Status of Outdoor Radioactive Contamination at the Hanford Site

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STATUS OF OUTDOOR RADIOLOGICAL CONTAMINATION AT THE HANFORD SITE

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STATUS OF OUTDOOR RADIOLOGICAL CONTAMINATION AT THE HANFORD SITE

EXECUTIVE SUMMARY

This document summarizes the status of outdoor radioactive contamination near Hanford Site facilities and disposal sites. It defines the nature and areal extent of the radioactively contaminated areas and describes the historical, ongoing, and planned radiological monitoring and control activities.

Radioactive waste has been disposed of to the soil column since shortly after the reactors and production facilities began operating. Radioactive liquid wastes were placed directly into the ground via liquid discharges to cribs, ponds, ditches, and reverse wells. Solid wastes were placed in trenches, burial vaults, and caissons.

Although the Hanford Site covers 1,450 km² (560 mi²), the radioactively contaminated area is only about 36 km² (14 mi²) or 2.5 percent of the original site (See Figure 1). Over time, contamination has migrated from some of the waste management sites through various vectors (e.g., burrowing animals, deep-rooted vegetation, erosion, containment system failure) or has been deposited to the surface soil via spills and unplanned releases (e.g., line leaks/breaks, tank leaks, and stack discharges) and created areas of outdoor radioactivity both on and below the surface. Currently 26 km² (10 mi²) are posted as surface contamination and 10 km² (4 mi²) are posted as underground contamination.

A U.S. Department of Energy "Tiger Team" assessment conducted at the Hanford Site in 1990 identified a key finding that the "radioactively contaminated surface soil areas are expanding at a rate greater than the stabilization and cleanup rates." This perception was partly caused by problems with methods for surveying and record keeping that led to uncertainties in the locations and areal extent of contamination. While the perception that "spread exceeded cleanup" was true at that time, current monitoring and cleanup techniques have reversed that trend.

An extensive sitewide near-field Operational Environmental Monitoring Program conducted by Westinghouse Hanford Company includes routine collection of air, water, soil, vegetation, and small animal samples. Also, waste sites are routinely surveyed to identify potential sources of migrating contamination. An herbicide spray program controls deep-rooted vegetation on waste sites. An animal and pest control program controls animals found in restricted areas. In addition to these "near-field" controls, the Site Environmental Surveillance Program, operated by Pacific Northwest Laboratory, monitors for environmental contaminants emanating from the Hanford Site.

Most of the contaminated open ponds and ditches have been removed from service and interim stabilized. Remediation of the remaining standing water sites should reduce sources of animal contamination and help control contamination spread. Discharge of contaminated waste water to the soil column will end by 1995, except for the State-Approved Land Disposal System,

which will discharge treated effluent to the ground immediately north of the 200 West Area.

The Radiation Area Remedial Action (RARA) program, now directed by the Environmental Restoration contractor, stabilizes contaminated inactive radioactive waste sites. Since the RARA program began in 1979, approximately 858 ha (2,121 acres) have been decontaminated, interim stabilized, or released from posting.

A sitewide, fully integrated, soil contamination control program established to prevent the spread of contamination to the environment needs to be improved so that, once completed, the restoration and remediation of the waste sites can be maintained. Reporting the extent and progress of cleanup status of outdoor radioactive contamination in the existing site annual environmental report would facilitate tracking and measuring progress.

Figure ES-1. Radioactive Contamination Status, October 1994.

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TERMS

AEC	Atomic Energy Commission
ALARA	As Low As Reasonably Achievable
ARHCO	Atlantic Richfield Hanford Company
DOE	U.S. Department of Energy
HGIS	Hanford Geographic Information System
MOU	memorandum of understanding
O&E	operations and engineering
OEMP	Operational Environmental Monitoring Program
PNL	Pacific Northwest Laboratory
R&D	research and development
RARA	Radiation Area Remedial Action
RARP	Radiation Area Reduction Program
RCA	Radiologically Controlled Area
RPR	radiological problem report
SALDS	State-Approved Land Disposal System
SC	Surface Contamination
URM	Underground Radioactive Material
WHC	Westinghouse Hanford Company
WIDS	Waste Information Data System

1.0 INTRODUCTION

This report summarizes the status of outdoor radioactive contamination near Hanford Site facilities and waste sites. The summary will enable management to better understand these areas and provide a basis for planning and funding requests for their surveillance, interim stabilization, and cleanup. The summary also defines the nature and extent of the radioactively contaminated areas and describes historical, ongoing, and planned radiological monitoring and control activities. It also includes recommendations for program improvements. A clear understanding of the nature, significance, risks, and potential liabilities from outdoor radiological surface contamination are required to ensure that adequate resources are applied to the cleanup of these areas.

Westinghouse Hanford Company (WHC), the Operations and Engineering (O&E) contractor for the U.S. Department of Energy (DOE) at the Hanford Site is responsible for managing the fuel reprocessing and radioactive waste management facilities at the Hanford Site. WHC's Operational Environmental Monitoring Program (OEMP) provides facility-specific environmental monitoring to protect the environment adjacent to these facilities and ensures compliance with WHC requirements and local, state, and federal environmental regulations.

2.0 SITE DESCRIPTION

The Hanford Engineering Works, now called the Hanford Site, was acquired by the Federal Government in 1943 for the development and production of nuclear material for national defense. With the shutdown of the last production facilities in 1994, the mission changed from nuclear materials production to nuclear waste management, technology development, and environmental cleanup and restoration.

The Hanford Site, shown in Figure 1, is located in south-central Washington State. It contains approximately 1,450 km² (560 mi²) of semi-arid shrub-steppe grassland. Only about 6 percent of the land has been used for producing nuclear materials and storing and disposing of waste.

The climate in the area is among the hottest and driest in the Pacific Northwest. The annual rainfall averages less than 16 cm (6.3 in.) and the annual average temperature is 11.9 °C (53.3 °F), with a maximum recorded temperature of 46 °C (115 °F) and a minimum recorded temperature of -32.8 °C (-27 °F) (Dirkes, et al. 1994).

During the 50 years of operation, liquid radioactive wastes resulting from the production of nuclear materials were released to the ground via discharges to cribs, ponds, ditches, and reverse wells; solid wastes were placed in trenches, burial vaults, and caissons. These waste management sites were designed for low maintenance; therefore, biological barriers were rarely an integral part of the design (Johnson et al., 1994). Over time, contamination has migrated from the waste management sites through various vectors (e.g., burrowing animals, uptake by deep-rooted vegetation, and erosion) and created areas of outdoor radioactive surface contamination. In addition to the planned disposal of wastes to the soil column, spills and

Figure 1. Hanford Site.

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unplanned releases (e.g., line leaks/breaks, tank leaks, and stack discharges) contributed to the contamination both on and below the surface.

3.0 HISTORICAL OPERATIONAL ENVIRONMENTAL MONITORING

Monitoring of the waste management sites started with nuclear materials production and continued throughout the operations period. It continues still with the change in mission, but now has added emphasis on the health and safety of the employees, the public, and the environment. The following are the highlights of the development of the Operational Environmental Monitoring program at the Hanford Site (Schmidt 1993a):

- 1943 The first environmental samples are collected at the Hanford Site. Subsequent monitoring expands and improves the "program," but no real coordination occurs between general environment and operations areas.
- 1974 The Atomic Energy Commission (AEC) manual requires AEC and its contractors to monitor and evaluate onsite discharges, liquid and airborne effluents, and the environment in the vicinity of AEC sites.
- 1975 The Atlantic Richfield Hanford Company (ARHCO) initiates the first of a series of annual reports describing the results of onsite routine environmental surveillance and the control of waste releases under the facility management. This report is the precursor to the *Westinghouse Hanford Company Operational Environmental Monitoring Annual Report*, WHC-EP-0573.
- 1978 An integrated operational environmental monitoring program in the 100 Areas is established in response to a U.S. Department of Energy, Richland Operations Office (RL) program review and operations 1979 directive. A grid system of monitoring is established in the 200 Areas, which treats the 200 East and 200 West Areas as if each were a "point source."
- 1979 Various O&E contractors begin annual "near-facility" environmental reporting. This involves up to five separate contractors. The Radiation Area Reduction Program (RARP), later to become the Radiation Area Remedial Action (RARA) Program is started and the management and control of contaminated surface soil sites begins. The primary elements of the RARP are to conduct the surveillance, maintenance, decontamination, and interim stabilization of inactive burial grounds, cribs, ponds, trenches, and unplanned release sites.
- 1987 Three contractors with remediation responsibilities are consolidated into one. To eliminate redundancy and consolidate the sitewide and operations monitoring programs, a memorandum of understanding (MOU) is developed that

delineates the tasks of the O&E and research and development (R&D) contractors. Major emphasis is placed on eliminating redundancy in sampling and monitoring and in sharing information among the contractors.

