that ran from the 105-F Reactor Building, at which point a 10.2-centimeter (4-inch) schedule 40 steel pipe was used. The pipeline was about 1.2 meters (4 feet) below grade. The vitrified clay pipe consisted of 1.2-meter (4-foot) sections. The bell ends were sealed with lead rings. The pipeline ended in a 3 by 3 by 2.7-meter (10 by 10 by 9-foot) excavation filled with cobble. Approximately 36.5 meters (120

feet) of the pipe, from 116-F-5 to the north end of the 116-F-4 excavation, was removed in 1993 during the 100 Area Excavation Treatability Test. The remaining 39.5 meters (130 feet) of pipe is part of site 100-F-26 for remedial action.

Waste Type: Process Effluent

Waste Description: The site received liquid waste associated with the decontamination of boron steel balls. Contaminants included strontium-90, cesium-137, europium-154, and europium-155. The waste also included nitric acid that was used for decontamination. However, sampling done in 1997 found only cobalt-60 and europium-155 to be above background levels.

The Cleanup Verification Package lists the final contaminants of concern (COCs) based on the Sampling and Analysis Plan (DOE/RL-96-22) as cesium-137 and cobalt-60.

Site Code:	116-F-6	**Classification:**	Accepted
Site Names:	116-F-6, 1608-F Liquid Waste Disposal Trench, 105-F Cooling Water Trench	**ReClassification:**	Interim Closed Out (11/3/2003)
Site Type:	Trench	**Start Date:**	1952
Site Status:	Inactive	**End Date:**	1965

Site Description: The site has been remediated and closed out.

The site was an open excavation used to receive reactor cooling water.

Waste Type: Process Effluent

Waste Description: The site received water diverted during reactor shutdowns when maintenance was necessary on the effluent system. This practice was used during several reactor upgrades. Contaminants would include, europium-152, cobalt-60, europium-154, cesium-137, and sulfamic acid (3,000 kilograms [6600 pounds]).

Site Code:	116-F-7	**Classification:**	Accepted
Site Names:	116-F-7, 117-F Crib and Pipeline, 116-F-7 Seal Pit Water Crib and Pipeline (See Subsites)	**ReClassification:**	No Action (11/14/2005)
Site Type:	Crib	**Start Date:**	1960
Site Status:	Inactive	**End Date:**	1965

Site Description: The site consisted of subsite 1) crib and 2) pipeline that has been filled with gravel and covered with clean soil. The pipeline originated at the 132-F-5 (117-F Filter Building) and terminated at the crib site.

Waste Type: Process Effluent

Waste Description: The site received drainage from confinement exhaust system filter seal pits in the 117-F Building.

UNI-946 states that boring 7-A appears to have been drilled very close to the center of the crib and a sample was collected at a depth of 3 meters (10 feet). Analysis of this material shows

concentrations of 0.032 picocuries/gram for cesium-137, 0.057 picocuries/gram for strontium-90, 0.1 picocuries/gram for plutonium-239/240, and 0.26 picocuries/gram for europium-152.

SubSites:

SubSite Code: 116-F-7:1

SubSite Name: 116-F-7:1, 116-F-7 Crib, 117-F Crib, 116-F-7 Seal Pit Water Crib

Classification: Accepted

ReClassification: No Action

Description: Subsite 1 consisted of the 116-F-7 Seal Pit Water Crib, a site evaluation was conducted as part of the Remaining Sites Verification Package (RSVP) attached to the Reclassification Form 2004-128 through field observations and focused sampling and analysis for the purpose of determining if hazardous or radiological contaminants were present.

One test pit was excavated to the bottom of the seal pit water crib structure. Four samples were collected at the site on October 12, 2004: a sample from nonfriable asbestos-cement pipe, a main sample and duplicate sample in the native soil below the gravel, and an equipment blank sample.

Contaminants of potential concern (COPCs) for this site were identified from historical information. The contaminants were carbon-14, cobalt-60, cesium-137, europium-152, europium-154, europium-155, tritium, strontium-90, uranium-234, uranium 235, uranium-238, hexavalent chromium, mercury, lead, semivolatile organics, and volatile organics (DOE/RL-96-17, Rev. 5). Based on further site-specific evaluation, plutonium-238, plutonium-239/240, arsenic, barium, cadmium, total chromium, selenium, silver, and polychlorinated biphenyls were also included as COPCs. Composite samples were collected and analyzed for the established contaminants of concern on 10/12/04. The results from the sampling event were reported as HEIS sample numbers J01XR0 through J01XR2.

The RSVP report demonstrated that the site met the objectives for a "No Action reclassification as established in the Remedial Design Report/Remedial Action Work Plan for the 100 Area (DOE/RL-96-17, Rev. 5) and the Interim Action Record of Decision for the 100-BC-1, 100-BC-2, 100-DR-1, 100-DR-2, 100-FR-1, 100-FR-2, 100-HR-1, 100-HR-2, 100-KR-1, 100-KR-2, 100-IU-2, 100-IU-6, and 200-CW-3 Operable Units, (ROD) (EPA 1999). The report also documented that the site soil contaminant concentrations support future land uses that can be represented (or bounded) by a rural-residential scenario and that contaminant levels remaining in the soil are protective of groundwater and the Columbia River.

SubSite Code: 116-F-7:2

SubSite Name: 116-F-7:2, 116-F-7 Crib Pipeline, 117-F Crib Pipeline, 116-F-7 Seal Pit Water Crib Pipeline

Classification: Accepted

ReClassification: No Action

Description: Subsite two consisted of the waste transfer pipeline. The pipeline originated at the 132-F-5 (117-F Filter Building) and terminated at the 116-F-7 Seal Pit Water Crib.

The 132-F-5 (117-F Filter Building) was reclassified as "No Action" based on a ResRad evaluation of the Allowable Residual Contamination Level (ARCL) information. The 116-F-7 Seal Pit Water Crib was closed with a "No Action" WIDS reclassification based on biased (worst case) sampling data for the soil in the crib. No significant contamination was found in

the verification samples. There was no significant scaling or radiation detected during the inspection of the crib influent piping.

This 10-centmeter (4 inch) diameter transite pipeline was used to transfer water from the 132-F-5 (117-F Filter Building) sump pump discharge to the 116-F-7 Seal Water Crib about 168 meters (550 feet) south of the building. The 132-F-5 Filter Building and the 116-F-7 Seal Pit Water Crib waste sites have been remediated and reclassified to "No Action". The pipeline drained into a perforated distributor pipe in the 116-F-7 crib, a total distance of about 185 meters (607 feet). The vented pipeline was fed from a sump pump and sloped for gravity drain with an average depth of about 1.5 meters (5 feet) below grade.

The fine soil at the top of the crib soil column had greater sorption capabilities for the contaminants of potential concern than either the 4-inch to 6-inch cobble fill in the Crib or the transite piping. The 116-F-7 influent pipeline was made of asbestos-cement which had less surface area than surface soils and did not adsorb ionic contaminants nor filter as effectively as fine soil particles. The soil analyses showed the crib and its internal piping met the cleanup standards. Because the pipeline was composed of the same material as in the crib and was exposed to the same waste stream, by analogy, the pipeline is also a candidate for "No Action" WIDS reclassification.

The absence of neither detectable radiation reading nor pipeline scaling indicates a low risk of significant contamination within the pipeline. The influent pipe is deemed to be a lower risk for contamination than within the crib since it has a lower sorptive or filtering capability. As such, the influent pipeline is recommended for acceptance as a "No Action" waste subsite of the 116-F-7 crib.

Site Code:	116-F-8	**Classification:**	Accepted
Site Names:	116-F-8, 1904-F Outfall Structure	**ReClassification:**	Interim Closed Out (9/25/2006)
Site Type:	Outfall	**Start Date:**	1945
Site Status:	Inactive	**End Date:**	1965

Site Description: The site has been remediated and interim closed.

This site consisted of an open-topped, compartmentalized, reinforced concrete outfall structure.

A 183 centimeter (72 inch) diameter steel retention basin pipeline entered the south face; and two 107 centimeter (42 inch) pipelines exited the north face to the river.

Waste Type: Construction Debris

Waste Description: Reactor water from the 107-F Basin was piped to the outfall structure that discharged into the Columbia River. The outfall could have also received reactor water that had been diverted for fish studies and other process wastes from the Experimental Animal Farm.

Contaminants of concern include cobalt-60, europium-152, europium-154, europium-155, and hexavalent chromium. Other contaminants of potential concern include carbon-14, cesium-137, nickel-63, and strontium-90.

Site Code:	116-F-9	**Classification:**	Accepted
Site Names:	116-F-9, Animal Waste Leaching Trench	**ReClassification:**	Interim Closed Out (10/16/2002

Site Type:	Trench	**Start Date:**	1963
Site Status:	Inactive	**End Date:**	1976

Site Description: The site has been remediated and closed out.

The site was a leaching trench that received waste water from the cleaning of animal pens in the Experimental Animal Farm. The pipelines that originated at the 141-C Building and terminated at the trench are documented in 100-F-29.

Waste Type: Animal Waste

Waste Description: The site received wash waste water from the cleaning of animal pens.

Waste Type: Soil

Waste Description: Contaminants found during sampling in 1979 included cesium-137, cobalt-60, europium-152, europium-154, europium-155, strontium-90, plutonium-238, plutonium-239/240. The total estimated radioactive inventory (1979) of the 116-F-9 Animal Leach Trench contaminated soil column was 4.1 curies (See Memorandum from V. R. Richards to J. J. Dorian).

Site Code:	116-F-10	**Classification:**	Accepted
Site Names:	116-F-10, 105-F Dummy Decontamination French Drain, 116-F-8, 105 Dummy/Perf Decontamination Crib, Perf Decontamination Drain	**ReClassification:**	Interim Closed Out (6/14/2003)
Site Type:	French Drain	**Start Date:**	1948
Site Status:	Inactive	**End Date:**	1965

Site Description: The site has been remediated and closed out.

The site consisted of a vitrified clay pipe placed in the ground vertically with approximately 3.0 meters (10 feet) of sand and gravel beneath the tile. The site also included a 10.16-centimeter (4-inch) steel feed pipeline located about 1.2 meters (4 feet) below grade. This pipeline terminated at the "Wash Pad" located in the southeast corner of the 105-F Building fuels storage basin.

Waste Type: Process Effluent

Waste Description: The site received radioactive water rinses and spent nitric acid from the decontamination of fuel element spacers and other reactor hardware, primarily pressure tube caps. In addition, the site received liquid waste containing 2000 kilograms (4400 pounds) of sodium dichromate, 2000 kilograms (4400 pounds) of sodium oxylate, and 2000 kilograms (4400 pounds) of sodium sulfamate. The site may have received other chemicals as well. Known decontamination solutions at 100-F included chromic acid, citric acid, oxalic acid, sulfamic acid, sulfuric acid, and sodium fluoride. Other chemicals, including organic solvents, were also used for some decontamination processes.

Three soil borings were drilled in the vicinity of the drain in 1975 (Dorian and Richards 1978). Boring 10-A was drilled next to the tile pipe, and borings 10-B and 10-C were completed approximately 3 meters (10 feet) and 9 meters (30 feet) east of the tile pipe respectively. Samples were collected from these borings at depths ranging from 3.8 to 8.2 meters (12.5 to 27 feet). Analytical results indicated elevated concentrations of cobalt-60 (610 picocuries/gram), europium-152 (250 picocuries/gram), europium-154 (31 picocuries/gram), europium-155 (100

picocuries/gram), and cesium-137 (7.4 picocuries/gram) in boring 10-B. Elevated concentrations were not detected in the samples from borings 10-A and 10-C.

Site Code:	116-F-11	**Classification:**	Accepted
Site Names:	116-F-11, 105-F Cushion Corridor French Drain	**ReClassification:**	Interim Closed Out (9/15/2003)
Site Type:	French Drain	**Start Date:**	1953
Site Status:	Inactive	**End Date:**	1965

Site Description: The site has been remediated and interim closed out.

A 0.9-meter (3-foot) diameter tile pipe was buried vertically with 2.5 to 5 centimeters (1 to 2 inches) extending above grade. The pipe had a metal lid.

Waste Type: Process Effluent

Waste Description: The site received liquid decontamination wastes from the cushion corridor area when reactor hardware was decontaminated.

Boring 105-F-A was completed in this area in 1975 (Dorian and Richards 1978). The boring was drilled to a depth of 2.4 meters (8 feet) before terminating due to a concrete obstruction. A soil sample was collected at a depth of 1.5 meters (5 feet) and radionuclide concentrations varied from 0.01 to 5.6 picocuries per gram. Since this boring is approximately 30 meters (100 feet) away from 116-F-11, these results are not likely to be representative of soils near this waste unit.

Site Code:	116-F-12	**Classification:**	Accepted
Site Names:	116-F-12, 148-F French Drain	**ReClassification:**	Interim Closed Out (5/22/2002)
Site Type:	French Drain	**Start Date:**	1944
Site Status:	Inactive	**End Date:**	1964

Site Description: The site has been remediated and interim closed out.

The drain was excavated during the removal of the 100-F-19:1 effluent pipelines.

Waste Type: Water

Waste Description: This drain would have received minimal amounts of leakage or spillage from two pumps located in the facility that were used to supply reactor cooling water to the fish studies facilities. Although Stenner, et al (PNL-6456) states that the site received recovered effluent pump prime, drawings (H-1-459-VOID and H-1-1518) indicate that the site could not have received any effluent except leakage or spillage from maintenance activities on the pumps.

Site Code:	116-F-13	**Classification:**	Not Accepted (7/29/1997)
Site Names:	116-F-13, 1705-F Experimental Garden French Drain	**ReClassification:**	
Site Type:	French Drain	**Start Date:**	

Site Status:	Inactive	**End Date:**	
Site Description:	The site has been described as a french drain. A review of documents and drawings has found no indication that a french drain ever existed at the 1705-F Experimental Garden. This site appears to be confused with both the 146-FR fish rearing ponds and the 1607-F6 septic tank.		

Site Code:	116-F-14	**Classification:**	Accepted
Site Names:	116-F-14, 107-F Retention Basin, 107-F	**ReClassification:**	Interim Closed Out (7/12/2002)
Site Type:	Retention Basin	**Start Date:**	1945
Site Status:	Inactive	**End Date:**	1965
Site Description:	The site has been remediated and closed-out. The retention basin was a rectangular, concrete-lined, open-top reservoir designed to retain reactor cooling water prior to being discharged to the Columbia River. The basin had an estimated capacity of 5.67E+08 liters (1.5E+08 gallons). It was divided into two equal sections by weir walls running lengthwise from inlet to outlet end. Each section was subdivided by a series of wooden baffles. The site was surrounded by sprinklers (Hanford Drawing H-1-14321) installed on the top of the wall to keep the sludge from drying out during those times when effluent was not being discharged to the basin.		
Waste Type:	Demolition and Inert Waste		
Waste Description:	This site received cooling water effluent from the 105-F Reactor and held it to allow radioactive decay and thermal cooling prior to releasing the effluent to the Columbia River. Approximately 10 curies of radioactivity had leached into the concrete floor and walls.		
Waste Type:	Water		
Waste Description:	This site received cooling water effluent from the 105-F Reactor for radioactive decay and thermal cooling prior to release to the Columbia River. Seventy percent of the total radionuclide inventory was contained within the soil adjacent to the basin.		

Site Code:	116-F-15	**Classification:**	Accepted
Site Names:	116-F-15, 108-F Radiation Crib	**ReClassification:**	Interim Closed Out (5/24/2007)
Site Type:	Sump	**Start Date:**	
Site Status:	Inactive	**End Date:**	
Site Description:	The site has been remediated and interim closed. The site consisted of a floor drain that emptied into a 0.91 by 0.91 by 0.91-meter (3-by 3-by 3-foot) concrete sump that then emptied into a trench, near the center and under the 108-F Radiobiology Laboratory Building first floor.		
Waste Type:	Process Effluent		
Waste Description:	Prior to 1996, the unit had not been sampled for radiological or chemical contamination. It was known that alpha contamination experiments were conducted in the 108-F Building. The sump was reported to have received liquid wastes from the 108-F Building sinks, glovebox drains, and ventilation hoods. Alpha contamination experiments were conducted at the 108-F Building, therefore the potential for alpha contamination of this waste site exists.		

Site Code:	116-F-16	**Classification:**	Accepted
Site Names:	116-F-16, PNL Outfall	**ReClassification:**	Interim Closed Out (9/14/2006)
Site Type:	Outfall	**Start Date:**	
Site Status:	Inactive	**End Date:**	

Site Description: The site has been remediated and interim closed.

This site consisted of an open-topped, compartmentalized, reinforced concrete outfall structure.

Waste Type: Construction Debris

Waste Description: The unit received animal sewage from various Experimental Animal Farm projects, 107-F Retention Basin water from fish studies, and low-level contamination.

The COPCs include Plutonium-239/240, Strontium-90, Cesium-137, Lead, and hexavalent chromium.

Site Code:	118-F-8	**Classification:**	Accepted
Site Names:	118-F-8, 105-F Reactor Building (See Subsites)	**ReClassification:**	
Site Type:	Reactor	**Start Date:**	1944
Site Status:	Inactive	**End Date:**	1965

Site Description: The site is an inactive plutonium production reactor that has been placed in Interim Safe Storage. The unit consists of a reactor block with associated shielding and controls, and contaminated portions of the reactor building.

Waste Type: Equipment

Waste Description: Before remediation and ISS the unit contained an estimated 16,000 curies of radionuclides, 85,300 kilograms (94 tons) of lead, and 13.6 kilograms (30 pounds) of cadmium.

Waste Type: Asbestos (friable)

Waste Description: The site was estimated to contain less than 2.83 cubic meters (100 cubic feet) of asbestos.

SubSites:

SubSite Code: 118-F-8:1

SubSite Name: 118-F-8:1, 105-F Reactor Ancillary Support Areas, 105-F Below-Grade Structures and Underlying Soils

Classification: Accepted

ReClassification: Interim Closed Out

Description: This subsite included the reactor ancillary support areas, below-grade structures and underlying soils. The ancillary support areas consisted of the office areas, the reactor control room, tool storage rooms, restrooms, cooling water influent areas, change rooms, ventilation equipment areas, and electrical systems areas.

Demolition of the facilities in subsites 1 and 3 began in fiscal year 1998. In 2004 the Cleanup Verification Package (CVP) 2003-00017 documented completion of the removal action and verified the protectiveness of subsites 118-F-8:1 (105-F Reactor Ancillary Support Areas, Below-Grade Structures and Underlying Soils) and 118-F-8:3 (105-F Fuel Storage Basin (FSB) and underlying soils).

Removal action "applicable or relevant and appropriate requirements" (ARARs) and cleanup standards for the 105-F site were established by the U.S. Environmental Protection Agency and the U.S. Department of Energy, Richland Operations Office, in concurrence with the Washington State Department of Ecology. These ARARs and cleanup standards for the subsites were documented in the Action Memorandum.

Removal of below grade structures to a minimum of 0.9 meters (3 feet) below surrounding grade outside of the 105 F Reactor core shield walls, verification that structures and soil left in place achieved specified cleanup standards, and disposal of contaminated excavation materials at the Environmental Restoration Disposal Facility in the 200 Area of the Hanford Site. In some cases, the floors of the below-grade structure (i.e., the valve pit and the solids feed area) or the entire structure (i.e., the FSB) were removed.

The subsite was divided into areas or zones as specified in the 105-F SAP and the FSB SAP according to process history and structure depth. These zones were treated as separate units such that cleanup evaluations were conducted on each individual area or zone. The 118-F-8:3, the underlying soils of the former FSB, was zone 1. The 118-F-8:1 subsite was divided into three zones (zones 2, 3, and 4), and also included the equipment decontamination areas, which were used during 105-F D&D and ISS activities.

Cleanup verification samples, including QA/QC samples, were collected and analyzed for the established contaminants of concern (COC) from 1999 to December 2003. Components of each zone were summarized, including structure floor depths and contaminants of concern (COCs). Floor depths were below ground surface. COCs were identified through process knowledge and were listed in the 105-F SAP and the FSB SAP. For the following zones 118-F-8:3; Zone 1 - FSB and underlying soils,118-F-8:1; Zone 2 - Valve pit, and the 118-F-8:1; Equipment Decontamination Areas the COCs were: americium-241, barium-133, carbon-14, cobalt-60, cesium-137, europium-152, europium -154, europium-155, nickel-63, plutonium-238, plutonium-239/240, strontium-90, technetium-99, uranium-234, uranium-235, uranium 238, hexavalent chromium, barium lead, mercury and PCBs.

For subsites 118-F-8:1; Zone 3 (Gas recirculation tunnel, solids feed area, flow laboratory basement, East water tunnel, trench under accumulator room) and 118-F-8:1; Zone 4, (West inlet water tunnel, east inlet water tunnel, 315 exhaust plenum, 316 exhaust plenum, pipe tunnel, southeast tunnel) the COCs were: americium-241, barium-133, carbon-14, cobalt-60, cesium-137, europium-152, europium -154, europium-155, nickel-63, plutonium-238, plutonium-239/240, strontium-90, hexavalent chromium and lead.

The CVP-2003-00017 demonstrated that the removal action at the 105-F Reactor subsites 1 and 3 have achieved the objectives established in the Action Memorandum and have achieved the corresponding cleanup standards established in the 105-F SAP, the FSB SAP, and the 100 Area RDR/RAWP.

The remaining soils and concrete at the 105 F Reactor site have been sampled, analyzed, and modeled. The results of this effort indicate that the materials from the 105 F Reactor site containing COCs at concentrations exceeding the cleanup standards have been excavated and disposed of at ERDF. These results also indicated that residual concentrations in the shallow

zone will support future land uses. However, the acceptability of unrestricted direct exposure to deep zone soils has not been demonstrated; therefore, institutional controls to prevent uncontrolled excavation into the deep zone (i.e., below 4.6 meters [15 feet]) are required. The 105-F Reactor subsites 1 and 3 are verified to meet protectiveness standards in accordance with the Action Memorandum.

SubSite Code: 118-F-8:2

SubSite Name: 118-F-8:2, 105-F Reactor Core and ISS Project

Classification: Accepted

ReClassification:

Description: Construction of the F Reactor was initiated in December 1943. Initial startup of the reactor was achieved on February 25, 1945. The F Reactor was shut down on June 25, 1965. Until the start of the Interim Safe Storage (ISS) Project, the F Reactor had been in a condition of minimum surveillance and maintenance (S&M).

