

100-B/C Reactor Area Underground Pipeline Historical Information Summary

*Prepared for the U.S. Department of Energy, Richland Operations Office
Office of Environmental Restoration*

Submitted by: Bechtel Hanford, Inc.

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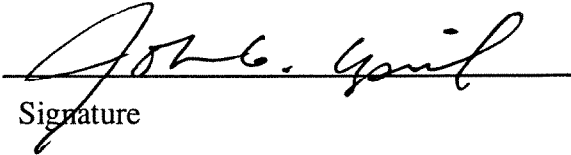
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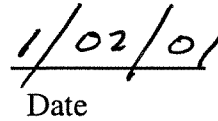
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100-B/C Reactor Area Underground Pipeline Historical Information Summary

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Date Published

December 2000

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METRIC CONVERSION CHART

Into Metric Units			Out of Metric Units		
<i>If You Know</i>	<i>Multiply By</i>	<i>To Get</i>	<i>If You Know</i>	<i>Multiply By</i>	<i>To Get</i>
Length			Length		
inches	25.4	millimeters	millimeters	0.039	inches
inches	2.54	centimeters	centimeters	0.394	inches
feet	0.305	meters	meters	3.281	feet
yards	0.914	meters	meters	1.094	yards
miles	1.609	kilometers	kilometers	0.621	miles
Area			Area		
sq. inches	6.452	sq. centimeters	sq. centimeters	0.155	sq. inches
sq. feet	0.093	sq. meters	sq. meters	10.76	sq. feet
sq. yards	0.0836	sq. meters	sq. meters	1.196	sq. yards
sq. miles	2.6	sq. kilometers	sq. kilometers	0.4	sq. miles
acres	0.405	hectares	hectares	2.47	acres
Mass (weight)			Mass (weight)		
ounces	28.35	grams	grams	0.035	ounces
pounds	0.454	kilograms	kilograms	2.205	pounds
ton	0.907	metric ton	metric ton	1.102	ton
Volume			Volume		
teaspoons	5	milliliters	milliliters	0.033	fluid ounces
tablespoons	15	milliliters	liters	2.1	pints
fluid ounces	30	milliliters	liters	1.057	quarts
cups	0.24	liters	liters	0.264	gallons
pints	0.47	liters	cubic meters	35.315	cubic feet
quarts	0.95	liters	cubic meters	1.308	cubic yards
gallons	3.8	liters			
cubic feet	0.028	cubic meters			
cubic yards	0.765	cubic meters			
Temperature			Temperature		
Fahrenheit	subtract 32, then multiply by 5/9	Celsius	Celsius	multiply by 9/5, then add 32	Fahrenheit
Radioactivity			Radioactivity		
picocuries	37	millibecquerel	millibecquerel	0.027	picocuries

1.0 INTRODUCTION

In 1997, the Remaining Sites Task Team, composed of the U.S. Environmental Protection Agency, the Washington State Department of Ecology, and the U.S. Department of Energy, Richland Operations Office, determined that pipelines in the 100 Areas would need to be dispositioned. The large effluent pipelines were known to be contaminated and were included in the 1995 Record of Decision (ROD) for the 100-BC-1, 100-DR-1, and 100-HR-1 Areas (EPA 1995). They are currently undergoing remediation as part of the 100 Area Remedial Action cleanup. Subsequent Detailed Work Plans have identified tasks to evaluate the remaining underground pipelines. The pipelines in the 100-D/DR Reactor area were the first pipelines to be evaluated in 1999. The 100-B/C Reactor area pipelines have been identified for evaluation in 2000.

This document was prepared to provide information on underground pipelines that transported water, waste, and chemicals to and from facilities throughout the 100-B/C Area. The primary focus of this effort was to determine the size and locations of pipelines and to determine what chemicals or radionuclides were potentially transported through the pipelines. Information was collected from a number of sources, including construction drawings, historical documentation, photographs, and waste site identification and characterization documentation (e.g., Waste Information Data System, appropriate 100 Area RODs, and the remedial design report/remedial action work plan). This document contains descriptive information for the pipelines associated with these 100-B/C Area waste sites and building locations. The depths of pipelines and waste sites included in this document refer to the depth of a physical structure (e.g., crib, french drain), not the depth of overburden from surface elevation to the below-grade structure. Information on pipelines was unavailable for numerous sites. Historical information indicates that temporary above-ground piping was used to transport liquids to some locations. Therefore, it is assumed that, if no information was available, a temporary line was used.

This report will be delivered to the Waste Information Data System organization and will evaluate the information through the *Tri-Party Agreement Handbook Management Procedures*, Guideline Number TPA-MP-14, "Maintenance of the Waste Information Data System (WIDS)" (DOE-RL 1998b) process to categorize/disposition the pipelines. The pipelines determined to be potentially contaminated and requiring action will be identified to the Remedial Action Waste Disposal project and recommended for remedial action. The plug-in approach described and approved through the 100 Area Remaining Sites ROD (EPA 1999) will be the path used to remediate the pipelines.

1.1 REPORT ORGANIZATION

In addition to this introduction, this report contains the following sections:

- Section 1.0, "Introduction."

Introduction

- Section 2.0, “100-B/C Reactor Area Site-Specific Information,” discusses location and a brief history of the B/C Reactor Area.
- Section 3.0, “100-B/C Reactor Area Facilities and Pipelines,” discusses facilities in the 100-B/C Reactor areas that include sanitary waste, waste sites, and buildings. A brief history of each site is provided along with potential contaminants, descriptions of associated pipelines, and references.
- Section 4.0, “References,” provides information on the documents used to prepare the report.
- Appendix A, “100-B/C Reactor Area Underground Pipeline Historical Information Summary Table,” condenses the text portion of the report into a simplified site-specific table. It includes headings and information for individual sites, pipeline descriptions, pipe diameter, estimated length, pipe material, contaminants, miscellaneous waste and/or use, and references.
- Appendix B, “Buildings and Waste Site Map,” provides information regarding the location of buildings and waste sites in the B/C Reactor areas.
- Appendix C, “Historical Photographs,” includes numerous construction era photographs showing various locations of pipelines in the 100-B/C Reactor areas.
- Appendix D, “Computer-Aided Design Maps,” contains four individual maps that include sanitary and process sewer pipelines, effluent pipelines, water pipelines, and a summary map of all outside pipelines. Pipeline diameters, lengths, use, and locations are presented in the maps.

2.0 100-B/C REACTOR AREA SITE-SPECIFIC INFORMATION

2.1 LOCATION

The 100 Areas of the Hanford Site are located along the southern shoreline of the Columbia River in southeastern Washington State. The 100 Areas include nine inactive plutonium-production reactors and related support facilities that are grouped within six noncontiguous reactor areas. The 100-B/C Area covers 1,834 ha (742 ac) and is located the furthest upstream of the reactor areas. The B and the C Reactors are located in the 100-B/C Area. Support facilities were designed to supply, treat, store, and transport the reactor cooling water and to house utilities, maintenance, and miscellaneous services. The 100-B/C Area contains three operable units: the 100-BC-1 and 100-BC-2 Operable Units (which consist of the liquid and solid waste disposal sites in the 100-B/C Area), and the 100-BC-5 Operable Unit, which consists of contaminated groundwater underlying the 100-B/C Area.

2.2 HISTORY

The B Reactor was the world's first operational nuclear reactor designed to produce plutonium during World War II. The reactor was constructed in 1943, began operation in 1944, and was retired from service in 1968. The C Reactor was constructed in 1951 and operated from 1952 to 1969. The C Reactor was the sixth of the nine reactors constructed on the Hanford Site (WHC 1989, DOE-RL 1995a) and shared some of the support facilities that were constructed for B Reactor.

On November 3, 1989, the U.S. Environmental Protection Agency placed the 100 Areas of the Hanford Site, including the 100-B/C Area, on the National Priorities List because of soil and groundwater contamination resulting from the past operation of the reactors and support facilities. The decision to proceed with remediation of waste sites in the 100-B/C Area has been accomplished by issuing a *Comprehensive Environmental Response, Compensation, and Liability Act of 1980* ROD for many of the liquid waste disposal sites in the 100-BC-1, 100-DR-1, and 100-HR-1 Operable Units. The removal actions include the removal of the contaminated pipelines within the 100-B/C Area that are identified and described in this document.

3.0 100-B/C REACTOR AREA FACILITIES AND PIPELINES

Pipelines of various types and sizes were used to support reactor operations. Pipeline diameters ranged from 0.75 in. to 72 in. and consisted of numerous materials (e.g., asbestos, cast iron, vitrified clay, reinforced concrete, concrete, and steel). Pipelines were used for process sewers, sanitary sewers, effluent pipelines, service water, steam, and fire protection.

Sanitary waste drainage systems and floor drains were installed in nearly all camp, service, and administrative facilities. All underground or subfloor sanitary waste and floor drain piping were initially cast-iron bell and spigot-type with caulk and leaded joints (Du Pont 1945).

3.1 100-B/C REACTOR AREA SANITARY WASTE FACILITIES (APPENDIX D, PLATES 1 AND 4)

This section provides information from historical documents and construction drawings related to the 100-B/C Area sanitary waste facilities. Sanitary waste facilities in the 100-B/C Area consisted of septic tanks, drain fields, and associated pipelines.

3.1.1 1607-B1 Septic Tank and Drain Field

The 1607-B1 septic tank and drain field, also referred to as the 1607-B1 sanitary sewer system and the 124-B-1, was located 300 ft north of the 1720-B patrol change room. It was originally labeled “1607” in October 1943 but was renamed 2 months later as “1607-B1” (W-71192). The septic tank was 14 ft by 7 ft by 11 ft deep and was constructed of reinforced concrete with 10-in.-thick walls. The tile field contained 4-in.-diameter vitrified clay pipe with a capacity for 125 people, at 35 gal per capita (WHC 1994). It received sanitary waste from the 1701-B, 1709-B, and 1720-B Buildings and was in operation from 1944 to 1960 (DOE-RL 1992).

3.1.1.1 Piping. Piping for the 1607-B1 septic tank and drain field included the following:

- A 6-in.-diameter by 177-ft vitrified clay sanitary sewer pipe exited the north side of the 1720-B Building and connected to the septic system.
- A 6-in.-diameter by 182-ft vitrified clay sanitary sewer pipe exited the 1701-B Building and connected to the 6-in.-diameter vitrified clay pipe leading to the septic system.

(See construction drawings W-71182 R31, W-71192, M-1901 sheets 3 and 4, and M-1904-B sheet 4.)

3.1.2 1607-B2 Septic Tank and Drain Field

The 1607-B2 septic tank and drain field, also referred to as 124-B-2, was located about 1,350 ft north of B Reactor. It was constructed in December 1943 with dimensions of 25 ft by 11.5 ft by 13 ft deep, with reinforced concrete that was 10 in. thick. It had a capacity for 450 people.

100-B/C Reactor Area Facilities and Pipelines

Dimensions of the drain field are 300 ft by 75 ft (EPA 1996). The septic system began receiving sanitary waste in 1944 from B Reactor, the 190-B pumphouse, and other B Area office buildings. The drain field is northwest of the septic tank (WHC 1994, DOE-RL 1992). Potential contaminants include undetermined organic and inorganic chemicals (DOE-RL 1998a, EPA 1999).

3.1.2.1 Piping. An 8-in.-diameter by 5,694-ft (estimated) vitrified clay pipe extending from the 1700 buildings, 190-B and 105-B, that flow to 1607-B2 (see construction drawings H-1-155, H-1-13050, M-1901 sheet 5, M-1904 sheet 5, W-71182 R31, and W-71192).

3.1.3 1607-B3 Septic Tank and Drain Field

The 1607-B3 septic tank and drain field was located about 200 ft north of the 184-B Building. It was constructed in 1943 and was 9.5 ft by 4.5 ft by 10.6 ft deep, with a capacity for 48 people. It was demolished in 1987 (DOE-RL 1992).

3.1.3.1 Piping. An 8-in.-diameter by 250-ft vitrified clay pipe exited the north side of the 184-B Building and connected to the septic system (see construction drawings H-1-155, H-1-13050, M-1904-B sheet 5, and W-71192).

3.1.4 1607-B4 Septic Tank and Drain Field

The 1607-B4 septic tank and drain field is located west of the 151-B substation and is believed to have been constructed in 1943. It was 6 ft by 3 ft by 8 ft by 25 ft deep and received sanitary waste from the 151-B substation beginning in 1944 (WHC 1994). The vertical type septic tank had a 350-gal capacity. Sanitary liquids were transported from the septic tank via a 6-in. vitrified clay pipe to the drain field.

3.1.4.1 Piping. An 8-in.-diameter by 148-ft vitrified clay sanitary sewer pipe exited the west side of the building and connected to the septic system (see construction drawings H-1-13050, M-1904-B sheets 5 and 8, P-5580 sheet 2, W-71182 R31, and W-71192).

3.1.5 1607-B5 Septic Tank and Drain Field

The 1607-B5 septic tank and drain field is located about 25 ft southeast of the 181-C river pumphouse. The septic system was constructed in 1943 or 1944 and was 4 ft by 2 ft by 8.25 ft deep and was constructed of reinforced concrete with a capacity of 350 gal (WHC 1994).

3.1.5.1 Piping. A 6-in.-diameter by 100-ft vitrified clay sanitary sewer pipe exited the east side of the 181-C Building and connected to the septic system (see construction drawings M-1904-B sheet 2, W-71182 R31, and W-71192).

3.1.6 1607-B6 Septic Tank and Drain Field

The 1607-B6 septic tank and drain field is located south of the 182-B reservoir. It was likely constructed in 1944 and had dimensions of 8 ft by 4 ft by 8.25 ft deep. The septic system

100-B/C Reactor Area Facilities and Pipelines

operated from 1944 until 1988 and during that time received sanitary sewage from the 182-B pump station. No contaminants of concern have been identified at this site (WHC 1994).

3.1.6.1 Piping. An 8-in.-diameter by 263-ft vitrified clay sanitary sewer pipe exited the west side of the 183-B filterhouse (see construction drawings H-1-155, H-1-13050, M-1904-B sheets 5 and 8, and W-71192).

3.1.7 1607-B7 Septic Tank and Drain Filed

The 1607-B7 septic tank and drain field is located about 500 ft northeast of the 183-B Filter Plant. It was 6 ft by 3 ft by 8.25 ft deep and was likely constructed in 1944 of reinforced concrete, with 10-in.-thick walls and a 12-person capacity. The drain field is 768 ft² (EPA 1996) and operated from 1951 to 1969, receiving sanitary sewage from the 183-B Water Treatment Plant (WHC 1994). Potential contaminants include undetermined organic and inorganic chemicals (DOE-RL 1998a, EPA 1999).

3.1.7.1 Piping. An 8-in.-diameter by 664-ft vitrified clay sanitary sewer pipe exited the east side of the building and connected to the septic system (see construction drawings H-1-155, H-1-13050, M-1904 sheets 5 and 8, and W-71192).