- 1991 Redundant sample locations are eliminated except for a few sample sites that are collocated to include regulator sample points for comparison purposes. Expansion of information exchanges is accomplished.
- 1993 Fine tuning of the MOU, sample and data sharing, and technical exchanges to ensure that contractors are meeting all regulatory requirements and eliminating redundant data acquisition are ongoing activities.

4.0 IDENTIFICATION AND CONTROL OF RADIOACTIVE CONTAMINATION

The control of radioactive contamination is monitored by conducting radiological surveys of radioactive waste sites and inspecting the waste sites to determine compliance with established standards and requirements. These regulations also identify group responsibilities for monitoring, tracking, cleanup, and follow-up. The results of contamination monitoring and control activities are available in various quarterly and annual status reports.

Radiological standards for the waste disposal sites and environs, along with the company-wide responsibilities for controlling radioactive contamination are delineated in the WHC manual *Environmental Compliance*, WHC-CM-7-5. While the overall responsibilities and standards are outlined in WHC-CM-7-5, each group's procedures relating to contamination control are delineated in controlled manuals specific to that group.

The Near-Field Monitoring group, in cooperation with the Radiological Control organization, schedules monitoring of the waste disposal sites, as well as interconnecting roads, railroads, and the nearby environs. Facilities and sites found out of compliance with existing standards are identified to the responsible organization (e.g., Tank Waste Remediation Systems, Solid Waste Division, and Plutonium Finishing Plant).

The Radiological Control organization's technicians perform the radiological surveys in accordance with procedures written in the *Health Physics Procedures Manual*, WHC-IP-0718 (WHC 1993). Copies of the radiological surveys are given to Near-Field Monitoring for review and to be kept as a site-specific historical reference. Radiological Control identifies contamination and posting discrepancies. A radiological problem report (RPR) may be issued to notify landlords of violations of the policies in the *WHC Radiological Control Manual*, WHC-CM-1-6.

The radiological status of the waste sites and facility environs, as well as the analytical results of air samples, surface soil/vegetation, surface water, sediment, aquatic vegetation, biota, and radiological survey results are documented in the *Westinghouse Hanford Company Environmental Surveillance Annual Report*, WHC-EP-0573. The status of the surface contamination also is tracked in the *Quarterly Environmental Radiological Survey Summary Report*, WHC-SP-0665. Data from these reports are summarized in

Survey Summary Report, WHC-SP-0665. Data from these reports are summarized in the *Hanford Site Environmental Report*, published by Pacific Northwest Laboratory (PNL).

Facility operations groups are responsible for the physical maintenance and posting of the waste sites. The operations personnel follow appropriate company procedures for posting and decontamination. When identified discrepancies are corrected, operations requests that the correction be verified and the item is closed.

4.1 POSTING

4.1.1 Underground Radioactive Material (URM) Areas. Posted areas with known contamination contained below the surface. These areas are typically cribs, burial grounds, covered ponds, trenches, and ditches. These areas are considered interim stabilized when the contaminated material is isolated so that it no longer affects the surface environs. Facility management is required to provide an adequate barrier over the contamination source to inhibit radionuclide transport to the surface.

4.1.2 Surface Contamination (SC) Areas. May or may not be associated with an URM structure. An URM with a breach in its biological barrier may result in growing contaminated vegetation and/or animal intrusion that may bring contamination to the surface. Vent pipes or risers from the structure can be a source of speck contamination. Fallout from stacks or unplanned releases from previously operating facilities may have caused an area of surface contamination that is not related to a subsurface structure. Both SC and URM sites are susceptible to contamination migration. Radioactive waste sites are routinely surveyed (at least annually) to document the current radiological status (Schmidt 1993b).

Radiological surveys are performed on road surfaces with a mobile radioactivity detection system equipped with sodium iodide detectors or plastic scintillators. Radiological surveys of railroads are conducted with a vehicle equipped with "high railers," which allow the vehicle to travel on both the roads and railroad tracks, and adjustable-height sodium iodide detectors. The average survey height is 30 cm. The vehicles are driven at less than 8 km/hr. When activity is detected, the vehicle is stopped and portable hand-held survey instruments are used to thoroughly survey the area and identify the extent of the contamination. Appropriate management is notified when contamination is identified and corrective actions are initiated.

4.2 CONTAMINATION SOURCES

4.2.1 Vegetation. Deep-rooted vegetation can absorb certain radionuclides, most commonly cesium, strontium, and technetium. Vegetation samples are also tested for uranium and plutonium to assess the possibility of airborne deposition from nearby facilities. Radionuclide uptake can be a concern in any deep-rooted vegetation, but the most common problem is with Russian thistle (i.e., tumbleweed) because it grows most profusely on soil disturbed by activities such as those found on waste disposal sites (Johnson, et al. 1994). Radionuclide uptake in tumbleweeds becomes a problem when the

contaminated weed breaks off and is then free to blow about the site. As it rolls, it may drop contaminated fragments, spreading contamination. It also drops seeds that are then available to be deposited on waste sites, increasing the possibility of more contaminated deep-rooted vegetation.

Contaminated vegetation also can become a food source for the animal population on the Hanford Site. Contaminated animal feces are frequently found to be the cause of contamination in outdoor areas. In addition, there is a small possibility of human consumption of contaminated fruits and vegetables. Mulberry trees in the 100 Areas and asparagus in the 100 and 300 Areas growing near the Columbia River bank have been found to contain detectable amounts of radionuclides (Schmidt, et al. 1993). Because public access from the river is possible, Washington State, DOE, and EPA all are interested in having the contaminated vegetation removed. Herbicide programs have been initiated to prevent regrowth.

4.2.2 Animal. Intrusion is evident in several forms. Burrowing animals (e.g., badgers, ants, and termites) may bring contamination to the surface as they dig. Some animals consume the radioactive salts and spread the contamination by excretion. In turn, some of the smaller contaminated animals (e.g., mice) are consumed by predators and the contamination is spread further in their excretions (Johnson et al. 1991).

Birds are attracted to open ponds and ditches that can contain radionuclides. Swallow nests made from contaminated mud have been found on the sides and eaves of buildings and structures. Pigeons drink the water leaving contaminated fecal material in their roosts and nests. Migratory waterfowl could possibly transport contamination off site. More information on the spread of contamination by biota on the Hanford Site can be found in *Historical Records of Radioactive Contamination in Biota at the 200 Areas of the Hanford Site*, WHC-MR-0418 (Johnson et al. 1994).

4.2.3 Physical Parameters. Windblown specks, erosion, and soil subsidence at contaminated facilities are other sources of outdoor surface contamination. Stacks, vents, risers, burial ground activities, tank farm operations, and dried effluent pond and ditch banks have contributed to the contamination problems at the Hanford Site. Radioactive shipments by trucks or railroad cars also have been known to deposit contaminants across the site.

Large areas of speck contamination are often designated as unplanned release sites when found. The area landlord is responsible for cleanup and remediation when the unplanned release is not associated with a specific waste site or facility. Therefore, large surface contamination zones may not be remediated in a timely manner.