The primary objective of the 105-F Reactor ISS Project is to provide storage for up to 75 years with minimal maintenance required. Design objectives are summarized as follows: safe storage for up to 75 years, no credible releases of radionuclides to the environment under normal design conditions, interim inspection required only on a 5-year frequency, further evaluation of extending this frequency will be done by the project group upon completion of the first 5-year surveillance

Access to the 105-F Reactor SSE is through the utility room. During periods of storage, the door to the SSE (located inside the utility room) will be locked and welded shut. The door to the utility room will be locked except during routine S&M activities. The SSE is entered only for periodic S&M activities. The 0.9 to 1.5-meter (3 to 5-feet)-thick concrete walls and the welded door provide the security barrier for the facility; therefore, a locked fence around the SSE is not required.

The original footprint area of the reactor building was approximately 4,994 meters squared (53,750 square feet). The final footprint area of the safe storage enclosure is 999 meters squared (10,750 square feet). Thus, the footprint area of the reactor was reduced by 80%. To avoid confusion, the footprint area is strictly the at-grade area and does not include the square footage of any above-grade rooms (e.g., sample rooms, ready room, upper electrical room, or exhaust plenums) or below-grade rooms/tunnels. The new steel roof decking was covered with foam and two applications of silicon rubber.

SubSite Code: 118-F-8:3

SubSite Name: 118-F-8:3, 105-F Reactor Fuel Storage Basin and Underlying Soils

Classification: Accepted

ReClassification: Interim Closed Out

Description: The fuel storage basin, located on the south side of the 105-F Building, was the underwater collection, storage, and transfer facility for irradiated fuel elements discharged from the reactor. This area included the fuel element discharge pickup area, fuel storage area (basin), fuel transfer area, wash pad area and underlying soils.

In 1970 the basin was pumped until 0.6 meters (2 feet) of water remained, where sediment/sludge and miscellaneous items were found (fuel buckets, fuel spacers, process tubes, tongs, wooden floor decking, and monorail pieces). Fine streambed sand was then placed into the remainder of the basin (5.4 meters [18 feet]).

After deactivation, the FSB was determined to have leaked therefore it had to be entirely removed. Fill removal was completed in November 2002. Seventeen pieces of fuel were identified and shipped to K Basins. The excavated site was confirmed to meet the deep zone cleanup criteria in the SAP.

A more detailed accounting of documentation in CVP-2003-00017 is located in subsite 1. Demolition of the facilities in subsites 1 and 3 began in fiscal year 1998. In 2004 the Cleanup Verification Package (CVP) 2003-00017 documented completion of the removal action and verified the protectiveness of subsites 118-F-8:1 (105-F Reactor Ancillary Support Areas, Below-Grade Structures and Underlying Soils) and 118-F-8:3 (105-F Fuel Storage Basin (FSB) and underlying soils).

Cleanup verification samples, including QA/QC samples, were collected and analyzed for the established contaminants of concern (COC) from 1999 to December 2003. Components of each zone were summarized, including structure floor depths and contaminants of concern (COCs). Floor depths were below ground surface. COCs were identified through process knowledge and were listed in the 105-F SAP and the FSB SAP. For sampling purposes this subsite was designated as 118-F-8:3; Zone 1, FSB and underlying soils, the COCs were: americium-241, barium-133, carbon-14, cobalt-60, cesium-137, europium-152, europium - 154, europium-155, nickel-63, plutonium-238, plutonium-239/240, strontium-90, technetium-99, uranium-234, uranium-235, uranium 238, hexavalent chromium, barium lead, mercury and PCBs. Sample results were listed in Appendix A of CVP-2003-00017.

The CVP-2003-00017 demonstrated that the removal action at the 105-F Reactor subsites 1 and 3 have achieved the objectives established in the Action Memorandum and have achieved the corresponding cleanup standards established in the removal action work plan, the 105-F SAP, the FSB SAP, and the 100 Area RDR/RAWP. The remaining soils and concrete at the 105 F Reactor site have been sampled, analyzed, and modeled.

The results of the sampling event indicated that the materials from the 105 F Reactor subsites containing COCs at concentrations exceeding the cleanup standards have been excavated and disposed of at ERDF. These results also indicated that residual concentrations in the shallow zone will support future land uses. The acceptability of unrestricted direct exposure to deep zone soils has not been demonstrated; therefore, institutional controls to prevent uncontrolled excavation into the deep zone (i.e., below 4.6 meters [15 feet]) are required. The 105-F Reactor subsites 1 and 3 are verified to meet protectiveness standards in accordance with the Action Memorandum.

SubSite Code: 118-F-8:4

SubSite Name: 118-F-8:4, 105-F Fuel Storage Basin West Side Adjacent and Side Slope Soils

Classification: Accepted

ReClassification: Interim Closed Out

Description: This subsite consists of an area of soil at the western boundary of the 118-F-8:3, FSB excavation. It was identified during the remediation of subsites 1 and 3. The Cleanup Verification Package for the 118-F-8:4 Fuel Storage Basin (FSB) West Side Adjacent and Side Slope Soils documents that the subsite has been remediated in accordance with the Removal Action Work Plan for 105-DR and 105-F Building Interim Safe Storage Projects and Ancillary Buildings and meets the remedial action objectives and goals for interim closure as established in the Action Memorandum and, by reference, the 100 Area Remedial Action Sampling and Analysis Plan (SAP) and the Remedial Design Report/Remedial Action Work Plan for the 100 Area (RDR/RAWP).

Remediation of the subsite began on March 14, 2007, and was completed on June 22, 2007. Remedial action activities involved removing the uncontaminated overburden, the buried contaminated material, and the underlying contaminated soil for disposal. Following remediation and field screening of the waste site, verification sampling was conducted between May 31 and June 22, 2007. Verification sampling was performed to collect data to determine if the remedial action goals (RAGs) had been met.

The requirements for verification sampling were established in an interoffice memorandum to be performed in accordance with the 100 Area SAP, except that the contaminants of concern (COCs) for these areas were those listed in the Sampling and Analysis Plan for the 105-F Phase IV Fuel Storage Basin (FSB SAP). The FSB SAP identified the contaminants of concern (COCs) for the side slope soils as americium-241, carbon-14, cobalt-60, cesium-137, europium-152, europium-154, europium-155, helium-3, nickel-63, plutonium-238, plutonium-239/240, strontium-90, uranium-234, uranium-235, uranium-238, hexavalent chromium, mercury, lead, barium, and PCBs. Barium-133 was included as a COC to be consistent with the analytical requirements for the adjacent and related 118-F-8:3 subsite, interim closure documented in CVP-2003-00017.

The results of verification sampling illustrated that residual contaminant concentrations did not preclude any future uses (as bounded by the rural-residential scenario) and allowed for unrestricted use of shallow zone soils (i.e., surface to 4.6 meters [15 feet] deep). The results also demonstrated that residual contaminant concentrations were protective of groundwater and the Columbia River. However, the acceptability of unrestricted direct exposure to deep zone soils has not been demonstrated due to the presence of residual activities from multiple radionuclides; therefore, institutional controls to prevent uncontrolled drilling/excavation into the deep zone (i.e., below 4.6 meters [15 feet]) are required.

The 118-F-8:4 subsite has been verified to meet protectiveness standards in accordance with the Action Memorandum. In accordance with this evaluation, the verification sampling and modeling results support a reclassification of the site to Interim Closed Out.

Site Code:	126-F-2	**Classification:**	Accepted
Site Names:	126-F-2, 183-F Clearwells	**ReClassification:**	Interim Closed Out (5/4/2006)
Site Type:	Dumping Area	**Start Date:**	1945
Site Status:	Inactive	**End Date:**	1965

Site Description: The unit consisted of covered, reinforced concrete basins (east and west), in the late 1970s, the eastern clearwell was used for the disposal of inert debris generated in the demolition of various 100-F Area buildings. The basins had a capacity of about 3.7E+07 liters (1E+07 gallons), they were separated in the center by a pump room.

Part of the concrete cover on both clearwells has been demolished to permit dumping into the clearwell cavity. The pump room was reinforced concrete and largely below grade. The above-ground portion of the pump room has been demolished, and the below-ground portion has been filled with pump room rubble and backfilled. Approximately 25% of the eastern clearwell basin contained waste. The west clearwell remains intact.

Waste Type: Demolition and Inert Waste

Waste Description: The unit now contains demolition waste from demolished facilities. This waste includes rubble from the uncontaminated portion of 115-F as well as rubble from such noncontaminated facilities as 183-F, 190-F, 189-F, 185-F, 171-F. The rubble is believed to include asbestos siding tiles from several buildings.

The site has been included in the Remaining Sites Record of Decision, and is listed as having "possible low-level radioactive waste."

Site Code:	128-F-2	**Classification:**	Accepted
Site Names:	128-F-2, 100-F Burning Pit	**ReClassification:**	Interim Closed Out (12/1/2008)
Site Type:	Burn Pit	**Start Date:**	1945
Site Status:	Inactive	**End Date:**	1965

Site Description: Originally, the pit was an irregularly shaped depression that was used for burning wastes. The site has been covered and appears as a flat surface with no sign of the burn pit or its contents. The pit appears to have been filled and leveled in preparation for the installation of soil sampling test well 199-F5-42.

Waste Type: Misc. Trash and Debris

Waste Description: The results of confirmatory sampling were used to determine the COCs and contaminants of potential concern (COPCs) for verification sampling. Metals (including hexavalent chromium and mercury), SVOCs (inclusive of the PAHs detected in confirmatory samples), chlorinated pesticides, TPH, PCBs, and asbestos were considered COCs/COPCs for verification sampling. Additionally, because radiological activity was detected above background levels during confirmatory sampling, laboratory radiological analysis was performed on verification samples to verify the absence of radiological contamination.

Site Code:	132-F-1	**Classification:**	Accepted
Site Names:	132-F-1, 132-F-1 Chronic Feeding Barn, 141-F, 141-F Sheep Barn	**ReClassification:**	Interim Closed Out (8/23/2006)
Site Type:	Laboratory	**Start Date:**	
Site Status:	Inactive	**End Date:**	

Site Description: The site has been remediated and interim closed.

The barn has been demolished. When in use, it was an L-shaped concrete block building with a concrete floor and concrete animal pens located both inside and outside of the building.

Waste Type: Demolition and Inert Waste

Waste Description: Residual strontium-90, cesium-137, and plutonium-239 contamination may remain in any buried debris.

Site Code:	132-F-2	**Classification:**	Not Accepted (7/29/1997)
Site Names:	132-F-2, 132-F-2 Inhalation Laboratory, 144-F, 144-FB	**ReClassification:**	
Site Type:	Laboratory	**Start Date:**	
Site Status:	Inactive	**End Date:**	

Site Description: The site was a laboratory that was part of the Experimental Animal Farm. The building has been demolished. It was a rectangular one-story, 302 square meter (3,250 square foot), concrete block building. The building contained an office, laboratories, and indoor and outdoor animal runs.

During the April 1999 visit, a survey grade GPS was used to locate the site using its mapped coordinates. A wooden stake was found in the ground at those coordinates. No evidence of the site was found. However, the area had been disturbed by heavy equipment, concrete chunks were visible and vegetation was sparse.

Site Code:	132-F-3	**Classification:**	Accepted
Site Names:	132-F-3, 115-F Gas Recirculating Facility	**ReClassification:**	No Action (12/9/2003)
Site Type:	Burial Ground	**Start Date:**	1943
Site Status:	Inactive	**End Date:**	1965

Site Description: The site has been evaluated and determined to meet remedial action objectives. The evaluation supports reclassification.

This site was the below grade remaining material from the decommissioning of the 115-F Gas Recirculation Facility. The building was demolished in-situ using Allowable Residual Contamination Level (ARCL) methodology. At present, the site looks like a gravel parking lot that is free of any debris.

Waste Type: Demolition and Inert Waste

Waste Description: The resident radionuclides are tritium, carbon-14, cobalt-60, strontium-90, cesium-137. Surface smears taken in the facility over a 100-square centimeter (15.5-square inch) area revealed alpha contamination of less than 200 disintegrations per minute (dpm) on all surfaces tested. The maximum direct reading of 15,000 counts per minute (cpm) was recorded in the east end of the piping tunnel that connected the gas recirculation facility to the reactor (Chattin and Powers 1985).

Site Code:	132-F-4	**Classification:**	Accepted
Site Names:	132-F-4, 116-F Reactor Stack, 116-F Reactor Exhaust Stack, 132-F-4 Reactor Stack Demolition Site (See Subsites)	**ReClassification:**	No Action (11/14/2005)
Site Type:	Burial Ground	**Start Date:**	1944
Site Status:	Inactive	**End Date:**	1965

Site Description: The site consists of two subsites: one is the 116-F Reactor Stack and Subsite 2 is the stack's octagon-shaped base. The site is a cobble covered field next to the 105-F Reactor Building.

Waste Type: Demolition and Inert Waste

Waste Description: The estimated radionuclide inventory for the 116-F Stack prior to demolition was 5.0 picocuries/gram. This amount was calculated from the concentration of nuclides over the interior of the stack to a depth of 1 centimeter (0.39 inches). The radionuclides found were tritium, carbon-14, cobalt-60, strontium-90, cesium-137, europium-152, and plutonium-239.

Testing performed on several of the reactor stacks in the 100 Area prior to decommissioning showed that the stacks contained residual quantities of radionuclide materials on their interior

surfaces. Standard smear testing performed over a 100-square centimeter (15.5-square inch) area on these surfaces showed the presence of tritium at concentrations of 400 to 13,000 picocuries per square centimeter and carbon-14 at concentrations of 200 to 2.1E+07 picocuries per square centimeter (Dorian and Richards 1978). Beta-gamma activity from other radionuclides was also identified.

SubSites:

SubSite Code: 132-F-4:1

SubSite Name: 132-F-4:1, 116-F Reactor Stack Demolition Site

Classification: Accepted

ReClassification: No Action

Description: The 116-F Stack was a reinforced concrete structure 61 meters (200 feet) high with a base diameter of 5.05 meters (16.58 feet) and a maximum thickness of 0.46 meters (18 inches) at the base. The stack rested on a double octagon-shaped base which extended 5.3 meters (17.5 feet) below grade. The interior of the unit contained 4.2 microcuries of radioactive materials. The stack was demolished by explosive demolition into a trench and then was broken into pieces smaller than 1 meter (3 feet) in diameter. Afterwards, all of the loose rubble was pushed into the trench and backfilled. The site was then graded to match the surrounding terrain.

RESRAD modeling was performed in 2003 to provide another data point. The RESRAD modeling accounted for radioactive decay from 1980 (the year of sample collection) to 2003, and predicted that none of the contaminants detected in the concrete from the interior of the stack would reach groundwater within 1,000 years.

This unit was demolished in September 1983 and buried in a trench between the 117-F Building Site and the 115-F Building Site. The trench was backfilled and covered with a 1-meter (3-foot) layer of soil. The site has been documented as achieving the remedial action objectives (RAOs) and the corresponding remedial action goals (RAGs) established in the 100 Area RDR/RAWP (DOE-RL 2002) and the Remaining Sites ROD (EPA 1999). Any residual concentrations will support future land uses that can be represented (or bounded) by a rural-residential scenario and that based on RESRAD modeling, pose no threat to groundwater or the Columbia River. The basis for reclassification is described in detail in the Waste Site Evaluation for 132-F-4, 116-F Reactor Exhaust Stack (0100F-CA-V0183), Bechtel Hanford Company, Richland, Washington.

SubSite Code: 132-F-4:2

SubSite Name: 132-F-4:2, 116-F Reactor Stack Base Burial

Classification: Accepted

ReClassification: No Action

Description: Subsite 2 consists of the (116-F) Reactor Stack Base. The monolithic concrete stack base and foundation included an imbedded stack condensate drain line. The 116-F stack base burial site has a separate waste site boundary about 0.5 meters (1.5 feet) east of 116-F stack burial site.

The 5.6 meters (18.5 feet) diameter octagonal stack base was removed to about 1 meter (3 feet) below grade and extended to 7.2 meters (23.5 feet) below grade. The vertical 15-centimeters (6-inches) cast iron condensate drain pipe in the center of the stack base exited the side of the concrete monolith about 1.6 meters (5.2 feet) below grade. The condensate

drain line from the stack base to the 105-F Building process sewer was removed during the demolition activities for the 105-F Reactor below-grade structures.

The stack base included a 15 centimeter (6 inch) diameter cast iron drain pipe in the center of the base that exited the east side of the base at a depth of 1.5 meters (5 feet) below grade. The 15 centimeter (6 inch) cast iron drain pipe ran east from the stack base to the 105-F Building wall a distance of 1.9 meters (6.2 feet) and entered the 105-F Building at a depth of 1.9 meters (6.2 feet) below grade. The external piping and the upper 1 meter (3 feet) of internal piping was removed during the demolition of the 116-F stack and the adjacent 105-F Building walls. About 3.4 meters (11 feet) of cast iron drain pipe remains imbedded in the stack base.

The potential contamination within the imbedded pipeline is deemed negligible since the pipe was a free draining condensate line to the process sewer. The 116-F stack, which was closed with a no action reclassification, represents the worst-case contamination potential for the drain line. The corresponding 105-D concrete base and foundation, including the imbedded cast iron drain line, was closed with no further action.

Site Code:	132-F-5	**Classification:**	Accepted
Site Names:	132-F-5, 117-F Filter Building	**ReClassification:**	No Action (12/8/2003)
Site Type:	Burial Ground	**Start Date:**	1960
Site Status:	Inactive	**End Date:**	1965
Site Description:	The site has been evaluated and determined to meet remedial action objectives. The evaluation supports reclassification.		
Waste Type:	Process Effluent		
Waste Description:	The radionuclides found in the 117-F Building are tritium, carbon-14, cobalt-60, cesium-137, strontium-90, europium-154, and europium-152. During the decommissioning of the facility, surface smears over 100-square centimeter (15.5-square inch) areas in the building revealed beta-gamma contamination of less than 200 counts/minute and alpha contamination less than 500 counts/minute.		

Site Code:	132-F-6	**Classification:**	Accepted
Site Names:	132-F-6, 1608-F Waste Water Pumping Station, 1608-F Effluent Pumping Station, 132-F-6 Lift Station	**ReClassification:**	No Action (12/8/2003)
Site Type:	Pump Station	**Start Date:**	1944
Site Status:	Inactive	**End Date:**	1965
Site Description:	The site has been evaluated and determined to meet remedial action objectives. The evaluation supports reclassification. The area where the demolished facility once stood is currently a cobble covered field.		
Waste Type:	Demolition and Inert Waste		
Waste Description:	Before demolition, this site received water from reactor building drains containing trace amounts of low-level radionuclides and decontamination chemicals (primarily Turco). Radionuclides were primarily miscellaneous activation products, including tritium, carbon-14,		

cobalt-60, strontium-90, cesium-137, europium-152, and europium-154. The decontamination chemicals consisted of sodium fluoride, oxalic acid, and citric acid. Water was pumped from the reactor collection pits into the reactor effluent lines near the 105-F Reactor Building and became part of the 107-F effluent that was discharged to the Columbia River. During decommissioning of the facility in 1987, a survey of the walls, ceilings, and floor areas of the main floor, pump room, switch gear room, and valve room revealed direct beta-gamma contamination to less than 200 counts/minute (cpm). The maximum contamination levels recorded were for the floor areas of the sumps at 5,000 to 25,000 counts/minute (cpm) direct beta-gamma.

During the Dorian and Richards (1978) study in 1975-1976, samples were collected from a soil boring identified as location 132-F-6. Analytical results of material collected in this boring at depths of 7.6 meters (25 feet) and 9 meters (30 feet) revealed elevated concentrations, with a maximum of 92 picocuries/gram for europium-152.

Site Code:	182-F	**Classification:**	Accepted
Site Names:	182-F, 182-F Reservoir	**ReClassification:**	Interim Closed Out (9/12/2005)
Site Type:	Dumping Area	**Start Date:**	
Site Status:	Inactive	**End Date:**	1977
Site Description:	The site has been remediated and interim closed out.		
Waste Type:	Demolition and Inert Waste		
Waste Description:	This unit received demolition rubble from the 182-F Pumping Station and the 183-F Water Treatment Building and Sedimentation Basins, and debris from other building demolitions. Some of the debris was from 144-F, 144-R, 141-N, 141-P, 141-F, 141-H and 141-L. The unit was covered with fill from adjacent land.		

Site Code:	1607-F2	**Classification:**	Accepted
Site Names:	1607-F2, 1607-F2 Septic Tank, 124-F-2, 1607-F2 Sanitary Sewer System	**ReClassification:**	Interim Closed Out (3/11/2003)
Site Type:	Septic Tank	**Start Date:**	1944
Site Status:	Inactive	**End Date:**	1988
Site Description:	The site has been remediated and closed out. The unit included a septic tank, tile field and associated pipeline. The unit was 4.6 meters (14.9 feet) deep, constructed of reinforced concrete, and had a 522-person capacity (130 liters [35 gallons] per capita) with an average detention period of 24 hours. The walls and floor were 25 centimeters (10 inches) thick. The tile field was constructed of 10-centimeter (4-inch) vitrified pipe, concrete pipe, or drain tile with a minimum of 2.4 meters (8 linear feet) per capita. The laterals were open jointed, spaced 2.4 meters (8 feet) apart. The tile field was irregularly shaped, measuring approximately 90.3 meters (296 feet) by 54.0 meters (177 feet).		
Waste Type:	Sanitary Sewage		
Waste Description:	This unit received unknown amounts of sanitary sewage from the 184-F Powerhouse, the 185-F Chemical Treatment Building, the 190-F Pumphouse, the 105-F Reactor Building, the 108-F		

Building, and the 1700 Administration and Service Buildings. The unit now services the 105-F and 108-F Buildings only. The other buildings have been demolished. Since the site serviced both the 105-F and 108-F Buildings, there is the potential to have received hazardous contaminants. The sludge in the septic tank was measured and sampled as part of the Group 4 Remedial Design Field Investigations. The sludge volume was estimated to be 49,970 liters (13,200 gallons). Sample numbers B0LC76, B0LC77, B0LC78 and B0LC82 were analyzed for metals, volatile organics and semi-volatile organics. Radionuclides were determined by Gamma Spectroscopy. Polyaromatic hydrocarbons were identified as well as elevated levels (above background) of cobalt-60, cesium-137, strontium-90, europium-154/155, radium-226, plutonium-238,239/240 and uranium-234, 235/238. The estimated dose rate from the tank sludge is 157.2 millirem per year.