3.1.8 1607-B8 Septic Tank and Drain Field

The 1607-B8 septic tank and drain field, also known as 124-C2, was located about 70 ft east of the 190-C pumphouse. It operated from 1951 to 1969 and received sanitary sewage from the 190-C pumphouse via a 6-in.-diameter vitrified clay pipeline (WHC 1994). The vertical steel septic tank has a 350-gal capacity, with dimensions of 6 ft by 3 ft by 8.3 ft deep. The drain field is 640 ft² (EPA 1996), was 20 ft long, and contained seven individual staggered pipelines extending from a pipeline in the center of the drain field. Each staggered pipeline was 10 ft long and was constructed of 8-in.-diameter vitrified clay pipe. A total of 190 ft of 8-in. vitrified clay pipe was used in the drain field and contained open joints. The site is potentially contaminated with undetermined organic and inorganic chemicals (EPA 1999, DOE-RL 1998a).

3.1.8.1 Piping. A 6-in.-diameter by 69-ft vitrified clay sanitary sewer pipe exited the east side of the building and connected to the septic system (see construction drawings H-1-13050, M-1904 sheet 8, and P-5580 sheet 2).

3.1.9 1607-B9 Septic Tank and Drain Field

The 1607-B9 site includes a 2,400-gal septic tank and drain field southeast of the 105-C Reactor. It received sanitary sewage from C Reactor (WHC 1994). The septic tank's dimensions are 14 ft by 3 ft by 8.3 ft deep. The drain field is 4,390 ft² (DOE-RL 1998a, EPA 1996). Contaminants include undetermined organic and inorganic chemicals (EPA 1999).

100-B/C Reactor Area Facilities and Pipelines

3.1.9.1 Piping. An 8-in.-diameter by 1,114-ft vitrified clay sanitary sewer pipe exited the south side of the C Reactor and connected to the septic system (see construction drawings H-1-13050, M-1904 sheet 9, and P-5580 sheet 2).

3.1.10 1607-B10 Septic Tank and Drain Field

The 1607-B10 septic tank and drain field are located about 30 ft south of the 183-C head house. The septic system received only sanitary sewer waste from the head house of the 183-C Water Treatment Plant. It contained a vertical-type, 350-gal steel septic tank. Site dimensions are 15 ft by 30 ft, with an assumed depth of 8.3 ft. The drain field is 640 ft² (EPA 1996). The drain field was 20 ft long and contained 90 ft of 8-in.-diameter vitrified clay pipe. The tile field was laid with open joints. The septic system operated from 1952 to 1969 (WHC 1994). Contaminants include undetermined organic and inorganic chemicals (EPA 1999).

3.1.10.1 Piping. An 8-in.-diameter by 84-ft vitrified clay sanitary sewer pipe exited the southwest corner of the 183-C head house and connected to the septic system (see construction drawings H-1-13050, M-1904 sheet 8, and P-5580).

3.1.11 1607-B11 Septic Tank and Drain Field

The 1607-B11 septic tank and drain field is located about 40 ft north of the 183-C Filter Building. It received only sanitary sewer waste from the filter building and pump room of the 183-C Water Treatment Plant. No known radionuclides are present. The septic system contained a vertical-style, 350-gal-capacity steel tank. Site dimensions are 15 ft by 30 ft, and the depth is assumed to be 8.3 ft. The drain field is 640 ft² (EPA 1996, 1999). The drain field was located 10 ft from the septic tank and contained 25 ft of 8-in.-diameter vitrified clay pipe. The septic system operated from 1952 to 1969 and was partially demolished in 1988 (WHC 1994). Potential contaminants include undetermined organic and inorganic chemicals (EPA 1999).

3.1.11.1 Piping. A 6-in.-diameter by 150-ft vitrified clay sanitary sewer pipe exited the north side of the building and connected to the septic system (see construction drawings H-1-13050, M-1904-B sheet 8, and P-5580).

3.2 B REACTOR AREA WASTE SITES (APPENDIX D, PLATES 2 AND 4)

3.2.1 116-B-1 Liquid Waste Disposal Trench

The 116-B-1 site, also referred to as the 107-B Liquid Waste Disposal Trench, was located about 200 ft east of the 107-B retention basin. The purpose of the trench was to prevent discharge of highly contaminated effluent water to the Columbia River from the 105-B Building during shutdown due to a ruptured slug (GE 1956). It was 375 ft by approximately 50 ft by 15 ft deep. The unlined effluent trench was in operation from 1946 to 1955 (DOE-RL 1992). During its operation it received an estimated 60 million liters of cooling water effluent.

100-B/C Reactor Area Facilities and Pipelines

The site received the following radionuclides: americium-241, cobalt-60, cesium-134, cesium-137, europium-152, europium-154, europium-154, tritium, potassium-40, strontium-90, technetium-99, plutonium-238, plutonium-238, plutonium-240, uranium-235, and uranium-238 (DOE-RL 1995b, 1998a; EPA 1996). In addition, the trench received between 7 and 60 kg of sodium dichromate (DOE-RL 1992; EPA 1999; UNI 1978; WHC 1994, 1988).

3.2.1.1 Piping. Liquid waste materials entered the trench through a 16-in.-diameter, 105-ft-long steel effluent pipe. The pipe extended from the east side of the 116-B-11 retention basin to the west side of the 116-B-1 disposal trench (see construction drawings G-7-215, H-1-4040, H-1-4049, H-1-13058, H-1-15200, H-1-80214, H-3-57210, M-1904-B sheet 3, P-3393, P-5533, P-5537, P-5540, and P-5595).

3.2.2 116-B-2 Storage Basin Trench

The 116-B-2 Storage Basin Trench received contaminated basin water after a fuel element was accidentally cut in half (DOE-RL 1996). The 116-B-2 waste site was often referred to as the 105-B Fuel Storage Basin Trench. It was 75 ft by 10 ft by 15 ft deep and was used only once in 1946 when it received contaminated basin water and was covered with 6 to 15 ft of soil (DOE-RL 1992, GE 1953, WHC 1988).

The radionuclide inventory includes americium-241, cobalt-60, strontium-90, technetium-99, cesium-134, cesium-137, europium-152, europium-154, europium-155, tritium, plutonium-238, plutonium-239, plutonium-240, and uranium-238 (DOE-RL 1998a, EPA 1996, UNI 1978, WHC 1994). An estimated 1 million gallons of water was discharged to the site (DOE-RL 1994). (See construction drawings H-1-4049, H-3-57210, and G-7-215.)

3.2.2.1 Piping. No piping was located for this site.

3.2.3 116-B-3 Pluto Crib

The 116-B-3 Pluto Crib was in operation from 1951-1952 (UNI 1978). The crib received cooling water waste previously contaminated by fuel cladding ruptures from B Reactor (DOE-RL 1996). The 116-B-3 waste site was often referred to as the 105-B Pluto Crib. The crib was 10 ft by 10 ft by 10 ft deep, and it was filled with sand and shored with railroad ties (DOE-RL 1992). During operation, the crib received an estimated 4,000 L of contaminated reactor cooling water.

The radionuclide inventory includes americium-251, cobalt-60, strontium-90, technetium-99, cesium-134, cesium-137, europium-152, europium-154, europium-155, tritium, plutonium-238, plutonium-239, plutonium-240, and uranium-238. In addition, 4×10^3 kg of sodium dichromate was disposed at the site (DOE-RL 1994, 1998a; EPA 1996; UNI 1978; WHC 1994, 1988). (See construction drawings G-7-210, H-1-4049, and H-3-57210.)

3.2.3.1 Piping. No piping was located for this site.

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3.2.4 116-B-4 French Drain

The 116-B-4 french drain, also referred to as the 105-B dummy decontamination french drain, was 4 ft in diameter and 20 ft deep. The french drain was located east of B Reactor and operated from 1957 through 1968 (DOE-RL 1992, 1994; UNI 1978).

The radionuclide inventory includes cobalt-60, cesium-137, europium-153, europium-154, europium-155, plutonium-239, potassium-40, radium-226, thorium-228, uranium-233, uranium-234, uranium-238, and barium (DOE-RL 1995b, 1998a; EPA 1996). Hazardous chemicals include nitrate, 2,200 lb of sodium dichromate, 2,200 lb of sodium oxalate, and 13,200 lb of sodium sulfamate (DOE-RL 1994, WHC 1994). The french drain received 300,000 L of spent acid rinse water from the 105-B Dummy Decontamination Facility (DOE-RL 1995a, 1996; WHC 1988). (See construction drawings G-7-210 and H-3-57210.)

3.2.4.1 Piping. No piping was located for this site.

3.2.5 116-B-5 Crib

The 116-B-5 Crib, also referred to as the 108-B Crib, received tritium waste from the 108-B Building (GE 1956). The facility was 84 ft by 16 ft by 11.5 ft and was located about 135 ft north of the 108-B Building. It began operation in 1950 and continued until 1968 when it was retired (DOE-RL 1988, 1992; UNI 1978). The crib received 10 million liters of low-level effluent (DOE-RL 1995a).

The site received liquid tritium wastes from the 108-B Building. Only wastes of less than $1 \mu\text{Ci}/\text{cm}^3$ were discharged to this unit.

Wastes with an activity density of less than $1 \mu\text{Ci}/\text{g}$ were discharged to the crib and included the following: americium-241, cobalt-60, cesium-134, cesium-137, europium-152, europium-154, europium-157, tritium, strontium-90, uranium-235, and uranium-238. Inorganics included barium, mercury, sodium dichromate, sodium oxalate, and sodium sulfamate (DOE-RL 1988, 1995b, 1998a, 1996; EPA 1996; GE 1953; UNI 1978; WHC 1988, 1994).

3.2.5.1 Piping. A 6-in.-diameter by 250-ft long vitrified clay pipe exited the east side of the 108-B Building and entered the south end of the crib about 1 ft below grade (see construction drawings G-7-215, H-1-1595, H-1-4049, and H-3-57210).

3.2.6 116-B-6A Crib/French Drain

The 116-B-6A Crib/french drain, also referred to as the 116-B-6-1, received radioactive liquid waste from equipment decontamination at the 111-B Building (GE 1953). It also received decontamination waste fuel element spacers and mixed waste (DOE-RL 1996). The crib was 12 ft by 8 ft by 15 ft deep and was in operation from 1951 through 1968 (DOE-RL 1992, 1994).

The radionuclide inventory includes cobalt-60, cesium-137, europium-152, europium-154, europium-155, plutonium-239, plutonium-240, strontium-90, and uranium-238. The crib/french

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drain also received 50 kg of sodium dichromate, 100 kg of sodium oxalate, 100 kg of sodium sulfamate, and nitrate (DOE-RL 1988; UNI 1978; WHC 1988, 1994). Lead may also be present (DOE-RL 1998a). (See construction drawings G-7-215, H-1-4049, and H-3-57210.)

3.2.6.1 Piping. No piping was located for this site.

3.2.7 116-B-6B Crib

The 116-B-6B Crib was located about 30 ft southeast of the 111-B Building. The crib was 12 ft by 8 ft by 6 ft deep and received radioactive waste from equipment decontamination at the 111-B Building and liquid waste from the decontamination of fuel element spacers (DOE-RL 1996). It operated from 1951 to 1968 (DOE-RL 1988).

The radionuclide inventory includes cobalt-60, cesium-134, cesium-137, europium-152, europium-155, tritium, nickel-63, uranium-238, and strontium-90 (DOE-RL 1992, 1998a; UNI 1978; WHC 1988). During operation, the crib received 50 kg of sodium dichromate, 100 kg of sodium oxalate, 100 kg of sodium sulfamate, and nitrate (WHC 1994, DOE-RL 1988). (See construction drawings G-7-215, H-1-4049, and H-3-57210.)

3.2.7.1 Piping. No piping was located for this site.

3.2.8 116-B-7 (1904-B Outfall)

The 116-B-7 waste site, also referred to as the 1904-B outfall, was located about 200 ft northwest of the 107-B retention basin, near the shore of the Columbia River. It was operational from 1944 to 1972 and was designed to dispose of wastes from the water treatment plant and reactor coolant water from the 107-B retention basin (WHC 1994, DOE-RL 1992). A new 66-in. 1904-B outfall line was installed October 1954 downstream of the older 42-in. line, and the new line extended 450 ft into the Columbia River (WHC 1994). The old line was maintained to drain the regular 100-B sewer, and the new line drained the effluent basin and all other process drainage.

Radionuclide contaminants of concern include cesium-137, plutonium-239, plutonium-240, europium-152, europium-154, europium-155, tritium, nickel-63, cobalt-60, and strontium-90 (DOE-RL 1998a, EPA 1999).

3.2.8.1 Piping. A 36-in.diameter by 177-ft reinforced-concrete effluent drain pipe extended from the west side of the retention basin to the 72-in.-diameter reinforced-concrete pipeline that led into the outfall. A 42-in.-diameter by 171-ft reinforced-concrete effluent drain pipe extended from the west side of the retention basin to the 72-in.-diameter reinforced-concrete pipeline that led to the outfall.

The 72-in.-diameter by 55-ft long reinforced-concrete effluent pipe drained into the outfall. This pipe was connected to the 105-B, 108-B, 182-B, 183-B, 184-B, and 190-B Buildings. The estimated length was 7,032 ft.

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3.2.9 116-B-8 (132-B-6 Outfall)

An outfall structure, also referred to as 132-B-6 and the 1904-B2, was located near the shoreline north of the east end of the 107-B retention basin. The outfall was designed to provide an escape for the effluent flow from the 107-B retention basin to the river in the event of a main line plug. The outfall was in service from 1944 to 1968 (WHC 1988).

The unit received and discharged reactor coolant effluent wastes to the river. Radionuclide contaminants of concern include cesium-137, plutonium-239, plutonium-240, europium-152, europium-154, europium-155, tritium, nickel-63, cobalt-60, and strontium-90 (DOE-RL 1998a, EPA 1999).

3.2.9.1 Piping. A 66-in.-diameter, 724-ft steel effluent pipe exited from the north side of the 116-C-5 retention basin and entered the south side of the outfall (see construction drawings H-1-26050 and H-1-26051).

3.2.10 116-B-9 French Drain

The 116-B-9 french drain, also referred to as the 104-B-2 french drain, received wastewater from the P-10 Storage Building drain (DOE-RL 1996, WHC 1988). The french drain was 4 ft in diameter by 3 ft deep and was in operation from 1952 to 1954. During that time, the french drain received about 4×10^4 L of liquid waste from the P-10 Storage Building.

Radiological contaminants included cobalt-60, cesium-137, europium-152, europium-154, europium-155, plutonium-239, plutonium-240, potassium-40, and thorium-228. Chemical contaminants include barium and hexavalent chromium (DOE-RL 1992, 1994, 1998a; WHC 1994). (See construction drawings G-7-215, H-1-4049, H-3-57210, and M-1904-B sheet 9.)

3.2.10.1 Piping. No piping was located for this site.

3.2.11 116-B-10 Dry Well

The 116-B-10 dry well/quench tank, also known as the 108-B dry well, was used as a collection chamber for the 108-B Building process wastes, storm drain waste, and roof drain. It also drained the 100-B Area process sewer through a vitrified clay pipe (DOE-RL 1996). The facility operated from 1950 to 1968 (DOE-RL 1992, WHC 1988). All underground piping leading into the tank was removed when the 108-B Building was demolished, and the dry well was covered with 1 m of soil (UNI 1986).

The radionuclide inventory includes cobalt-60, cesium-137, europium-153, europium-154, and tritium (DOE-RL 1998a, WHC 1994). The well received about 1.3 million gallons of liquid waste from the 132-B-1 Building from 1950 to 1968 (DOE-RL 1994). (See construction drawings H-1-2946, H-1-10206, H-3-57210, and M-1904-B sheet 8.)