4.3 CONTAMINATION CONTROLS

Several methods have been used to control surface contamination. During the 1970's, the 100 Areas underwent an extensive cleanup campaign in which the surface contaminated sites were decontaminated or the contaminated soil consolidated and covered with pit run cobbles. Soil sterilants were then applied to eliminate vegetation regrowth. Because of different surface soil types in the 200, 300, and 600 Areas, a different method for interim stabilization of the waste sites was used. The waste sites were

decontaminated or the contaminated soil was consolidated then covered with varying amounts of soil backfill followed by approximately 7 cm of top soil. The interim stabilized area was then revegetated with shallow-rooted grasses. Selective herbicides were used to minimize deep-rooted vegetation growth, while allowing shallow-rooted grasses to remain for erosion control and to inhibit deep-rooted vegetation such as Russian thistle.

In June 1989, the Secretary of Energy announced a 10-point initiative to strengthen environmental protection and waste management activities in the DOE. One part of the initiative involved conducting Tiger Team assessments at all of DOE's operating facilities (DOE 1990). The assessment conducted at the Hanford Site from May to July of 1990 identified a key finding that the "radioactively contaminated surface soil areas are expanding at a rate greater than the stabilization and cleanup rates." The report went on to state that "despite efforts by the Site to locate, post, stabilize, and clean up surface contamination, the total area of contaminated soil continues to increase by approximately 8 ha (20 acres) per year." The perception of increased expansion was compounded by the fact that problems with the methods for surveying and record keeping led to uncertainties in the locations and areal extent of contamination. It should be noted that the situation has reversed in the last several years, but it could revert to past conditions if monitoring and cleanup were discontinued.

The Tiger Team asked that, pursuant to DOE order requirements, WHC establish the necessary controls to prevent the spread of identified contamination to the uncontaminated environment. In response, WHC initiated the extensive, sitewide, Near-Field Operational Environmental Monitoring Program, which collects samples and surveys waste sites routinely to identify potential sources of contamination migration. The Site Environmental Surveillance Program, operated by PNL, monitors the overall environment and measures offsite levels of radioactivity. Deep-rooted vegetation with potential to take up radionuclides is controlled through a vegetation control program. Herbicides are used in selected areas to minimize deep-rooted vegetation on waste sites. The WHC Animal Control Program seeks to eliminate animals found in restricted areas and relocates uncontaminated species to appropriate uncontaminated areas.

Most of the radioactively contaminated open ponds and ditches have been removed from service and interim stabilized. Waste sites that have been interim stabilized are listed in Appendix B. Remediation of the remaining standing-water sites should reduce animal contamination sources and help control contamination spread. Discharge of contaminated waste water to the soil column is to cease by 1995 with the exception of the State-Approved Land Disposal System (SALDS).

The As Low As Reasonably Achievable (ALARA) program and other company standards have increased awareness of the consequences of our operations. Tighter restrictions and changes in procedures have reduced many sources of speck contamination. Remediation techniques have been modified to minimize the contaminated soil volume. New technologies in fixatives and soil additives are being tested and considered.

The RARA program, now under direction of the environmental restoration contractor, interim stabilizes contaminated inactive radioactive waste sites. Since the beginning of the RARA program in 1979, approximately 858 ha

(2,121 acres) have undergone decontamination, interim stabilization, or reposting. Table 1 summarizes the number of sites and the amount of area decontaminated, stabilized, or reposted and gives the year it was accomplished.

The large area down-posted in 1991 was the result of the removal from radiological controls of an unplanned release site known as UN-216-E-31. This site had encompassed approximately 405 ha (1,000 acres) of speck contamination and was posted as a RCA. Extensive surveys of the rough terrain with the removal of any contamination found allowed for the release of the area.

Table 1. RARA Decontamination, Remediation, and Reposting.

Year	Number of Sites	Area [ha (acres)]
1994 (10/31/94)	14	43 (107)
1993	23	10 (24)
1992	25	33 (82)
1991	21	416 (1029)
1990	9	8 (19)
1989	7	8 (20)
1988	2	8 (19)
1987	4	17 (42)
1986	5	13 (31)
1985	10	50 (123)
1984	10	60 (149)
1983	16	70 (172)
1982	8	31 (76)
1981	65	49 (122)
1980	11	28 (70)
1979	6	15 (36)
Before 1979	16	16 (40)
Total	248	874 (2161)

5.0 RESULTS

Approximately 2,575 ha (6,364 acres) of outdoor SC and 981 ha (2,423 acres) of URM are posted on site. These posted areas are listed in Table 2. Outdoor SC and URM areas are shown in Figures 2 and 3, respectively.

Active waste storage and disposal facility areas (i.e., tank farms and burial grounds) are included in these calculations. The size and posting of the waste sites were obtained through actual field measurements/verification, which were entered into the Hanford Geographic Information System (HGIS); areas assigned by the RARA program after interim stabilization; or through the Waste Information Data System (WIDS).

Table 2. Outdoor Contamination Posting Status as of October 1994.

Hanford Site (by area)	Surface Contamination [ha (acres)]	Underground Radioactive Material [ha (acres)]
100 B/C	8.0 (20)	38.9 (96)
100 KE/KW	10.7 (26)	52.2 (129)
100 N	29.4 (73)	0.3 (1)
100 D/DR	6.1 (15)	32.9 (81)
100 H	0.4 (1)	13.4 (33)
100 F	8.0 (20)	30.1 (74)
200 East	2,269.5 (5,608) ¹	138.9 (343)
200 West	222.2 (549)	656.0 (1,621)
300	21.2 (52)	12.5 (31)
400	0	0
600	0	5.8 (14)
Total	2,575.5 (6,364)	981.0 (2,423)

¹This large area includes the BC Controlled Zone.

The SC area is approximately three times larger than the URM sites because of the tendency for surface contamination to be spread more readily by such factors as wind and biotic uptake (e.g., the BC Controlled Area located south of 200 East Area). This area contains known speck contamination that originated primarily from animal intrusion. It is posted as a Radiologically Controlled Area (RCA) and encompasses approximately 1,012 ha (2,500 acres) (Schmidt, et al. 1994).

The number of posted surface contaminated hectares is not constant because the various responsible facilities and organizations are continually working to clean, stabilize, and remediate known areas of contamination. New areas of contamination are identified by the OEMP. Newly identified contaminated areas may be the result of contamination migration caused by erosion or biological intrusion. Occasionally, changing radiological standard criteria affect the designation of contaminated areas. Area maps showing the surface contamination and underground radioactive contamination zones are in Appendix A.

Contamination Status (Hectares)

October 1994

Underground Radioactive Material

Figure 2. Status of Surface Contamination.

WMC-SP-1149

Contamination Status (Hectares)

October 1994

Surface Contamination

Figure 3. Status of Underground Contamination.

6.0 SUMMARY

During May, June and July of 1990, a DOE Tiger Team was on site to ensure that the Hanford Site was operating in accordance with DOE orders and objectives. That assessment, DOE/EH-0139, *Tiger Team Assessment of the Hanford Site*, Finding Number SSB/CF-1 (DOE 1990), indicated a need for a fully integrated soil contamination control program. The finding also stated that appropriate controls should be established to prevent the spread of radioactive contamination to the uncontaminated environment.

Prioritization of cleanup activities and levels needs to take into account programmatic responsibilities. A *Hanford Site Surface Soil Radioactive Contamination Control Plan* (WHC 1991, 1992) was issued in 1991 and 1992. The plan addresses contaminated site identification, establishes owner responsibility, and helps to prioritize the site cleanup criteria. The RARA program refers to this document when drafting their work plan for the next years activities. Tank Farms Environmental Engineering issued a report on 1995 Surface Contamination Reduction in Tank Farms for fiscal year 1995 in September 1994, which addresses the cleanup schedule for Tank Farm Facilities. However, the programs still lack adequate, consistent funding to support the planned cleanup schedules. Many of the surface-contaminated sites have landlords other than RARA or Tank Farms. The status, ownership, area, year interim stabilized, and posting category of the radioactive waste sites are listed in Appendix B. Current facility landlord budgets, such as B Plant, Plutonium Finishing Plant, Plutonium-Uranium Reduction Plant, and T Plant, allow for only minimal maintenance of outdoor waste sites. Facility program managers need to be aware of the Tiger Team finding and provide the means to allow the facilities to be responsible for the waste sites under their control. A work plan similar to the one the RARA program issues is needed for facilities considered to be ACTIVE to incorporate outdoor radiological contamination reduction into their programs.