Site Code:	1607-F3	**Classification:**	Accepted
Site Names:	1607-F3, 1607-F3 Septic Tank, 124-F-3, 1607-F3 Sanitary Sewer System	**ReClassification:**	Interim Closed Out (4/26/2007)
Site Type:	Septic Tank	**Start Date:**	1944
Site Status:	Inactive	**End Date:**	1965
Site Description:	The site has been remediated and interim closed. The site consisted of a septic tank, drainfield and associated pipeline. It was constructed of reinforced concrete; the walls and floor were 25 centimeters (10 inches) thick.		
Waste Type:	Sanitary Sewage		
Waste Description:	This unit received an unknown amount of sanitary sewage from the 182-F Pump Station, the 183-F Water Treatment Plant, and the 151-F Substation.		

Site Code:	1607-F4	**Classification:**	Accepted
Site Names:	1607-F4, 1607-F4 Septic Tank, 124-F-4, 1607-F4 Sanitary Sewer System	**ReClassification:**	Interim Closed Out (12/3/2007)
Site Type:	Septic Tank	**Start Date:**	1944
Site Status:	Inactive	**End Date:**	1965
Site Description:	The site consisted of a septic tank, drainfield, and associated pipeline. The tank was constructed of reinforced concrete.		
Waste Type:	Sanitary Sewage		
Waste Description:	This unit received an unknown amount of sanitary sewage from the 115-F Gas Recirculation Building. There is the potential for the site to have received hazardous contaminants from the 115-F Building.		

Site Code:	1607-F5	**Classification:**	Accepted
Site Names:	1607-F5, 1607-F5 Septic Tank, 124-F-5, 1607-F5 Sanitary Sewer System	**ReClassification:**	Interim Closed Out (9/14/2006)
Site Type:	Septic Tank	**Start Date:**	1944

Site Status:	Inactive	**End Date:**	1965
Site Description:	The site has been remediated and interim closed out. The system consisted of a septic tank, drainfield, and associated pipeline.		
Waste Type:	Sanitary Sewage		
Waste Description:	This unit received an unknown amount of sanitary sewage from the 181-F Pumphouse.		

Site Code:	1607-F6	**Classification:**	Accepted
Site Names:	1607-F6, 1607-F6 Septic Tank, 124-F-6, 1607-F6 Sanitary Sewer System	**ReClassification:**	Interim Closed Out (11/8/2001)
Site Type:	Drain/Tile Field	**Start Date:**	1945
Site Status:	Inactive	**End Date:**	1975
Site Description:	The site has been remediated and closed out. The 1607-F6 Sanitary Sewer System was below grade. It included two old tanks, a new tank, a tile field, and pipelines. The old "tanks" were constructed of two 0.91-meter (3-foot) lengths of 91-centimeter (36-inch) concrete pipe connected in series. The pipes were sealed to a wood planking base with asphalt and had wood plank covers. The new tank was constructed of a 1.91-meter (6-foot 3-inch) section of 183-centimeter (72-inch) diameter steel pipe installed vertically with an attached bottom and two layers of tongue and groove planking for the top. The tank is shown on drawing H-1-1518 to have a 61-centimeter (24-inch) by 61-centimeter (24-inch) square access hole at the surface.		
Waste Type:	Sanitary Sewage		
Waste Description:	This unit received sanitary sewage from the 146-F and 146-FR Buildings. The amount of waste received is unknown. Since the site serviced both the 146-F and 146-FR Buildings, there is the potential to have received hazardous contaminants.		
Waste Type:	Sanitary Sewage		
Waste Description:	Waste site contaminants of concern (COCs) and contaminants of potential concern (COPCs) identified through process knowledge are listed in the SAP. Because a portion of the septic system drainfield piping was located over the 100-F-19 Reactor cooling water effluent pipelines, the COC/COPC lists for both sites were combined for the CVP. The COCs listed below are attributed to the 100-F-19 Reactor cooling water effluent pipelines, while the COPCs are attributed to the 1607-F6 site. Waste site COCs include: Carbon-14, Cesium-137, Cobalt-60, Europium-152, Europium-154, Europium-155, Nickel-63, Strontium-90. COPCs include: Lead, Polychlorinated biphenyls (PCBs), Semivolatile organic compounds.		

Site Code:	1607-F7	**Classification:**	Accepted
Site Names:	1607-F7, 141-M Building Septic Tank, 124-F-7	**ReClassification:**	Interim Closed Out (10/19/2006
Site Type:	Septic Tank	**Start Date:**	1945
Site Status:	Inactive	**End Date:**	1975

Site Description: The site has been remediated and interim closed.

The site consisted of a septic tank, tile field, and interconnecting pipeline located under an area that was historically used for animal grazing (i.e., pasture). The septic tank received sanitary sewage from the former 141-M Building and had a volume of 3,800 Liters (1,000 gallons).

Waste Type: Sanitary Sewage

Waste Description: The site received sanitary sewage from the 141-M Building.

Site Code: UPR-100-F-1 **Classification:** Accepted

Site Names: UPR-100-F-1, 141 Building Sewer Line Spill, UN-100-F-1, 141-C to 141-M Sewer Line Leak **ReClassification:** Interim Closed Out (9/15/2003)

Site Type: Unplanned Release **Start Date:** 1971

Site Status: Inactive **End Date:**

Site Description: The site has been remediated and interim closed out.

The site was an unplanned release that occurred on March 13, 1971.

Waste Type: Animal Waste

Waste Description: The spill consisted of wash water used to clean out animal pens. The water contained 4.0E-5 curies of strontium-90 and 1.06E-6 curies plutonium-239.

Site Code: UPR-100-F-2 **Classification:** Accepted

Site Names: UPR-100-F-2, Basin Leak Ditch, 107-F Basin Leak Ditch, 100-F-3 **ReClassification:** Interim Closed Out (4/23/2002)

Site Type: Unplanned Release **Start Date:**

Site Status: Inactive **End Date:**

Site Description: The site has been remediated and closed out.

Waste Type: Process Effluent

Waste Description: The waste was radioactive process liquid effluent from the 107-F Retention Basin.

Site Code: UPR-100-F-3 **Classification:** Accepted

Site Names: UPR-100-F-3, Mercury Spill **ReClassification:** Interim Closed Out (8/14/2003)

Site Type: Unplanned Release **Start Date:** 1977

Site Status: Inactive **End Date:**

Site Description: The site has been remediated and closed out.

The site was an unplanned release that occurred at the northeast corner of the 146-FR Fish Laboratory (demolished).

Waste Type: Chemical Release

Waste Description: The waste was an unplanned release of mercury. The quantity is unknown.

100-FR-2

Site Code:	100-F-1	**Classification:**	Not Accepted (7/29/1997)
Site Names:	100-F-1, 100-FR-2 Depression	**ReClassification:**	
Site Type:	Depression/Pit (nonspecific)	**Start Date:**	
Site Status:	Inactive	**End Date:**	

Site Description: The site is a depression surrounded by a post and chain barricade with warning signs stating "DANGER, KEEP AWAY." The surface of the depression is grass-covered. The site may be the location of a valve box along the raw water line that went from 190-C to the Pump House for the Radiological Science Laboratory Building and the Grazing Plot. During the April 1999 visit, metal and wooden stakes were observed on the ground and a soil gas probe was visible.

Site Code:	100-F-2	**Classification:**	Accepted
Site Names:	100-F-2, Strontium Garden, PNL Ecological Study Strontium Garden	**ReClassification:**	Interim Closed Out (7/25/2002)
Site Type:	Laboratory	**Start Date:**	1952
Site Status:	Inactive	**End Date:**	1970

Site Description: The site has been remediated and closed out.

The site was a garden plot consisting of twelve 1.2 by 3 meter (4 by 10 feet) plots arranged in two rows of six plots each. The area was surrounded on all sides and overhead by a wooden frame with 0.63-centimeter (0.25-inch) screen material attached. Hanford Drawing SK-1-2847, Sheet 2 shows it measured 24 by 9 meters (80 by 30 feet). In 1997, a site visit confirmed that the dimensions of the site were 24 meters (80 feet) by 9.4 meters (31 feet).

Waste Type: Soil

Waste Description: The waste was contaminated soil. Approximately 39 microcuries of strontium-90 and 120 microcuries of cesium-137 were added to the soil for botany experiments.

Site Code:	100-F-14	**Classification:**	Accepted
Site Names:	100-F-14, 100-FR-2 Vent Pipe, 100-F Carpenter Shop Waste Site Vent	**ReClassification:**	No Action (3/2/2005)
Site Type:	Storage Tank	**Start Date:**	
Site Status:	Inactive	**End Date:**	

Site Description: The site is a steel vent pipe extending above grade. The above grade pipe was 10 centimeters (4 inches) in diameter with a 180 degree bend at its top. The top points downward at its tip which is fitted with a vent assembly. Steel fence posts surrounded the vent pipe. During a April 1999 visit, several soil gas probes were observed. The area was fairly level with sandy soil and had a moderate cover of grasses. A concrete foundation pad (6 m x 9 m [20 ft x 30 ft]) is 13.7 m (45 ft) east of the site.

Waste Type: Water

Waste Description:

Site Code:	100-F-15	**Classification:**	Accepted
Site Names:	100-F-15, 108-F Building Ventilation French Drain	**ReClassification:**	Interim Closed Out (7/25/2002)
Site Type:	French Drain	**Start Date:**	
Site Status:	Inactive	**End Date:**	

Site Description: The site has been remediated and closed out.

The french drain was constructed of concrete buried to a depth that placed the upper drain surface at grade level. A highly degraded wooden cover was in place over the drain. The bottom of the drain consisted of soil and large gravel, which supported a five-gallon carboy container. A copper tube connected the exhaust duct from the third floor, room # 302, to the carboy.

Waste Type: Water

Waste Description: The drain received condensate that formed inside several large hood ventilation ducts mounted externally on the east wall of the building. Condensate formed during cold weather and ran through 2.5-centimeter (1-inch) stainless steel lines to the drain. The quantity of waste received is not known.

A bottle containing 3 gallons of liquid from the 100-F-15 french drain was characterized between 05/07/96 and 08/08/96. A radiological survey of the bottle was conducted using field detection equipment and the resulting readings showed less than detectable. A sample from the liquid was collected and sent to the laboratory for chemical and radiochemistry analysis. The resulting analysis was received on 08/28/96 and indicated the liquid contained above threshold amounts of radiological and hazardous material (i.e., plutonium and chromium). Specifically, the chemical constituents analyzed for were TCLP Metals, Inorganic Ions, and Total Cyanide, and the radiological constituents were GEA, Gross Alpha, Gross Beta, Strontium-90, Isotopic Plutonium, and Total Uranium.

Site Code:	100-F-20	**Classification:**	Accepted
Site Names:	100-F-20, PNL Parallel Pits	**ReClassification:**	Interim Closed Out (1/17/2007)
Site Type:	Trench	**Start Date:**	1962
Site Status:	Inactive	**End Date:**	

Site Description: The has been remediated and interim closed.

The site consisted of two earthen pits or trenches, both oriented northeast to southwest. The pits were observed on aerial photographs (#7620 and #6451-5) from 1962, which show the site to be actively in use, with refuse material visible in the pit bottoms. The access roads appear well used, suggesting frequent motor vehicle access to the pit locations.

Prior to remediation, the area was covered with cheat grass and rabbit brush vegetation. Evidence of surface disturbance was visible. Bricks and subsidence were observed at the site, but the exact location of the trenches is not visually discernible from the surface. Blue wooden stakes remain at the site from geophysical surveys. Between March 31, 1995 and April 4, 1995, a radiological survey was conducted over the general area of the Pacific Northwest Laboratory (PNL) parallel pits. Counts as high as 12,000 counts per minute (cpm) were collected over the

surface of the site.

Waste Type: Misc. Trash and Debris

Waste Description: A retired Hanford employee was interviewed in 1995. He clearly remembered delivering waste to the pits. The southern pit may have received radioactively contaminated animal feces (mostly sheep) and pen sweepings, small quantities of animal tissue, and miscellaneous Experimental Animal Farm wastes. The northern pit may have received non-radioactive Experimental Animal Farm wastes including hardware, lumber, and soft materials. Neither of these pits was used as a burn pit. Potential contaminates included: Co-60, Sr-90, Pu-239/240

Site Code: 100-F-28 **Classification:** Accepted

Site Names: 100-F-28, Septic Tank and Drainfield **ReClassification:** Rejected (1/29/2003)

Site Type: Septic Tank **Start Date:**

Site Status: Inactive **End Date:**

Site Description: This site was a septic tank and its drainfield for an isolated office building, discovered on a 1954 drawing. No septic tank or markers were found during a field investigation at this site. The tank's mapped location placed it within an area that was excavated to a depth of between 3.1 and 4.6 meters (10 and 15 feet) for fill material. The area was lightly vegetated with cheatgrass and shrubs.

Waste Type: Sanitary Sewage

Waste Description: The unit would have received sanitary sewage. Because the unit appears to have supported only one building and that building is not near any contaminated facilities, it is highly unlikely that it received any radiological contamination.

Site Code: 100-F-35 **Classification:** Accepted

Site Names: 100-F-35, Soil Contamination Area Inside the 105-F Exclusion Area **ReClassification:** Interim Closed Out (6/16/2003)

Site Type: Unplanned Release **Start Date:**

Site Status: Inactive **End Date:**

Site Description: The site has been remediated and closed out.

The site was a posted Soil Contamination Area with no distinguishing features.

Waste Type: Soil

Waste Description: An area of radiologically contaminated soil, reading 60,000 disintegrations/minute was identified within the 105-F Exclusion Area. The ground contamination was the result of a large container placed in this area to hold contaminated soil removed from 116-F-4 Crib. Soil samples from 116-F-4 Crib identified strontium-90 and cesium-137 as the major contaminants.

Site Code: 100-F-50 **Classification:** Accepted

Site Names: 100-F-50, 100-F Railroad French Drain, **ReClassification:** No Action (4/15/2008)

Storm Water Run Off Culvert

Site Type:	French Drain	**Start Date:**	
Site Status:	Inactive	**End Date:**	

Site Description: This site consisted of a circular concrete basin and a steel culvert (pipe). The basin, approximately 1 meter (3 feet) in diameter, collected surface water runoff that drained via a 36-centimeter (14-inch) diameter steel diversion culvert under one of the railroad grades and flowed down an embankment to the flat terrain below.

Waste Type: Soil

Waste Description: There is evidence of soil erosion below the culvert from the french drain. The concrete ring (french drain) is filled with soil.

Site Code:	118-F-1	**Classification:**	Accepted
Site Names:	118-F-1, Minor Construction Burial Ground No. 2, Burial Ground No. 1, Solid Waste Burial Ground No. 2	**ReClassification:**	Interim Closed Out (12/20/2007
Site Type:	Burial Ground	**Start Date:**	1954
Site Status:	Inactive	**End Date:**	1965

Site Description: The site consisted of a combination of two locations formerly called Minor Construction Burial Ground No. 2 and Solid Waste Burial Ground No. 2. The burial ground received radioactive equipment and other miscellaneous wastes from the 100-F Reactor operations. There were three unlined trenches and a pit present at the site. The trenches were oriented north-south and were typically 91 meters (300 feet) long by 6.1 meters (20 feet) wide. The site appeared as a cobble-covered, open field after remediation.

Waste Type: Equipment

Waste Description: This site received radioactive reactor components and hardware (dummy elements, process tubing, etc) and other miscellaneous radioactive solid wastes. Potential contaminates include: Co-60, Sr-90, Pu-239/240

Site Code:	118-F-2	**Classification:**	Accepted
Site Names:	118-F-2, Burial Ground No. 2, Solid Waste Burial Ground No. 1	**ReClassification:**	Interim Closed Out (2/8/2008)
Site Type:	Burial Ground	**Start Date:**	1945
Site Status:	Inactive	**End Date:**	1965

Site Description: The site consisted of a solid waste burial ground that served as the original solid waste disposal site for the 100F Area. It was formerly called Solid Waste Burial Ground No. 1.

Waste Type: Equipment

Waste Description: The site contains miscellaneous radioactive solid wastes, reactor components and hardware. Potential contaminates include: Co-60, Ni-63, Sr-90, Cs-137, Eu-152, Eu-154, U-238, Pu-238, Pu-239/240, chromium, lead, mercury

Waste Type: Animal Waste

Waste Description: The burial ground contains several long metal pipes with wooden lids used to dispose of contaminated animal carcasses.

Site Code: 118-F-3 **Classification:** Accepted

Site Names: 118-F-3, Minor Construction Burial Ground No. 1, Burial Ground No. 3 **ReClassification:** Interim Closed Out (12/21/2006

Site Type: Burial Ground **Start Date:** 1952

Site Status: Inactive **End Date:** 1952

Site Description: The site has been remediated and interim closed.

The site was backfilled after use. The solid waste burial ground received irradiated reactor parts that were removed during the Ball 3X project to convert the 100-F Reactor from the liquid 3X to the ball 3X safety systems. The southern half of the burial ground ran in a north-south direction and the northern half angled toward the west forming a dogleg.

Waste Type: Equipment

Waste Description: The site received irradiated reactor parts that were removed during the project to convert the 105-F Reactor from the Liquid 3X to the Ball 3X safety systems. The parts primarily included vertical safety rod thimbles and step plugs. Thirty-eight thimbles were known to have been buried there and possibly as many as 61. The principal radionuclide was short-lived cobalt-60.

Site Code: 118-F-4 **Classification:** Accepted

Site Names: 118-F-4, 115-F Pit, 115-F Crib **ReClassification:** No Action (2/14/2005)

Site Type: Crib **Start Date:** 1949

Site Status: Inactive **End Date:** 1949

Site Description: The area appears today as an open field covered with cobbles. No vegetation grows on the surface. The unit was a small unlined disposal pit/crib.

Waste Type: Chemicals

Waste Description: The site contains 270 kilograms (0.3 tons) of silica gel removed from a gel tower in one of the 115-F dryer rooms.

Site Code: 118-F-5 **Classification:** Accepted

Site Names: 118-F-5, PNL Sawdust Pit, PNL Sawdust Respository, Battelle Sawdust Pit **ReClassification:** Interim Closed Out (5/6/2008)

Site Type: Burial Ground **Start Date:** 1954

Site Status: Inactive **End Date:** 1975

Site Description: The site consisted of a single, unlined trench that received radioactive sawdust from the floors of animal pens in the 100F Experimental Animal Farm. The site now appears as a large raised mound. Prior to backfilling, the site consisted of several trenches oriented north and south.

Waste Type: Animal Waste

Waste Description: The site contains low-level activity sawdust and other solids from floors of dog kennels and swine pens. A facsimile sent from W. D. Richmond to M. R. Schneller on March 31, 1971 contains an estimate that the site had received 15 curies of strontium-90 and 0.3 curies of plutonium-239. The site was active and still receiving waste when the facsimile was sent. The facsimile is included in Appendix D of WHC-EP-0087.

Site Code: 118-F-6 **Classification:** Accepted

Site Names: 118-F-6, PNL Solid Waste Burial Ground **ReClassification:** Interim Closed Out (9/23/2008)

Site Type: Burial Ground **Start Date:** 1965

Site Status: Inactive **End Date:** 1973

Site Description: The site was an unlined burial ground that received animal and laboratory wastes related to the 100F Experimental Animal Farm. A 2002 Geophysical investigation of this burial ground identified six north south trending trenches. Prior to remediation the burial ground was designated by HPS-AC-5-40 concrete markers.

Waste Type: Animal Waste

Waste Description: This unit contains animal and laboratory wastes including plutonium-238 contaminated animal ash. The site did not receive reactor related waste.

Site Code: 118-F-7 **Classification:** Accepted

Site Names: 118-F-7, 100-F Miscellaneous Hardware Storage Vault, Concrete Box **ReClassification:** Interim Closed Out (10/30/2006

Site Type: Storage **Start Date:** 1945

Site Status: Inactive **End Date:** 1965

Site Description: The site has been remediated and interim closed out.

The site consisted of an inactive solid waste storage vault used for temporary storage of slightly contaminated reactor parts. The majority of the vault was underground.

Waste Type: Equipment

Waste Description: This site served as temporary storage for miscellaneous reactor hardware. In 1965, contamination levels within the box were 200 to 300 counts-per-minute. There was some confusion in existing documentation as to whether equipment still remained in the vault. Table 11 of Miller and Wahlen (WHC-EP-0087) reported that 134,700 kilograms (148.3 tons) of lead of 5,600 kilograms (6.2 tons) of cadmium remains in the vault. Appendix A of the same report states that the vault contains only a small amount of radioactive material. DeFord (1993) reports that site personnel believe that the vault was empty.

Site Code: 118-F-9 **Classification:** Accepted

Site Names: 118-F-9, PNL Rad Site **ReClassification:** Rejected (8/24/2006)

Site Type: Burial Ground **Start Date:**

Site Status:	Inactive	**End Date:**	
Site Description:	The site has been reclassified to Rejected based on analytical data and minor excavation. The site consisted of one trench running east to west. It has been backfilled and vegetation has re-established itself after the remediation. The site was not marked or posted.		

Site Code:	120-F-1	**Classification:**	Accepted
Site Names:	120-F-1, Glass Dump	**ReClassification:**	Interim Closed Out (6/27/2008)
Site Type:	Trench	**Start Date:**	
Site Status:	Inactive	**End Date:**	
Site Description:	The site consisted of two distinct disposal areas, one a trench that ran east to west.		
Waste Type:	Misc. Trash and Debris		
Waste Description:	The site is covered with approximately 0.61 meters (2 feet) of fluorescent tubes, incandescent light bulbs, instrument vacuum tubes, and small AAA, C, and D batteries. The site also contains an assortment of chemical bottles, both large and small.		