3.2.11.1 Piping. No piping was located for this site.

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3.2.12 116-B-11 Retention Basin

The 116-B-11 waste site, also referred to as the 107-B retention basin, was located about 0.5 mi north of B Reactor (WHC 1988). The retention basin received effluent cooling water from the B and C Reactors. The effluent cooling water was held to allow for cooling and decay prior to release into the Columbia River. The retention basin was 470 ft by 230 ft by about 25 ft deep (DOE-RL 1995a) and was in operation from 1944 until 1954. Due to a crack in the basin in 1954, extensive leaks occurred in the soils in the area (DOE-RL 1996).

The radionuclide and chemical inventory near the retention basin contained americium-241, carbon-14, cobalt-60, cesium-134, cesium-137, europium-152, europium-154, europium-155, tritium, nickel-63, plutonium-238, plutonium-239, plutonium-240, radium-226, strontium-90, thorium-228, uranium-238, antimony, chromium, lead, and mercury (DOE-RL 1992, 1995b, 1998a; EPA 1996; UNI 1978; WHC 1994).

3.2.12.1 Piping. Facility piping included the following:

- A 6-in.-diameter by 186-ft vitrified clay process sewer pipe exited the east side of the retention basin and connected to a diversion box.
- A 6-in.-diameter by 2,176-ft asbestos cement service water pipe exited the west side of the retention basin and connected to the northwest corner of the 108-B Building. It was also part of the primary service water line.
- A 6-in.-diameter by 2,152-ft service water pipe exited the west side of the retention basin and connected to the service water pipe that delivered water to the 108-B, 182-B, 184-B, 1704-B, 1707-B, 1713-B, 1716-B, 1717-B, 1719-B, and 1722-B Buildings.
- A 16-in.-diameter by 105-ft steel effluent pipe exited east side of the retention basin to the west side of the 116-B-1 site.
- A 36-in.-diameter by 177-ft reinforced-concrete effluent drain pipe extended from the west side of the retention basin to the 72-in.-diameter reinforced-concrete pipeline that led into the outfall.
- A 42-in.-diameter by 171-ft reinforced-concrete effluent drain pipe extended from the west side of the retention basin to the 72-in.-diameter reinforced-concrete pipeline that led into the outfall.
- A 48-in.-diameter by 2,383-ft concrete effluent pipe exited the west side of the retention basin and extended to B Reactor.
- A 66-in.-pipe that reduced in size to a 60-in.-diameter by 2,450-ft steel effluent pipe exited the west side of the retention basin and extended to B Reactor.

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(See construction drawings H-1-1478, H-1-13050, H-1-13058, H-1-26050, H-1-80214, M-1901-B sheet 3, M-1904-B sheets 2 and 3, P-3393, P-5533, P-5540, and P-5595.)

3.2.13 116-B-12 Crib

The 116-B-12 waste site, also referred to as the 117-B Crib, received drainage materials from the confinement system seal pits in the 132-B-4 Building (DOE-RL 1996). The facility was about 10 ft by 10 ft by 10 ft (DOE-RL 1995a, 1992). The site was in operation from 1961 to 1968 and received 4.2×10^5 L of liquid waste from the 117-B Building. Following sampling in 1978, the site was determined to have no contamination above background levels (WHC 1994). However, thorium-228, arsenic, and chromium were documented (DOE-RL 1995b, 1998a; EPA 1996).

3.2.13.1 Piping. A 4-in.-diameter by 281-ft asbestos cement effluent pipe exited from the northwest corner of the site and extended to the 132-B Facility (see construction drawing H-1-19820).

3.2.14 116-B-13 South Sludge Trench

The 116-B-13 waste site, also referred to as the 107-B South Sludge Trench, was constructed in 1952 and operated until 1969. It received sludge from the 107-B basin (116-B-11) (DOE-RL 1992, 1996). The trench was about 50 ft by 50 ft by 10 ft (DOE-RL 1995a). The waste was later covered with about 6 ft of soil (GE 1956, WHC 1994).

Contaminants include americium-241, cesium-134, cesium-137, cobalt-60, europium-152, europium-154, europium-155, plutonium-238, plutonium-239, radium-226, strontium-90, thorium-228, uranium-238, antimony, chromium, lead, and mercury (DOE-RL 1995b, 1998a; EPA 1996).

3.2.14.1 Piping. A 3-in.-diameter by 490-ft cast-iron water pipe exited the west side of the waste site.

3.2.15 116-B-14 North Sludge Trench

The 116-B-14 waste site was also referred to as the 107-B North Sludge Trench and the 107-B Liquid Waste Disposal Trench No. 1. It was constructed directly north of the 107-B retention basin in 1948 and was 120 ft by about 10 ft by about 10 ft (DOE-RL 1992). The trench received sludge that had accumulated in the 107-B retention basin (116-B-11) (DOE-RL 1995a, 1996; UNI 1978). It was later covered with about 6 ft of soil (GE 1953, 1956).

Contaminants include americium-241, cesium-134, cesium-137, cobalt-60, europium-152, europium-154, europium-155, plutonium-238, plutonium-239, radium-226, strontium-90, thorium-228, uranium-238, antimony, chromium, lead, and mercury (DOE-RL 1995b, 1998a; EPA 1996).

3.2.15.1 Piping. No piping was located for this site.

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3.2.16 116-B-15 Percolation Pit

The 116-B-15 waste site is also referred to as the 105-B fuel storage basin cleanout percolation pit, 105-B pond, 105-B discharge pond, and the 105-B fuel storage discharge pond. The site is an open excavated pit, 100 ft by 50 ft by 6 ft deep, with cobble and soil walls. It operated from November 1984 until December 1985. During its operational use it received 567,750 L of processed water from the fuel storage basin cleanup project (WHC 1994). Contaminated water was processed through filters and an ion-exchange system before discharge (EPA 1999). Contaminants include cobalt-60, strontium-90, cesium-137, europium-155, uranium-238, and hexavalent chromium (DOE-RL 1998a).

3.2.16.1 Piping. No piping was located for this site.

3.2.17 116-B-16 Fuel Examination Tank

The 116-B-16 waste site, also referred to as the 111-B fuel examination tank and the 116-B-6 storage tank was under the northwest corner of the 111-B Building. The tank was approximately 11 ft by 6 ft by 9 ft deep (WHC 1994). The tank received liquid wastes from the decontamination of fuel element spacers from the 111-B Building. Undetermined radionuclides and inorganics exist at this site (DOE-RL 1998a).

3.2.17.1 Piping. No piping was located for this site.

3.3 B REACTOR AREA FACILITIES (APPENDIX D, PLATES 1 THROUGH 4)

3.3.1 B Reactor

The B Reactor was the first reactor constructed on the Hanford Site in 1943 as part of the U.S. Army Corps of Engineers Manhattan Project. The reactor produced plutonium that fueled the world's first atomic explosion at Alamogordo, New Mexico (WHC 1994), the plutonium fuel used in the bomb dropped on Nagasaki, Japan, during World War II, and the tritium used for the first hydrogen bomb. The building housed the nuclear reactor and associated equipment for reactor operations. The facility was 234 ft by 181 ft by 120 ft, and operated from 1944 to 1968. Radionuclides present include strontium-90, cesium-137, plutonium-239, and plutonium-240 (DOE-RL 1992).

Process cooling water was pumped from the 190-B Building to the B Reactor valve pit through twelve 12-in.-diameter steel pipes, which were located in an underground tunnel. These lines were later supplemented by two 18-in.-diameter carbon-steel lines (WHC 1993b).

The main process coolant piping underwent major revisions. Four existing 20-in.-diameter stainless-steel lines connecting the main valve pit headers to the risers were replaced with two 36-in.-diameter carbon-steel lines. Additionally, two existing 20-in.-diameter carbon-steel main headers were replaced with a single, 36-in.-diameter carbon-steel header (WHC 1993b).

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3.3.1.1 Piping. Piping entering and exiting the B Reactor included the following:

- A 4-in.-diameter by 40-ft cast-iron effluent pipe exited the north side of the facility.
- A 6-in.-diameter by 100-ft steel sewer pipe exited the west side of the building and connected to the 190-B Annex Building.
- A 6-in.-diameter by 45-ft vitrified clay effluent pipe exited the north side of the building and joined a 12-in.-diameter effluent pipe.
- A 6-in.-diameter by 14-ft vitrified clay effluent pipe exited the north side of the building.
- A 6-in.-diameter by 585-ft vitrified clay effluent pipe exited the north side of the building.
- Three 6-in.-diameter by 42-ft vitrified clay effluent pipes exited the east side of the building and connected to a 30-in.-diameter effluent pipe.
- An 8-in.-diameter by 239-ft vitrified clay effluent pipe exited the east side of the building and joined a 15-in.-diameter vitrified clay effluent pipe.
- A 12-in.-diameter by 439-ft water pipe exited the south side of the building.
- A 12-in.-diameter by 336-ft water pipe exited the south side of the building and connected to the north side of the 115-B building.
- A 20-in.-diameter by 2,201-ft steel return condenser water pipe exited the west side of the reactor and connected to the 42-in.-diameter concrete export water pipe.
- A 36-in.-diameter by 100-ft reinforced-concrete pipe exited the west side of the building and connected to the 190-B Building Annex.
- A 48-in.-diameter by 2,282-ft concrete effluent pipe exited the north side of the building and extended to the 116-B-11 retention basin.
- A 54-in.-diameter by 428-ft steel effluent cross-tie pipe exited the north side of the building and connected to the 66-in.-diameter steel effluent line that led to the 116-C-5 retention basin.
- A 66-in.-diameter by 2,450-ft steel effluent line exited the north side of the building and connected to the west side of the 116-B-11 retention basin.
- A 66-in.-diameter by 524-ft steel effluent line exited the east side of the building and connected with the 66-in.-diameter steel effluent line that led to the 116-C-5 retention basin.

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(See construction drawings H-1-1495 sheet 2, H-1-1478, H-1-13050, H-1-19820, H-1-80213, H-1-80214, HW-73788, M-1901-B sheet 5, M-1904 sheets 5 and 8, SK-1-3842, W-70833, W-70829, and W-65013.)

3.3.2 108-B Laboratory Building/Tritium Separation Facility

The intended use of this facility was to provide facilities for the mixing and addition of chemicals used in the treatment of the reactor cooling water. Shortly after the reactor began operation, it was determined that the chemical mixing and addition function could be better performed elsewhere in the cooling water supply system. The 108-B Building was then converted to a tritium recovery processing facility. The tritium separation facility was designed to support reactor operations by recovering tritium from irradiated lithium-aluminum target elements. The four-story building (three above-ground levels and a basement) was 132 ft by 32 ft by 41 ft and served as a water quality laboratory and was later converted to a mechanical development laboratory. The third floor was used for chemical storage; the second floor for chemical mixing and pumping equipment storage, and the first floor was used for chemical mixing, pumping, and unloading of bulk shipments. Sodium silicate and sulfuric acid were used in this facility (WHC 1993a). From 1948 to 1952, it was used as a pilot line for tritium separations (WHC 1989). Prior to demolition of the facility, the upper three floors were contaminated with tritium (UNI 1978). The facility was demolished in 1985 (WHC 1988, UNI 1986).

3.3.2.1 Piping. Piping in the 108-B Laboratory Building consisted of the following:

- A 2-in.-diameter by 585-ft vitrified clay effluent drain pipe exited the west side of the building and connected to the north side of B Reactor.
- A 2-in.-diameter by approximately 35-ft effluent pipe exited the east side of the building and connected to a french drain.
- A 3-in.-diameter by approximately 35-ft effluent pipe exited the east side of the building and connected to a french drain.
- A 3-in.-diameter by approximately 35-ft effluent pipe exited the west side of the building and connected to a french drain.
- A 3-in.-diameter by 893-ft steel sodium dichromate pipe exited the west side of the building and connected on the north side of the 190-B process pumphouse.
- A 3-in.-diameter by 887-ft steel sodium silicate pipe exited the west side of the building and connected on the north side of the 190-B process pumphouse.
- A 4-in.-diameter by 115-ft water pipe exited the northwest corner of the building and connected to the water line that supplied the 105, 115, 182, 183, 184, 1703, 1704, 1707, 1713, 1717, 1720, 1799, and 116-B-11 facilities.

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- A 6-in.-diameter by 54-ft cast-iron fresh water line exited the south side of the building and connected with the water line that joined the south side of the 115-B Building.
- A 6-in.-diameter by 134-ft vitrified clay effluent pipe exited the west side of the building and connected to a 12-in.-diameter vitrified clay process sewer pipe.
- A 6-in.-diameter by 170-ft vitrified clay sewer pipe exited the east side of the building and connected to a 12-in.-diameter vitrified clay process sewer pipe.
- A 6-in.-diameter by 250-ft vitrified clay effluent pipe exited the east side of the building and connected to the 116-B-5 waste site.
- A 6-in.-diameter by 100-ft vitrified clay sanitary sewer pipe exited the north side of the building and connected to the 8-in.-diameter stainless steel sanitary sewer pipe.

(See construction drawings H-1-1478, H-1-1595, H-1-2946, H-1-10206, H-1-10216, H-1-10260, H-1-2946, H-1-13050, M-1901-B sheet 5, M-1904 sheets 5 and 8, and W-74382.)

3.3.3 115-B Gas Recirculation Facility

The Gas Recirculation Facility housed pumps and other equipment related to the reactor gas coolant system. The 115-B Facility contained apparatus for circulating helium from pressurized storage tanks in the 110-B Building, and contained three silica gel towers that dried the gas as it passed through them. Underground piping connected the 115-B Building to the 105-B Building (WHC 1993b). The building was 113 ft long by 34 ft wide (WHC 1988). The facility was later demolished (WHC 1994).

3.3.3.1 Piping. A 6-in.-diameter by 54-ft cast-iron fresh water line exited the south side of the building and connected with the water line that joined the 108-B Building. A 10-in.-diameter by 54-ft water pipe exited the south side of the building and connected to the water pipe that supplied the 105-B, 182-B, 183-B, 184-B, 1703-B, 1704-B, 1707-B, 1713-B, 1717-B, 1720-B, 1799-B, and 116-B-11 facilities.

(See construction drawings H-1-12231, H-1-13050, M-1901-B sheet 5, M-1904 sheets 5 and 8, W-74670, W-71824, and W-72439.)

3.3.4 120-B-1 Battery Acid Sump

The 120-B-1 waste site, also referred to as the 105-B battery acid sump, was immediately adjacent to the 105-B Reactor building and operated from 1944 to 1969. The concrete-lined sump was designed for use during the emergency power pack batteries and the disposal of battery acid. The dimensions were 5 ft by 5 ft by 10 ft. The sump was formerly used for disposal of waste battery acid, solvents, and ethylene glycol. Heavy metals and chromium were located at the site (WHC 1994). Chemical contaminants included hexavalent chromium, lead,

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mercury, ethylene glycol and undetermined organic chemicals (DOE-RL 1992, 1998a; EPA 1996). There were no radionuclide contaminants of concern at this site. The sump was cleaned in 1986.