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APPENDIX A

MAPS BY AREA SHOWING CONTAMINATION STATUS

(Note: The area maps are also available using different colors to to define the contamination status).

Figure A-1. Status of Outdoor Radiological Contamination at the 100B Controlled Zones (1994).

Figure A-2. Status of Outdoor Radiological Contamination at the 100F Controlled Zones (1994).

Figure A-3. Status of Outdoor Radiological Contamination at the 100 D/DR Controlled Zones (1994).

WHCWNFM12-9411DCZNBW

Figure A-4. Status of Outdoor Radiological Contamination at the 100H Controlled Zones (1994).

WHC/NFM12-94/1HCZNBW

Figure A-5. Status of Outdoor Radiological Contamination at the 100 KE/KW Controlled Zone (1994).

WHC/FM12-941KCZNEW

Figure A-6. Status of Outdoor Radiological Contamination at the 100N Controlled Zones (1994).

Figure A-7. Status of Outdoor Radiological Contamination at the 200 East Area Controlled Zones (1994).

WHC/NFM/12-94/2ECZNBW

Figure A-8. Status of Outdoor Radiological Contamination at the 200 West Area Controlled Zones (1994).

WHC/NFM12-94/2WCZNBW

Figure A-9. Status of Outdoor Radiological Contamination at the 300 Area Controlled Zones (1994).

Figure A-10. Status of Outdoor Radiological Contamination at the 400 Area Controlled Zones (1994).

Figure A-11. Status of Outdoor Radiological Contamination at the 600 Area Controlled Zones (1994).

APPENDIX B

WASTE SITE STATUS AND POSTING

Table B-1. Waste Site Status and Posting

Waste Site	Status	Landlord	Area [hectares (acres)]	Stabilized	Posted
107-B Basin (116-B-11)	I	ERC	1.0 (2.5)		SC
107-C Basin (116-C-5)	I	ERC	0.8 (1.9)		SC
107-D Basin (116-D-7)	I	ERC	1.0 (2.5)		SC
107-DR Basin (116-DR-9)	I	ERC	1.7 (4.2)		SC
107-F Basin (116-F-14)	I	ERC	1.0 (2.5)	1994	URM
107-H Basin (116-H-7)	I	ERC	1.6 (4.0)	1994	URM
107-KE Basin (116-KE-4)	I	ERC	3.5 (8.6)		SC
107-KW Basin (116-KW-3)	I	ERC	3.4 (8.5)		SC
UN-100-F-1 (UPR-100-F-1)	I	WHC	0.02 (0.04)	1970's	URM
116-B-1 trench	I	ERC	0.2 (0.5)	1970's	URM
116-B-2 trench	I	ERC	0.007 (0.02)	1970's	URM
116-B-3 crib	I	ERC	9.3m ²	1970's	URM
116-B-4 crib (French drain)	I	ERC	2.3m ²	1970's	URM
116-B-5 trench	I	ERC	0.8 (1.9)	1970's	URM
116-B-6-1 crib (116-B-6A)	I	ERC	8.9m ²	1970's	URM
116-B-6-2 crib (116-B-6B)	I	ERC	3.0m ²	1970's	URM
116-B-7 outfall	I	ERC	0.004 (0.009)	1970's	URM
116-B-8 outfall (132-B-6)	I	ERC	0.004 (0.009)	1970's	URM
116-B-9 French drain	I	ERC	1.0m ²	1970's	URM
116-B-10 dry well	I	ERC	1.0m ²	1970's	URM
116-B-13 crib	I	ERC	0.02 (0.06)	1970's	URM
116-B-14 crib (sludge trench)	I	ERC	0.01 (0.03)	1970's	URM
116-C-1 trench	I	ERC	0.8 (1.9)	1970's	URM
116-C-2A pluto crib	I	ERC	32.3m ²	1970's	URM
116-C-2B pump station	I	ERC	7.4m ²	1970's	URM
116-C-2C sand filter	I	ERC	0.006 (0.02)	1970's	URM
116-C-4 outfall 132-C-2	I	ERC	0.004 (0.009)	1970's	URM
116-C-8 crib					
116-D-1A trench	I	ERC	0.01 (0.03)	1970's	URM
116-D-1B trench	I	ERC	0.009 (0.02)	1970's	URM
116-D-2 crib	I	ERC	0.01 (0.03)	1970's	URM
116-D-3 crib (French drain)	I	ERC	0.7m ²	1970's	URM
116-D-4 French drain	I	ERC	0.7m ²	1970's	URM

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Waste Site	Status	Landlord	Area [hectares (acres)]	Stabilized	Posted
116-D-5 outfall	I	ERC	0.01 (0.03)	1970's	URM
116-D-6 crib	I	ERC	0.7m ²	1970's	URM
116-DR-1 and -2 trenches	I	ERC	0.49 (1.2)	1970's	URM
116-DR-3 trench	I	ERC	0.05 (0.12)	1970's	URM
116-DR-4 crib (105-DR pluto)	I	ERC	9.3m ²	1970's	URM
116-DR-5 outfall	I	ERC	0.004 (0.009)	1970's	URM
116-DR-6 trench	I	ERC	0.005 (0.01)	1970's	URM
116-DR-7 inkwell crib	I	ERC	2.3m ²	1970's	URM
116-DR-8 storage pad	I	ERC	9.3m ²	1970's	URM
116-F-1 Lewis canal	I	ERC	1.01 (2.5)	1992	URM
116-F-2 trench	I	ERC	0.24 (0.60)	1970's	URM
116-F-3 trench	I	ERC	0.03 (0.075)	1970's	URM
116-F-4 crib	I	ERC	9.3m ²	1970's	URM
116-F-5 crib	I	ERC	0.08 (0.2)	1970's	URM
116-F-6 trench (P-11)	I	ERC	0.31 (0.76)	1970's	URM
116-F-7 crib (117-F-7)	I	ERC	1.2m ²	1986	RELEASED
116-F-8 French drain	I	ERC	0.004 (0.009)	1970's	URM
116-F-9 trench	I	ERC	0.17 (0.41)	1970's	URM
116-F-10 dummy decon French drain	I	ERC	0.7m ²	1970's	URM
116-F-11 French drain (105-F)	I	ERC	0.7m ²	1970's	URM
116-F-12 French drain	I	ERC	0.7m ²	1970's	URM
116-F-13 exp. garden French drain	I	ERC	0.7m ²	1970's	URM
116-H-1 trench	I	ERC	2.1 (5.1)	1970's	URM
116-H-2 trench	I	ERC	0.3 (0.6)	1992	URM
116-H-3 French drain	I	ERC	0.7m ²	1970's	URM
116-H-4 crib (105-H pluto crib)	I	ERC	1.5m ²	1960	EXHUMED
116-H-5 outfall	I	ERC	0.02 (0.05)	1970's	URM
116-H-6 basin (183-H solar pond)	I	ERC	1.5 (3.6)		SC/URM
116-K-1 trench	I	ERC	1.5 (3.7)	1992	URM
116-K-2 trench	I	ERC	1.6 (4.0)		SC
116-K-3 outfall	A	ERC	0.06 (0.15)	1970's	URM
116-KE-1 crib	I	ERC	0.015 (0.04)	1970's	URM
116-KE-2 crib	I	ERC	0.002 (0.006)	1970's	URM
116-KE-3 French drain	I	ERC	0.002 (0.006)	1970's	URM