Site Code:	126-F-1	**Classification:**	Accepted
Site Names:	126-F-1, 184-F Powerhouse Ash Pit, 188-F Ash Disposal Area	**ReClassification:**	Interim Closed Out (9/20/2007)
Site Type:	Coal Ash Pit	**Start Date:**	1944
Site Status:	Inactive	**End Date:**	1965
Site Description:	This waste site consisted of an area that had received coal ash from the 100-F Area coal-fired steam plant that operated from 1944 to 1965. Coarse textured bottom ash and boiler slag were evident at the site. The northern portion of the ash pit was delineated with AC-540 concrete markers (approximately 2.4 hectares [6 acres]).		
Waste Type:	Ash		
Waste Description:	Unknown amounts of coal ash from the 184-F Powerhouse were sluiced to this unit with raw river water. The ash has been analyzed using the EP Toxicity Test in accordance with Washington Administrative Code (WAC 173-303), and no hazardous materials were found. This site also received low-level radionuclides from effluent system leakage. Radioactive contamination in excess of 50,000 counts/minute existed in the northwest corner of the pit.		

Site Code:	128-F-1	**Classification:**	Accepted
Site Names:	128-F-1, 100-F Burning Pit, 100-F Burning Pit No. 1	**ReClassification:**	No Action (12/8/2003)
Site Type:	Burn Pit	**Start Date:**	1945
Site Status:	Inactive	**End Date:**	1965
Site Description:	The site has been evaluated and determined to meet remedial action objectives. The evaluation supports reclassification.		

The site was used to dispose of nonradioactive, combustible materials from the 100F Area. The site has been backfilled.

Waste Type: Misc. Trash and Debris

Waste Description: The site was used for the disposal of nonradioactive, combustible materials, such as paint waste, office waste, and chemical solvents.

Site Code: 128-F-3 **Classification:** Accepted

Site Names: 128-F-3, PNL Burn Pit **ReClassification:** Interim Closed Out (10/20/2006

Site Type: Burn Pit **Start Date:**

Site Status: Inactive **End Date:**

Site Description: The site has been remediated and interim closed.

Waste Type: Misc. Trash and Debris

Waste Description: It was not known what was burned at the site. However, Pacific Northwest Laboratory (PNL) and Westinghouse Hanford Company (WHC) employees verified that the site was used for burning. It was assumed the burned material came from the Experimental Animal Farm.

Site Code: 1607-F1 **Classification:** Accepted

Site Names: 1607-F1, 1607-F1 Septic Tank and Associated Drain Field, 124-F-1, 1607-F1 Sanitary Sewer System, 1607-F1 Septic Tank **ReClassification:** Interim Closed Out (3/14/2008)

Site Type: Septic Tank **Start Date:** 1944

Site Status: Inactive **End Date:** 1965

Site Description: The unit includes a septic tank, drain field and associated pipeline. The septic tank is constructed of reinforced concrete; the walls and floor are 25 centimeters (10 inches) thick. The septic tank has a capacity of 16561.18 liters (4375 gallons). The system could support 125 persons assuming input of 130 liters (35 gallons) per capita per day and a one day retention period. The drain field is constructed of 10-centimeter (4-inch) vitrified pipe, concrete pipe, or drain tile with a total of 304.8 meters (1000 linear feet) of piping (2.4 linear meters [8 linear feet] per capita). The four laterals are open jointed, 38 meters (125 feet) long, and spaced 2.4 meters (8 feet) apart.

Waste Type: Sanitary Sewage

Waste Description: This unit received an unknown amount of sanitary sewage from the 1701-F Badge House (security checkpoint), the 1709-F Fire Station, and the 1720-F Administrative Office and change room for security patrol personnel. Since the site was connected to administrative and support facilities (security and fire protection), the site should not have received hazardous contaminants.

Site Code: 600-31 **Classification:** Accepted

Site Names:	600-31, 100-F Area Bottle Disposal Site	**ReClassification:**	Rejected (7/29/1997)
Site Type:	Dumping Area	**Start Date:**	
Site Status:	Inactive	**End Date:**	

Site Description: The site is a sandy area with rabbitbrush growing throughout. It exhibits physical evidence that the dumping of laboratory materials took place. The area also appears to have been disturbed by a blade or bulldozer.

During the April 1999 visit, scattered debris was visible, composed primarily of glass with some metal and wood debris. The glass is found in a swath on the west side of a sandy rise. There is a moderate vegetation cover of rabbitbrush and grasses on the sandy rise with less cover on the disturbed ground.

Waste Type: Misc. Trash and Debris

Waste Description: Wastes identified are laboratory-type bottles and bottle caps with the following markings on some of the caps: 1) Sulfuric 2) Mallinckrodt, 3) Bakers, 4) B & A, 5) Fisher. The markings and colors on the bottles and caps indicate they most likely contained laboratory chemicals (e.g. nitric acid, sulfuric acid, hydrochloric acid, etc).

Site Code:	600-351	**Classification:**	Discovery
Site Names:	600-351, Stained areas outside of 100-F Area	**ReClassification:**	
Site Type:	Dumping Area	**Start Date:**	
Site Status:	Inactive	**End Date:**	

Site Description: The site contains two stained soil areas. The first area consists of stained, crusted soil and no vegetation, measuring 4 meters (13.2 feet) in diameter, located at Easting: 579790.07 Northing: 146715.53. The second area consists of stained, crusted soil, no vegetation, and scattered empty oil cans, measuring 2 meters (6.6 feet) in diameter, located at Easting: 579789.44 Northing: 146706.44

100-HR-1

Site Code:	100-H-1	**Classification:**	Accepted
Site Names:	100-H-1, Rod Cave	**ReClassification:**	Interim Closed Out (3/26/2001)
Site Type:	Storage	**Start Date:**	
Site Status:	Inactive	**End Date:**	
Site Description:	This site was a rod cave and has been remediated and closed out. Other rod caves, such as the 105-C Horizontal Control Rod Cave and the 100-K Area Horizontal Control Rod Caves, consisted of sections of metal culvert pipe on a concrete pad with an earthen mound. This rod cave was not as advanced a construction as other rod caves, but was similar in construction. End walls at other rod caves were formed of concrete, but the end walls at this site were made of lead bricks.		
Waste Type:	Equipment		
Waste Description:	The site was contaminated from horizontal control rods and possibly other miscellaneous reactor facility components. The ends were constructed from lead bricks.		

Site Code:	100-H-3	**Classification:**	Accepted
Site Names:	100-H-3, 1716-H Garage Fuel Tank Site	**ReClassification:**	
Site Type:	Storage Tank	**Start Date:**	1949
Site Status:	Inactive	**End Date:**	
Site Description:	The site may contain one or more underground storage tanks (USTs) from the 1716-H Garage. The garage has been demolished. Some disturbance of the concrete pavement is visible at the site.		

Site Code:	100-H-4	**Classification:**	Accepted
Site Names:	100-H-4, 1717-H Hot Shop, French Drain, and Contaminated Storage Unit	**ReClassification:**	
Site Type:	Maintenance Shop	**Start Date:**	
Site Status:	Inactive	**End Date:**	
Site Description:	The french drain cannot be visually located.		
Waste Type:	Water		
Waste Description:			

Site Code:	100-H-5	**Classification:**	Accepted
Site Names:	100-H-5, 107-H Retention Basin Sludge Burial Site, 107-H Buried Sludge Site, Sludge Disposal Trench, 107-H Grave	**ReClassification:**	Interim Closed Out (12/18/2000

Site Type:	Burial Ground	**Start Date:**	1953
Site Status:	Inactive	**End Date:**	
Site Description:	This site has been remediated and closed out. The trench was about 100 meters (328 feet) long, 16 meters (52 feet) wide, and 4.6 meters (15 feet) deep.		
Waste Type:	Sludge		
Waste Description:	In 1975, samples of sludge from the basin floor had a maximum Geiger-Mueller (GM) probe reading of 20,000 counts/minute. Samples had an average concentration of 3.1E+04 picocuries/gram beta/gamma and 57 picocuries/gram of plutonium-239/240. The sludge buried in the trench would have similar characteristics.		

Site Code:	100-H-6	**Classification:**	Not Accepted (8/8/1997)
Site Names:	100-H-6, Suspect Waste Site: Contaminated Ramp	**ReClassification:**	
Site Type:	Unplanned Release	**Start Date:**	
Site Status:	Inactive	**End Date:**	
Site Description:	The site is a contaminated concrete ramp connected to the 105-H Reactor Building. The concrete ramp is enclosed in heavy wire mesh and is posted as a "Contamination Area".		

Site Code:	100-H-7	**Classification:**	Accepted
Site Names:	100-H-7, French Drain A	**ReClassification:**	No Action (7/28/2009)
Site Type:	French Drain	**Start Date:**	
Site Status:	Inactive	**End Date:**	
Site Description:	The site consists of a french drain and an adjoining pipeline. It is a vertical, 76-centimeter (30-inch) diameter vitrified clay pipe with a metal lid. Its upper surface is at grade. A 6.3 centimeter (2.5 inch) steel pipe exits the reactor building at a point in line with the drain, suggesting the possibility of drainage from the 105-H Building to the drain. The drain had no markings.		
Waste Type:	Process Effluent		
Waste Description:			

Site Code:	100-H-8	**Classification:**	Accepted
Site Names:	100-H-8, French Drain B	**ReClassification:**	No Action (12/3/2009)
Site Type:	French Drain	**Start Date:**	
Site Status:	Inactive	**End Date:**	
Site Description:	The site consisted of as a 91-centimeter (36-inch) diameter concrete pipe with a steel lid. The drain was buried vertically with its upper surface at grade and was filled with gravel to within 20 centimeters (8 inches) of its top. Prior to site evaluation the drain was surrounded by a rope and posts and signs that read "Danger - Keep Out".		
Waste Type:	Process Effluent		

Waste Description:

Site Code: 100-H-9 **Classification:** Accepted

Site Names: 100-H-9, French Drain C **ReClassification:** Interim Closed Out (6/22/2006)

Site Type: French Drain **Start Date:**

Site Status: Inactive **End Date:**

Site Description: The site has been remediated and interim closed out.

The waste site consisted of a vertical 61-centimeter (24-inch) diameter concrete pipe with a rusted metal lid. The drain had no markings.

Waste Type: Process Effluent

Waste Description:

Site Code: 100-H-10 **Classification:** Accepted

Site Names: 100-H-10, French Drain D **ReClassification:** Interim Closed Out (6/22/2006)

Site Type: French Drain **Start Date:**

Site Status: Inactive **End Date:**

Site Description: The site has been remediated and interim closed.

The unit consisted of a vertically buried 122-centimeter (48-inch) diameter vitrified clay pipe with a steel lid. It was suspected to be a french drain. The unit had no markings.

Waste Type: Process Effluent

Waste Description:

Site Code: 100-H-11 **Classification:** Accepted

Site Names: 100-H-11, Expansion Box French Drain E **ReClassification:** Interim Closed Out (6/22/2006)

Site Type: French Drain **Start Date:**

Site Status: Inactive **End Date:**

Site Description: The site has been remediated and interim closed.

It appeared that the drain was installed to provide drainage for an expansion box. The drain had no markings.

Site Code: 100-H-12 **Classification:** Accepted

Site Names: 100-H-12, Expansion Box French Drain F and Shielding Lead **ReClassification:** Interim Closed Out (6/22/2006)

Site Type: French Drain **Start Date:**

Site Status:	Inactive	**End Date:**	
Site Description:	The site has been remediated and interim closed. The site consisted of a french drain, accessed through a 0.76-meter (30-inch) vertical steel manhole set in a concrete pad.		
Waste Type:	Process Effluent		
Waste Description:	The french drain may have received radioactive process effluent.		

Site Code:	100-H-13	**Classification:**	Accepted
Site Names:	100-H-13, French Drain G	**ReClassification:**	Interim Closed Out (6/22/2006)
Site Type:	French Drain	**Start Date:**	
Site Status:	Inactive	**End Date:**	
Site Description:	The site has been remediated and interim closed. The site consisted of a french drain that was constructed of vitrified clay pipe and covered by two metal lids (the second metal lid positioned 15.2 centimeters [6 inches] below the first).		
Waste Type:	Process Effluent		
Waste Description:	The site is suspected of having received drainage from the 105-H Reactor Building.		

Site Code:	100-H-14	**Classification:**	Accepted
Site Names:	100-H-14, Surface Contamination Zone H	**ReClassification:**	Interim Closed Out (6/22/2006)
Site Type:	Unplanned Release	**Start Date:**	
Site Status:	Inactive	**End Date:**	
Site Description:	The site has been remediated and interim closed. The site consisted of an area of surface contamination located next to the south wall of the 105-H Reactor Building fuel storage basin (FSB). The area had been surface stabilized with 46 to 61 centimeters (18 to 24 inches) of gravel and cobbles.		
Waste Type:	Chemical Release		
Waste Description:	No documentation has been found to identify the source of the contamination or describe the stabilization activity.		

Site Code:	100-H-17	**Classification:**	Accepted
Site Names:	100-H-17, 116-H-2 Trench Overflow	**ReClassification:**	Interim Closed Out (3/1/2001)
Site Type:	Unplanned Release	**Start Date:**	1953
Site Status:	Inactive	**End Date:**	

Site Description:	This site has been remediated and closed out.
Waste Type:	Water
Waste Description:	The technical baseline report lists 116-H-2 contaminants as including cobalt-60, cesium-134, cesium-137, europium-152, europium-154, europium-155, tritium, plutonium-239, plutonium-240, strontium-90, uranium-235, and uranium-238. Waste site COCs identified through process knowledge were listed in the 100 Area Remedial Action Sampling and Analysis Plan (DOE-RL 1998). The COCs identified for this site in the CVP consist of plutonium-239/240, yranium-238, strontium-90, cesium-137, cobalt-60, europium-152, europium-154, and hexavalent chromium.

Site Code:	100-H-18	**Classification:**	Not Accepted (8/8/1997)
Site Names:	100-H-18, Undocumented Unplanned Airborne Release: Stack Emission No. 1	**ReClassification:**	
Site Type:	Unplanned Release	**Start Date:**	1955
Site Status:	Inactive	**End Date:**	
Site Description:	There are no posted areas related to this release.		
Waste Type:	Process Effluent		
Waste Description:	The waste consisted of airborne radioactive particulates released through the 105-H stack.		

Site Code:	100-H-19	**Classification:**	Not Accepted (8/8/1997)
Site Names:	100-H-19, Undocumented Unplanned Airborne Release: Stack Emission No. 2	**ReClassification:**	
Site Type:	Unplanned Release	**Start Date:**	1955
Site Status:	Inactive	**End Date:**	
Site Description:	There are no posted areas related to this site.		
Waste Type:	Process Effluent		
Waste Description:	The waste consisted of airborne radioactive particulates released through the 105-H stack.		

Site Code:	100-H-20	**Classification:**	Not Accepted (8/8/1997)
Site Names:	100-H-20, Undocumented Unplanned Release: Swallow Nests and Droppings	**ReClassification:**	
Site Type:	Unplanned Release	**Start Date:**	1956
Site Status:	Inactive	**End Date:**	
Site Description:	There are no posted areas related to this release.		
Waste Type:	Soil		

Waste Description: The 107-H Liquid Waste Disposal Trench received highly contaminated cooling water from the 107-H Retention Basin. The mud used by the swallows would have contained radioactive contamination from fuel element rupture.

Site Code:	100-H-21	**Classification:**	Accepted
Site Names:	100-H-21, 100-H Reactor Cooling Water Effluent Underground Pipelines	**ReClassification:**	Interim Closed Out (3/19/2001)
Site Type:	Radioactive Process Sewer	**Start Date:**	1949
Site Status:	Inactive	**End Date:**	1965

Site Description: This site has been remediated and was closed out in March 2001.

The site is the underground 100-H Reactor cooling water effluent lines. These include those effluent lines that transported 105-H Reactor cooling water from the reactor to the 116-H-7 (107-H) Retention Basin, and from the basin to the 116-H-5 (1904-H) Outfall Structure and/or to the 116-H-1 Trench. This waste site includes all associated expansion and valve boxes and excludes the retention basin, outfall structure, and those effluent lines that are within the confines of the 105-H Reactor Building. It also excludes all reactor influent lines that are upstream of the reactor building. The site also includes the pipeline(s) from the 1608-H Waste Water Pumphouse to 116-H-2 (1608-H Liquid Waste Disposal Trench).

Waste Type: Process Effluent

Waste Description: The waste was contaminated steel piping, concrete, and soil. Reactor cooling water became radioactively contaminated as it passed through the reactor core. Activation products created in the water included calcium-41, chromium-51, and zinc-65. Activation products from the reactor core that were picked up and transported by the cooling water included tritium, carbon-14, cobalt-60, nickel-63, and europium-152/154/155. Fuel element fission products such as strontium-90, and cesium-137, as well as transuranics such as plutonium-239/240 were introduced into cooling water due to fuel cladding failures. Concentrations of radionuclides in cooling water during normal reactor operations were approximately 0.2 microcuries/liter. Concentrations of radionuclides built up in rust flakes and scale on the inner surfaces of the pipelines and in sludge in the diversion and junction boxes. Average beta-gamma concentrations for the effluent line scale and junction/diversion boxes were 83,000 and 120,000 picocuries/liter, respectively. Average plutonium-239/240 concentrations were 66 picocuries/gram for the effluent line scale and 720 picocuries/gram for the sludge at the bottom of the diversion and junction boxes. Direct readings of the bottom of the effluent lines averaged approximately 40,000 counts/minute with a Geiger-Mueller probe. Chemicals during water treatment included aluminum sulfate (alum), hydrated calcium oxide, sulfuric acid, chlorine, and sodium dichromate. Water pH was maintained at about 7.5, and the free chlorine residual was approximately 0.2 milligrams/liter. The waste was any remaining process effluent and the contaminated pipelines.

Site Code:	100-H-22	**Classification:**	Accepted
Site Names:	100-H-22, Soil Contaminated by Effluent Line Leakage	**ReClassification:**	Interim Closed Out (3/19/2001)
Site Type:	Unplanned Release	**Start Date:**	
Site Status:	Inactive	**End Date:**	

Site Description: The release occurred from the reactor cooling effluent lines. Both the lines and the unplanned release have been remediated and cleaned up.

Waste Type: Process Effluent

Waste Description: Contaminants at the 100-H Area included plutonium, strontium, europium, cobalt, cesium, uranium, nickel, hexavalent chromium, lead, and arsenic.

Site Code:	100-H-24	**Classification:**	Accepted
Site Names:	100-H-24, 151-H Electrical Facilities, 100-H-24 Substation, 151-H Substation	**ReClassification:**	Interim Closed Out (5/9/2001)
Site Type:	Electrical Substation	**Start Date:**	1948
Site Status:	Inactive	**End Date:**	1978

Site Description: The site has been remediated and closed out.

It is the area of the demolished 151-H Substation, which includes the 151-H Building and adjacent Switchyard. The former switchyard area had a layer of crushed gravel with several remaining concrete structures that were used to support electrical equipment. Electrical conduit was observed protruding up from underground areas near the concrete structures. Two manholes that appeared to provide access to the main electrical feeder cables that ran from the switchyard to the 151-H Building were observed near the center of the site. These features were removed during the remedial action excavation of the site.

In the area of the former 151-H Building, the southwest corner of the building appears to be protruding through the ground surface and several pieces of rebar were visible to the north. An area of subsidence was also visible near the former northeast corner of the building. An inactive power pole structure exists off the northeast corner of the site. The railroad spur that serviced the switchyard area has been removed. A former chain link fence, that has been cut off and removed just above ground level, surrounds the site. Demolition debris, such as rebar and broken concrete, was observed in the area of the former 151-H Building.

Note: The soil samples taken in 1991 were located at oil stained sites adjacent to existing concrete transformer foundations. A site visit on 3/20/96 observed that no oil spills or stains were visible at the site.

The 151-H Substation was constructed west of the 105-H Reactor to provide electrical service to the 100-H Area. The 151-H Substation was comprised of a fenced area and a switch house. The fenced area contained two power transformers, overhead static wires, large ground mat, lightning arrestors, and underground 13.8 kV feeders. Outgoing feeder cables were run in underground ducts approximately 60 meters (200 feet) from the substation building to overhead pole lines. The 151-H building contained the 13.8 kV switchgear. The 151-H building was a one story building with a basement. The basement portion contained a sump and conduit openings for underground feeder wires. The main floor housed the switchgear room, battery room, shop, mechanical equipment room, locker room and toilet. The switchgear from this facility was reused at 151-B.

Waste Type: Demolition and Inert Waste

Waste Description: The 151-H Building was demolished in 1978. The demolition debris was placed in the basement cavity and covered with earth.

Waste Type: Oil

Waste Description: The site contains polychlorinated biphenyls (PCBs) contaminated soil. Seven samples were taken from stained area around the transformer foundations. The sample results indicated the presence of PCBs, however, the PCB levels were below Toxic Substance Control Act cleanup levels.

Site Code: 100-H-26 **Classification:** Not Accepted (8/8/1997)

Site Names: 100-H-26, Grounds Surrounding Deactivated Areas, Exclusion Area **ReClassification:**

Site Type: Unplanned Release **Start Date:**

Site Status: Inactive **End Date:**

Site Description: The grounds within the 100-H exclusion area that are not part of other waste sites.

Site Code: 100-H-28 **Classification:** Accepted

Site Names: 100-H-28, 100-H Water Treatment Facilities Underground Pipelines (See Subsites) **ReClassification:**

Site Type: Process Sewer **Start Date:** 1949

Site Status: Inactive **End Date:** 1965

Site Description: The site encompasses the upstream (pre-reactor) process sewers for the 100-H Reactor, including all underground water lines used to transport reactor cooling water between water treatment facilities and the 105-H Reactor Building. These include all underground lines running between buildings and those that run to drainage facilities and to the emergency cooling high tanks (water towers).

Lines excluded from this site are those within buildings and all lines that are downstream from the reactor building, i.e., those lines that carry cooling water from the reactor to the retention basin, trench, and/or the river.

Waste Type: Water

Waste Description: The waste is steel piping, concrete, and soil (if contaminants are present). Chemical additives to the reactor cooling water included aluminum sulfate (alum) with excess hydrated calcium oxide, sulfuric acid, chlorine, and sodium dichromate. Water pH was maintained at about 7.5, and the free chlorine residual was approximately 0.2 milligrams/liter.

SubSites:

SubSite Code: 100-H-28:1

SubSite Name: 100-H-28:1, 184-H Power House Ash Sluicing Line

Classification: Accepted

ReClassification: No Action

Description: The Remaining Sites Verification Package, (RSVP-2006-020) has documented that the current site conditions have achieved the remedial action objectives (RAOs) and the corresponding remedial action goals (RAGs) established in the Remedial Design

Report/Remedial Action Work Plan for the 100 Area (DOE-RL-96-17) and the Interim Action Record of Decision for the 100-BC-1, 100-BC-2, 100-DR-1, 100-DR-2, 100-FR-1, 100-FR-2, 100-HR-1, 100-HR-2, 100-KR-1, 100-KR-2, 100-IU-2, 100-IU-6, and 200-CW-3 Operable Units (ROD).