3.3.4.1 Piping. No piping was located for this site.

3.3.5 126-B-2 Clearwells

The 126-B-2 waste site, also referred to as the 183-B clearwells, the 126-B-2 clearwells, and the 126-B-2 landfill site, was located at the 183-B Water Treatment Facility. The clearwells were 751 ft long by 135 ft wide. No waste materials were deposited at the site (WHC 1994).

3.3.5.1 Piping. No piping was located for this site.

3.3.6 132-B-6 Outfall

The 132-B-6 waste site, also referred to as 116-B-8 or the 1904-B2 outfall, was located near the Columbia River. It was constructed in 1954 and was 27 ft long by 14 ft wide. It contained a sump and effluent line designed to discharge near the center of the Columbia River.

Radionuclide contaminants of concern include cesium-137, plutonium-239, plutonium-240, europium-152, europium-154, europium-155, tritium, nickel-63, cobalt-60, and strontium-90 (DOE-RL 1998a).

3.3.6.1 Piping. A 66-in.-diameter by 724-ft steel effluent pipe extended from the 116-C-5 retention basin to the south side of the outfall.

3.3.7 151-B Primary Electrical Substation

The primary electrical substation housed two transformers that provided electrical power from the Grand Coulee Dam to Bonneville Dam grid to the B-Reactor (WHC 1993b). The 151-B substation released sanitary waste to the 1607-B-4 septic tank and drain field.

3.3.7.1 Piping. An 8-in.-diameter by 148-in. vitrified clay sanitary sewer pipe exited the west side of the building and connected to the 1607-B-4 septic system (see construction drawings H-1-13050, H-1-80213, M-1901-B sheet 5, and M-1904 sheets 5 and 8). A 10-in.-diameter by 226-ft water line exited the east side of the building and connected to the primary water line.

3.3.8 181-B River Pumphouse

The 181-B river pumphouse supported both B and C Reactors by pumping river water to water treatment plants. The pumphouse was 245 ft long, 50 ft wide, and 20 ft high (WHC 1994). The water intake channel in front of the 181-B Building was dredged and lined with rock and concrete to form a forebay. There were 10 electric-driven pumps with a capacity of 10,500 gal/min (WHC 1989).

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As additional support for the C Reactor, 12 additional pump bays were later added to the 181-B pumphouse, and this addition was referred to as the 181-C pumphouse. Operations were remotely controlled from the 183-C Treatment and Filter Plant. Three parallel 48-in. raw water lines were laid from the 181-B Building to the 183-C Treatment and Filter Plant, and one 24-in. emergency raw water pipe was installed from the 182-B Building to the 183-C Facility (WHC 1993b).

3.3.8.1 Piping. The piping in the 181-B pumphouse included the following:

- A 6-in.-diameter by 100-ft vitrified clay sanitary sewer pipe exited the east side of the 181-B pumphouse and connected to the 1607-B5 septic system.
- A 30-in.-diameter by 2,258-ft steel raw water pipe joined the north side of the 182-B reservoir.
- A 42-in.-diameter by 4,517-ft steel raw water pipe joined the north and east sides of the 182-B reservoir.
- A 48-in.-diameter by 3,389-ft steel raw water pipe joined the 183-B filter house.
- A 48-in.-diameter by 5,074-ft steel raw water pipe joined the west side of the 183-C head house.
- A 48-in.-diameter by 5,284-ft steel raw water pipe joined the west side of the 183-C head house.
- A 48-in.-diameter by 5,428-ft steel raw water pipe joined the west side of the 183-C head house.

(See construction drawings H-1-13050, H-1-80213 sheets 1 and 5, M-1901-B sheets 2 and 3, P-3393, and P-5595.)

3.3.9 182-B Reservoir

The reservoir pumphouse provided reserve water for reactor cooling and raw export water for the 100 and 200 Areas. It was 482 ft by 309 ft by 38 ft and about 23 ft deep (WHC 1994). The river pumphouse (181-B) supplied water to the two storage reservoirs, and the reservoir capacity was 2.5×10^7 gal. Seven pumps were located in the pump room, each capable of pumping 6,000 gal/min (WHC 1989). Water was treated to reduce corrosion and film formation in the water cooling tubes and the canned uranium slugs in the reactor (GE [no date]).

In April 1946, the 24-in.-diameter cast-iron and 42-in.-diameter reinforced-concrete pipelines failed resulting in settlement at the transition anchor (GE 1955).

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The export water system served the dual function of supplying emergency raw water to the reactors and also supplying the entire raw water requirements of the chemical processing areas (200 Areas). The raw water was supplied to the export system by one steam-driven pump and five electric pumps with a combined flow capacity of 42,000 gal/min. The pipelines were concrete cylinder pipe, consisting of a 12/64-in.-thick steel shell lined with 0.5-in. centrifugal-cast cement mortar, reinforced with spirally wound steel rod, spaced on approximately 2-in. centers. The outside shell of the pipe was covered with concrete, and the joints between the 30-ft sections were bell- and spigot-type with rubber gaskets (WHC 1989).

3.3.9.1 Reservoir Piping. Piping for the reservoir included the following:

- A 4-in.-diameter by 661-ft steel filtered water pipe exited the north side of the reservoir and connected with the 30-in. stainless-steel service water pipe. This water line provided service to the 105-B, 108-B, 182-B, 183-B, 184-B, 1703-B, 1704-B, 1707-B, 1709-B, 1713-B, 1717-B, 1720-B, 1722-B, 105-C, 183-C, and 190-C Buildings.
- An 8-in.-diameter by 430-ft vitrified clay process sewer pipe exited the north side of the reservoir and joined the 36-in.-diameter process sewer pipe.
- A 10-in.-diameter by 1,120-ft cast-iron service water pipe exited the north side of the building and connected to the east side of the 183-B filter house.
- A 24-in.-diameter by 2,108-ft steel service water pipe exited the east side of the reservoir and joined the west side of the 183-C head house.
- A 24-in.-diameter by 760-ft reinforced-concrete water pipe exited the north side of the reservoir and joined the east side of the 183-B filter house.
- A 36-in.-diameter reinforced-concrete process sewer pipe exited the east side of the reservoir and eventually drained into the 116-B-7 outfall.
- A 42-in.-diameter by 45-ft reinforced-concrete process sewer pipe exited the east side of the reservoir and joined the main pipe that drained into the 116-B-7 outfall.
- A 42-in.-diameter by 6,019-ft concrete export water line exited the south side of the reservoir.

3.3.10 183-B Filter Plant

The 183-B Filter Plant contained water treatment and filtering facilities and served as a reservoir for treated water. The facility consisted of a head house and chemical building, flocculation and subsidence basins, filter building, and clearwell storage with pump room (WHC 1989, 1994). The filter building contained the chemical feeding equipment, mechanical mixing and flocculating chambers, gravity filters, subsidence basins, and a 1 x 10⁷-gal clearwell used for the storage of filtered water (WHC 1989). The filter plant was designed to remove suspended

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materials from the water by mixing chemicals followed by a sedimentation period and filtration through a bed of Anthrafil, sand, and gravel. Chemicals used for water treatment in the facility included lime, aluminum or ferric sulfate, activated carbon, chlorine, and Calgon (GE 1944). The total capacity of the 183-B pumping facility was 1,160,000 gal/min (WHC 1989). WHC (1993b) indicates that piping that carried lime had to be re-routed because the lime was added at the filter outlet flume after filtration instead of at the raw water inlet line. After the modifications, the line flowed to a 36-ft-diameter liquid alum storage tank above ground on the north side of the 183-B head house. Additionally, a pipeline was installed from the 183-C activated silica preparation facility to a storage tank outside of 183-B.

Over the years, several pipelines broke in the vicinity of the 183-B Facility. In November 1948, the 10-in.-diameter pipeline split and broke due to a leak and settling. In August 1950, the 36-in.-diameter filtered pipeline had a bell leak at the building line. In February 1954, a 4-in.-diameter cast-iron line was crushed under the road (GE 1955).

3.3.10.1 Piping. Piping for the 183-B Filter Plant included the following:

- A 3-in.-diameter by about 1,800-ft service water pipe exited the east side of the building and connected to the 126-B-4 Facility.
- An 8-in.-diameter by 263-ft vitrified clay sanitary sewer pipe exited the east side of the building and connected to the 1607-B-7 septic system.
- Two 10-in.-diameter by about 1,021-ft service water cast-iron pipes exited the east side of the building and connected to the south side of the 184-B Building.
- A 10-in.-diameter by 1,120-ft cast-iron service water pipe exited the east side of the building and connected to the north side of the 182-B reservoir.
- A 14-in.-diameter by about 1,270-ft service water pipe exited the east side of the building and connected to the south side of the 184-B Building.
- Three 18-in.-diameter by 65-ft process sewer vitrified clay pipes exited the west side of the building and connected with the 27-in.-diameter reinforced-concrete pipe that eventually drained into the main line leading to the 116-B-7 outfall.
- Two 18-in.-diameter by 30-ft process sewer vitrified clay pipes exited the west side of the building and connected to a 27-in.-diameter vitrified clay process sewer pipe that remained connected to the west side of the building.
- A 27-in.-diameter by 340-ft vitrified clay process sewer pipe exited the west side of the building and reconnected to the building near the southwest wall.
- A process sewer pipe about 27 in. in diameter by about 132 ft in length exited the west side of the building and connected to the mainline that drained at the 116-B-7 outfall.

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- A 30-in.-diameter by about 450-ft stainless-steel service water pipe exited the east side of the building and connected with the water line that provided service to 105-B, 108-B, 182-B, 183-B, 184-B, 1703-B, 1704-B, 1707-B, 1709-B, 1713-B, 1717-B, 1720-B, 1722-B, 105-C, 183-C, and 190-C.
- A 36-in.-diameter cast-iron service water pipe exited the east side of the building and connected to the east side of the 182-B reservoir. The estimated overall length was 1,485 ft.
- A 42-in.-diameter by approximately 1,100-ft process sewer pipe exited the east side of the building and connected to the mainline that drained at the 116-B-7 outfall.
- A 48-in.-diameter by approximately 115-ft process sewer pipe exited the north side of the building and connected to the mainline that drained into the 116-B-7 outfall.

(See construction drawings H-1-13050, H-1-15698, H-1-80213 sheets 1 and 5, H-1-80214, M-1901-B sheet 5, and M-1904 sheets 5 and 8.)

3.3.11 184-B Powerhouse

The 184-B Building powerhouse provided steam and emergency electrical power for the secondary coolant system located in 181-B. The 184-B Building also supplied office heat and other heating needs through overhead steam lines that looped throughout the 100-B Area (WHC 1993b). It was demolished in 1983 (WHC 1994).

In January 1951, the 6-in.-diameter pipeline broke at the anchor near the building line. However, no 6-in.-diameter pipes were located during data collection for this project. In April 1954, the 8-in.-diameter pipeline main leaked at the building line (GE 1955).

3.3.11.1 Piping. The piping for the 184-B powerhouse included the following:

- An 8-in.-diameter by 250-ft vitrified clay sewer pipe exited the north side of the building and connected to the 1607-B-3 septic system.
- A 10-in.-diameter by 1,021-ft service water pipe exited the south side of the building and connected to the east side of the 183-B Filter Building.
- A 10-in.-diameter by 1,100-ft cast-iron water pipe exited the south side of the building and connected with the east side of the 183-B Filter Building.
- A 10-in.-diameter by 95-ft cast-iron process sewer pipe exited the south side of the building and connected to the mainline that eventually drained at the 116-B-7 outfall.

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- A 12-in.-diameter by 100-ft vitrified clay process sewer pipe exited the south side of the building and connected with the 18-in.-diameter vitrified pipe leading to the mainline that drained at the 116-B-7 outfall.
- A 14-in.-diameter by about 1,270-ft service water pipe exited the south side of the building and connected to the east side of the 182-B Filter Building.
- A 16-in.-diameter by 2,818-ft cast-iron service water pipe exited the south side of the building and connected to the west side of the 183-C head house.

(See construction drawings H-1-13050, H-1-15698, H-1-80214, M-1904 sheets 5 and 8, P-5944, and P-5649.)

3.3.12 185-B Water Treatment Plant

The 185-B Deaeration Facility (i.e., 185-B Water Treatment Plant) received filtered water from underground clearwells, removed the dissolved gases and entrained air, and then pumped the gases and air to steel storage tanks in the 190-B process pumphouse (WHC 1993b). The facility provided coolant water for B Reactor and was later used to store resin for N Reactor. The dimensions of the facility were 307 ft by 48 ft by 60 ft (WHC 1994).

3.3.12.1 Piping. The piping for the 185-B Water Treatment Plant included the following:

- A 6-in.-diameter by approximately 1,040-ft stainless-steel process sewer pipe exited the north side of the building and connected to the east side of the 190-B Building.
- A 24-in.-diameter by approximately 340-ft cast-iron process sewer pipe exited the south side of the building and connected to the sump on the east side of the 190-B Building.
- A 48-in.-diameter by about 125-ft stainless-steel process sewer pipe exited the north side of the building and connected to the mainline that eventually drained at the 116-B-7 outfall.

(See construction drawings H-1-13050, H-1-80213 sheets 1 and 5, H-1-80214, P-5065, P-5593, and W-71742.)

3.3.13 187-B Process Water Pumphouse and Annex

The 187-B emergency cooling water storage tanks stored emergency cooling water. The capacities of the high tanks were 300,000 gal each (WHC 1989). The structures were demolished in 1979 (see construction drawing W-71824).

3.3.13.1 Piping. No piping was located for this site.

3.3.14 190-B Process Water Pumphouse and Annex

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Process water was pumped to the 190-B process pumphouse for the addition of rust-inhibiting sodium dichromate. Twelve sets of steam and electric pumps located in the 190-B Building pumped the treated water through the B Reactor building. Process cooling water was pumped from the 190-B Building to the B Reactor valve pit through twelve 12-in.-diameter pipes located in an underground tunnel. These lines were later supplemented by two 18-in.-diameter carbon-steel lines (WHC 1993b). The main pumphouse provided the primary coolant water for B Reactor. It was 456 ft by 184 ft and was contiguous with the 185-B Building (WHC 1988). An annex to the 190-B Building was constructed in 1955.

Piping for the pumphouse included the following:

- A 3-in.-diameter by 887-ft steel sodium silicate pipe exited the north side of the 190-B pumphouse and joined the west side of the 108-B Building.
- A 3-in.-diameter by 893-ft steel sodium dichromate pipe exited the north side of the 190-B pumphouse and joined the west side of the 108-B Building.
- Three 4-in.-diameter by about 40-ft stainless-steel process sewer pipes exited the east side of the pumphouse and connected with a 6-in.-diameter stainless-steel process sewer pipe that returned to the north side of the 185-B Building.
- A 10-in.-diameter by 1,021-ft raw water pipe exited the south side of the pumphouse and joined the east side of the 183-B filter house.
- A 10-in.-diameter by 300-ft raw water pipe exited the south side of the pumphouse and joined the 20-in.-diameter reinforced-concrete pipe on the south side of the 182-B reservoir.
- A 16-in.-diameter by 300-ft water line exited the north side of the pumphouse and connected to the 24-in.-diameter return condenser water line leading to the 182-B reservoir.
- An 18-in.-diameter by about 74-ft stainless-steel process sewer pipe exited the north side of the pumphouse and connected to the 36-in. reinforced-concrete pipe that eventually drained at the 116-B-7 outfall.
- A 20-in.-diameter by 2,446-ft return condenser water pipe exited the south side of the pumphouse and joined the service water pipe that connected on south side of the 182-B pumphouse.
- A 24-in.-diameter by 250-ft water pipe exited the north side of the building and connected to the north side of the 182-B reservoir.
- A 30-in. by approximately 30-ft cast-iron process sewer pipe exited the south side of the pumphouse and connected with a 24-in.-diameter cast-iron process sewer pipe leading to the sump on the east side of the pumphouse.