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Waste Site	Status	Landlord	Area [hectares (acres)]	Stabilized	Posted
116-KW-1 crib	I	ERC	0.015 (0.04)	1970's	URM
116-KW-2 French drain	I	ERC	5.3m ²	1970's	URM
116-N-1 crib (1301-N LWDF)	I	ERC	1.4 (3.4)		SC
116-N-3 crib (1325-N LWDF)	A	ERC	2.2 (5.4)		SC
116-N-4 retention basin (LERF)	A	ERC	0.1 (0.2)		SC
117-D crib (116-D-9)	I	ERC	9.3m ²	1970's	URM
117-DR crib (116-DR-8)	I	ERC	9.3m ²	1970's	URM
117-H crib (116-H-9)	I	WHC	9.3m ²	1970's	URM
118-B-1 burial ground	N/A	ERC	0.4 (1.0)	1994	EXHUMED
118-B-2 burial ground	I	ERC	0.02 (0.04)	1970's	URM
118-B-3 burial ground	I	ERC	0.9 (2.2)	1970's	URM
118-B-4 burial ground	I	ERC	0.01 (0.03)	1970's	URM
118-B-5 burial ground	I	ERC	0.03 (0.07)	1970's	URM
118-B-6 burial ground	I	ERC	0.01 (0.04)	1970's	URM
118-B-7 burial ground	I	ERC	5.9m ²	1970's	URM
118-C-1 burial ground	I	ERC	0.08 (0.2)	1970's	URM
118-C-2 ball storage	I	ERC	2.6m ²	1970's	URM
118-C-4 control rod storage	I	ERC	0.009 (0.02)	1970's	URM
118-D-1 burial ground	I	ERC	0.04 (0.1)	1970's	URM
118-D-2 burial ground	I	ERC	0.4 (1.0)	1970's	URM
118-D-3 burial ground	I	ERC	1.6 (4.1)	1970's	URM
118-D-4 burial ground	I	ERC	0.5 (1.3)	1970's	URM
118-D-5 burial ground (ball 3X)	I	ERC	0.09 (0.2)	1970's	URM
118-DR-1 burial ground	I	ERC	0.004 (0.01)	1970's	URM
118-F-1 burial ground	I	ERC	0.4 (1.0)	1970's	URM
118-F-2 burial ground	I	ERC	0.8 (2.0)	1970's	URM
118-F-3 burial ground	I	ERC	0.08 (0.2)	1970's	URM
118-F-4 burial ground	I	ERC	9.3m ²	1970's	URM
118-F-5 burial ground	I	ERC	4.3 (1.75)	1970's	URM
118-F-6 burial ground	I	ERC	0.8 (1.9)	1970's	URM
118-H-1 burial ground	I	ERC	1.8 (4.5)	1970's	URM

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Waste Site	Status	Landlord	Area [hectares (acres)]	Stabilized	Posted
118-H-2 burial ground	I	ERC	0.04 (0.1)		SC
118-H-3 burial ground	I	ERC	0.6 (1.5)	1970's	URM
118-H-4 burial ground	I	ERC	.04 (0.1)	1970's	URM
118-H-5 burial ground	I	ERC	0.003 (0.007)	1970's	URM
118-K-1 burial ground	I	ERC	3.3 (8.2)	1970's	URM
118-KE-2 control rod storage	I	ERC	0.02 (0.04)	1970's	URM
118-KW-2 control rod storage	I	ERC	0.02 (0.04)	1970's	URM
118-N burial ground (118-N-1)	I	ERC	0.06 (0.14)		SC
1310-N unplanned release (UN-100-N-5)	I	ERC	U.G. PIPING LEAK		URM
207-A retention basin	A	TFO	0.3 (0.8)		SC
207-AA retention basin	A	TFO	0.3 (0.7)		SC
207-B retention basin	A	B-PLANT	0.3 (0.7)		SC
207-S retention basin	I	ERC	0.7 (1.7)	1994	URM
207-SL retention basin	A	LAB	0.02 (0.06)		SC
207-T retention basin	A	T-PLANT	0.3 (0.7)		SC
207-U retention basin	A	TFO	0.3 (0.7)		SC
216-A-1 crib	I	ERC	0.08 (0.19)	1992	URM
216-A-2 crib	I	PUREX	0.004 (0.01)		SC
216-A-3 crib	I	ERC	0.004 (0.01)		URM
216-A-4 crib	I	PUREX	0.004 (0.01)		URM
216-A-5 crib	I	ERC	0.004 (0.01)		URM
216-A-6 crib	I	ERC	0.6 (1.5)	1993	URM
216-A-7 crib	I	ERC	0.06 (0.15)	1992	URM
216-A-8 crib	A	TFO	0.8 (2.0)		URM
216-A-9 crib	I	ERC	0.2 (0.4)	1993	URM
216-A-10 crib	I	ERC	0.2 (0.4)		URM
216-A-11 French drain	I	PUREX	0.004 (0.01)		SC/URM
216-A-12 French drain	I	PUREX	0.004 (0.01)		URM
216-A-13 French drain	I	PUREX	0.004 (0.01)		URM
216-A-14 French drain	I	PUREX	0.004 (0.01)		SC
216-A-15 French drain	I	PUREX	0.004 (0.01)		URM
216-A-16 French drain	I	PUREX	0.004 (0.01)		SC
216-A-17 French drain	I	PUREX	0.004 (0.01)		SC

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Waste Site	Status	Landlord	Area [hectares (acres)]	Stabilized	Posted
216-A-18 crib	I	ERC	0.2 (0.4)		URM
216-A-19 crib	I	ERC	0.06 (0.15)		URM
216-A-20 crib	I	ERC	0.06 (0.15)		URM
216-A-21 crib	I	PUREX	0.2 (0.4)		URM
216-A-22 French drain	I	PUREX	0.004 (0.01)		SC
216-A-23 A and B French drain	I	PUREX	0.004 (0.01)		SC
216-A-24 crib	I	ERC	1.5 (3.7)	1981	URM
216-A-25 pond	I	ERC	30.4 (75.0)	1983	URM
216-A-26 A and B French drain	I	TFO	0.004 (0.01)		URM
216-A-27 crib	I	ERC	0.2 (0.4)	1994	URM
216-A-28 crib	I	PUREX	0.25 (0.6)		URM
216-A-29 ditch	A	ERC	2.6 (6.5)	1992	URM
216-A-30 crib	A	TFO	1.2 (3.0)	1991	URM
216-A-31 crib	I	PUREX	0.2 (0.4)		URM
216-A-32 crib	I	PUREX	0.008 (0.02)		SC
216-A-33 French drain	I	PUREX	0.004 (0.01)		SC
216-A-34 crib	I	ERC	0.06 (0.15)		URM
216-A-35 French drain	I	PUREX	0.004 (0.01)		URM
216-A-36 A and B crib	I	ERC	0.8 (2.0)		URM
216-A-37 1 and 2 crib	I/A	ERC/TFO	1.0 (2.5)		URM
216-A-38 1 and 2 crib	N/A	ERC	0.2 (0.6)	NEVER USED	N/A
216-A-40 basin	I	TFO	0.4 (1.0)	1994	URM
216-A-41 crib	I	WHC	0.004 (0.01)		URM
216-A-42 trench	I	PUREX	0.3 (0.75)		SC
216-A-45 crib	A	TFO	0.2 (0.4)		URM
216-B-2-1 ditch	I	ERC	0.5 (1.2)	1979	URM
216-B-2-2 ditch	I	ERC	0.3 (0.8)	1979	URM
216-B-2-3 ditch	I	ERC	0.7 (1.8)	1979	URM
216-B-3-1 ditch	I	ERC	0.2 (0.5)	1984	URM
216-B-3-2 ditch	I	ERC	0.5 (1.2)	1984	URM
216-B-3-3 ditch	I	ERC	0.7 (1.7)	1994	URM
216-B-3 pond	I	ERC	16.2 (40.0)	1994	URM
216-B-3A pond	I	TFO	4.0 (10.0)	1994	URM
216-B-3B pond	I	TFO	4.0 (10.0)	1994	URM
216-B-3C pond	A	TFO	16.6 (41.0)		SC
216-B-4 reverse well	I	B-PLANT	0.004 (0.01)		URM
216-B-5 reverse well	I	ERC	0.004 (0.01)	1994	URM
216-B-6 reverse well	I	B-PLANT	0.004 (0.01)		URM