The subsite consisted of a single 0.20 m (8-in.-) Ashcolite pipeline; it was used to sluice coal ash from the 184-H boiler house to the 126-H-1 ash pit (BHI-00127). The other 100-H-28 subsites are addressed separately. This pipeline was located between the east side of the former 184-H boiler house and the east side of the 126-H-1 ash pit. The total length of the pipeline was approximately 265 m (870 ft), with an approximate depth of 1.5 m (5 ft) below existing grade.

The contaminants of potential concern (COPCs) for the 100-H-28:1 waste site were identified in discussion with the Washington State Department of Ecology and the U.S. Department of Energy, Richland Operations Office and were based on process knowledge and data from samples taken at other ash disposal sites in Hanford's 100 Areas (e.g. 126-D-1). COPC's include metals and polycyclic aromatic hydrocarbons [PAHs]). Confirmatory sampling results indicate that the residual concentrations of COPCs at the 100-H-28:1 site meets the remedial action objectives for direct exposure, groundwater protection, and river protection. A summary of the evaluation of the sampling results against the applicable criteria was presented in Table ES-1 of the RSVP.

The COPC list for the 100-H-28:1 waste site was identified in discussion with the Washington State Department of Ecology and the U.S. Department of Energy, Richland Operations Office, and was based on process knowledge and characterization data from samples taken at other ash disposal sites in Hanford's 100 Areas (e.g. 126-D-1). Analytical results for Hanford Site coal ash samples from the 126-D-1 ash pit by total metals analytical methods were provided in DOE/RL-92-71, Rev. 2. Other data for these samples, including for organics and radionuclides were contained in the Hanford Environmental Information System. Subsite COPCs included polycyclic aromatic hydrocarbons (PAHs), arsenic, barium, cadmium, chromium, lead, selenium, silver, and mercury. Additionally, antimony, beryllium, boron, cobalt, copper, manganese, molybdenum, nickel, uranium, vanadium, and zinc were reported as part of the expanded inductively coupled plasma (ICP) metals analysis in the analytical results package. In agreement with the Washington State Department of Ecology, hexavalent chromium analysis was not required due to matrix interference concerns associated with coal ash.

Confirmatory sampling was performed on August 28, 2008, and September 24, 2008. A focused sampling design was selected for confirmatory sampling based on historical drawings, process knowledge, and other available information.

Due to the expected uniform distribution of residual material, no sampling location was preferred for collecting a focused sample within the pipeline. Therefore, a sample representative of pipeline contents was collected from a location selected based on access considerations—at the outfall of the pipeline. The most appropriate focus location for characterization of potential impact to underlying soils was also selected at the outfall of the pipeline, as the pipeline terminus was a free discharge to soil.

During excavation, a 0.20 m (8-in.-) steel pipeline was encountered, it was broken at the end and filled with soil and gravel, see photo. Field observations of the end of the pipeline and the broken concrete slab were that the pipeline outfall had been demolished in place and backfilled. The excavator was then used to break into the pipeline near the exposed end. No scale or sediment was found inside the pipeline. To collect a soil sample it was decided to excavate below the concrete slab underlying the pipeline. On September 24, 2008, at test pit 2 the excavator broke into the pipeline, no material was observed inside the pipeline.

Therefore, no additional sampling was performed and the excavation was backfilled.

All confirmatory samples were analyzed using analytical methods approved by the U.S. Environmental Protection Agency (DOE-RL -96-22). The laboratory-reported data results for all constituents were stored in the Environmental Restoration project-specific database prior to submission for archival in the Hanford Environmental Information System site-wide database and were summarized in Appendix B of the RSVP.

The results of confirmatory sampling show that residual contaminant concentrations do not preclude any future uses, as bounded by the rural residential scenario, and allow for unrestricted use of shallow-zone soils (i.e., surface to 4.6 m [15 ft] deep). The results also demonstrated that residual contaminant concentrations were protective of groundwater and the Columbia River. This subsite does not have a deep zone component; therefore, institutional controls to prevent uncontrolled drilling or excavation into the deep zone are not required. In accordance with the RSVP, the confirmatory sampling results support a reclassification of the subsite to No Action.

SubSite Code: 100-H-28:2

SubSite Name: 100-H-28:2, South Process Sewers

Classification: Accepted

ReClassification:

Description: This subsite encompasses those vitrified clay, reinforced concrete, and cast iron process sewer lines formerly servicing the 105-H Reactor Building, 190-H Pumphouse, 183-H clearwells and pumphouse (126-B-2), and miscellaneous 1700-series buildings east of the 190-H Pumphouse. These process sewers formerly drained to the 1906-H lift station, which pumped wastes to the 1904-H Outfall.

SubSite Code: 100-H-28:3

SubSite Name: 100-H-28:3, North Process Sewers

Classification: Accepted

ReClassification:

Description: This subsite encompasses those vitrified clay, reinforced concrete, and cast iron process sewer lines formerly servicing the 184-H Power Plant, and 183-H Filter Plant. These process sewers formerly drained to the 100-H-28:2 process sewers east of the 183-H facility.

SubSite Code: 100-H-28:4

SubSite Name: 100-H-28:4,1607-H1 Sanitary Sewers

Classification: Accepted

ReClassification:

Description: This subsite encompasses those vitrified clay pipelines that formerly carried sanitary wastes to the 1607-H1 septic system. These sewers formerly serviced the 105-H Reactor Building, 190-H Pumphouse, and 151-H Electrical Substation.

SubSite Code: 100-H-28:5

SubSite Name: 100-H-28:5, 1607-H2 Sanitary Sewer

Classification: Accepted

ReClassification:

Description: This subsite encompasses those vitrified clay pipelines that formerly carried sanitary wastes to the 1607-H2 septic system. These sewers formerly serviced the 182-H Reservoir pumphouse, 183-H Filter Plant, 184-H Power House, 190-H Pumphouse, and 1700-series buildings east of the 190-H Pumphouse. The administrative boundary of this subsite extends to the boundary of previous remedial activities at the 1607-H2 septic system.

SubSite Code: 100-H-28:6

SubSite Name: 100-H-28:6, 182-H Reservoir Sump Drains

Classification: Accepted

ReClassification: No Action

Description: The Remaining Sites Verification Package, (RSVP-2006-026), documents that the 100-H-28:6 subsite has met the remedial action objectives (RAOs) and the corresponding remedial action goals (RAGs) for No Action as established in the Remedial Design Report/Remedial Action Work Plan for the 100 Area (RDR/RAWP) and the Interim Action Record of Decision for the 100-BC-1, 100-BC-2, 100-DR-1, 100-DR-2, 100-FR-1, 100-FR-2, 100-HR-1, 100-HR-2, 100-KR-1, 100-KR-2, 100-IU-2, 100-IU-6, and 200-CW-3 Operable Units, (ROD).

The 100-H-28:6 subsite consists of approximately 190 m (620 ft) of 20 cm (8-in.) vitrified clay pipeline north of the 182-H Reservoir. The pipeline was installed during construction of the 182-H Reservoir. The water that traveled through the pipeline originated directly from the Columbia River via the 181-H Pumphouse, with the exception of steam condensate. The exact location of the pipeline was documented in drawings P-1215 and P-1216 (GE 1949a, 1953). The pipeline was approximately 4.6 m (15 ft) below ground surface.

Confirmatory sampling activities at the site were conducted on September 2, 3, and 24, 2008. A focused sampling design was selected for confirmatory sampling based on historical drawings and process information. The contaminants of potential concern (COPCs) for the 100-H-28:6 subsite were selected based on the entire COPC list identified in the 100 Area Remedial Action Sampling and Analysis Plan (SAP) for the site. They included: cobalt-60, cesium-137, europium-152, europium-154, strontium-90, lead, hexavalent chromium, and metals. Polychlorinated biphenyls (PCBs) were also added at the request of the Washington State Department of Ecology. Confirmatory sampling results indicated that the residual concentrations of COPCs at this site met the remedial action objectives for direct contact, groundwater protection, and river protection.

Soil cleanup levels were established in the ROD based on a limited ecological risk assessment. Although not required by the ROD, a comparison against ecological risk screening levels has been made for the site contaminants of concern and other constituents and is presented in Appendix A of the RSVP.

Screening levels were exceeded for antimony, arsenic, barium, boron, cadmium, chromium, copper, lead, manganese, vanadium, and zinc. Exceeding screening values is intended to trigger additional evaluation and does not necessarily indicate the existence of risk to ecological receptors. Because concentrations of antimony, manganese, and vanadium are below background levels (DOE/RL -92-24, Rev. 4), it is believed that the presence of these constituents does not pose a risk to ecological receptors. Since no site background exists for antimony, a state-wide background reference is provided. An established background value is not available for boron at this time. Arsenic, barium, cadmium, chromium, copper, lead and zinc present at concentrations exceeding background, as well as the boron concentration, will be evaluated in the context of additional lines of evidence for risk to ecological receptors as

part of the final closeout decision for this site.

During excavation and sampling, radiological field screening was performed as specified in the confirmatory sampling work instruction. No radiological contamination was detected above background levels. Field screening for the presence of volatile organic compounds (VOCs) was also negative. No anomalous media indicated by staining, evidence of burning, and/or debris were observed during test pit excavations.

All confirmatory samples were analyzed using analytical methods approved by the U.S. Environmental Protection Agency. The laboratory-reported data results for all constituents were stored in the WCH Environmental Restoration project-specific database prior to submission for archival in the Hanford Environmental Information System site-wide database. The results were also summarized in Appendix B of the RSVP.

The results of confirmatory sampling show that residual contaminant concentrations do not preclude any future uses (as bounded by the rural-residential scenario) and allow for unrestricted use of shallow zone soils (i.e., surface to 4.6 m [15 ft] deep). The results also demonstrate that residual contaminant concentrations are protective of groundwater and the Columbia River. Site contamination did not extend into the deep zone soils; therefore, institutional controls to prevent uncontrolled drilling or excavation into the deep zone are not required.

SubSite Code: 100-H-28:7

SubSite Name: 100-H-28:7, 183-H Process Water Lines

Classification: Accepted

ReClassification:

Description: This subsite encompasses the filtered/treated water supply lines originating at the 183-H Filter Plant, including two 0.91-meters (36-inches) steel lines terminating at the 190-H building, a 0.76-meters (30-inches) line terminating at the 182-H Reservoir pumphouse, two 0.25-meters (10-inches) steel lines terminating at the 184-H Power House, and the former supply lines to the emergency cooling water high tanks at the 105-H Reactor Building.

SubSite Code: 100-H-28:8

SubSite Name: 100-H-28:8, 190-H Process Water Lines

Classification: Accepted

ReClassification: No Action

Description: The subsite consisted of four 0.61 -meter (24-inch)-diameter seamless welded steel pipelines located in two subsurface, reinforced concrete tunnels between the 190-H and 105-H facilities, as well as possible ancillary piping within the tunnels. These pipelines were used during operations from 1949 to 1965 to provide final treated cooling water originating from the 190-H Pumphouse, limited to the residual portions of the 105-H Reactor Building supply lines within the reactor cooling water tunnels.

The 190-H Pumphouse was demolished in 1977 and the tunnels between the 190-H footprint and the 105-H exclusion fence were excavated and collapsed in 1985. Piping in the tunnels north of the reactor exclusion fence was removed prior to demolition; no piping was observed south of the exclusion fence at the time of demolition activities. The remaining portions of the tunnels between the reactor block and the exclusion fence were excavated and removed during Interim Safe Storage (ISS) activities for the 105-H Reactor Building. Remaining portions of the tunnels and piping at the reactor block were sealed as part of ISS

activities and will be addressed as part of closure of the reactor facilities (118-H-6 waste site).

The cooling water tunnels were sloped downwards toward the 190-H Pumphouse; accordingly, any water entering the tunnel would accumulate at the pumphouse facility. There was no known record of any leaks occurring within the cooling water tunnels. Sampling of soils underlying the cooling water tunnels at the 105-C Reactor-where radioactive process water from the reactor back flowed into the tunnels-did not reveal any residual hexavalent chromium or uranium (the sole contaminants of potential concern) above remedial action goals.

The subsite evaluation and supporting documentation demonstrated that the pipeline subsite has met remedial action objectives specified in the Remedial Design Report/Remedial Action Work Plan for the 100 Area (RDR/RAWP) and the Interim Action Record of Decision for the 100-BC-1, 100-BC-2, 100-DR-1, 100-DR-2, 100-FR-1, 100-FR-2, 100-HR-1, 100-HR-2, 100-KR-1, 100-KR-2, 100-IU-2, 100-IU-6, and 200-CW-3 Operable Units (Remaining Sites ROD). The evaluation showed that there were no constituents present that posed a risk to human health or the environment at the subsite. Therefore, the subsite is protective of human health, groundwater, and the Columbia River. No institutional controls were required.

Site Code:	100-H-30	**Classification:**	Accepted
Site Names:	100-H-30, 110-H Sanitary Sewer Trench	**ReClassification:**	Interim Closed Out (3/1/2001)
Site Type:	Trench	**Start Date:**	
Site Status:	Inactive	**End Date:**	
Site Description:	The site has been remediated and closed out. It was a sanitary sewer trench and feed pipeline.		
Waste Type:	Sanitary Sewage		
Waste Description:	The unit received unknown amounts of sanitary sewage from the 110-H Building.		
Waste Type:	Process Effluent		
Waste Description:	The trench is likely to have received radionuclide and chemical contamination from the overflows of the 116-H-2 (1608-H) Crib. The crib received cooling water from the 105-H Reactor Building during the Ball 3X system upgrade program. The site was used during other upgrade programs and on the effluent system when maintenance was necessary.		

Site Code:	100-H-31	**Classification:**	Accepted
Site Names:	100-H-31, Polychlorinated Biphenyl in Soil on North Side of 105-H Reactor Building	**ReClassification:**	Interim Closed Out (6/22/2006)
Site Type:	Unplanned Release	**Start Date:**	
Site Status:	Inactive	**End Date:**	
Site Description:	The site has been remediated and interim closed. The site consisted of a gravel area near a former electrical substation with no visible oil stains or vegetation. The adjacent concrete pad had electrical conduit and wiring extending up to the surface where the electrical equipment was removed. The site was not marked or posted. The reactor exclusion fence was posted as Underground Radioactive Material.		

The reactor exclusion fence was posted as Danger, Restricted Area, Multiple Hazards, No Entry Without Written Authorization and Underground Radioactive Material.

Waste Type: Soil

Waste Description: The waste is polychlorinated biphenyl (PCB) contaminated soil.

Site Code:	100-H-33	**Classification:**	Accepted
Site Names:	100-H-33, 183-H Solar Evaporation Basins Radionuclide Components	**ReClassification:**	
Site Type:	Retention Basin	**Start Date:**	1949
Site Status:	Inactive	**End Date:**	1985

Site Description: The site was created to address the radionuclides of the former 183-H Solar Evaporation Basins (116-H-6 TSD) that was used for solar evaporation of liquid wastes from the 300 area.

The basins were remediated in 1985 and 1995 and closed out on May 13, 1997, under a Modified Closure signed by Washington State Department of Ecology. This RCRA closure did not address any radionuclide COCs that were associated with the site (gross alpha, gross beta, uranium-234, uranium-235, technetium-99, total uranium, and gamma energy analysis). This RCRA closure did not address any radionuclides that were associated with the site. Consequently, site 100-H-33 was created to address the radionuclide component. The site was backfilled and revegetated in the spring of 1997. No radiological posting is associated with the backfilled basin.

Waste Type: Process Effluent

Waste Description: The facility received routine and nonroutine wastes. The routine wastes consisted of spent acid etch solutions (primarily nitric, sulfuric, hydrofluoric, and chromic acids) generated by the Nuclear Fuel Fabrication process. These acidic solutions were reacted with excess sodium hydroxide before being transported to the 183-H Basins. Metal constituents include copper, silicon, zirconium, nickel, aluminum, chromium, manganese, and uranium, which were in the form of precipitates. Nonroutine wastes consisted of unused chemicals and spent solutions from miscellaneous processes. Beginning in July 1973, radioactive and dangerous (mixed) waste from the 300 Area fuel fabrication facilities was shipped to the basins for storage and treatment. The waste has been designated an Extremely Hazardous Waste (EHW) because of toxicity, waste code (WT01). The basins also received various nonradioactive waste (listed discarded chemical products), resulting in designation for cyanide (P030), vanadium pentoxide (P120), and formic acid (U123). Additionally, Basin #2 was designated EP Toxic because of the presence of chromium (D007). More detailed descriptions of these wastes and quantities are contained in DOE/RL 88-04, Interim Status Closure/Post-Closure Plan 183-H Solar Evaporation Basins.

Additional radionuclide contaminants of concern were identified in the Closure/Post Closure Plan.

Site Code:	100-H-34	**Classification:**	Accepted
Site Names:	100-H-34, 100H River Effluent Pipelines, 100H River Lines	**ReClassification:**	

Site Type:	Radioactive Process Sewer	**Start Date:**	
Site Status:	Inactive	**End Date:**	
Site Description:	This site includes the river effluent pipelines (river lines) that extend from the outfall (116-H-5) into the main channel of the Columbia River. This site includes two 152 centimeter (60 inch) diameter (1.3 centimeter [0.5 inch] thick walls), steel river effluent pipelines that extend 229.5 meters (753 linear feet) from the face of 116-H-5 (the 1904 H outfall structure) into the main channel of the Columbia River.		
Waste Type:	Process Effluent		
Waste Description:	The waste includes the pipelines and the contaminated scale contained within them. Contaminants of concern/potential concern are based on those for the outfall itself. Contaminants of potential concern include Co-60, Cs-137, Eu-152, -154, -155, Ni-63, Pu-238, -239/240, Am-241, C-14, H-3, Tc-99, Sr-90, U-234, -235, -238, Cr+6, Cr (total), Pb, and Hg.		

Site Code:	100-H-35	**Classification:**	Accepted
Site Names:	100-H-35, 100-H Service Water Pipelines, 100-H Clean Water Pipelines	**ReClassification:**	
Site Type:	Product Piping	**Start Date:**	
Site Status:	Unknown	**End Date:**	
Site Description:	The site encompasses the clean water pipelines for the 100-H Area, including underground pipelines used to transport raw water from the river pumphouse to the water treatment facilities and to 100-H Area facilities and fire hydrants. Pipelines excluded from this site include those within buildings, process and sewer pipes, pipes that carried water treated with sodium dichromate, and all lines that were downstream from the reactor building, i.e., those lines that carried cooling water from the reactor to the retention basin, trench, and/or the river.		
Waste Type:	Equipment		
Waste Description:	The waste is the old buried pipes from the clean water pipeline system.		

Site Code:	100-H-36	**Classification:**	Accepted
Site Names:	100-H-36, 1904-H Spillway, 116-H-5 Spillway, 100-H-34:1 Flume (Spillway) for the 116-H-5 Outfall Structure	**ReClassification:**	
Site Type:	Outfall	**Start Date:**	
Site Status:	Inactive	**End Date:**	
Site Description:	The 100-H-36 Spillway (also referred to as a flume) is an underground concrete sluiceway that led from the 116-H-5 Outfall Structure to the river shoreline.		
Waste Type:	Construction Debris		

Waste Description: Possible chemical and/or radionuclide contamination (see Contaminants of Potential Concern).

The contaminants of potential concern are based on those for the 116-H-5 outfall, and include C-14, Cs-137, Sr-90, U-235, -238, and Pu-239/240.

Site Code:	100-H-41	**Classification:**	Accepted
Site Names:	100-H-41, Contaminated Area	**ReClassification:**	
Site Type:	Unplanned Release	**Start Date:**	
Site Status:	Inactive	**End Date:**	

Site Description: This site consists of soil in a posted radiologically Contaminated Area (CA). Also within the CA area is a 35.6 centimeter (14 inch) diameter concrete structure. The area appears as a flat, graded, gravel covered area with rabbit brush.

Site Code:	100-H-42	**Classification:**	Accepted
Site Names:	100-H-42, 1906-H Drainage Lift Station	**ReClassification:**	
Site Type:	Pump Station	**Start Date:**	
Site Status:	Inactive	**End Date:**	

Site Description: The site consists of the following components:
-An underground reinforced concrete flume/reservoir filled with building rubble and clean soil. The concrete structure is in contact with underlying soil which may be contaminated from past leaks from the structure. There are no documented unplanned releases from this facility.
-A 183 cm (72 in) diameter, 37 m (121 ft) long, reinforced concrete pipeline exiting the east side of the underground structure and connecting to the 1904-H diversion box (outfall structure). The pipeline is in contact with underlying soil which may be contaminated from past leaks. There are no documented unplanned releases from this pipeline.
-A 15.2 cm (6 in) diameter, 67 m (220 ft) long, steel effluent sample line between the 1904-H outfall and the 1908-H effluent monitoring station. A 9.18 m (30.13 ft) section of this pipeline is drawn on drawing P-4407 with a different orientation than what is shown on drawing P-1220. Both versions of the pipe orientation are shown on the waste site drawing to ensure that it is not missed.
-A 20.3 cm (8 in) diameter, 94 m (308 ft) long, steel sample drain line from the 1908-H effluent monitoring station that empties into the 1904-H outfall. A 10.84 m (35.55 ft) section of this pipeline is drawn on drawing P-4407 with a different orientation than what is shown on drawing P-1220. Both versions of the pipe orientation were shown on the waste site drawing to ensure that it was not missed.

Waste Type: Soil

Waste Description: The waste associated with the 1906-H lift station includes piping and remaining equipment (pipeline and concrete reservoir), rubble and underlying soils associated. Potential contaminants of concern include sodium dichromate, total petroleum hydrocarbons (TPH), polychlorinated biphenyls (PCBs), sulfuric acid, lead, mercury, and paint solvents.

The waste associated with the 1908-H Effluent Monitoring Station includes the piping and underlying soils associated. Potential contaminants of concern include Cs-137, Co-60, Eu-152, Eu-154, Eu-155, Ni-63, Pu-238, Pu-239/240, Sr-90, U-238, hexavalent chromium, total chromium, lead, mercury, paint solvents, sulfuric acid, TPH and PCBs.