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- A 30-in.-diameter by about 74-ft stainless-steel process sewer pipe exited the north side of the pumphouse and connected to the 36-in. reinforced-concrete pipe that eventually drained at the 116-B-7 outfall.
- A 30-in.-diameter by about 250-ft steel emergency bypass pipe exited the north side of the building and connected with the mainline.
- A 36-in.-diameter by 244-ft cast-iron service water pipe exited the north side of the pumphouse and connected with the service water pipe that joined the east side of the 183-B building. The overall length was 1,485 ft.

(See construction drawings H-1-13050, H-1-80213 sheets 1 and 5, H-1-80214, H-1-15698, M-1901-B sheets 2 and 5, M-1904-sheets 5 and 8, and HW-72064.)

3.3.15 1608-B Contaminated Drain and Transfer Station

The 1608-B contaminated drain and transfer station provided a collection area for all contaminated drains in the reactor building and for the cooling flow from the fuel storage basin. Water from the facility was transferred to the reactor effluent lines using deep well pumps (WHC 1989). The facility was 32 ft below grade and was 12 ft by 12 ft (WHC 1988, UNI 1978).

3.3.15.1 Piping. No piping was located for this site.

3.3.16 1701-B Badge House

The 1701-B badge house provided entrance into the exclusion area and was later used as a lunchroom and restroom facility. The facility was designed to house personnel who verified employee identification entering the work area. The facility contained a guard, equipment, clock alley, laboratory, storage, office, and restrooms (WHC 1989, 1993a).

3.3.16.1 Piping. The piping for the 1701-B badge house included the following:

- A 6-in.-diameter by approximately 430-ft vitrified clay sanitary sewer pipe exited the west side of the building and drained into the 1606-B1 septic system.
- An 8-in.-diameter service water pipe exited the west side of the building and connected with the primary water line that serviced most of the facilities in the reactor areas.

(See construction drawings M-1901-B sheet 4 and M-1904-B sheet 4.)

3.3.17 1703-B Technical Office Building

The piping for the 1703-B Technical Office Building included the following:

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- A 6-in.-diameter by about 465-ft vitrified clay process sewer exited the north side of the building and connected with the mainline that drained into the 8 in.-diameter vitrified clay pipe and into the 1607-B2 septic system.
- An 8-in.-diameter by 365-ft service water pipe exited the south side of the building and connected with the mainline that connected to the west side of the 116-B-11 retention basin.

(See construction drawings H-1-10206 and M-1904 sheets 5 and 8.)

3.3.17.1 Piping. No piping was located for this site.

3.3.18 1704-B Office Building

The single-story 1704-B Office Building was used as a supervisor's office and a laboratory. The facility was later moved to the 200 Area in the 1970s (WHC 1989).

3.3.18.1 Piping. Piping for the 1704-B Office Building included the following:

- A 3-in.-diameter by approximately 25-ft service water pipe exited the north side of the building and connected with the primary service water pipe that eventually connected to the primary service water line.
- A 6-in.-diameter by about 230-ft stainless-steel sanitary sewer pipe exited the north side of the building and connected to the primary sanitary sewer pipe that drained into the 1607-B-2 septic system.

(See construction drawings H-1-80213, H-1-13050, M-1901-B sheet 5, and M-1904 sheets 5 and 8.)

3.3.19 1707-B Change House

The 1707-B Building was originally used as a change house and lunchroom and later as office space located along the main gatehouse road. The building was later dismantled (WHC 1989, 1993a).

3.3.19.1 Piping. Piping for the 1707-B Building included the following:

- A 2-in.-diameter by 130-ft cast-iron service water pipe exited the north side of the building and connected to the south side of the 1713-B Building.
- A 6-in.-diameter by approximately 85-ft stainless-steel sanitary sewer pipe exited the north side of the building and connected to the primary sanitary sewer pipe that drained into the 1607-B-2 septic system.

(See construction drawings H-1-13050 and M-1904-B sheets 5 and 8.)

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3.3.20 1709-B Fire Headquarters

The 1709-B Fire Headquarters Building was located near the main gate entrance to the B Reactor area. The 3,560 ft² facility was designed to provide living quarters for firemen and also included truck storage (WHC 1989, 1993a).

3.3.20.1 Piping. Piping for the 1709-B Fire Headquarters Building included a 6-in.-diameter by 3,350-ft fresh water line that exited the east side of the building and connected with the primary water line (see construction drawings M-1901-B sheets 4 and M-1901 sheet 4).

3.3.21 1713-B Store Room and Warehouse

The single-story 1713-B Building was used for storeroom and warehouse space (WHC 1993a). All 100-B Area supplies were received and dispersed from this building. Later it was converted to an instrument and development testing facility (WHC 1989).

3.3.21.1 Piping. Piping for the 1713-B Building included the following:

- A 2-in.-diameter by 130-ft cast-iron service water pipe exited the south side of the building and connected to the north side of the 1707-B Building.
- A 6-in.-diameter by approximately 25-ft stainless-steel sanitary sewer pipe exited the south side of the building and connected to the primary sanitary sewer pipe that drained into the 1607-B2 septic system.

(See construction drawings M-1901-B sheet 5 and M-1904 sheets 5 and 8.)

3.3.22 1717-B Maintenance Shop

The single-story 1717-B Maintenance shop was located along the main entrance road and contained a large machine, carpenter, pipe, sheet metal, electric and forge shops, a tool room, several offices, and a restroom (WHC 1993a). The building was later demolished.

3.3.22.1 Piping. The piping for the 1717-B maintenance shop included the following:

- A 4-in.-diameter by 74-ft service water pipe exited the south side of the building and connected to the primary service water pipe.
- A 6-in.-diameter by approximately 35-ft stainless-steel sanitary sewer pipe exited the south side of the building and connected to the primary sanitary sewer pipe that drained into the 1607-B2 septic system.

(See construction drawings H-1-13050, M-1901-B sheet 5, and M-1904 sheets 5 and 8.)

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3.3.23 1719-B First Aid Station

The 1719-B first aid station was a single-story structure located near the center of the process area. It contained a first aid room, cot room, laboratory, office, and restrooms (WHC 1993a). The building was later demolished.

A water line about 20-ft long exited the north side of the building and connected to the primary water line.

3.3.23.1 Piping. A 6-in.-diameter by about 100-ft stainless-steel sanitary sewer pipe exited the north side of the building and connected to the primary sanitary sewer pipe that drained into the 1607-B2 septic system. (See construction drawings H-1-13050, M-1901-B sheet 5, and M-1904 sheets 5 and 8.)

A water line about 20 ft long exited the north side of the building and connected to the primary water line.

3.3.24 1720-B Patrol Headquarters

The 1720-B Building was a single-story building originally used as the area patrol headquarters and later for office space. The structure was later removed from the site (WHC 1994).

3.3.24.1 Piping. The piping for the 1720-B Building included the following:

- A 6-in.-diameter by approximately 35-ft service water pipe exited the north side of the building and connected to the primary service water pipe that provided service to most of the area facilities.
- An 8-in.-diameter by 178-ft vitrified clay sanitary sewer pipe exited the north side of the building and connected to the 1607-B-1 septic system.

(See construction drawings H-1-80213, M-1901-B sheet 4, and M-1904 sheets 4 and 5.)

3.3.25 1722-B Paint Shop

The 1722-B paint shop was a single-story building that contained a riggers' loft and paint storage room (WCH 1993a). The facility was later demolished.

3.3.25.1 Piping. The piping in the 1722-B paint shop was as follows:

- A 2-in.-diameter by 27-ft service water pipe exited the west side of the building and connected to the primary line leading to the 116-B-11 retention basin.
- A 6-in.-diameter by about 60-ft stainless-steel sanitary sewer pipe exited the northwest corner of the building and connected to the primary sanitary sewer pipe that drained into the 1607-B-2 septic system.

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(See construction drawings H-1-13050, M-1901 sheet 5, and M-1904 sheets 5 and 8.)

3.4 C REACTOR AREA WASTE SITES (APPENDIX D, PLATES 2 AND 4)

3.4.1 116-C-1 Process Effluent Trench

The 116-C-1 waste site, also referred to as the 107-C Liquid Waste Disposal Trench and the 107-C Liquid Waste Disposal Trench, was dug in 1952 and operated until 1968 (DOE-RL 1992). Site dimensions were 500 ft by 50 ft by 25 ft and the trench was designed to divert effluent water from the Reactors during outages due to ruptured slugs (GE 1956, DOE-RL 1996).

The facility received 700 million liters of high-activity effluent (DOE-RL 1995a) and was later filled with 5 ft of soil. The radionuclide inventory includes americium-241, carbon-14, cobalt-60, cesium-134, cesium-137, europium-152, europium-154, europium-155, tritium, plutonium-238, plutonium-239, plutonium-240, radium-226, strontium-90, thorium-228, uranium-235, uranium-238, antimony, chromium, lead, and mercury (DOE-RL 1995b, 1998a; EPA 1996; WHC 1988, 1994).

3.4.1.1 Piping. Piping in the 116-C-1 process effluent trenches included the following:

- A 24-in.-diameter by 944-ft steel effluent pipe exited the west side of the facility and connected to the north side of the 116-C-5 retention basin.
- A 24-in.-diameter by 659-ft concrete effluent pipe exited the west side of the facility and connected to the northeast side of the 116-C-5 retention basin.
- A 42-in.-diameter by 409-ft steel effluent pipe exited the west side of the facility and connected to the 60-in.-diameter steel effluent pipe that drained at the outfall.
- A 42-in.-diameter by 416-ft steel effluent pipe exited the west side of the facility and connected to the 60-in.-diameter steel effluent pipe that drained at the outfall.

(See construction drawings G-7-215, H-1-4049, H-1-13050, H-1-13058, H-1-80214, H-3-57210, M-1904 sheet 3, P-3393, P-5533, P-5540, and P-5595.)

3.4.2 116-C-2A Pluto Crib

The 116-C-2A waste site, also referred to as the 116-C-2A Pluto Crib and 116-C-2, was located 275 ft east of C Reactor. The crib was unique in that effluents passed through a sump pump and sand filter prior to being discharged to the crib. It was 140 ft by 100 ft by 20 ft deep and was constructed of concrete ties notched and stacked with a gravel and sand fill. The crib began operation in 1952 and use was discontinued in 1968 or 1969. The crib received contaminated wastes from the decontamination of dummy fuel elements, contaminated water from C Reactor irradiated fuel examining facilities, and reactor rear face liquid wastes.

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The radionuclide inventory includes cobalt-60, cesium-134, cesium-137, europium-152, europium-154, europium-155, tritium, strontium-90, and uranium-238 (DOE-RL 1998a, EPA 1997, UNI 1978). The site is also believed to contain sodium dichromate, sodium oxalate, sodium sulfamate, sodium hydroxide, and nitric acid (WHC 1988, 1994) (DOE-RL 1988).

3.4.2.1 Piping. An 8-in.-diameter by about 100-ft vitrified clay effluent pipe exited the west side of the facility and connected to the east side of the 116-C-2C facility. The pipe has been removed (see construction drawings G-7-210, H-1-4049, H-3-57210, and P-8882).

3.4.3 116-C-2B Pluto Crib Pumping Station

The 116-C-2B waste site (also referred to as the 116-C-2B pump station, the 105-C Pluto Crib pump station, and 116-C-2-1) was located about 40 ft northwest of the 116-C-2C sand filter. The crib was 140 ft by 100 ft by 20 ft deep. It was in operation from 1952 until 1969 and received mixed waste from C Reactor (WHC 1994). The site was backfilled with 12 to 15 ft of soil.

The radionuclide inventory includes tritium, cobalt-60, strontium-90, cesium-134, cesium-137, europium-152, europium-154, europium-155, plutonium-239, plutonium-240, and uranium-238 (DOE-RL 1998a, EPA 1997, WHC 1988).

3.4.3.1 Piping. Piping in the 116-C-2B Pluto Crib pumping station included the following:

- A 2-in.-diameter by approximately 210-ft stainless-steel effluent pipe exited the west side of the site and connected to the 66-in.-diameter steel effluent line that drained into the 116-C-5 retention basins.
- A 2-in.-diameter by 333-ft stainless-steel effluent pipe exited the north side of the site and connected to the west side of the 116-C-3 waste site.

(See construction drawings G-7-210, H-1-4049, H-3-57210, M-1904-B sheet 3, and P-8880.)

3.4.4 116-C-2C Pluto Crib Sand Filter

The 116-C-2C waste site (also referred to as the 116-C-2C sand filter, the 105-C Pluto Crib sand filter, 116-C-8, and 116-C-2-2 Crib) was located about 50 ft west of the 105-C Pluto Crib. The crib was 16 ft by 23 ft by 6 ft deep. It was operational from 1952 until 1968, and it was covered with concrete lids when it was retired.

The radionuclide inventory includes cobalt-60, cesium-134, cesium-137, europium-152, europium-154, europium-155, tritium, plutonium-238, plutonium-239, plutonium-240, strontium-90, and uranium-238 (DOE-RL 1998a; EPA 1997; WHC 1988, 1994). While in operation, the sand filter received 7.5×10^6 L of mixed wastes.

3.4.4.1 Piping. The piping in the 116-C-2C Pluto Crib sand filter was as follows:

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- A 4-in.-diameter by approximately 60-ft vitrified clay effluent pipe exited the west side of the waste site. The exact destination is unknown.
- An 8-in.-diameter by about 100-ft vitrified clay effluent pipe exited the east side of the waste site and connected to the west side of the 116-C-2A waste site.

(See construction drawings G-7-215 and H-3-57210.)

3.4.5 116-C-3 Chemical Waste Tank

The 116-C-3 waste site, also referred to as the 105-C chemical waste tank, was located about 300 ft northeast of C Reactor. Two below-ground storage tanks may have never been used. The tanks were installed to receive caustic waste from the metal examination facility and may be filled with water. Both tanks are 12 ft in diameter by 12 ft deep (EPA 1996, WHC 1994). Potential contaminants include undetermined organic and inorganic chemicals (DOE-RL 1998a, EPA 1999).

3.4.5.1 Piping. A 2-in.-diameter by 369-ft stainless-steel effluent pipe exits the west side of the site and connected to the north side of the 116-C-2B waste site.

3.4.6 116-C-4 Outfall

The 116-C-4 outfall, also known as 132-C-2 and the 1904-C outfall, was used for the effluent flow from the 107-C liquid waste disposal trench to the river in the event the line that normally carried effluent to the river became plugged. The outfall consisted of a concrete water box (WHC 1988).

Radionuclide contaminants of concern include cobalt-60, strontium-90, cesium-137, europium-152, europium-154, europium-155, tritium, and nickel-63 (DOE-RL 1998a, EPA 1999).