Waste Site	Status	Landlord	Area [hectares (acres)]	Stabilized	Posted
216-B-7 A and B crib	I	ERC	0.01 (0.03)	1992	URM
216-B-8 crib	I	ERC	0.004 (0.01)	1994	URM
216-B-9 crib	I	ERC	0.2 (0.4)	1992	URM
216-B-10 A and B crib	I	ERC	0.08 (0.2)	1983	URM
216-B-11 A and B reverse well	I	ERC	0.04 (0.1)	1992	URM
216-B-12 crib	I	ERC	0.2 (0.4)	1993	URM
216-B-13 French drain	I	B-PLANT	0.004 (0.01)		URM
216-B-14 T019 BC cribs	I	ERC	1.1 (2.7)	1982	RCA/SC
216-B-20 TO 34 trenches	I	ERC	11.8 (29.1)	1982	RCA/URM
216-B-35 TO 42 trenches	I	ERC	2.0 (4.9)		URM
216-B-43 TO 50 cribs	I	ERC	0.5 (1.25)	1991	URM
216-B-51 French drain	I	ERC	0.004 (0.01)	1992	URM
216-B-52 TO 54 trenches	I	ERC	-	1982	RCA/URM
216-B-55 crib	A	TFO	0.23 (0.56)		URM
216-B-56 crib	N/A	ERC	0.008 (0.02)	NEVER USED	N/A
216-B-57 crib	I	ERC	0.14 (0.35)	1991	URM
216-B-58 BC trench	I	ERC	-	1982	URM
216-B-59 retention basin (trench)	A	B-PLANT	0.8 (2.1)		URM
216-B-60 French drain	I	B-PLANT	0.004 (0.01)	UNDER 225-B	N/A
216-B-61 crib	N/A	N/A	0.008 (0.02)	NEVER USED	N/A
216-B-62 crib	A	TFO	0.2 (0.5)		URM
216-B-63 ditch	I	TFO	0.24 (0.6)		SC
216-B-64 retention basin	A	B-PLANT	1.1 (2.8)		SC
241-B-361 tank	I	ERC	0.004 (0.01)	1994	URM
216-C-1 crib	I	ERC	0.004 (0.01)	1979	URM
216-C-2 reverse well	I	ERC	0.004 (0.01)		URM
216-C-3 crib	I	ERC	0.004 (0.01)	1979	URM
216-C-4 crib	I	WHC	0.004 (0.01)		URM
216-C-5 crib	I	ERC	0.004 (0.01)	1979	URM
216-C-6 crib	I	ERC	0.004 (0.01)	1979	URM
216-C-7 crib	I	WHC	0.004 (0.01)		URM
216-C-8 French drain	I	ERC	0.004 (0.01)	1991	SC
218-C-9 pond/burial	I	ERC	0.12 (0.3)	1990	URM
216-C-10 crib	I	ERC	0.01 (0.03)	1992	URM
216-N-1 pond	I	N/A	0.04 (0.1)	EXHUMED	URM
216-N-2 crib	I	ERC	0.004 (0.01)		URM

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Waste Site	Status	Landlord	Area [hectares (acres)]	Stabilized	Posted
216-N-3 crib	I	ERC	0.004 (0.01)		URM
216-N-4 pond	I	ERC	0.89 (2.2)		URM
216-N-5 crib	I	ERC	0.02 (0.04)		URM
216-N-6 pond	I	ERC	0.7 (1.75)		URM
216-N-7 crib	I	ERC	0.04 (0.1)		URM
216-N-8 pond (Westlake)	N/A	N/A	7.7 (19.0)	NATURAL	N/A
216-S-1 crib	I	ERC	0.06 (0.15)	1994	SC
216-S-2 crib	I	ERC	0.06 (0.15)	1994	SC
216-S-3 crib	I	ERC	0.04 (0.1)		URM
216-S-4 French drain	I	ERC	0.04 (0.1)	1991	URM
216-S-5 crib	I	ERC	0.45 (1.12)	1990	URM
216-S-6 crib	I	ERC	0.55 (1.36)	1990	URM
216-S-7 crib	I	ERC	0.15 (0.38)	1992	URM
216-S-8 trench	I	ERC	0.12 (0.3)	1994	SC
216-S-9 crib	I	ERC	0.28 (0.7)		SC
216-S-10 ditch	I	ERC	0.4 (1.0)		URM
216-S-10 pond	I	ERC	1.6 (4.0)		URM
216-S-12 trench	I	ERC	0.06 (0.15)		URM
216-S-13 crib	I	ERC	0.36 (0.09)	1991	URM
216-S-14 trench	I	WHC	0.008 (0.02)	1992	RELEASED
216-S-15 pond	I	ERC	0.04 (0.1)		SC
216-S-16 trench	I	ERC	13.4 (33.0)	1984	URM
216-S-16 pond	I	ERC	-	1984	URM
216-S-17 pond	I	ERC	7.3 (18.0)	1984	URM
216-S-18 pond	I	ERC	0.02 (0.05)	1972	RELEASED
216-S-19 pond	I	ERC	1.4 (3.5)	1984	URM
216-S-20 crib	I	ERC	0.3 (0.07)		URM
216-S-21 crib	I	ERC	0.9 (0.23)	1991	URM
216-S-22 crib	I	ERC	0.04 (0.1)		URM
216-S-23 crib	I	ERC	0.3 (0.75)	1993	URM
216-S-25 crib	A	TFO	0.19 (0.46)	1984	URM
216-S-26 crib	A	TFO	0.18 (0.44)		URM
203-S-4, 5 area	I	ERC	1.6 (4.0)	1981	URM
2904-S-160	I	ERC	0.16 (0.4)	1991	URM
2904-S-170	I	ERC	0.16 (0.4)	1992	URM
2904-S-171 weir box	I	ERC	0.16 (0.4)	1992	URM

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Waste Site	Status	Landlord	Area [hectares (acres)]	Stabilized	Posted
2904-S-172 weir box	I	ERC	0.2 (0.5)	1992	URM
216-T-1 ditch	A	TFO	0.18 (0.45)		SC
216-T-2 reverse well	I	ERC	0.004 (0.01)		URM
216-T-3 reverse well	I	ERC	0.12 (0.3)	1993	URM
216-T-4A pond	I	ERC	6.5 (16.0)		SC
216-T-4-1 ditch	I	ERC	0.065 (0.16)		SC
216-T-4-2 ditch	A	TFO	0.12 (0.32)		SC
216-T-5 trench	I	ERC	0.49 (1.2)	1992	SC
216-T-6 crib	I	ERC	0.05 (0.12)		URM
216-T-7 tile field/crib	I	ERC	0.6 (1.5)	1992	URM
216-T-8 crib	I	T-PLANT	0.03 (0.08)	1991	URM
216-T-9 trench	I	T-PLANT	N/A	1972	EXHUMED
216-T-10 trench	I	T-PLANT	N/A	1972	EXHUMED
216-T-11 trench	I	T-PLANT	N/A	1972	EXHUMED
216-T-12 trench	I	T-PLANT	0.004 (0.01)		URM
216-T-13 trench	I	WHC	0.004 (0.01)		URM
216-T-14 trench	I	ERC	0.14 (0.35)	1992	URM
216-T-15 trench	I	ERC	-	1992	URM
216-T-16 trench	I	ERC	-	1992	URM
216-T-17 trench	I	ERC	-	1992	URM
216-T-18 trench	I	ERC	0.008 (0.02)	1990	URM
216-T-19 tile field/crib	I	ERC	0.4 (1.0)	1991	URM
216-T-20 crib	I	ERC	0.004 (0.01)		URM
216-T-21 trench	I	ERC	1.2 (3.0)	1982	URM
216-T-22 trench	I	ERC	-	1982	URM
216-T-23 trench	i	erc	-	1982	urm
216-T-24 trench	i	erc	-	1982	urm
216-T-25 trench	i	erc	-	1982	urm
216-T-26 crib	i	erc	0.65 (1.6)	1990	Urm
216-T-27 crib	I	ERC	-	1990	URM
216-T-28 crib	I	ERC	-	1990	URM
216-T-29 French drain	I	T-PLANT	0.004 (0.01)		URM
216-T-30 catch tank	I	T-PLANT	0.008 (0.02)	1991	URM
216-T-31 French drain	I	WHC	0.004 (0.01)	1962	EXHUMED
216-T-32 crib	I	ERC	0.008 (0.02)	1992	URM
216-T-33 crib	I	ERC	0.008 (0.02)	1991	URM
216-T-34 crib	I	ERC	0.2 (0.5)	1990	URM