Site Code:	100-H-43	**Classification:**	Accepted
Site Names:	100-H-43, Maintenance Garage, Repair Shop	**ReClassification:**	
Site Type:	Foundation	**Start Date:**	
Site Status:	Inactive	**End Date:**	

Site Description: This site consists of the below-grade components of the 1716-H Maintenance Garage. The facility was used to service the area vehicles. The site includes the following components:

-An 8.4 m (27.6 ft) long concrete lubrication pit. -A 2,082 L (550 gal) underground waste oil tank located on the north side of the facility and the 10.2 cm (4 in) diameter underground cast iron pipeline running to it from the lubrication pit.
-A 10.2 cm (4 in) diameter, underground cast iron pipeline that carried waste from floor drains in the battery room, compressor and oil storage room, lubrication pit, and the repair shop to the process sewer (100-H-28:2).
-A 61 cm (24 in) french drain on the north side of 1716-H that received steam condensate through a 5.1 cm (2 in) cast iron pipeline (See orphan site photo # 03122008-962). The french drain may also have been available to receive other wastes through a 10.2 cm (4 in) cleanout near the wall opening in the battery room (P-1435).
-A 61 cm (24 in) french drain on the north side of 1716-H (just west of the french drain described above) that received effluent from a floor drain and sink in the battery room (See orphan site photo # 03122008-963). The two underground pipelines that carried the waste to the french drain were a 7.6 cm (3 in) cast iron pipe and a 3.8 cm (1.5 in) lead pipe.
-A 122 cm (48 in) diameter french drain, built in 1963, received steam condensate through two 3.8 cm (1.5 in) underground pipelines (See orphan site photo # 03122008-964).
-A pump island and underground piping associated with two 18,927 L (5,000 gal) underground storage tanks. The tanks, one for diesel fuel and the other for gasoline, are part of the 100-H-3 waste site. The piping included two 3.8 cm (1.5 in) cast iron suction lines and two 5.1 cm (2 in) vent risers (partially above grade).

Waste Type: Process Effluent

Waste Description: Automobile wastes may include gasoline, diesel, motor oil, antifreeze, automatic transmission fluid, battery acid, engine and radiator flushes, brake fluid, engine and metal degreasers. Contaminants of potential concern include volatile organic compounds, semi-volatile organic compounds, sulfate, pH, lead, cadmium, mercury, chromium, hexavalent chromium, polychlorinated biphenyls, TPH-Gasoline Range, TPH -Diesel Range, and TPH-Oil Range.

Site Code:	100-H-44	**Classification:**	Accepted
Site Names:	100-H-44, 183-H Neutralization Pit, H-016	**ReClassification:**	
Site Type:	Process Unit/Plant	**Start Date:**	
Site Status:	Inactive	**End Date:**	

Site Description: The site consists of the 183-H Neutralization Pit and its potentially contaminated soils, possibly a concrete structure (pit), acid brick and associated piping. There are no visible surface features that identifies the pit. The neutralization pit lies within the footprint of the 100-H-28 Process Sewer.

Waste Type: Equipment

Waste Description: The site received concentrated sulfuric acid which may have included lead and mercury. There may be contaminated equipment components, piping and soil that remain in place.

Site Code: 100-H-45 **Classification:** Accepted

Site Names: 100-H-45, 1717-H UST, Underground Propane Tank, H-015 **ReClassification:** No Action (7/8/2010)

Site Type: Unplanned Release **Start Date:**

Site Status: Inactive **End Date:**

Site Description: The site was a suspect propane underground storage tank (UST) and included any associated below grade piping or features. It is unknown if the propane tank shown in the historical construction drawing (SK-1-7325) was ever installed.

Waste Type: Chemical Release

Waste Description: Potential contaminants include propane hydrocarbons in the soil.

Site Code: 100-H-46 **Classification:** Accepted

Site Names: 100-H-46, 190-H Potential Contaminated Soil **ReClassification:**

Site Type: Process Unit/Plant **Start Date:**

Site Status: Inactive **End Date:**

Site Description: This site consists of contaminated soils, concrete structures and drain pipes that were beneath the sodium dichromate process equipment, piping, unloading dock and railroad spur. This site is within the footprint of the 190-H Pump house which was demolished and removed to 1 m (3 ft) below grade in 1977. The site is approximately the northern twenty percent of the facility with original elevation of 421.0 ft.

The site consists of several locations that existed along the northern and west sections of the 190-H building where sodium dichromate was handled, mixed and injected into the reactor process water system. There were 4 equipment pads which measured 3.04 m (10 ft) by 1.34 m (4.4 ft) by 0.61 m (2 ft) high. There were 3 concrete trenches that formed a "U" shape which measured 7.66 m (25.16 ft) by 10.56 m (34.66 ft) by 1.52 m (5 ft) depth. Each of the four process water storage tanks had concrete drain pits which measured overall 3.04 m (10 ft) by 4.87 m (16 ft) by 1.52 m (5 ft) depth. A 15.24 cm (6 in) drain line which received fifteen percent sodium dichromate, in the form of overflow, exited the building towards the south process sewer at an elevation of 417.5 ft. There was a loading dock, which received the dry sodium dichromate, it was located adjacent to the railroad spur. And there was an elevator which was used to transport dry sodium dichromate to the upper floors.

Waste Type: Demolition and Inert Waste

Waste Description: The primary contaminate of concern is sodium dichromate. There may be buried debris, i.e., concrete, rebar, and piping below grade.

Site Code: 100-H-47 **Classification:** Accepted

Site Names:	100-H-47, 1717-H Geophysical Anomaly, Possible UST, Orphan Site H-015	**ReClassification:**	Rejected (2/22/2010)
Site Type:	Unplanned Release	**Start Date:**	
Site Status:	Inactive	**End Date:**	
Site Description:	This waste site is an anomaly found during a geophysical investigation. It is possibly an underground propane tank (shown on drawing SK-1-7326) associated with the demolished 1717-H building.		

Site Code:	100-H-48	**Classification:**	Accepted
Site Names:	100-H-48, 184-HA Underground Fuel Oil Tanks Associated Piping	**ReClassification:**	
Site Type:	Product Piping	**Start Date:**	1965
Site Status:	Inactive	**End Date:**	
Site Description:	The site consists of potentially remaining fuel oil piping that was associated with two fuel oil underground storage tanks (UST's) that supported the 184-HA Boiler House Building. The two 45,651 liter (12,036 gallon) fuel oil tanks have already been removed from the site.		
Waste Type:	Soil		
Waste Description:	Fuel oil potentally remains in the piping and the underlying soil.		

Site Code:	100-H-49	**Classification:**	Accepted
Site Names:	100-H-49, Potentially Contaminated French Drains, (See Subsites)	**ReClassification:**	
Site Type:	French Drain	**Start Date:**	
Site Status:	Inactive	**End Date:**	
Site Description:	This site consists of sixteen french drains, the underlying soil of the potentially contaminated french drains, and their associated below grade piping components. The site has been divided into two subsites as follows: 1. 100-H-49:1, 184-H Boiler House and 1717-H Hot Shop French Drains, 2. 100-H-49:2, 119-H, 181-H, 184-H, and 183-H French Drains.		
Waste Type:	Equipment		
Waste Description:	The waste consists of the french drains, piping to the french drains , and potentially contaminated soil. The contaminants of potential concern need to be evaluated during work planning and confirmatory sampling.		

SubSites:

SubSite Code:	100-H-49:1
SubSite Name:	100-H-49:1, 184-H Boiler House and 1717-H Hot Shop French Drains
Classification:	Accepted
ReClassification:	

Description: This site consists of three french drains, the underlying soil of the potentially contaminated french drains, and their associated below grade piping components. The drains include:

FD4 is a 1 m (36 in) french drain with a 11 m (36.1 ft) long, 0.1 m (4 in) condensate (CNDS) drain line from the 184-H Boiler House Reclaining Hopper (P-1418) to the french drain. The pipeline enters the french drain -1.07 m (-3.5 ft) below grade. The 184-H building utilized steam from the boilers to heat the coal conveyor system and coal shack. It's unknown whether a non-contact form of steam heating was used. The resulting condensate was drained to 0.1 m (4 in) VCT piping 1.07 m (3.5 ft.) below grade and was the inlet piping to the french drain. No documents or records were obtained during historical research to indicate the end state of the french drain or underlying soil. (See orphan site photo # 03122008-939)

FD5 is a 0.6 m (24 in) french drain with a 7.2 m (24 ft) long, 0.1 m (4 in) vitrified clay type (VCT condensate (CNDS) drain line from the 184-H Boiler House Transfer House to the french drain. The pipeline enters the 1.9 m (76 in) deep french drain at 1.07 m (42 in) below grade (P-1417, P-1418). The 184-H building utilized steam from the boilers to heat the coal conveyor system and coal shack. It's unknown whether a non-contact form of steam heating was used. The resulting condensate was drained to 0.1 m (4 in) VCT piping 1.07 m (3.5 ft) below grade and was the inlet piping to the french drain. No documents or records were obtained during historical research to indicate the end state of the french drain or underlying soil. (See orphan site photo # 03122008-940).

FD16 is a 0.9 m (36 in) french drain with a 5.2 m (17.1 ft) long, and a 11.0 m (36.1 ft) long pipeline; each is a 0.08 m (3 in) diameter heating/steam return line from 1717-H Hot Shop (west side) to the french drain. (P-1436) No
documents or records were obtained during historical research to indicate the end state of the french drain or underlying soil. (See orphan site photo # 03122008-969).

Process Description:
The process description was inferred from the construction drawings and the function of the building that they were associated with. This information is provided for each of the french drains in the Site Description above.

Location Description:
The locations for each of the French Drains are listed below. Washington State Plane coordinates are provided for each french drain. The associated drawings were rectified to Washington State Plane coordinates to obtain the
coordinates listed below.
FD4 - E577504.29, N153006.45
FD5 - E577553.28, N152996.60
FD16 - E577970.71, N152553.58

ICP metals, Mercury, Hexavalent Chromium, Polyaromatic Hydrocarbons, Pesticides and Total Petroleum Hydrocarbons. The waste is the french drain, piping to the french drain, and potentially contaminated soil

SubSite Code: 100-H-49:2

SubSite Name: 100-H-49:2, 119-H, 181-H, 184-H, and 183-H French Drains

Classification: Accepted

ReClassification:

Description: This site consists of thirteen french drains, the underlying soil of the potentially contaminated french drains, and their associated below grade piping components. One of the french drains is already part of the 100-H-4 waste site. The piping for the 100-H-4 french drain was not

previously identified as a component of that waste site. Therefore the piping associated with the 100-H-4 french drain has been included within 100-H-49. The drains include:

FD1 is a dry well that was associated with the 119-H Sample Building. A 5.1 cm (2 in) cast iron pipeline ran from the 119-H Sample Building to the dry well. (H-1-19812, H-19805). During the Orphan Site's Walkdown the dry well could not be proven to exist or not exist from the view point outside the fence of the contamination area for the 105-H Reactor. No documents or records were obtained during historical research to indicate the end state of the dry well or underlying soil. Analogous sites include 100-D-24 and 100-F-46. (See orphan site photo # 031708-976).

FD2 is a 0.6 m (24 in) french drain with a 4.5 m (14.8 ft) long, 0.1 m (4 in) cast iron soil line from the 181-H Battery Room to the french drain (P-1337, P-1334). During the Orphan Site's Walkdown, there was no evidence of a recent disturbance or french drain existing within a 5 m (16.4ft) diameter area. No documents or records were obtained during historical research to indicate the end state of the french drain or underlying soil. (See orphan site photo #03172008-973).

FD3 is a 1 m (36 in) french drain with a 4.7 m (15.4 in) long, 0.1 m (4 in) vitrified clay type (VCT) condensate (CNDS) drain line (P-1417, P-1418). The french drain is 1.9 m (76 in) deep with the inlet pipeline at 1.1 m (42 in) below grade. The pipeline comes from the 184-H Boiler House Coal Shack Track Hopper. The 184-H building utilized steam from the boilers to heat the coal conveyor system and coal shack. It is unknown whether a non-contact form of steam heating was used. The resulting condensate was drained via 0.1 m (4 in) VCT piping 1.07 m (3.5 ft.) below grade and was the inlet piping to the french drain. No documents or records were obtained during historical research to indicate the end state of the french drain or underlying soil. (See orphan site photo # 03172008-974).

FD6 is a 1 m (36 in) french drain with a 8.7 m (28.5 ft) long, 0.1 m (4 in) diameter vitrified clay type (VCT) condensate (CNDS) drain line from the 184-H Coal Crusher House to the french drain (P-1417, P-1418). The pipeline enters the 1.9 m (76 in) deep french drain at 1.04 m (42 in) below grade (P-1417, P-1418). The 184-H building utilized steam from the boilers to heat the coal conveyor system and coal shack. It's unknown whether a non-contact form of steam heating was used. The resulting condensate was drained to a 0.1 m (4 in) VCT pipe 1.07 m (3.5 ft.) below grade and was the inlet piping to french drain. No documents or records were obtained during historical research to indicate the end state of the french drain or underlying soil. (See orphan site photo # 03122008-941).

FD7 is a 0.6 m (24 in) french drain with two pipe segments that are 0.1 m (4 in) diameter vitrified clay type (VCT) condensate (CNDS) drain lines from the 184-H Coal Transfer Tower to the french drain (P-1418). The pipeline RCC enters the 1.9 m (76 in) deep french drain at 1.07 m (42 in) below grade (P-1418). The french drain had a total below grade depth of 1.92 m (76 in) with two 10.2 cm (4 in) diameter VCT inlet pipes 1.07 m (42 in) below grade and located 4.5 m (15 ft) east from the transfer house and conveyor system. The piping appears to be condensate from a 15.25 cm (6 in) above grade steam main. No documents or records were obtained during historical research to indicate the end state of the french drain or underlying soil. (See orphan Sste photo # 03122008-942).

FD8 is a 1 m (36 in) french drain with a 5.9 m (19.4 ft) long, 0.1 m (4 in) vitrified clay type (VCT) line. The inverse elevation at the french drain is 125.9 m (413 ft). The pipeline runs from the 184-H Boiler House Battery Room floor drain to the french drain. There is a second inlet from an unknown source. No documents or records were obtained during historical research to indicate the end state of the french drain or underlying soil. The location is estimated. (P-1413, P-1417) (See orphan site photo # 03122008-944).

FD9 is a 1 m (36 in) french drain with a 5.6 m (18.4 ft) long segment, a 6.6 m (21.7 ft) long segment, and a 2.4 m (7.9 ft) long segment of pipe; all are 10.16 cm (4 in) vitrified clay type (VCT) line. The french drain is 1.9 m (76 in) deep with the line inlet at 1.04 m (42 in) below grade (P-1417). The line runs from the 184-H Boiler House laboratory and radiator heating system to the french drain. There is a second inlet pipe at the french drain from an unknown source. No documents or records were attained/obtained during historical research to indicate the end state of the french drain or underlying soil. (See orphan site photo # 03122008-946).

FD10 is a 0.46 m (18 in) Drywell with a 45.5 m (149.3 in) long, 0.1 (4 in) diameter cast iron (CI) pipe to the french drain. The line runs from the 183-H Post Filter Building to the french drain. The site receives drainage from the battery, electrical, pump house and chlorine room. The inverse elevation at the french drain is 124.4 m (408.11 ft). The location is estimated. No documents or records were obtained during historical research to indicate the end state of the french drain or underlying soil. (P-1221, P-4302, P-4305) (See orphan site photo # 03122008-957).

FD11 is a 0.9 m (36 in) french drain with a 17.9 m (58.7 ft) long, 0.1 m (4 in) diameter pipeline from 183-H (post filter) to the french drain. The site receives drainage from the battery, electrical, pump house and chlorine room. The inverse elevation at the french drain is 124.4 m (408.11 ft). The location is estimated. (P-1221, P4302, P-4305) No documents or records were obtained during historical research to indicate the end state of the french drain or underlying soil. (See orphan site photo # 03122008-958).

FD12 is a 1 m (36 in) french drain with a 9.7 m (37.8 ft) long, 0.1 m (4 in) diameter vitrified clay pipeline from the 1719-H First Aid Building (Laboratory Waste) to the french drain. (P-1235) No documents or records were obtained during historical research to indicate the end state of the french drain or underlying soil. (See orphan site photo #03122008-961).

FD13 is a 8.0 m (26.2 ft) long cast iron 0.08 m (3 in) diameter pipeline from the 1717-H machine/welding shop typical heaters to a 0.76 m (30 in) french drain (100-H-4). No documents or records were obtained during historical research to indicate the end state of the french drain or underlying soil (P-1436) (See orphan site photo # 03122008-967).

FD14 is a 0.9 m (36 in) french drain with a 5.3 m (17.4 ft) long, 0.08 m (3 in) diameter cast iron (CI) pipeline from 1717-H (northwest side) pipe shop radiator heater to the french drain (P-1436). The pipeline is 1.07 m (3.5 ft) below grade. (P-1436) No documents or records were obtained during historical research to indicate the end state of the french drain or underlying soil. (See orphan site photo # 03122008-966).

FD15 is a 0.76 m (30 in) french drain with a 7.8 m (25.6 ft) long, 0.08 (3 in) diameter cast iron (CI) pipeline from 1717-H (east side) Electrical Shop and Mechanical Equipment room heaters to the french drain (P-1436). No documents or records were obtained during historical research to indicate the end state of the french drain or underlying soil. (See orphan site photo # 03122008-968).

Process Description:
The process description was inferred from the construction drawings and the function of the building that they were associated with. This information is provided for each of the french drains in the Site Description above.

The locations for each french drain. The associated drawings were rectified to Washington State Plane coordinates to obtain the coordinates listed below. Order is maintained with the listing in the site description.

FD1 - E577726.55, N152492.97

FD2 - E577523.25, N153473.24
FD3 - E577454.99, N153009.28
FD6 - E577503.89, N152994.26
FD7 - E577553.38, N152956.89
FD8 - E577537.92, N152954.51
FD9 - E577556.16, N152942.17
FD10 - E577782.08, N152761.73 (No french drain exists)
FD11 - E577778.37, N152752.41 (The location is estimated.)
FD12 - E577927.32, N152676.63 (No french drain exists)
FD13 - E578009.56, N152598.17 (100-H-4; The location is estimated.)
FD14 - E577970.58, N152592.89 (No french drain exists)
FD15 - E578009.69, N152570.62 (No french drain exists)

Associated Structures:
The french drains (and drywells) are related to 119-H, 181-H, 183-H, 184-H, 1717-H, and 1719-H.

Site Comment: Analogous sites include 100-D-59 for the 183-H building acid drain and 100-D-24 and 100-F-46 for the 119-H sample building.

The waste consists of the french drains, piping to the french drains, and potentially contaminated soil. Contaminates of potential concern include: ICP metals, mercury, hexavalent chromium, polyaromatic hydrocarbons, polychlorinated biphenyls and total petroleum hydrocarbons.

Site Code:	100-H-50	**Classification:**	Accepted
Site Names:	100-H-50, 100-H Steam Condensate French Drains	**ReClassification:**	
Site Type:	French Drain	**Start Date:**	
Site Status:	Inactive	**End Date:**	

Site Description: The site consists of fourteen discrete locations, underlying soil and their associated below grade piping components for steam condensate French drains. The French drains were discovered during the Orphan Site Evaluation (OSE) historical review. Each of the facilities that the French drains are associated with, were identified and processes or functions of the buildings summarized in the list below. Details of inlet pipe sizes, depths and French drain size and construction details and depths are provided when available in the descriptions below. When exact locations were not available from construction drawings the location was estimated by placing the location 4.6m (15 ft) away from building. In these cases the inlet piping is in a well defined location. See detailed spatial analysis map for French Drain locations.

Orphan sites field investigations were conducted on March 12th and 17th of 2008. Photographs of the present site conditions were obtained.

1. The site is a 1.22 m (48 in) reinforced concrete pipe French drain with a 0.1 m (4 in) clay tile 6.1 m (20 ft) long at a 1% slope (1 in of slope per linear foot of pipe) from 1.1 m (42 in) raw water line. The site is associated with the 182-H Reservoir (north end) (P-4737 Sheet 1, P-4737 Sheet 2). No documents or records were obtained during historical research to indicate a final disposition for the site.

2. The site is a 0.9 m (36 in) French drain with a 0.1 m (4 in) diameter cast iron (CI) pipeline from the 182-H Reservoir (south side) heater systems to the French drain (P-1368, P-1370). No documents or records were obtained during historical research to indicate a final disposition for

the site.

3. The site is a 0.46 m (18 in) dry well with a 2.54 cm (1 in) steam condensate pipeline from the 190-H Building (north side) (H-1-14575, H-1-14580, H-1-14581). No documents or records were obtained during historical research to indicate a final disposition for the site.

4. The site is a 0.46 (18 in) dry well with a 0.05 m (2 in) steam condensate pipeline from the 190-H Building (east side) (H-1-14575, H-1-14580, H-1-14581). No documents or records were obtained during historical research to indicate a final disposition for the site.

5. The site is a 0.61 m (24 in) dry well, 1.4 m (4.6 ft) deep with a 2.54 cm (1 in) steam condensate pipeline from 190-H Building to the dry well (H-1-14575, H-1-14580, H-1-14581). No documents or records were obtained during historical research to indicate a final disposition for the site.

6. The site is a 0.61 m (24 in) dry well with a steam condensate pipeline from the 1703-H Office Building (west side) to the dry well (P-9340). No documents or records were obtained during historical research to indicate a final disposition for the site.

7. The site is a 0.61 m (24 in) French drain with a ventilation drainage pipeline from the 1703-H Office Building (east side) to the French drain (P-9340). No documents or records were obtained during historical research to indicate a final disposition for the site.

8. The site is a 0.9 m (36 in) French drain from the 184-H building (north side) that utilized steam radiator unit heaters with 1.9 cm (0.75 in) condensate blow off traps and drip legs which discharged to French drains with 0.1 m (4 in) diameter vitrified clay type (VCT) inlet piping to the French drain (P-1417).

9. The site is a 0.9 m (36 in) French drain with a 0.1 m (4 in) diameter VCT pipeline from a return riser and steam supply riser from the 184-H Boiler House (east side) to the French drain (P-1417). No documents or records were obtained during historical research to indicate a final disposition for the site.