3.4.6.1 Piping. The piping in the 116-C-4 outfall included the following:

- Two 48-in. by 72-in. by 7,032-ft concrete process sewer lines extended from the north side of the 183-C head house and provided services to the 183-C, sedimentation basins, filter building, clearwells, and 190-C Buildings and drained at the outfall.
- A 60-in.-diameter by 1,498-ft stainless-steel effluent pipe exited the northeast side of the 116-C-5 retention basin and connected to the south side of the outfall.
- A 60-in.-diameter by 1,357-ft stainless-steel effluent pipe exited the northeast side of the 116-C-5 retention basin and connected to the south side of the outfall.

3.4.7 116-C-5 Retention Basins

100-B/C Reactor Area Facilities and Pipelines

The 116-C-5 waste site, also referred to as the 107-C retention basins, contained two circular open-topped tanks with a capacity of 10 million gallons. Each tank was 331 ft in diameter by 16 ft deep and was located about 0.5 mi north of B Reactor (WHC 1988). The basins were operational from 1952 to 1969 (DOE-RL 1996). The facility held effluent water from the B and C Reactors for cooling and decay prior to its release into the Columbia River (DOE-RL 1995a).

The radionuclide inventory includes americium-241, cobalt-60, cesium-134, cesium-137, europium-152, europium-154, europium-155, tritium, nickel-63, strontium-90, plutonium-238, plutonium-239, plutonium-240, radium-226, strontium-90, thorium-228, nickel-63, and uranium-238. Inorganics include antimony, chromium, lead, and mercury (DOE-RL 1992, 1995b, 1998a; EPA 1996; UNI 1978; WHC 1994).

3.4.7.1 Piping. The piping in the 116-C-5 retention basins included the following:

- A 24-in.-diameter by 944-ft steel effluent pipe exited the northeast side of the retention basin and connected to the west side of the 116-C-1 waste site.
- A 24-in.-diameter by 659-ft concrete effluent pipe exited the northeast side of the retention basin and connected to the west side of the 116-C-1 waste site.
- A 60-in.-diameter by 186-ft steel effluent pipe exited the south side of the retention basin and connected to the north side of the diversion box.
- A 60-in.-diameter by 262-ft steel effluent pipe exited from the south side of the retention basin and connected to the north side of the diversion box.
- A 60-in.-diameter by 1,357-ft steel effluent pipe exited from the northeast side of the retention basin and connected to the 132-C outfall.
- A 60-in.-diameter by 1,498-ft steel effluent pipe exited from the northeast side of the retention basin and connected to the 132-C outfall.
- A 66-in.-diameter by 238-ft steel effluent pipe exited from the south side of the retention basin and connected to the northeast side of the diversion box.
- From the diversion box, effluent pipes extended to 116-B-11 and to C Reactor.

(See construction drawings H-1-13050, H-1-13058, H-1-26055, H-1-80213, H-1-80214, M-1901 sheet 3, M-1904-B sheet 3, P-3393, P-5537, P-5540, P-5582, P-5595, and P-5944.)

3.4.8 116-C-6 Fuel Storage Basin Cleanout Percolation Pit

The 116-C-6 waste site, also referred to as the 105-C fuel storage basin cleanout percolation pit, was located about 400 ft east of C Reactor (WHC 1994). The site received treated water from the 105-C fuel storage basin cleanup project. Contaminated water was processed through filters

100-B/C Reactor Area Facilities and Pipelines

and an ion-exchange system before being discharged. The site was an unlined, "L"-shaped, open excavated pit with side lengths of 100 ft by 100 ft, by 45 ft by 50 ft by 55 ft (a total area of 7,250 ft²). Contaminants included cobalt-60, strontium-90, cesium-137, europium-155, plutonium-238, and hexavalent chromium (DOE-RL 1998a, EPA 1999).

3.4.8.1 Piping. No piping was located for this site.

3.5 C REACTOR AREA FACILITIES (APPENDIX D, PLATES 1 - 4)

3.5.1 105-C Reactor Building

The 105-C Reactor building was the sixth reactor constructed on the Hanford Site. Construction began in 1951 and was completed the following year. Initially 72,000 gal/min of cooling water was used to cool the reactor core; later the amount of water was increased to 100,000 gal/min. Effluent water was discharged to retention basins where it was held while awaiting the radioactive decay of short-lived radionuclides. From the retention basins, water was discharged through outfall structures and into the Columbia River.

Between 1964 and 1965, a 20-in.-diameter reinforced-concrete pipe was installed from the 182-B Facility to the 105-C valve pit to carry potential tertiary coolant flow. A 70-in reinforced-concrete water line was also installed between the 182-B Building and C Reactor in April 1965.

Effluents discharged from the reactor included cooling water, fuel storage basin water, and decontamination solutions. Contaminants discharged from the reactor included calcium-41, cobalt-60, chromium-51, cesium-137, europium-152, europium-154, europium-155, nickel-63, plutonium-238, plutonium-240, strontium-90, and zinc-65.

3.5.1.1 Piping. The piping in the 105-C Reactor building included the following:

- A 4-in.-diameter by about 35-ft stainless-steel effluent pipe exited the east side of the reactor and connected to the 8-in.-diameter pipe leading to the west side of the 116-C-2B.
- A 4-in.-diameter by 406-ft asbestos cement effluent pipe exited the southeast side of the reactor and connected to the north side of the 132-C-3 site.
- A 4-in.-diameter by 120-ft steel water pipe exited the south side of the building and connected to the south side of the 132-C-3 site.
- An 8-in.-diameter by about 115-ft stainless-steel effluent pipe exited the northeast side of the reactor connected to the 4-in.-diameter stainless-steel and connected to the west side of the 116-C-2B site.
- An 8-in.-diameter by 1,114-ft stainless-steel sanitary sewer pipe exited the south side of the reactor and drained at the 1607-B-9 septic system.

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- A 10-in.-diameter by 3,999-ft reinforced-concrete water pipe exited the west side of the reactor and connected to the 183-C head house.
- A 12-in.-diameter by 273-ft steel effluent pipe exited the north side of the reactor and connected to the 66-in.-diameter effluent pipe.
- A 12-in.-diameter by 365-ft steel effluent pipe exited the north side of the reactor and connected to the 66-in.-diameter effluent pipe.
- Two 12-in.-diameter by 93- and 97-ft steel effluent pipes exited the south side of the reactor and connected to the east side of the building.
- Two 15-in.-diameter by 98-ft steel effluent pipes exited the south side of the reactor and connected to the east side of the reactor.
- A 20-in.-diameter by 148-ft reinforced-concrete water pipe exited the west side of the reactor and connected to the primary site water pipe.
- A 24-in.-diameter by about 810-ft service water pipe exited the northwest corner of the reactor and connected to the primary water line that connected with the 183-C and 190-C Facilities.
- A 66-in.-diameter by 3,139-ft steel effluent pipe exited the north side of the reactor and connected to the diversion box south of the 116-C-5 retention basin.
- A 66-in.-diameter by 3,324-ft steel effluent pipe exited the north side of the reactor and connected to the diversion box south of the 116-C-5 retention basin.

(See construction drawings H-1-13050, H-1-80213, H-1-80214, M-1904-B sheet 8 and 9, P-5528, P-5533, P-5579, P-5591, P-5595, P-6289, P-8882, P-9135, and SK-1-3842.)

3.5.2 183-C Facility

The 183-C Facility was a complete chemical storage and handling facility (head house), with flocculation and sedimentation basins, mixers, sample and analyses facilities, flow control devices, and steel clearwell tanks with the capacity for 3 million gallons of storage were also provided (WHC 1993b). (For piping information, see subheadings below.)

3.5.3 183-C Head House

The 183-C head house supplied treated water to B Reactor. A filtered water line and 20-in. export water line was laid between from the 100-B loop to serve the 183-C Facility and 105-C Buildings (WHC 1993b).

100-B/C Reactor Area Facilities and Pipelines

3.5.3.1 Piping. The piping for the 183-C head house included the following:

- A 6-in.-diameter by about 247-ft vitrified clay process sewer pipe exited the north side of the building and connected to the 18-in.-diameter cast-iron process sewer pipe.
- An 8-in.-diameter by 84-ft vitrified clay sanitary sewer pipe exited the southwest corner of the building and connected to the 1607-B10 septic system.
- A 10-in.-diameter by 3,999-ft steel water pipe exited the south side of the building and connected to the west side of C Reactor.
- A 16-in.-diameter by 2,818-ft cast-iron service water pipe exited the north side of the building and connected to the south side of the 184-B Building.
- A 18-in.-diameter by 7,032-ft cast-iron process sewer pipe exited the north side of the building and eventually connected to the 72-in. concrete process sewer pipe that drained into the 132-C-2 outfall.
- A 24-in.-diameter by 2,108-ft steel service water pipe exited from the north side of the building and connected with the east side of the 182-B reservoir.
- A 48-in.-diameter by 5,428-ft steel service water pipe exited the west side of the building and connected to the south side of the 181-B Building.
- A 48-in. diameter by 5,284-ft steel service water pipe exited the west side of the building and connected to the south side of the 181-B building.
- A 48-in.-diameter by 5,074-ft steel service water pipe exited the west side of the building and connected to the south side of the 181-B Building.

(See construction drawings H-1-13050, H-1-80213, H-1-80214, M-1901-B sheet 8, M-1904 sheet 8, P-5521, P-5528, P-5591, P-5648, P-5649, P-5652, P-5653, P-5657, P-5658, P-5661, H-1-5668, and P-5595.)

3.5.4 183-C Sedimentation Facility

This portion of the 183-C Facility contained open reinforced concrete basins east of the head house.

3.5.4.1 Piping. The piping in the 183-C Sedimentation Facility included the following:

- A 4-in.-diameter by 153-ft cast-iron process sewer exited the north side of the building and connected to the 18-in.-diameter process sewer that eventually drained to the 132-C2 outfall.

100-B/C Reactor Area Facilities and Pipelines

- Two 4-in.-diameter by 135-ft cast-iron process sewer exited the north side of the building and connected to the 18-in.-diameter process sewer that eventually drained to the 132-C2 outfall.
- A 4 in. by 6-in. by 134-ft concrete pipe exited the north side of the building and connected to the 18-in.-diameter process sewer that eventually drained to the 132-C2 outfall.

(See construction drawings M-1901 sheet 8, P-5528, P-5591, P-5593, and P-5644.)

3.5.5 183-C Filter Building

The 183-C Filter Building housed water treatment and filtering facilities and reservoir capacity for treated water (WHC 1988). The 183-C Facility was equipped as an independent, rapid filtration plant with initial capacity of 72,000 gal/min and was later expanded to 90,000 gal/min.

From 1959 to 1960, a 30-in. cross-tie line was installed from the 183-C Filtered Water Plant to the 183-B clearwells in an effort to share some of the surplus water pumping and filtration capacity of the 100-C systems with B Reactor (WHC 1993b).

3.5.5.1 Piping. The piping for the 183-C Filter Building included the following:

- A 6-in.-diameter by 321-ft concrete process sewer pipe exited the north side of the building and connected to the 18 in.-diameter process sewer pipe that eventually drained at the 132-C2 outfall.
- A 6-in.-diameter by 150-ft sanitary sewer pipe exited the north side of the building and connected to the 1607-B11 septic system.
- A 6-in.-diameter by 305-ft steel service water pipe exited the south side of the building and connected to the 10-in.-diameter steel service water pipe that extended from the 183-C head house to C Reactor.
- A 24-in.-diameter by 1,887-ft service water pipe exited the east side of the building and connected to the west side of C Reactor.

(See construction drawings M-1901-B sheet 8, P-5528, P-5591, P-5593, P-5644, and P-5645.)

3.5.6 183-C Clearwells

The 183-C clearwells were constructed of steel with a storage capacity of 3 million gallons (WHC 1993b).

3.5.6.1 Piping. The piping for the 183-C clearwells included the following:

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- A 36-in.-diameter by approximately 2,000-ft cast-iron process sewer pipe was buried around the outside edges of the clearwells and connected to the 18-in. cast-iron process sewer pipe that eventually drained into the 132-C2 outfall.
- A 48-in.-diameter by approximately 800-ft cast-iron process sewer pipe was buried between the tanks in a north south orientation.

(See construction drawings H-1-13050, M-1904 sheet 8, P-553, P-5528, and P-5591.)

3.5.7 190-C Pumphouse

The 190-C process pumphouse contained 10 pumping units with 8,000-gal/min capacity each, that supplied process water to the reactor via six 24-in. lines (WHC 1993b). The 190-C main pumphouse facility pumped water to C Reactor as part of the reactor cooling process after the water was treated/filtered in the 183-C Filter Building/pump room. The water was chemically treated with sodium dichromate and stored in outside tanks located between the 190-C and 183-C Facilities. Physical attributes of the facility are take-offs from available facility drawings. The 190-C Facility was an approximately 160-ft by 59.7-ft by 196-ft by 32-ft above-ground structure, constructed on a reinforced-concrete foundation with a full basement. The interior and exterior walls were made of 0.5-in.-thick transite, totaling approximately 100,000 ft². The building contained approximately 1,900 linear ft of asbestos-lagged pipes and valves. Ten pumping stations were located on the main floor with a 10,000-gal/min capacity each, electrical switchgear room, control room, survey room, lunchroom, change room, bathroom, shop area, and filter storage area. The basement contained cooling water, compressed air and steam piping, fluid coupling heat exchanger, solids injection system, valve pits, and the entrances to the 105-C water tunnels. Each tunnel contained the piping used to supply water to C Reactor and a steam supply pipe to 190-C. The tunnels are located at the northeast and southeast corners of the building and are approximately 10 ft by 12 ft by 500 ft long (Rodovsky 1998).

3.5.7.1 Piping. The piping for the 190-C pumphouse included the following:

- A 4-in.-diameter by about 400-ft service water pipe exited the east side of the building and connected to the 10-in.-diameter service water pipe leading to the 183-C head house.
- A 4-in. by 6-in. by 286-ft concrete process sewer pipe exited the north side of the building and connected to the 18-in.-diameter cast-iron pipe that eventually drained at the 132-C-2 outfall.
- A process sewer pipe of unknown diameter by 311 ft exited the north side of the building and connected to the process sewer pipe that eventually drained at the 132-C-2 outfall.
- A 6-in.-diameter by about 115-ft vitrified clay sanitary sewer pipe exited the east side of the building and connected to the 1607-B8 septic system.

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- A 12-in.-diameter by 325-ft service water pipe exited the north side of the building and connected to the 24-in.-diameter service water pipe between the 183-C Filter Building and C Reactor.
- A 24-in.-diameter by 317-ft service water pipe exited the east side of the building and connected to the main service water line leading to the 183-C head house.

(See construction drawings H-1-13050, H-1-80213, H-1-80214, M-1901-B sheet 8, M-1904 sheet 8, P-5528, and P-5591.)