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Waste Site	Status	Landlord	Area [hectares (acres)]	Stabilized	Posted
216-T-35 crib	I	ERC	0.15 (0.37)	1990	URM
216-T-36 crib	I	ERC	0.08 (0.2)	1992	URM
216-T-37 crib	N/A	N/A	-	NOT BUILT	N/A
T-Plant waste unloading station	I	ERC	0.1 (0.25)		SC
241-T-361 tank	I	ERC	0.04 (0.1)	1991	URM
216-U-1 crib	I	ERC	0.6 (1.5)	1992	URM
216-U-2 crib	I	ERC	0.6 (1.5)	1992	URM
216-U-3 French drain	I	ERC	0.008 (0.02)		URM
216-U-4 Reverse well	I	ERC	0.004 (0.01)		URM
216-U-4A French drain	I	ERC	0.004 (0.01)		URM
216-U-4B reverse well	I	ERC	0.004 (0.01)		URM
216-U-5 trench	I	ERC	0.02 (0.05)	1993	URM
216-U-6 trench	I	ERC	0.03 (0.07)	1993	URM
216-U-7 French drain	I	ERC	0.004 (0.01)		SC
216-U-8 crib	I	ERC	0.12 (0.29)	1994	URM
216-U-9 ditch	I	N/A	0.2 (0.5)	1983	RELEASED
216-U-10 pond	I	ERC	14.2 (35.0)	1991	SC/URM
216-U-11 A and B ditch	I	ERC	6.1 (15.0)		URM
216-U-12 crib	I	ERC	0.1 (0.25)	1992	URM
216-U-14 ditch	I/A	ERC/TFO	0.7 (1.8)		URM/SC
216-U-15 trench	I	WHC	0.004 (0.01)		URM
216-U-16 crib	I	ERC	0.5 (1.3)		URM
216-U-17 crib	A	TFO	0.12 (0.3)		URM
241-U-361 tank	I	ERC	0.04 (0.1)	1992	URM
216-W-LWC laundry crib	I	TFO	0.42 (1.03)		URM
216-Z-1 and 2 tile field/crib	I	PFP	0.016 (0.04)		URM
216-Z-1 ditch	I	ERC	0.16 (0.4)	1982	URM
216-Z-3 crib	I	PFP	0.004 (0.01)		URM
216-Z-4 trench	I	PFP	0.004 (0.01)		URM
216-Z-5 crib	I	ERC	0.16 (0.4)	1991	URM
216-Z-6 crib	I	ERC	0.03 (0.07)		URM
216-Z-7 French drain	I	ERC	0.34 (0.83)	1991	URM
216-Z-8 French drain	I	ERC	0.016 (0.04)		URM
216-Z-9 crib	I	PFP	0.36 (0.9)		URM
216-Z-10 French drain	I	ERC	0.4 (1.0)		URM

Waste Site	Status	Landlord	Area [hectares (acres)]	Stabilized	Posted
216-Z-11 ditch	I	ERC	0.1 (0.25)	1982	URM
216-Z-12 crib	I	ERC	0.1 (0.25)	1993	URM
216-Z-13 French drain	I	PFP	0.004 (0.01)		URM
216-Z-14 French drain	I	PFP	0.004 (0.01)		URM
216-Z-15 French drain	I	PFP	0.004 (0.01)		URM
216-Z-16 crib	I	ERC	0.04 (0.10)		URM
216-Z-17 trench	I	ERC	0.14 (0.35)		URM
216-Z-18 crib	I	ERC	0.6 (1.5)		URM
216-Z-19 ditch	I	ERC	0.8 (2.0)	1982	URM
216-Z-20 ditch (crib)	A	TFO	0.12 (0.3)		URM
218-E-1 burial ground	I	ERC	1.3 (3.25)	1981	URM
218-E-2 burial ground	I	ERC	2.2 (5.4)	1979	URM
218-E-2A burial ground	I	ERC	-	1979	URM
218-E-3 burial ground	I	N/A	0.012 (0.03)	1971	EXHUMED
218-E-4 burial ground	I	ERC	1.45 (3.58)		URM
218-E-5 burial ground	I	ERC	-	1979	URM
218-E-5A burial ground	I	ERC	-	1979	URM
218-E-6 burial ground	I	N/A	0.004 (0.01)	1981	EXHUMED
218-E-7 burial ground	I	ERC	0.008 (0.02)		SC
218-E-8 burial ground	I	ERC	0.45 (1.1)	1981	URM
218-E-9 burial ground	I	ERC	-	1979	URM
218-E-10 burial ground	I/A	ERC/SWO	8.1 (20.0)		SC/URM
218-E-12A burial ground	I	ERC	8.1 (20.0)	1994	URM
218-E-12B burial ground	I	ERC	10.5 (26.0)	1994	URM
218-E-12B burial ground	A	SWO	15.0 (37.0)		SC/URM
218-E-13 PUREX tunnel	I	PUREX	0.012 (0.03)		URM
218-E-14 PUREX tunnel	I	PUREX	0.06 (0.16)		URM
218-E-15 PUREX tunnel	A	PUREX	0.53 (1.3)		URM
218-W-1 burial ground	I	ERC	2.8 (7.0)	1983	URM
218-W-1A burial ground	I	ERC	2.8 (7.0)	1983	URM
218-W-2 burial ground	I	ERC	2.8 (7.0)		URM
218-W-2A burial ground	I	ERC	13.8 (34.0)		URM
218-W-3 burial ground	I	ERC	3.4 (8.5)	1983	URM
218-W-3A burial ground	A	SWO	12.1 (30.0)		SC
218-W-4A burial ground	I	ERC	2.8 (7.0)	1983	URM
218-W-4B burial ground	I/A	ERC/SWO	8.1 (20.0)		URM/SC

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Waste Site	Status	Landlord	Area [hectares (acres)]	Stabilized	Posted
218-W-4C burial ground	A	SWO	10.1 (25.0)		SC
218-W-5 burial ground	A	SWO	4.0 (10.0)		SC
218-W-7 burial ground	I	ERC	0.004 (0.01)		URM
218-W-8 burial ground	I	ERC	0.028 (0.07)		SC
218-W-9 burial ground	I	ERC	0.1 (0.24)	1991	URM
218-W-11 burial ground	I	ERC	2.8 (7.0)	1983	URM
UN-216-E-1	I	TFO	4.0m ²		URM
UN-216-E-2	I	TFO	4.0m ²		URM
UN-216-E-3	I	TFO	0.04 (0.1)		RA
UN-216-E-4	I	TFO	0.4 (1.0)		URM
UN-216-E-5	I	TFO	0.2 (0.5)		SC
UN-216-E-6	I	TFO	0.004 (0.01)		SC
UN-216-E-7	I	TFO	0.04 (0.1)		URM
UN-216-E-8	I	TFO	0.4 (1.0)		URM
UN-216-E-9	I	TFO	4.0m ²		URM
UN-216-E-10	I	TFO	0.004 (0.01)		URM
UN-216-E-11 (BC controlled area)	I	ERC	1012 (2500)		RCA/SC
UN-216-E-12	I	TFO	0.2 (0.5)		SC
UN-216-E-13	I	B-PLANT	0.004 (0.01)	1984	URM
UN-216-E-14	I	ERC	0.18 (0.44)		URM
UN-216-E-15	I	ERC	0.004 (0.01)		URM
UN-216-E-16	I	PUREX	0.8 (2.0)		SC
UN-216-E-17	I	TFO/ERC	1.2 (3.0)	1991	SC/URM
UN-216-E-18	I	B-PLANT	N/A		NONE
UN-216-E-19	I	N/A	N/A	1981	RELEASED
UN-216-E-20	I	N/A	N/A	1981	RELEASED
UN-216-E-21	I	N/A	N/A	1982	RELEASED
UN-216-E-22	I	TFO	0.03 (0.07)	1984	RELEASED
UN-216-E-23	I	B-PLANT	0.14 (0.35)		SC
UN-216-E-24	I	PUREX	1.0 (2.5)		SC
UN-216-E-25	I	PUREX	0.04 (0.1)	1984	URM
UN-216-E-26	I	TFO	0.04 (0.1)		SC/URM
UN-216-E-27	I	N/A	0.04 (0.1)	1981	RELEASED
UN-216-E-29	I	TFO	3.4 (8.5)	1994	URM
UN-216-E-30	I	ERC	0.008 (0.02)	1994	URM
UN-216-E-31	I	N/A	405 (1000)	1991	RELEASED
UN-216-E-32	I	SWO	SEE 216-E-12B		SC