10. The site is a 0.9 m (36 in) French drain with a 0.1 m (4 in) diameter VCT condensate pipeline from the 184-H Boiler House (west side) to the French drain. (P-1417) No documents or records were obtained during historical research to indicate a final disposition for the site.

11. The site is a 0.61 m (24 in) French drain with a 0.1 m (4 in) diameter VCT pipeline from a return riser and steam supply riser from 184-H Boiler House (south side) to the French drain. (P-1417) No documents or records were obtained during historical research to indicate a final disposition for the site.

12. The site is a 1 m (36 in) French drain with a 9.4 m (31 ft) long, 2.54 cm (1 in) line connecting from the 1901-H Water Tower trap discharge to the French drain (P-1426). There is an additional pipeline to the French drain that is a 8.8 m (29 ft) long, 3.81 cm (1.5 in) line connecting from the 1901-H Water Tower ejector discharge to the French drain (P-1426). The pipelines are soft water trap discharge lines (P-1416 and P-1426).

13. The site is a 0.9 m (36 in) French drain with a 0.1 m (4 in) vitrified clay (VC) pipeline to the French drain (P-1237). No documents or records were obtained during historical research to indicate a final disposition for the site.

14. The site is a 0.61 m (24 in) French drain filled with soil/gravel. The drain was discovered in the field during the orphan site evaluation. The french drain does not appear on any construction drawings. The proximity of french drain FD5 to FD14 suggests that they might one in the same.

The french drain is believed to receive steam condensate from the 190-H Annex.

Waste Type: Equipment

Waste Description: The waste is the French drain and associated piping.

Site Code: 100-H-51 **Classification:** Accepted

Site Names: 100-H-51,100-H-51, Potentially Contaminated Pipeline Segments (See subsites) **ReClassification:**

Site Type: Process Sewer **Start Date:**

Site Status: Inactive **End Date:**

Site Description: This site consists of five subsites. 1. Is a 15.2 cm (6 in) vitrified clay pipe sanitary sewer pipeline. 2. Is a 5.08 cm (2 in) steel brine discharge line. 3. Consists of two parallel pipelines, a 5.1 cm (2 in) steel brine discharge line and a 7.6 cm (3 in) steel filtered water line. 4. Is a 15.24 cm (6 in) vitrified clay storm drain (and smaller laterals) that run between the 1701-H, 1709-H and 1720-H buildings and a ditch (100-H-27). 5. Consists of a 25.4 cm (10 in) carbon steel pipe located between the Columbia River shoreline and the 184-H Power House.

Waste Type: Equipment

Waste Description: The waste will include the pipelines and any potential contaminated soil. Contaminants of potential concern have not been fully evaluated for each individual pipeline segment.

SubSites:

SubSite Code: 100-H-51:1

SubSite Name: 100-H-51:1, 1703-H Sanitary Sewer Segment

Classification: Accepted

ReClassification:

Description: The subsite consists of a 15.2 cm (6 in) diameter vitrified clay pipe (VCP) sanitary sewer segment. The line connects the 1703-H building with the 100-H-28, 100-H Water Treatment Facilities Underground Pipelines. The subsite also includes a short section of a 10.16 cm (4 in) soil pipe where the 15.2 cm (6 in) VCP connects to the 1703-H building. The pipeline segment is located on the west side of 1703-H building and runs north, terminating at a manhole where it joins the 100-H-28:5 Sanitary Sewer pipeline.

The 1703-H building was constructed in 1949 and contained offices for area administrative and technical personnel. The building was demolished in 1974 leaving the footings and foundations after demolition of the building were buried and leveled (UNI-7231974). The 100-H-28:5 waste site has been identified by WCH for remediation, see WCH CCN #141052.

The subsite waste has been described as contaminated soil. The COPCs include: arsenic, barium, cadmium, chromium, hexavalent chromium, lead, selenium, silver, mercury, semivolatile organic compounds (SVOCs), polychlorinated biphenyls (PCBs), and chlorinated pesticides.

SubSite Code: 100-H-51:2

SubSite Name: 100-H-51:2, 117-H Seal Pit Crib Feedline

Classification: Accepted

ReClassification:

Description: The subsite consists of a 10 cm (4 in) diameter cement asbestos feed line that ran from the 117-H Air Filter Building to waste site 116-H-9,117-H Crib, 117-H Seal Pit Crib.

The pipeline segment is located between the 117-H Air Filter Building and the 117-H Seal Pit Crib. COPCs include: carbon-14, cesium-137, cobalt-60, europium-152, europium-154, europium-155, plutonium-238, plutonium-239/240, strontium-90, tritium, radium-226, thorium-228, thorium-232, uranium-238, cadmium, chromium (total), hexavalent chromium, mercury, lead, selenium, silver, and PCBs.

The 117-H Air Filter Building and crib were constructed in 1960. The building was closed under a determination of residual contamination levels (ARCL) (UNI-3001).The 117-H building was demolished in 1984. A distribution header lies approximately 1.5 m (5 feet) below grade and is covered by a polyethylene barrier.

The pipeline was identified as part of the 116-H-9 waste site initially and later reassigned to the 100-H-51 waste site on 2/19/2009. This was done to facilitate closure of 116-H -9 while postponing remediation of the pipeline. Per WCH documentation remediation of 116-H-9 began in October 2008.

SubSite Code: 100-H-51:3

SubSite Name: 100-H-51:3, 184-H Brine Discharge Line

Classification: Accepted

ReClassification:

Description: The subsite consists of two parallel pipelines, a 5.1 cm (2 in) steel brine discharge line and a 7.6 cm (3 in) steel filtered water line that ran from the 184-H Power House Building to the 184-H Salt Dissolving Pit and Brine Pump House. Filtered water was piped from the 184-H Power House to the 184-H Salt Dissolving Pit and Brine Pump House where sodium chloride was added and the brine was pumped back to the 184-H Power House for further use.

Documentation established that the Power House was demolished in 1997. The 184-H Salt Dissolving Pit and Brine Pump House (100-H-16) were probably demolished in place as were similar brine pits at 184-B and 184-D.

SubSite Code: 100-H-51:4

SubSite Name: 100-H-51:4, 100-H Main Gate Storm Drain

Classification: Accepted

ReClassification:

Description: The subsite consists of a 15.2 cm (6 in) diameter vitrified clay pipeline (VCP) storm drain that ran north from the 1701-H, 1702-H and 1709-H Buildings to 100-H-27, 100-H Area Patrol Headquarters Storm Runoff Ditch. The pipeline includes two 10.2 cm (4 in) lateral sections of VCP feed pipe from 1702-H and 1709-H buildings to the 15.2 cm (6 in) pipeline.

Built in 1949 the buildings 1701-H and 1702-H served as badge houses; 1701-H Building for vehicle and pedestrian entry in and out of H area, and 1702-H for entry into the reactor exclusion area. 1701-H Building also housed a laboratory and mechanical room in addition to

administrative offices, and lunch room (HW-24800-2).

SubSite Code: 100-H-51:5

SubSite Name: 100-H-51:5, Discovery Pipeline at 128-H-1

Classification: Accepted

ReClassification:

Description: The pipeline is located between the Columbia River shoreline and the 1713-H building. It consists of a steel pipe that ran from the Columbia River to the sanitary water system just south of the 1713-H building. The 100-H-51:5 pipeline was discovered in a "man-made pit" during a walkdown just outside of the 128-H-1 burn pit in 2009. Exposed portions of the pipeline resemble the 25.4 cm (10 in) carbon steel pipe at the Columbia River (100-H-53). A geophysics investigation performed in July 2009 (GI 0590309) determined that the pipeline ran from a location just south of 128-H-1 (E 55385, N 153134) to the Columbia River shoreline at E 577381, N 153578. The size and location is consistent with the temporary water system pipelines used during construction of 100-H. A second geophysics investigation in June 2010 determined that the pipeline continued from E 577385, N 153064 to E577386, N 152753 before turning east and connecting with the existing 15.24 cm (6 in) sanitary water pipeline.

Site Code:	100-H-52	**Classification:**	Accepted
Site Names:	100-H-52, 184-HA Septic Drain Field and Associated Piping	**ReClassification:**	
Site Type:	Septic Tank	**Start Date:**	1965
Site Status:	Inactive	**End Date:**	1974

Site Description: The site consists of a septic drain field and associated piping that supported the 184-HA boiler annex. In the center of the drain field (oriented east/west) are four, 20 centimeter (8 inch) diameter perforated concrete pipe laterals.

Site Code:	100-H-53	**Classification:**	Accepted
Site Names:	100-H-53, Carbon Steel Pipe in River Bank	**ReClassification:**	
Site Type:	Process Sewer	**Start Date:**	
Site Status:	Inactive	**End Date:**	

Site Description: This site is a 25 cm (10 in) diameter and 1.8 m (6 ft) long (exposed portion) carbon steel pipe that runs northeast toward the river shore. A WCH Orphan Sites Field Evaluation was conducted in this area in August of 2007. Geophysics (GI # 0590309) was conducted in October 2007, and results indicate that the visible segment of the 25 cm (10 in) diameter pipe is not part of an intact system and does not extend below grade beyond the 1.8 m (6 ft) currently visible.

Waste Type: Equipment

Waste Description: The waste is the pipeline and any potentially contaminated soil underlying the pipe. Since the pipeline can not be related to any particular human activity, the contaminants of potential concern are unknown.

Site Code:	100-H-54	**Classification:**	Discovery
Site Names:	100-H-54, GPERS 100-H Shoreline Survey Unplanned Release	**ReClassification:**	
Site Type:	Unplanned Release	**Start Date:**	
Site Status:	Inactive	**End Date:**	
Site Description:	On June 3, 2004, a radiological field survey of the 100-H Shoreline was conducted. The system used to collect the data was a man-carried back pack with walking stick system called the Global Positioning Environmental Radiological Surveyor (GPERS). The survey was performed as part of the risk assessment work performed by Bechtel Hanford, Inc. (BHI).		
Waste Type:	Soil		
Waste Description:	The site is an area of systematically elevated radiological activity, generally less than twice background measurements, as shown in the GPERS plot (Image #1, Image #2). No survey data has been located for the area between the survey area shown in the images (Image #1, Image #2) and the 116-H-7 (107-H Retention Basin) remediation footprint.		

Site Code:	100-H-56	**Classification:**	Discovery
Site Names:	100-H-56, H-Area Miscellaneous Pipelines	**ReClassification:**	
Site Type:	Product Piping	**Start Date:**	
Site Status:	Inactive	**End Date:**	
Site Description:	The site consists of all 100-H Area miscellaneous pipelines not associated with an existing waste site. The pipelines were observed during remediation.		

Site Code:	100-H-57	**Classification:**	Accepted
Site Names:	100-H-57, Water Tower Foundations at 100-H	**ReClassification:**	
Site Type:	Foundation	**Start Date:**	
Site Status:	Inactive	**End Date:**	
Site Description:	The site consists of the underground piping, valves, sumps and other structures at the base of the two elevated water towers adjacent to the 105-H Reactor.		

Site Code:	116-H-1	**Classification:**	Accepted
Site Names:	116-H-1, 107-H Liquid Waste Disposal Trench	**ReClassification:**	Interim Closed Out (4/3/2001)
Site Type:	Trench	**Start Date:**	1952
Site Status:	Inactive	**End Date:**	1965
Site Description:	The site has been remediated and closed out. The disposal trench was oriented in a north-south direction and was divided into three separate lobes. The trench was fed by a single 51-centimeter (20-inch) pipe that originated in the pumphouse located at the northwest corner of the 107-H Retention Basin (this pipeline is part of		

100-H-21).

Waste Type: Water

Waste Description: The site received diversion effluent from the 107-H Retention Basin during reactor outages due to fuel element ruptures and water and sludge from 107-H during deactivation of the unit.

Site Code:	116-H-2	**Classification:**	Accepted
Site Names:	116-H-2, 1608-H Liquid Waste Disposal Trench, 1608-H Crib & Trench	**ReClassification:**	Interim Closed Out (3/1/2001)
Site Type:	Trench	**Start Date:**	1953
Site Status:	Inactive	**End Date:**	1965

Site Description: This site, including its feed pipe, has been remediated and closed out. It was an open trench that was fed by a 15-centimeter (6-inch) vitrified clay pipe that originated from the 1608-H Pump House. The feed pipe is shown on Hanford drawings H-1-19824 and M-1904-H.

Waste Type: Water

Waste Description: The site received coolant water from the 105-H Reactor Building during the Ball 3X system upgrade program. The site was used during other upgrade programs and when maintenance was necessary on the effluent system.

Site Code:	116-H-3	**Classification:**	Accepted
Site Names:	116-H-3, 105-H Dummy Decontamination French Drain, Perf Decontamination Drain	**ReClassification:**	Interim Closed Out (4/3/2001)
Site Type:	French Drain	**Start Date:**	1950
Site Status:	Inactive	**End Date:**	1965

Site Description: This site has been remediated and closed out.

The site was a french drain made of vitreous tile conduit. The upper surface of the french drain extended a few inches above the ground and had a metal cover. The waste site includes an underground feed pipeline which is 65 meters (215 feet) in length.

Waste Type: Process Effluent

Waste Description: The site received spent acid and rinse water from the 105-H Dummy Decontamination Facility, which decontaminated fuel element spacers and other reactor hardware.

Site Code:	116-H-4	**Classification:**	Accepted
Site Names:	116-H-4, 105-H Pluto Crib	**ReClassification:**	
Site Type:	Crib	**Start Date:**	1950
Site Status:	Inactive	**End Date:**	1952

Site Description: The site is currently a flat, cobble covered field located inside the 105-H security fence. The crib location is not marked.

Waste Type: Process Effluent

Waste Description: The site received effluent from tubes containing ruptured fuel elements. A 1953 document reports that approximately 270 curies of fission products were released to the crib as a result of the rupturing of ten slugs and the presence of 1,000 kilograms (2,200 pounds) of sodium dichromate.

Site Code:	116-H-5	**Classification:**	Accepted
Site Names:	116-H-5, 116-H-5 Outfall Structure, 1904-H Outfall Structure	**ReClassification:**	
Site Type:	Outfall	**Start Date:**	1949
Site Status:	Inactive	**End Date:**	1965

Site Description: This site includes the open-topped, compartmentalized, reinforced concrete outfall structure. A 183 centimeter (72 inch) concrete process sewer line from the 1906-H Pump House, and two 152 centimeter (60 inch) diameter steel retention basin pipelines entered the eastern face; and two 152 centimeter (60 inch) concrete pipelines exited the western face to the river.

Waste Type: Construction Debris

Waste Description: The site received effluent water through two lines from the 107-H Retention Basin. A third line from the 100 H Area process sewer also discharged to it.

Contaminants of potential concern include Co-60, Cs-137, Eu-152, -154, -155, Ni-63, Pu-238, -239/240, Am-241, C-14, H-3, Tc-99, Sr-90, U-234, -235, -238, Cr+6, Cr (total), Pb, and Hg.

Site Code:	116-H-6	**Classification:**	Accepted
Site Names:	116-H-6, 183-H Solar Evaporation Basins	**ReClassification:**	Closed Out (5/13/1997)
Site Type:	Retention Basin	**Start Date:**	1949
Site Status:	Inactive	**End Date:**	1985

Site Description: The site was a concrete water storage and treatment basin divided into four sections . Each section was subdivided into a deep subsidence basin and a shallow flocculation basin. The flocculation basin was 14 meters (46 feet) wide, 10 meters (33 feet) long, and 3 meters (10 feet) deep. The subsidence basin was 16 meters (50 feet) wide, 29 meters (95 feet) long, and 5 meters (17 feet) deep at the north end and 5 meters (16 feet) deep at the south end. The deep and shallow basins were separated by a redwood plank weir. The basins had an earthen berm around three sides and an asphalt-covered berm on the north side for tank truck unloading. The basins were completely demolished in the fall of 1996. The site was backfilled and re-vegetated in the spring of 1997. The site is marked. No radiological posting is associated with the backfilled basin.

Waste Type: Process Effluent

Waste Description: The facility received routine and nonroutine wastes. The routine wastes consisted of spent acid etch solutions (primarily nitric, sulfuric, hydrofluoric, and chromic acids) generated by the Nuclear Fuel Fabrication process. These acidic solutions were reacted with excess sodium hydroxide before being transported to the 183-H Basins. Metal constituents include copper, silicon, zirconium, nickel, aluminum, chromium, manganese, and uranium, which were in the

form of precipitates. Nonroutine wastes consisted of unused chemicals and spent solutions from miscellaneous processes. The waste has been designated an Extremely Hazardous Waste (EHW) because of toxicity, waste code (WT01). The basins also received various nonradioactive waste (listed discarded chemical products), resulting in designation for cyanide (P030), vanadium pentoxide (P120), and formic acid (U123). Additionally, Basin #2 was designated EP Toxic because of the presence of chromium (D007). More detailed descriptions of these wastes and quantities are contained in DOE/RL 88-04, Interim Status Closure/Post-Closure Plan 183-H Solar Evaporation Basins.

Site Code:	116-H-7	**Classification:**	Accepted
Site Names:	116-H-7, 107-H Retention Basin, 107-H	**ReClassification:**	Interim Closed Out (7/24/2001)
Site Type:	Retention Basin	**Start Date:**	1949
Site Status:	Inactive	**End Date:**	1965

Site Description: This site has been remediated and closed out.

The basin was a concrete-lined rectangular structure. The unit had been partially demolished and backfilled to a depth of approximately 1.2 meters (4 feet) above the floor, and sloped to the top of the walls.

Waste Type: Process Effluent

Waste Description: This site received cooling water effluent from the 105-H Reactor for radioactive decay and thermal cooling prior to release to the Columbia River. Seventy percent of the total radionuclide inventory is contained within the soil adjacent to the unit. Approximately 10 curies have leached into the concrete floor and walls.

Site Code:	116-H-9	**Classification:**	Accepted
Site Names:	116-H-9, 117-H Crib, 117-H Seal Pit Crib	**ReClassification:**	
Site Type:	Crib	**Start Date:**	1960
Site Status:	Inactive	**End Date:**	1965

Site Description: The unit is a gravel filled crib. A distribution header lies approximately 1.5 meters (5 feet) below grade and is covered by a polyethylene barrier. The polyethylene barrier is covered by 1.2 meters (4 feet) of clean fill material. A large vent pipe marks the site and is placed off center of the crib structure. The site includes a 10-centimeter (4-inch) cement asbestos feed pipeline that runs from the demolished 117-H Air Filter Building to the crib. The pipeline is approximately 80 meters (263 feet) long.

Waste Type: Water

Waste Description: The site received drainage from confinement system 117-H Building Seal Pits.

Site Code:	118-H-6	**Classification:**	Accepted
Site Names:	118-H-6, 105-H Reactor Building (See Subsites)	**ReClassification:**	
Site Type:	Reactor	**Start Date:**	1949

Site Status: Inactive **End Date:** 1965

Site Description: The unit consisted the 105-H Reactor which is represented the following subsites: 1. 105-H Reactor Core and ISS Project which includes the graphite moderator stack, biological and thermal shields, pressure tubes, safety and control systems; 2, 105-H Reactor Ancillary Support Areas, Below-Grade Structures and Underlying Soils; 3, 105-H Reactor Fuel Storage Basin and Underlying Soils; 4, 105-H Fuel Storage Basin Shallow Zone Side Slope Soils; 5, 105-H Decontamination Pads, 6, Deep Zone Side Slopes.

Waste Type: Equipment

Waste Description: The primary source of contamination at the site was reactor coolant water and water in the FSB that became contaminated through contact with irradiated and ruptured fuel elements and components from the reactor cooling system. In 1987 this unit contained an estimated 15,000 curies of radionuclides, 102,000 kilograms (112 tons) of lead, less than 2.8 cubic meters (100 cubic feet) of asbestos, and 9 kilograms (20 pounds) of cadmium.

SubSites:

SubSite Code: 118-H-6:1

SubSite Name: 118-H-6:1, 105-H Reactor Block and ISS Project

Classification: Accepted

ReClassification:

Description: The CVP-2006-00003 documents the decontamination and decommissioning (D&D) and the interim safe storage (ISS) activities of the reactor facility . The safe storage enclosure (SSE) consists of the area within the shield walls, including the reactor block; the front-face work area; the elevator; the rear-face work area; ancillary support areas, and below-grade structures and soils. This part of the reactor building will remain in place to act as temporary storage for the reactor block in accordance with the Removal Action Work Plan for 105-D and 105-H Building Interim Safe Storage Projects and Ancillary Buildings.

As much as was practical, all objects and surface contamination were removed. A new roof was added as part of the ISS effort. All doors were permanently sealed except for one door that remains locked and is welded shut. The only planned entrance to this structure is for surveillance and maintenance activities that will occur approximately every 5 years.

The original footprint area of the 105-H Reactor Building was approximately 6,934 meters squared (74,640 square feet). The final ground-level footprint area of the safe storage enclosure (SSE) is 1,387 meters squared (14,928 square feet). The areas of the reactor building that have been removed to ERDF represent 80% of the original footprint of the reactor building. The entirety of the below-grade portion of the facility outside the SSE has been completely demolished, removed, and all below-grade areas were backfilled to eliminate future subsidence

SubSite Code: 118-H-6:2

SubSite Name: 118-H-6:2, 105-H Reactor Ancillary Support Areas, Below-Grade Structures and Underlying Soils

Classification: Accepted

ReClassification: Interim Closed Out

Description: The site has been remediated and interim closed out.

Remediation of the subsite has been documented in the Cleanup Verification Package (CVP) 2006-00003 as several demolition zones. Per the Sampling and Analysis Plan for Interim Closure of 105-D and 105-H Reactor Below-Grade Structures and Underlying Soils (SAP), the 105 H Reactor ancillary support areas and below-grade structures (118-H-6:2) did not require sampling and analysis because the structures were removed in their entirety and then disposed at the Environmental Restoration Disposal Facility (ERDF). Also per the 105-H Reactor SAP, sampling of the underlying soils was not required because the structures that were removed were not subjected to standing contaminated water and there was no mechanism for residual surface contamination to penetrate into the concrete and underlying soil.

Remedial action goals (RAGs) were documented in The Action Memorandum for the 105-D and 105-H Reactor Buildings and Ancillary Facilities (Action Memorandum) and the Removal Action Work Plan for 105-D and 105-H Building Interim Safe Storage Projects and Ancillary Buildings. The RAGs were further detailed in the Sampling and Analysis Plan for Interim Closure of 105 D and 105-H Reactor Below-Grade Structures and Underlying Soils (105 H Reactor SAP), the 100 Area Remedial Action Sampling and Analysis Plan, and the Remedial Design Report/Remedial Action Work Plan for the 100 Area.