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APPENDIX A

**100-B/C REACTOR AREA UNDERGROUND PIPELINE
HISTORICAL INFORMATION SUMMARY TABLE**

**Appendix A – 100-B/C Reactor Area b Underground b b
Pipeline Historical Information Summary Table**

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Site ID	Pipeline Description	Pipe Diameter	Estimated Length	Pipe Material	Contaminants, Miscellaneous Waste, and/or Use	References
100-B/C Reactor Area Sanitary Waste Facilities						
1607-B1	Septic tank and tile field	6 in. 6 in.	177 ft 182 ft	VCP VCP	Sanitary sewer. The unit received unknown amounts of nonhazardous/nonradioactive sanitary sewage from the 1701-B Badgehouse (security checkpoint), the 1709-B Fire Station, the 1720-B patrol change room, and offices.	DOE/RL-90-07, WHC-SD-EN-TI-220; construction drawings: M-1901 sh 3 & 4, M-1904 sh 4, W-71182R31, and W-71192.
1607-B2	Septic tank and drain field	8 in.	5,694 ft	VCP	Sanitary sewer. Received nonhazardous/nonradioactive sanitary waste from B Reactor, 190-B pumphouse, and other 100-B Area office buildings including 1707, 1719, 1717, 1704, 1722, 1707, 1713, 1703, 108, and 115-B. There are no radionuclide COCs at this site. Chemical COCs are undetermined.	DOE/RL-90-07, DOE/RL-96-17, WHC-SD-EN-TI-220; construction drawings: H-1-155, H-1-13050, M-1901 sh 5, M-1904 sh 5 & 8, and W-71192
1607-B3	Septic tank and drain field	8 in.	250 ft	VCP	Sanitary sewer. This unit received an unknown amount of nonhazardous/nonradioactive sanitary sewage from the 184-B powerhouse.	DOE/RL-90-07; construction drawings: H-1-155, H-1-13050, M-1904 sh 5, W-71182, and W-71192
1607-B4	Septic tank and drain field	8 in.	148 ft	VCP	Sanitary sewer. Received nonhazardous/nonradioactive sanitary waste from the 151-B substation.	WHC-SD-EN-TI-220; construction drawings: H-1-13050, M-1904 sh 5 & 8, P-5580 sh 2, W-71182R3, and W-71192
1607-B5	Septic tank and drain field	6 in.	100 ft	VCP	Sanitary sewer. Received approximately 35 gal/day of nonhazardous/nonradioactive sanitary sewer waste from the 151-B substation.	WHC-SD-EN-TI-220; construction drawings: M-1904-B sh 2, W-71182R3, and W-71192
1607-B6	Septic tank and drain field	8 in.	263 ft	VCP	Sanitary sewer. Received sanitary waste from the 182-B and 183-B Facilities.	WHC-SD-EN-TI-220; construction drawings: H-1-155, H-1-13050, M-1904 sh 5 & 8, and W-71192
1607-B7	Septic tank and drain field	8 in.	664 ft	VCP	Sanitary sewer. Received sanitary waste from the 183-B Water Treatment Plant. There are no radionuclide COCs at this site. Chemical COCs are undetermined.	DOE/RL-96-17, WHC-SD-EN-TI-220; construction drawings: H-1-155, H-1-13050, M-1904 sh 5 & 8, W-71192
1607-B8	Septic tank and drain field	6 in.	69 ft	VCP	Sanitary sewer. Received sanitary waste from the 190-C pumphouse. Nonradioactive waste. Inorganic and organic COCs are undetermined at this time.	DOE/RL-96-17, EPA 1999, WHC-SD-EN-TI-220; construction drawings: H-1-13050, M-1904-B sh 8, and P-5580 sh 2
1607-B9	Septic tank and drain field	8 in.	1,114 ft	VCP	Sanitary sewer. Received sanitary waste from C Reactor. Nonradioactive waste. Inorganic and organic COCs are undetermined at this time.	DOE/RL-96-17, EPA 1996, EPA 1999, WHC-SD-EN-TI-220; construction drawings: H-1-13050, M-1904 sh 9, and P-5580 sh 2

Appendix A – 100-B/C Reactor Area Underground Pipeline Historical Information Summary Table

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Site ID	Pipeline Description	Pipe Diameter	Estimated Length	Pipe Material	Contaminants, Miscellaneous Waste, and/or Use	References
1607-B10	Septic tank and drain field	8 in.	84 ft	VCP	Received sanitary sewage from the headhouse of the 183-C Water Treatment Plant. 1,325-L (350-gal) steel septic tank and tile drain field. Site dimensions are 4.6 m by 9.1 m (15 ft by 30 ft), depth assumed to be 2.5 m (8.3 ft). Drain field is 59 m ² (640 ft ²). Undetermined organic and inorganic chemicals.	EPA 1996, EPA 1999, DOE/RL-96-17, WHC-SD-EN-TI-220; construction drawings: H-1-13050, M-1904-sh 8, and P-5580
1607-B11	Septic tank and drain field	6 in.	150 ft	VCP	Received sanitary sewage from the 183-C Filter Building and pump room. 1,325-L (350-gal) steel septic tank and tile drain field. Site dimensions are 4.6 m by 9.1 m (15 ft by 30 ft), depth assumed to be 2.5 m (8.3 ft). Drain field is 59 m ² (640 ft ²). (References: Carpenter 1994, EPA 1996.) Undetermined organic and inorganic chemicals.	DOE/RL-96-17, EPA 1999, WHC-SD-EN-TI-220; construction drawings: H-1-13050, M-1904-B sh 8, and P-5580
B Reactor Area Waste Sites						
116-B-1	Process effluent trench	16 in.	105 ft	Steel	Effluent The trench received about 6.0 x 10 ⁷ L of waste effluent from the 107-B retention basin. The site received the following radionuclides: ²⁴¹ Am, ⁶⁰ Co, ¹³⁴ Cs, ¹³⁷ Cs, ¹⁵² , ¹⁵⁴ , & ¹⁵⁵ Eu, ³ H, ⁴⁰ K, ⁹⁰ Sr, ⁹⁹ Tc, ²³⁸ , ²³⁹ , & ²⁴⁰ Pu, and chromium. It received between 7 and 60 kg of sodium dichromate. It also received 60 million L of high-activity effluent Chemical contaminants: Cr (total), hexavalent chromium, Mn, and Zn.	DOE/RL-90-07, DOE/RL-94-61, DOE/RL-94-99, DOE/RL-96-17, DOE/RL-96-22, EPA 1996, HW-46715, UNI-946, WHC-SD-EN-TI-220, WHC-SP-0331; construction drawings: G-7-215, H-1-4040, H-1-2049, H-1-13058, H-1-15200, H-1-80214, H-3-57210, M-1904-B sh 3, P-3393, P-5533, P-5540, P-5537, and P-5595
116-B-2	Fuel storage basin trench				The radionuclide inventory includes ²⁴¹ Am, ⁶⁰ Co, ⁹⁰ Sr, ⁹⁹ Tc, ¹³⁴ & ¹³⁷ Cs, ¹⁵² , ¹⁵⁴ , & ¹⁵⁵ Eu, ³ H, ²³⁸ , ²³⁹ , & ²⁴⁰ Pu, and ²³⁸ U. Inorganics include hexavalent chromium. An estimated 1 million gal of water was discharged to the site.	DOE/RL-90-07, DOE/RL-93-06, DOE/RL-96-17, DOE/RL-96-22, EPA 1996, HW-27337, UNI-946, WHC-SD-EN-TI-220, WHC-SP-0331; construction drawings: G-7-215, H-1-4049, and H-3-57210.
116-B-3	Pluto crib				The radionuclide inventory includes ²⁴¹ Am, ⁶⁰ Co, ²³⁸ Ra, ⁹⁰ Sr, ⁹⁹ Tc, ¹³⁴ & ¹³⁷ Cs, ¹⁵² , ¹⁵⁴ , & ¹⁵⁵ Eu, ³ H, ²³⁸ , ²³⁹ , & ²⁴⁰ Pu, and ²³⁸ U. In addition 4 x 10 ⁻³ kg of sodium chromate was disposed at the site. Hexavalent chromium is a contaminant of concern.	DOE/RL-90-07, DOE/RL-93-06, DOE/RL-96-17, DOE/RL-96-22, EPA 1996, UNI-946, WHC-SD-EN-TI-220, WHC-SP-0331; construction drawings: G-7-210, H-1-4049, and H-3-57210.

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Site ID	Pipeline Description	Pipe Diameter	Estimated Length	Pipe Material	Contaminants, Miscellaneous Waste, and/or Use	References
116-B-4	French drain				The radionuclide inventory includes ⁶⁰ Co, ¹³⁷ Cs, ¹⁵² , ¹⁵⁴ , & ¹⁵⁵ Eu, ²³⁹ Pu, ⁴⁰ K, ²²⁶ Ra, ²²⁸ Th, ²³³ , ²³⁴ , & ²³⁸ U, and barium. Chemical contaminants: Ba. Hazardous chemicals include nitrate, 2,200 lb of sodium dichromate, 2,200 lb of sodium oxalate, and 13,200 lb of sodium sulfamate. It received 300,000 L of spent acid rinse water from the 105-B Dummy Decontamination Facility.	DOE/RL-90-07, DOE/RL-93-06, DOE/RL-94-61, DOE/RL-94-99, DOE/RL-96-17, DOE/RL-96-22, EPA 1996, UNI-946, WHC-SD-EN-TI-220, WHC-SP-0331; construction drawings: G-7-210, and H-3-57210
116-B-5	Crib	6 in.	250 ft	VCP	Effluent Wastes with an activity density of less than 1 µCi/cc were discharged to the crib that included ²⁴¹ Am, ⁶⁰ Co, ¹³⁴ & ¹³⁷ Cs, ¹⁵² , ¹⁵⁴ , & ¹⁵⁷ Eu, ³ H, ²³⁹ & ²⁴⁰ Pu, ⁹⁰ Sr, ²³⁵ & ²³⁸ U, barium, and mercury. Chemical contaminants: Ba, and Hg. Inorganics include NaCr2, Na2C2O4, and NaNh2So3. ¹⁵² Eu and ¹⁵⁴ Eu are additional radionuclide COCs.	DOE/RL-88-19, DOE/RL-90-07, DOE/RL-94-61, DOE/RL-94-99, DOE/RL-96-17, DOE/RL-96-22, EPA 1996, HW-27337, HW-46715, UNI-946, WHC-SD-EN-TI-220, WHC-SP-0331; construction drawings: G-7-215, H-1-1595, H-1-4049, and H-3-57210.
116-B-6A	Crib				The radionuclide inventory includes ⁶⁰ Co, ¹³⁷ Cs, ¹⁵² , ¹⁵⁴ , & ¹⁵⁵ Eu, ²³⁹ & ²⁴⁰ Pu, ²²⁶ Ra, ⁹⁰ Sr, and ²²⁸ Th, ²³⁸ U. It also received 50 kg of sodium dichromate, 100 kg of sodium oxalate, 100 kg of sodium sulfamate, and nitrate.	DOE/RL-88-19, DOE/RL-90-07, DOE/RL-93-06, DOE/RL-96-17, DOE/RL-96-22, HW-27337, UNI-946, WHC-SD-EN-TI-220, WHC-SP-0331; construction drawings: G-7-215, H-1-4049, and H-3-57210.
116-B-6B	Crib				The radionuclide inventory includes ⁶⁰ Co, ¹³⁴ & ¹³⁷ Cs, ¹⁵² & ¹⁵⁵ Eu, ³ H, ⁶⁵ Ni, ²²⁶ Ra, ⁹⁰ Sr, ²²⁸ Th, and ²³⁸ U. During its operational period, it received 50 kg of sodium dichromate, 100 kg of sodium oxalate, 100 kg of sodium sulfamate, and nitrate. Inorganics include NaCr2, Na2C2O4, and NaNH2SO3.	DOE/RL-88-19, DOE/RL-90-07, DOE/RL-96-17, DOE/RL-96-22, UNI-946, WHC-SD-EN-TI-220, WHC-SP-0331; construction drawings: G-7-215, H-1-4049, and H-3-57210.
116-B-7	1904-B-1 outfall	36 in. 42 in. 72 in.	177 ft 171 ft 7,032 ft	Conc Steel Conc	Effluent Effluent Effluent Radionuclide contaminants of concern include ¹³⁷ Cs, ^{239/240} Pu, ¹⁵² , ¹⁵⁴ , & ¹⁵⁵ Eu, ³ H, ⁶⁵ Ni, ⁶⁰ Co, and ⁹⁰ Sr.	DOE/RL-90-07, DOE/RL-96-17, EPA 99, WHC-SD-EN-TI-RPT-004, and WHC-SD-EN-TI-220
116-B-8	1904-B-2 outfall	66 in.	724 ft.	Steel	Effluent The unit received and discharged reactor coolant effluent wastes to the river. Radionuclide contaminants of concern include ¹³⁷ Cs, ^{239/240} Pu, ¹⁵² , ¹⁵⁴ , & ¹⁵⁵ Eu, ³ H, ⁶⁵ Ni, ⁶⁰ Co, and ⁹⁰ Sr.	DOE/RL-96-17, EPA 99, WHC-SP-0331, construction drawings: H-1-26050 and H-1-26051

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116-B-9	French drain				Received waste water from the P-10 Storage Building drain. Radiological contaminants: ⁶⁰ Co, ¹³⁷ Cs, ^{152, 154, & 155} Eu, ^{239 & 240} Pu, K40, and Th228. Chemical Contaminants: Ba, and hexavalent chromium. Potential H-3.	DOE/RL-90-07, DOE/RL-93-06, DOE/RL-96-17, DOE/RL-96-22, WHC-SD-EN-TI-220, WHC-SP-0331; construction drawings: G-7-215, H-1-4049, H-3-57210, and 1904-B sh 9.
116-B-10	Dry/well quench tank				The radionuclide inventory includes ⁶⁰ Co, ¹³⁷ Cs, ^{152, 154, & 155} Eu, ³ H, ^{239 & 240} Pu, ⁴⁰ K, and ²²⁸ Th. The chemical contaminant is Ba. The well received about 1.3 million gal of liquid waste from the 132-B-1 Building from 1950 to 1968.	DOE/RL-90-07, DOE/RL-93-06, DOE/RL-96-17, DOE/RL-96-22, UNI-3745, WHC-SD-EN-TI-220, WHC-SP-0331; construction drawings: H-1-2946, H-1-10206, H-3-57210, and M-1904-B sh 8.
116-B-11	Retention basin	6 in. 6 in. 6 in. 16 in. 36 in. 42 in. 48 in. 66 in.	186 ft 2,176 ft 2,152 ft 105 ft 177 ft 171 ft 2,383 ft 2,450 ft	VCP AC NA Steel RCP RCP Conc Steel	Process sewer Water Fresh water Effluent Effluent Effluent Effluent Effluent	DOE/RL-90-07, DOE/RL-94-61, DOE/RL-94-99, DOE/RL-96-17, DOE/RL-96-22, EPA 1996, UNI-946, WHC-SD-EN-TI-220, WHC-SP-0331; construction drawings: H-1-1478, H-1-13050, H-1-13058, H-1-26050, H-1-80214, M-1901 sh 3, M-1904-B sh 2 & 3, P-3393, P-5533, P-5540, and P-5595
116-B-12	Seal pit crib	4 in.	281 ft.	AC	Effluent Possibility of ²²⁸ Th, arsenic, and chromium.	DOE/RL-90-07, DOE/RL-94-61, DOE/RL-94-99, DOE/RL-96-17, DOE/RL-96-22, EPA 1996, WHC-SD-EN-TI-220; construction drawing: H-1-19820
116-B-13	Sludge trench	3 in.	490 ft	CI	Water The radionuclide inventory includes ²⁴¹ Am, ^{134 & 137} Cs, ⁶⁰ Co, ^{152, 154, & 155} Eu, ^{238, 239, & 240} Pu, ²²⁶ Ra, ⁹⁰ Sr, ⁹⁹ Tc, ²²⁸ Th, ²³⁸ U, antimony, chromium, lead, and mercury. Chemical contaminants hexavalent chromium, Cu, Hg, Mn, Pb, As, Ba, Cd, and Sb.	DOE/RL-90-07, DOE/RL-94-61, DOE/RL-94-99, DOE/RL-96-17, DOE/RL-96-22, EPA 1996, HW-46715, and WHC-SD-EN-TI-220.