Waste Site	Status	Landlord	Area [hectares (acres)]	Stabilized	Posted
UN-216-E-33	I	ERC	1.9 (4.6)	1981	URM
UN-216-E-34	I	PUREX	2.6 (6.5)		URM
UN-216-E-35	I	ERC	SEE UN-216-E-31		NONE
UN-216-E-36	I	B-PLANT	0.8 (2.0)	1991	SC
UN-216-E-37	I	N/A	6.1 (15.0)	1991	RELEASED
UN-216-E-38	I	ERC	0.4 (1.0)		URM
UN-216-E-39	I	N/A	3.6 (9.0)	1989	RELEASED
UN-216-E-40	I	ERC	0.8 (2.0)	1984	URM
UN-216-E-41	I	TFO	6.9 (17.0)	1994	SC
UN-216-E-43	I	TFO	1.0 (2.5)	1994	SC
UN-216-E-44	I	TFO	1.2 (3.0)	1992	URM
UN-216-W-2	I	ERC	0.4 (1.0)	1993	URM
UN-216-W-4	I	ERC	0.012 (0.03)		URM
UN-216-W-5	I	ERC	1.0 (0.24)	1994	URM
UN-216-W-6	I	T-PLANT	0.03 (0.07)		SC
UN-216-W-7	I	ERC	1.2 (3.0)	1990	URM
UN-200-W-8	I	OSS	0.002	1972	URM
UN-216-W-8	I	TFO	0.04 (0.1)		URM
UN-216-W-9	I	ERC	0.04 (0.1)		SC
UN-216-W-11	I	TFO	0.04 (0.1)		SC
UN-216-W-12	I	T-PLANT	0.004 (0.01)		URM
UN-216-W-13	I	PFP	0.004 (0.01)		URM
UN-216-W-14 (216-U-10 pond)	I	ERC	0.2 (0.5)	1991	URM
UN-216-W-15	I	ERC	0.2 (0.5)	1991	URM
UN-216-W-16	I	ERC	0.08 (0.2)	1991	URM
UN-216-W-17	I	ERC	0.8 (2.0)	1992	URM
UN-216-W-18	I	TFO	0.08 (0.2)		SC/URM
UN-216-W-19	I	ERC	0.1 (0.24)	1991	URM
UN-216-W-20	I	ERC	0.004 (0.01)	1982	URM
UN-216-W-21	I	TFO	0.004 (0.01)		SC
UN-216-W-22	I	TFO	0.004 (0.01)		SC
UN-216-W-23	I	ERC	0.07 (0.18)	1983	SC/URM
UN-216-W-24	I	ERC	2.6 (6.5)	1993	SC
UN-216-W-25	I	ERC	0.36 (0.88)		SC
UN-216-W-26	I	ERC	0.8 (2.0)	1993	SC
UN-216-W-27	I	N/A	0.8 (2.0)	1983	RELEASED
UN-216-W-28	I	ERC	0.4 (1.0)	1983	RELEASED

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Waste Site	Status	Landlord	Area [hectares (acres)]	Stabilized	Posted
UN-216-W-29	I	ERC	0.04 (0.1)	1993	URM
UN-216-W-30	I	ERC	3.1 (7.75)	1993	URM
UN-216-W-31	I	ERC	1.6 (4.0)	1992	URM
UN-216-W-32	I	TFO	0.8 (2.0)	1989	RELEASED
UN-216-W-33	I	ERC	1.2 (3.0)	1994	SC/URM
UN-216-W-34	I	TFO	4.0m ²		URM
UN-216-W-35	I	TFO	0.8 (2.0)		SC
UN-216-W-36	I	T-PLANT	2.0 (5.0)		URM
UN-216-W-37	I	TFO	0.2 (0.5)		SC
UN-216-W-38	I	ERC			
241-A tank farm	A	TFO	1.7 (4.2)		SC
241-AN tank farm	A	TFO	1.5 (3.7)		URM
241-AP tank farm	A	TFO	2.1 (5.2)		SC
241-AW tank farm	A	TFO	1.1 (2.6)		SC
241-AX tank farm	A	TFO	1.0 (2.6)		SC
241-AY tank farm	A	TFO	0.7 (1.7)		SC
241-AZ tank farm	A	TFO	1.0 (2.4)		SC
241-B tank farm	A	TFO	2.6 (6.5)		SC
241-BX tank farm	A	TFO	3.3 (8.3)		SC
241-BY tank farm	A	TFO	1.9 (4.9)		SC
241-C tank farm	A	TFO	3.5 (8.5)		SC
241-S tank farm	A	TFO	3.4 (8.3)		SC
241-SX tank farm	A	TFO	2.7 (6.6)		SC
241-SY tank farm	A	TFO	0.9 (2.2)		SC
241-T tank farm	A	TFO	3.3 (8.1)		SC
241-TX tank farm	A	TFO	4.3 (10.5)		SC
241-TY tank farm	A	TFO	2.3 (5.7)		SC
241-U tank farm	A	TFO	2.9 (7.2)		SC
300 Area RR spur	A	WHC	0.4 (1.0)		SC
307 retention basin	A	TFO	0.004 (0.01)		SC
UN-300-2 (UPR-300-2)	I	WHC	0.004 (0.01)		RA
UN-300-4 (UPR-300-4)	I	WHC	0.004 (0.01)		URM
UN-300-5 (UPR-300-4)	I	WHC	0.004 (0.01)		URM
UN-300-11 (UPR-300-11)	I	WHC	0.6m ²		RA
UN-300-17 (UPR-300-17)	I	WHC	0.4 (1.0)		URM
UN-300-40 (UPR-300-40)	I	WHC	0.04 (0.1)		URM

Waste Site	Status	Landlord	Area [hectares (acres)]	Stabilized	Posted
UN-300-44 (313 building)	I	WHC	0.004 (0.01)		SC/URM
UN-300-XX	I	WHC	0.004 (0.01)		URM
UN-300-XY	I	WHC	0.004 (0.01)		SC/URM
316-1A unplanned release	I	ERC	0.004 (0.01)		URM
316-1 pond	I	ERC	3.2 (8.0)		SC
316-2 pond	I	ERC	4.0 (10.0)		SC
316-3 trench	I	ERC	0.2 (0.5)		URM
316-4 crib	I	ERC	0.004 (0.01)		URM
316-5 trench	I	ERC	0.012 (0.03)		URM
618-1 burial ground	I	ERC	0.4 (1.0)		URM
618-2 burial ground	I	ERC	0.6 (1.5)		URM
618-3 burial ground	I	ERC	0.6 (1.5)		URM
618-4 burial ground	I	ERC	1.2 (3.0)		SC
618-5 burial ground	I	ERC	0.4 (1.0)		URM
618-6 burial ground	I	N/A	N/A	1962	EXHUMED
618-7 burial ground	I	ERC	6.5 (16.0)		URM
618-8 burial ground	I	ERC	1.3 (3.15)		URM
618-9 burial ground	I	N/A	N/A	1991	EXHUMED
618-10 burial ground	I	ERC	2.2 (5.5)	1983	URM
618-11 burial ground	I	ERC	3.4 (8.5)	1982	URM

ERC = Environmental Restoration Contractor

OSS = Operations Support Services

SWO = Solid Waste Operations

TFO = Tank Farm Operations

WHC = Westinghouse Hanford Corporation, not assigned to a facility or Group.

URM = Underground Radioactive Material

SC = Surface Contamination

RA = Radiation Area

RCA = Radiological Controlled Area

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