SubSite Code: 118-H-6:3

SubSite Name: 118-H-6:3, 105-H Reactor Fuel Storage Basin and Underlying Soils

Classification: Accepted

ReClassification: Interim Closed Out

Description: The site has been remediated and interim closed out.

Remediation of the subsite has been documented in the Cleanup Verification Package (CVP) 2006-00003. During D&D activities additional evaluation was required in order to determine if the soils underlying the former FSB floor (118-H-6:3) had achieved the RAGs. Therefore, the evaluation of the FSB soils and deep zone side-slope soils also refer to the soils underlying waste sites 100-H-11, 100-H-12, and 100 H 14.) To determine compliance with the RAGs, and in accordance with the 105-H Reactor SAP, radiological surveys and verification sampling analysis were performed on the FSB underlying soils and deep zone side-slope soils.

These data were used in the RESRAD computer model to verify that cleanup criteria were satisfied. The local contamination was removed in preparation for clean demolition, and a fixative was applied as required. With one exception, there are no below-grade structures remaining. A portion of the FSB floor, at its northern end between the two access labyrinths to the D elevator, remains.

Waste site COCs identified through process knowledge were identified in the SAP and classified the different areas and structures into affected media, a summary list of the COCs include: Americium-241, Carbon-14, Cesium-137, Cobalt-60, Europium-152, Europium-154, Europium-155, Neptunium-237, Nickel-63, Plutonium-238, Plutonium-239/240, Strontium-90, Thorium-228, Thorium-232, Tritium (H-3), Uranium-234, Uranium-235, Uranium-238, Hexavalent chromium, Lead, Mercury, and PCBs.

Verification soil samples were collected from soils underlying the former FSB floor in conformance with the 105-H Reactor SAP. Samples numbers All demolition debris from excavations associated with the area was sent to ERDF. Final cleanup verification samples for the FSB underlying soils and deep zone side-slope soils were collected following evaluation of field screening for radiological contaminants using global positioning

environmental radiological surveyor (GPERS) and laser-assisted ranging and data system (LARADS) surveys. This field screening was performed in order to obtain an initial assessment of attainment of radiological cleanup levels

The sample design for the FSB underlying soils was developed specifically to address potential contamination from the known leakage of the FSB. Samples were collected from 10 random sample locations and 3 judgmental sample locations. At each location, soil grab samples were collected from two intervals: the first native soils below the FSB over a 0.3 meter (1 foot) interval and also at 2.4 meters (8 feet) to 3.1 meters (10 feet) below the surface. Soil samples were collected on March 24 and 25, 2004, and on April 6, 2004. The results of the focused sampling (i.e., 3 judgmental samples) are consistent with the statistical sampling results (i.e., the 10 random sample locations) and are provided in Appendix A of the CVP-2006-00003. As yet the results from the HEIS sample numbers have not been loaded into the database.

SubSite Code: 118-H-6:4

SubSite Name: 118-H-6:4, 105-H Fuel Storage Basin Shallow Zone Side Slope Soils

Classification: Accepted

ReClassification: Interim Closed Out

Description: The cleanup verification package (CVP-2010-00005) has demonstrated that remedial action at the 118-H-6:4 subsite has met the Remedial Action Objectives (RAOs) and corresponding Remedial Action Goals (RAGs) as established in the approved Interim Action Record of Decision (ROD) and Remedial Design Report/Remedial Action Work Plan for the 100 Area (RDR/RAWP).

In April 2004, the 118-H-4:6 FSB Shallow Zone Soil subsite was deferred to the Remedial Action Program in order to support the safe storage enclosure (SSE) subcontractor replacement of the 105-H Building roof structure in accordance with the Action Memorandum for the 105-D & 105-H Reactor Facilities and Ancillary Facilities (Action Memorandum) (Ecology 2001). Backfill and stabilization of the FSB excavation was required to accommodate the roof replacement.

In March 2009, further remediation was performed at the 118-H-6:4 waste site, in accordance with the Remaining Sites ROD (EPA 1999), resulting in newly exposed shallow zone side-slope soils requiring verification sampling to interim close this waste site. The side-slope soils in the 105-H FSB shallow zone are at grade level to 4.6 m (15 ft) below grade level.

The contaminants of potential concern (COPCs) were specified in the Sampling and Analysis Plan for Interim Closure of the 105-D and 105-H Reactor Below-Grade Structures and Underlying Soils (DOE-RL 2001) and included radionuclides, lead, mercury, hexavalent chromium, and polychlorinated biphenyls (PCBs). The radionuclides include americium-241, carbon-14, cesium-137, cobalt-60, europium-152, europium-154, europium-155, nickel-63, neptunium-237, plutonium-238, plutonium-239/240, strontium-90, thorium-228, thorium-232, tritium, uranium-233/234, uranium-235, and uranium-238.

Remedial actions occurred in two stages. The first stage of remedial action was conducted in 2004 during D&D of the 105-H Reactor ancillary facilities and the FSB. In March 2004, verification samples indicated that radiological cleanup criteria had not been met in the FSB side-slope shallow zone (CVP-2006-00003). Further remediation was deferred to the Remedial Action Program to allow backfill and stabilization of the FSB excavation for construction of the SSE for the reactor core (WCH CCN 113402). Excavation of the subsite was resumed by the Field Remediation Project on March 17, 2009, and continued through June 29, 2009.

Verification sampling was conducted on January 20 and January 21, 2010, to support a determination that residual contaminant concentration in the soil met cleanup criteria specified in the RDR/RAWP and the Action Memorandum (Ecology 2001).The complete laboratory results were stored in the ENvironmental REstoration (ENRE) project-specific database prior to submitting to the Hanford Environmental Information System (HEIS) for archiving and were provided in Appendix C of the CVP.

Approximately 4,096 bank cubic meters (BCM) (5,358 bank cubic yards [BCY]) of clean overburden material were removed and stockpiled east and west of the excavation to access the original 2004 excavation side-slope soil. Approximately 2,682 BCM (3,508 BCY) of contaminated shallow zone side-slope soil was excavated and direct loaded for disposal at the ERDF. No debris or anomalous material was found during the 2009 excavation.□

The results also show that contaminant levels remaining in the soil are protective of groundwater and the Columbia River. This waste site does not have a deep zone; therefore, no deep zone institutional controls are required.

SubSite Code: 118-H-6:5

SubSite Name: 118-H-6:5, 105-H Decontamination Pads

Classification: Accepted

ReClassification:

Description: Three decontamination (decon) pads were created by the Environmental Restoration Contractor Decommissioning and Demolition Project. The decon pads are arranged in an arc on the south-southeast side of the 105-H SSE. The three decon pads were deferred to the Field Remediation Closure Project in accordance with the Action Memorandum and the Removal Action Work Plan for 105-D and 105-H Building Interim Safe Storage Projects and Ancillary Buildings. This decision was documented in the Deferral of Three Decontamination Areas to the Field Remediation Project. The decontamination areas were not addressed in CVP-2006-00003.

SubSite Code: 118-H-6:6

SubSite Name: 118-H-6:6,118-H-6:6 Deep Zone Side Slope Soils

Classification: Accepted

ReClassification: Interim Closed Out

Description: The site has been remediated and interim closed out.

The CVP-2006-00003 documents that removal action at the 105-H Reactor subsites (118-H-6:2, 118 H-6:3, and 118-H-6:6) has achieved the removal action objectives and remedial action goals (RAO/RAGs) established in The Action Memorandum for the 105-D and 105-H Reactor Buildings and Ancillary Facilities and the Removal Action Work Plan for 105-D and 105-H Building Interim Safe Storage Projects and Ancillary Buildings. The RAGs were further detailed in the Sampling and Analysis Plan for Interim Closure of 105-D and 105-H Reactor Below-Grade Structures and Underlying Soils (SAP), the 100 Area Remedial Action Sampling and Analysis Plan, and the Remedial Design Report/Remedial Action Work Plan for the 100 Area.

The verification sample design for the deep zone side-slope soils in 118-H-6:6 consisted of dividing the area into three equal sections, with a composite of four soil grab samples being collected within each area. Soil samples were collected on March 29, 2004. The verification

sample design for the deep zone side-slope soils was in accordance with the 100 Area SAP and was detailed in the SAP. Waste site contaminants of concern (COCs) identified in the SAP through process knowledge classified the different areas and structures into affected media, a summary list of the COCs included: Americium-241, Carbon-14, Cesium-137, Cobalt-60, Europium-152, Europium-154, Europium-155, Neptunium-237, Nickel-63, Plutonium-238, Plutonium-239/240, Strontium-90, Thorium-228, Thorium-232, Tritium (H-3), Uranium-234, Uranium-235, Uranium-238, Hexavalent chromium, Lead, Mercury, and PCBs.

The remaining soils at the 105 H Reactor site have either been deferred to the Field Remediation Closure Project or have been shown to meet the applicable RAGs through verification sampling, analysis, and RESRAD modeling. All excavated materials generated during the D&D activities were disposed at ERDF, and the area was backfilled to grade with clean backfill. These results also indicate that residual concentrations in the shallow zone will support future land uses that can be represented (or bounded) by a rural-residential scenario and that residual concentrations throughout the site pose no threat to groundwater or the Columbia River.

The subsite has been verified to be remediated in accordance with the Removal Action Work Plan for 105-D and 105 H Building Interim Safe Storage Projects and Ancillary Buildings and the Remedial Design Report/Remedial Action Work Plan for the 100 Area and can be interim closed. The CVP does not demonstrate the acceptability of unrestricted access to deep zone soils (i.e., below 4.6 meters [15 feet]) therefore, institutional controls to prevent uncontrolled drilling or excavation into these deep zone soils are required.

Site Code:	126-H-2	**Classification:**	Accepted
Site Names:	126-H-2, 183-H Clearwells/Disposal Pit	**ReClassification:**	
Site Type:	Dumping Area	**Start Date:**	1975
Site Status:	Active	**End Date:**	

Site Description: The clearwells were used as a disposal facility for demolition waste from the 183-H Basins. A portion of the backfilled clearwells is posted with Soil Contamination signs.

Waste Type: Demolition and Inert Waste

Waste Description: The unit now contains nonhazardous and nonradioactive demolition and inert waste from demolished facilities. This waste includes rubble from such facilities as 190-H, 151-H, 1701-D and the 183-H Solar Evaporation Basins. The following materials were taken to the 183-H Clearwell:

- On (date unknown), 0.78 cubic meters (27.7 cubic feet) of transite from the 1717;
- On 11/10/1986, 125.4 cubic meters (164 cubic yards) of insulators from the Hanford power line cleanup;
- On (date unknown), 0.89 cubic meters (31.5 cubic feet) of transite from the 190 Annex;
- On 9/25/1987, 44.3 cubic meters (58 cubic yards) of non-excessible building equipment from the 1713-H Storage Facility;
- On 3/3/1987, (volume unknown) of galvanized posts and concrete from the perimeter fence;
- On 11/17/1987, 45.9 cubic meters (60 cubic yards) of decommissioned utility fixtures and cross arms;
- On 1/14/1988, 72.6 cubic meters (95 cubic yards) of decommissioned utility guy wires, rebar, and gravel;
- On 1/15/1988, 22.9 cubic meters (30 cubic yards) of decommissioned utility guy wires and concrete;
- On 10/10/1988, 880 used wooden pallets (1.07 by 1.07 meters [3.5 by 3.5 feet]) from the 183-

H Basin;
- On 8/30/1990, 11.5 cubic meters (15 cubic yards) of cement block (60%), wood (30%), insulation (5%), pipe (5%) from 1701-D; (record #1 for 8/30/1990); (radiological release record included);
- On 8/30/1990, 11.5 cubic meters (15 cubic yards) of cement block (60%), wood (30%), insulation (5%), pipe (5%) from 1701-D; (record #2 for 8/30/1990); (radiological release record included);
- On 8/30/1990, 11.5 cubic meters (15 cubic yards) of cement block (60%), wood (30%), insulation (5%), pipe (5%) from 1701-D; (record #3 for 8/30/1990); (radiological release record included);
- On 8/30/1990, 11.5 cubic meters (15 cubic yards) of cement block (60%), wood (30%), insulation (5%), pipe (5%) from 1701-D; (record #4 for 8/30/1990); (radiological release record included);
- On 8/30/1990, 11.5 cubic meters (15 cubic yards) of cement block (60%), wood (30%), insulation (5%), pipe (5%) from 1701-D; (record #5 for 8/30/1990); (radiological release record included);
- On 8/30/1990, 11.5 cubic meters (15 cubic yards) of cement block (60%), wood (30%), insulation (5%), pipe (5%) from 1701-D; (record #6 for 8/30/1990); (radiological release record included);
- On 8/31/1990, 11.5 cubic meters (15 cubic yards) of cement block (60%), wood (30%), insulation (5%), pipe (5%) from 1701-D; (record #1 for 8/31/1990); (radiological release record included);
- On 8/31/1990, 11.5 cubic meters (15 cubic yards) of cement block (60%), wood (30%), insulation (5%), pipe (5%) from 1701-D; (record #2 for 8/31/1990); (radiological release record included);
- On 8/31/1990, 11.5 cubic meters (15 cubic yards) of cement block (60%), wood (30%), insulation (5%), pipe (5%) from 1701-D; (record #3 for 8/31/1990); (radiological release record included);
- On 8/31/1990, 11.5 cubic meters (15 cubic yards) of cement block (90%), rebar (5%), pipe/conduit (5%) from 1701-D; (record #4 for 8/31/1990); (radiological release record included);
- On 8/31/1990, 11.5 cubic meters (15 cubic yards) of cement block (90%), rebar (5%), pipe/conduit (5%) from 1701-D; (record #5 for 8/31/1990); (radiological release record included);
- On 8/31/1990, 11.5 cubic meters (15 cubic yards) of cement block (90%), rebar (5%), pipe/conduit (5%) from 1701-D; (record #6 for 8/31/1990); (radiological release record included);
- On 8/31/1990, 11.5 cubic meters (15 cubic yards) of cement block (90%), rebar (5%), pipe/conduit (5%) from 1701-D; (record #7 for 8/31/1990); (radiological release record included);
- On 8/31/1990, 11.5 cubic meters (15 cubic yards) of cement block (90%), rebar (5%), pipe/conduit (5%) from 1701-D; (record #8 for 8/31/1990); (radiological release record included);
- On 9/7/1990, 9.6 cubic meters (12.5 cubic yards) of roofing asphalt (80%), pipe metal (5%), toilet wood (5%), windows (10%) from 2719-W;
- On 4/26/1991, 245 pallets, 2 cable spools, 53.6 meters (176 feet) of 2 by 6 (9.23 cubic meters [326 cubic feet]) of wood from 100-H;
- On 9/11/1993, 332.6 cubic meters (435 cubic yards) of wood (85%), metal (5%), concrete (10%) from 1722-D and 1713-D; (radiological release record included);
- On 9/12/1993, 137.6 cubic meters (180 cubic yards) of wood (60%), metal (10%), concrete (30%) from 1722-D; (radiological release record included);
- On 11/30/1993, 11.5 cubic meters (15 cubic yards) of material not identified on form from 100-H;
- On 2/22/1994, 1.36 cubic meters (48 cubic feet) of metal (70%), wood (20%), cardboard (10%) from 105-D;

- On 8/10/1994, 0.28 cubic meters (10 cubic feet) of crushed vent ducting (100%) from 105-H; (radiological release survey included);
- On 2/16/1995, 45.9 cubic meters (60 cubic yards) of wood (40%), concrete (40%), steel (40%) from laydown yard, east of the carpenter shop, outside 100-N double fence;
- On 2/16/1995, 45.9 cubic meters (60 cubic yards) of wood (40%), concrete (40%), steel (40%) from laydown yard, east of the carpenter shop, outside 100-N double fence; (record #2 for 2/16/1995);
- On 4/10/1995, 30.6 cubic meters (40 cubic yards) of roofing material, including tar and gravel (asphalt), fiberboard, metal flashing and wood debris from 105-D roof replacement; (radiological release statement included);
- On 4/11/1995, 30.6 cubic meters (40 cubic yards) of roofing material, including tar and gravel (asphalt), fiberboard, metal flashing and wood debris from 105-D roof replacement; (radiological release statement included);
- On 10/23/1995, 2,666.5 cubic meters (3,487.6 cubic yards) of concrete (90%), iron (10%), including superstructure, walls, catwalks, pillars, rebar from 100-H/183-H Solar Basins; (See second waste record);
- On 12/14/1995, 11.5 cubic meters (15 cubic yards) of wood (50%), plastic (40%), metal (10%) from 100-N, N Reactor Deactivation;
- On 10/11/1995, 38.2 cubic meters (50 cubic yards) of wood (99%), soil/metal (1%) from 100-D/190-D demolition;
- On 10/11/1995, 7.6 cubic meters (10 cubic yards) of asphalt/concrete from 100-N waterline upgrade;
- On 10/23/1995, 0.8 cubic meters (1.0 cubic yard) of scrap electrical wire from 100-N potable waterline upgrade;
- On 11/10/1995, 122.3 cubic meters (160 cubic yards) of metal (75%), concrete (10%), wood (10%), conduit (5%) from 100-N, Buildings 1100 and 1101;
- On 2/20/1996, 22.9 cubic meters (30 cubic yards) of asphalt (80%), dirt (20%) from 100-N/Field Deactivation;
- On 3/4/1996, 0.4 cubic meters (0.5 cubic yards) of plastic (100%) from 100-HR-3 Pump and Treat;
- On 5/9/1996, 12.2 cubic meters (16 cubic yards) of iron (5%), tar-rock (95%) from 100-H;
- On 5/11/1996, 12.2 cubic meters (16 cubic yards) of tar (40%), iron (30%), wood (20%), tin (10%) from 100-H;
- On 5/12/1996, 12.2 cubic meters (16 cubic yards) of galvanized metal (60%), wood (40%) from 100-H; (truck #1);
- On 5/12/1996, 12.2 cubic meters (16 cubic yards) of galvanized metal (40%), wood (60%) from 100-H; (truck #2);
- On 5/17/1996, 12.2 cubic meters (16 cubic yards) of tar (95%), iron (5%) from 100-H;
- On 5/18/1996, 12.2 cubic meters (16 cubic yards) of tar (100%) from 100-H; (truck #1)
- On 5/18/1996, 12.2 cubic meters (16 cubic yards) of tar (85%), steel (15%) from 100-H; (truck #2);
- On 5/18/1996, 12.2 cubic meters (16 cubic yards) of tar (100%) from 100-H; (truck #2);
- On 5/19/1996, 12.2 cubic meters (16 cubic yards) of tar-rock (95%), iron (5%) from 100-H;
- On 8/18/1996, 24.5 cubic meters (32 cubic yards) of concrete (80%), iron (20%) from 100-DR;
- On 8/19/1996, 24.5 cubic meters (32 cubic yards) of concrete (80%), iron (20%) from 100-DR;
- On 2/12/1997, 84.1 cubic meters (110 cubic yards) of asphalt (95%), rock (4%), metal (1%) from 100-H/183-H;
- On 4/11/1997, 34.4 cubic meters (45 cubic yards) of old asphalt from 200 West Area, 200-ZP-1 Phase III;
- On 7/16/1997, 15.3 cubic meters (20 cubic yards) of fiberglass insulation from the exterior of the 1715-N Diesel Tanks;
- On 7/15/1997, 22.9 cubic meters (30 cubic yards) of fiberglass insulation from demolition from 163-N roofing;

- On 7/18/1997, 11.5 cubic meters (15 cubic yards) of fiberglass insulation from the exterior of the 1715-N Diesel Tanks;
- On 7/18/1997, 1.5 cubic meters (2 cubic yards) of hatch lid, metal on wood construction from 163-N Roof;
- On 8/7/1997, 7.6 cubic meters (10 cubic yards) of broken asphalt pieces from pipeline road crossings from 100-HR-3 Project;
- On 8/26/1997, 160.6 cubic meters (210 cubic yards) of concrete (80%), rebar (20%) from 100-N/105-NC;
- On 9/25/1997, 107.0 cubic meters (140 cubic yards) of concrete, rebar, metal roofing and miscellaneous steel from 100-N/1734-N;
- On 10/11/1997, 11.5 cubic meters (15 cubic yards) of concrete (90%), wood (10%) from 2614 E2, W2, W4, W5.

Waste Type: Demolition and Inert Waste

Waste Description: The suspected contaminated waste is concrete and debris from the demolition of the 183-H Solar Evaporation Basins (116-H-6). The area is posted as a soil contamination area. After removal of the surface of the concrete, prior to demolition, all surfaces were surveyed with field instrumentation. The survey results for all surfaces were less than 1,000 disintegrations per minute per 100 square centimeters (15.5 square inches) smearable (loose) contamination and less than 5,000 disintegrations per minute per 100 square centimeters (15.5 square inches) total contamination.

On October 23, 1995, 2,666.5 cubic meters (3,487.6 cubic yards) of concrete (90%), iron (10%), including superstructure, walls, catwalks, pillars, rebar from 100-H/183-H Solar Basins were disposed of in the 183-H Clearwell.

Site Code: 132-H-1 **Classification:** Accepted

Site Names: 132-H-1, 116-H Reactor Exhaust Stack Burial Site **ReClassification:** Interim Closed Out (6/26/2007)

Site Type: Burial Ground **Start Date:** 1945

Site Status: Inactive **End Date:** 1965

Site Description: The site consisted of an excavated trench that contained demolition rubble of the Reactor Exhaust stack and foundation. The stack was originally part of the 105-H Reactor Gas and Exhaust Air system.

Waste Type: Demolition and Inert Waste

Waste Description: Air moving from the least contaminated zones through increasingly contaminated zones was discharged to the stack unfiltered. At the time of demolition low-level smearable alpha contamination was present measuring up to 30 disintegrations/minute per 100 square centimeters (190 disintegrations/minute per 100 square inches). Smearable beta contamination ranged from 100 to 5,000 disintegrations/minute per 100 square centimeters (650 to 32,000 disintegrations/minute per 100 square inches).

Site Code: 132-H-3 **Classification:** Accepted

Site Names: 132-H-3, 1608-H Waste Water Pumping Station Site, 116-H-8, 1608-H Effluent Pumping Station Site **ReClassification:**