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116-B-14	Sludge trench				The radionuclide inventory includes ²⁴¹ Am, ¹³⁴ Am, ¹³⁷ Cs, ⁶⁰ Co, ¹⁵² Eu, ¹⁵⁴ Eu, ¹⁵⁵ Eu, ²³⁸ U, ²³⁹ Pu, ²⁴⁰ Pu, ²²⁶ Ra, ⁹⁰ Sr, ⁹⁹ Tc, ²²⁸ Th, ²³⁸ U, antimony, chromium, lead, and mercury. Chemical contaminants: hexavalent chromium, Cu, Hg, Mn, Pb, Zn, Fe, As, Ba, Cd, and Sb.	DOE/RL-90-07, DOE/RL-94-61, DOE/RL-94-99, DOE/RL-96-17, DOE/RL-96-22, EPA 1996, HW-27337, HW-46715, and UNI-946
116-B-15	Percolation pit				During its operational use it received 567,750 L of processed water from the fuel storage basin cleanup project. Radionuclide contaminants: ⁶⁰ Co, ⁹⁰ Sr, ¹³⁷ Cs, ¹⁵⁵ Eu, ²³⁸ U. Chemical contaminant: hexavalent chromium.	DOE/RL-96-17, EPA 1999, and WHC-SD-EN-TI-220
116-B-16	Fuel examination tank				The tank received liquid wastes from the decontamination of fuel elements spacers from the 111-B Building. Undetermined radionuclides and inorganics exist at this site.	DOE/RL-96-17 and WHC-SD-EN-TI-220
B Reactor Area Facilities						
105-B	Reactor	4 in. 6 in. 6 in. 6 in. 6 in. 6 in. 8 in. 12 in. 12 in. 20 in. 36 in. 48 in. 54 in. 66 in. 66 in.	40 ft 100 ft 45 ft 14 ft 42 ft 42 ft 42 ft 585 ft 239 ft 336 ft 439 ft 2,201 ft 100 ft 2,282 ft 428 ft 2,450 ft 524 ft	CI Steel VP VP VP VP VP VP VP Steel NA Steel RCP Conc Steel Steel Steel	Effluent Sewer Effluent Effluent Effluent Effluent Effluent Effluent drain Effluent Water Water Return condenser water Effluent Effluent Effluent cross tie Effluent Effluent	DOE/RL-90-07, WHC-SD-ED-RPT-004, WHC-SD-EN-TI-220; construction drawings: H-1-1495 sh 2, H-1-1478, H-1-13050, H-1-19820, H-1-80213, H-1-80214, HW-73788, M-1901 sh 5, M-1904 sh 5 & 8, SK-1-3842, W-70833, W-70829, and W-65013

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Site ID	Pipeline Description	Pipe Diameter	Estimated Length	Pipe Material	Contaminants, Miscellaneous Waste, and/or Use	References
108-B	Laboratory building	2 in. 2 in. 3 in. 3 in. 3 in. 4 in. 6 in. 6 in. 6 in. 6 in. 3 in. 6 in.	585 ft 35 ft 35 ft 893 ft 887 ft 115 ft 134 ft 170 ft 250 ft 100 ft 35 ft 54 ft	VCP NA Steel Steel Steel NA VCP VCP VCP VCP NA CI	Effluent Effluent Effluent Sodium dichromate Sodium silicate Water Effluent Sewer Effluent Sanitary sewer Effluent Water Upper three floors were contaminated with tritium. The building has been demolished.	UNI-946, WHC-EP-0273, WHC-MR-0425, and WHC-SP-0331; construction drawings: H-1-1478, H-1-1595, H-1-2946, H-1-10206, H-1-10216, H-1-10260, H-1-2946, H-1-13050, M-1901-B sh 5, M-1904-sh 5 & 8, and W-74382
115-B	Gas recirculation facility	6 in. 10 in.	54 ft 54 ft	CI NA	Fresh water Fresh water	Construction drawings: H-1-12231, H-1-13050, M-1901-B sh 5, M-1904 sh 5 & 8, W-71824, and W-72439
117-B	Crib					Construction drawings: H-1-13050, H-1-19809, and H-1-19825
151-B	Primary electrical substation	8 in. 10 in.	148 ft 226 ft	VCP NA	Sanitary sewer Water	WHC-SD-ED-RPT-004; construction drawings: H-1-13050, H-1-80213, M-1901 sh 5, M-1904 sh 5 & 8
181-B	River pumphouse	6 in. 30 in. 42 in. 48 in. 48 in. 48 in.	100 ft 2,258 ft 4,517 ft 3,389 ft 5,074 ft 5,284 ft 5,428 ft	VCP Steel Steel Steel Steel Steel Steel	Sanitary sewer Raw water Raw water Raw water Raw water Raw water Raw water	WHC-SD-EN-TI-220, WHC-EP-0273, and WHC-SD-EN-004; construction drawings: H-1-13050, H-1-80213 sh 1 & 5, M-1901 sh 2 & 3, P-3393, and P-5595
182-B	Reservoir	4 in. 8 in. 10 in. 24 in. 24 in. 36 in. 42 in. 42 in.	661 ft 430 ft 1,120 ft 2,108 ft 760 ft NA 45 ft 6,019 ft	Steel VCP CI Steel RCP Conc RCP Conc	Sanitary sewer Service water Service water Service water Water Process sewer Process sewer Process sewer	References: HW-33911, WHC-EP-0273, WHC-SD-EN-TI-220 construction drawings: H-1-13050, H-1-80213 sh 1 & 5, H-1-80214, M-1901 sh 2 & 5, M-1904 sh 5 & 8, and HW-72064,

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183-B	Filter building	3 in. 8 in. 2-10 in. 10 in. 14 in. 3-18 in. 2-18 in. 27 in. 27 in. 30 in. 36 in. 42 in. 48 in.	~1,800 ft 263 ft 1,021 ft 1,120 ft 1,270 ft 65 ft 30 ft 340 ft 132 ft 450 ft 1,485 ft 1,100 ft 115 ft	NA VCP CI CI NA VCP VCP VCP NA Stainless steel CI NA NA	Service water Sanitary sewer Service water Service water Service water Process sewer Process sewer Process sewer Service water Service water Process sewer Process sewer	HW-10475B, HW-33911, WHC-SD-EN-EP-0273, WHC-SD-EN-TI-220, and WHC-SD-ED-RPT-004; construction drawings: H-1-13050, H-1-15698, H-1-80213 sh 1 & 5, H-1-80214, M-1901 sh 5, and M-1904 sh 5 & 8
184-B	Powerhouse	8 in. 10 in. 10 in. 10 in. 12 in. 14 in. 16 in.	250 ft 1,021 ft 1,100 ft 95 ft 100 ft 1,270 ft 2,818 ft	VCP NA CI CI VCP NA CI	Sanitary sewer Service water Water Process sewer Process sewer Service water Service water	References: HW-33911, WHC-SD-ED-RPT-004, and WHC-SD-EN-TI-220; construction drawings: H-1-13050, H-1-15698, H-1-80214, M-1901-B sh 5, M-1904 sh 5 & 8, P-5644 and P-5944
185-B	Water treatment plant	6 in. 24 in. 48 in.	1,040 ft 340 ft 125 ft	Stainless steel CI Stainless steel	Process sewer Process sewer Process sewer	References: WHC-SD-ED-RPT-004 and WHC-SD-EN-TO-220; construction drawings: H-1-13050, H-1-80213 sh 1 & 5, H-1-80214, H-1-13050, P-5065, P-5593, and W-71742

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190-B	Process water pumphouse and annex	3 in. 3 in. 3-4 in. 10 in. 10 in. 16 in. 18 in. 20 in. 24 in. 30 in. 30 in. 36 in.	893 ft 887 ft 40 ft 1,021 ft 300 ft 300 ft 74 ft 2,446 ft 250 ft 30 ft 74 ft 250 ft 244 ft	Steel Steel Stainless steel NA NA NA Stainless steel NA NA CI Stainless steel Steel CI	Sodium silicate Sodium dichromate Process sewer Water Water Service water Process sewer Condenser water Water Process sewer Process sewer Emergency bypass Service water	construction drawings: H-1-13050, H-1-26077, H-1-26081, H-1-80213 sh 1 & 5, H-1-80214, M-1901 sh 5 & 8, M-1904 sh 5, W-71742, W-73632, H-1-13050, H-1-80213 sh 1 & 5, H-1-80214, H-1-15698, M-1901-B sh 2 & 5, M-1904 sh 5 & 8, and HW-72064
1608-B	Contaminated drain and transfer station				Pumped contaminated liquid waste into the reactor effluent lines.	UNI-946, WHC-EP-0273, and WHC-SP-0331
1701-B	Badge house	6 in. 8 in.	430 ft NA	VCP NA	Sanitary sewer Service water	WHC-EP-0273 WHC-MR-0425; construction drawings: M-1901-B sh 4, and M-1904-B sh 4
1703-B	Technical office building	6 in. 8 in.	465 ft 365 ft	VCP NA	Sanitary sewer Service water	Construction drawings: M-1904 sh 5 & 8, and H-1-10206
1704-B	Office building	3 in. 6 in.	25 ft 230 ft	NA Stainless steel	Service water Sanitary sewer	WHC-EP-0273; construction drawings: H-1-80213, H-1-13050, M-1901-B sh 5, M-1904-B sh 5 & 8
1707-B	Change house	2 in. 6 in.	130 ft 85 ft	CI Stainless steel	Service water Sanitary sewer	WHC-EP-0273; construction drawings: H-1-13050, M-1904-B sh 5 & 8
1709-B	Fire headquarters	6 in.	3,350 ft	NA	Fresh water	WHC-EP-0273, WHC-MR-0425; construction drawings: M-1901-B sh 4, and M-1901 sh 4
1713-B	Store Room and Warehouse	2 in. 6 in.	130 ft 25 ft	CI Stainless steel	Service water Sanitary sewer	WHC-EP-0273, WHC-MR-0425; construction drawings: M-1901-B sh 5, M-1904 sh 5 & 8
1716-B	Automotive repair	¾ in. 1 in.	160 ft NA	NA NA	Service water Sanitary water	Construction drawings: H-1-13050, and M-1901-B sh 5

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1717-B	Maintenance shop	4 in. 6 in.	74 ft 35 ft	NA Stainless steel	Sanitary water Sanitary sewer	Construction drawings: H-1-13050, M-1901-B sh 5, M-1904 sh 5 & 8
1719-B	First aid station	6 in. NA	100 ft 25 ft	Stainless steel NA	Sanitary sewer Water	WHC-MR-0425; construction drawings: H-1-13050, M-1901-B sh 5, M-1904-B sh 5 & 8
1720-B	Patrol headquarters	6 in. 8 in.	35 ft 178 ft	NA VCP	Service water Sanitary sewer	WHC-SD-EN-TI-220; construction drawings: H-1-80213, M-1901-B sh 4, M-1904-B sh 4 & 5
1722-B	Paint shop	2 in. 6 in.	27 ft 60 ft	NA Stainless steel	Service water Sanitary sewer	WHC-MR-0425; construction drawings: H-1-13050, M-1901-B sh 5, M-1904 sh 5 & 8
C Reactor Area Waste Sites						
116-C-1	Process effluent trench	24 in. 24 in. 42 in. 42 in.	944 ft 659 ft 409 ft 416 ft	STEEL CONC STEEL STEEL	Effluent Effluent Effluent Effluent Radiological contaminants: ²⁴¹ Am, ⁶⁰ Co, ¹³⁷ Cs, ¹⁵² , ¹⁵⁴ , & ¹⁵⁵ Eu, ²³⁸ , ²³⁹ , & ²⁴⁰ Pu, ⁹⁰ Sr, ²³⁸ U, ⁹⁹ Tc, ²²⁶ Ra, and ²²⁸ Th. Chemical contaminants: hexavalent chromium, Mn, Zn, Toluene, SVOC, Sb, Pb, and Hg.	DOE/RL-90-07, DOE/RL-94-61, DOE/RL-94-99, DOE/RL-96-17, DOE/RL-96-22, EPA 1996, HW-46715, WHC-SD-EN-TI-220, and WHC-SP-0331; construction drawings: G-7-215, H-1-4049, H-1-13050, H-1-13058, H-1-80214, M-1904-B sh 3, P-3393, P-5533, P-5537, P-5540, and P-5595
116-C-2	Pluto crib				Radiological contaminants: ⁶⁰ Co, ¹³⁴ ¹³⁷ Cs, ¹⁵² , ¹⁵⁴ , & ¹⁵⁷ Eu, ³ H, ²³⁸ , ²³⁹ , & ²⁴⁰ Pu, ⁹⁰ Sr, and U.	UNI-946
116-C-2A	Pluto crib	8 in.	100 ft	VCP	Effluent Radiological contaminants: ²⁴¹ Am, ⁶⁰ Co, ¹³⁷ Cs, ¹⁵² , ¹⁵⁵ Eu, ³ H, ⁶³ Ni, ⁹⁰ Sr, ²³⁸ , ²³⁹ , & ²⁴⁰ Pu, and ²³⁸ U. Chemical contaminants: Ag, Cd, hexavalent chromium, Sb, Zn	DOE/RL-96-17, DOE/RL-96-22, EPA 1996, EPA 1997, UNI-946, WHC-SD-EN-TI-220, and WHC-SP-0331; construction drawings: G-7-210, H-1-4049, H-3-57210, and P-8882
116-C-2B	Pluto crib pumping station	2 in. 2 in.	210 ft 333 ft	Stainless steel Stainless steel	Effluent Effluent Radiological contaminants: ⁶⁰ Co, ¹³⁴ & ¹³⁷ Cs, ¹⁵² Eu, ³ H, ²³⁹ & ²⁴⁰ Pu, and ⁹⁰ Sr. Chemical contaminants: Ag, Cd, hexavalent chromium, Sb, Zn	DOE/RL-96-17, DOE/RL-96-22, EPA 1996, EPA 1997, WHC-SD-EN-TI-220, WHC-SP-0331; construction drawings: G-7-210, H-1-4049, H-3-57210, M-1904 sh 3, and P-8880

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116-C-2C	Pluto crib sand filter	4 in. 8 in.	60 ft 100 ft	VCP VCP	Effluent Effluent Received approximately 7.5E6 L of mixed waste. Radiological contaminants: ⁶⁰ Co, ¹³⁴ & ¹³⁷ Cs, ¹⁵² , ¹⁵⁴ , ¹⁵⁵ Eu, ³ H, ²³⁸ , ²³⁹ , & ²⁴⁰ Pu, ⁹⁰ Sr, and ²³⁸ U. Chemical contaminants: Ag, Cd, hexavalent chromium, Sb, Zn	DOE/RL-96-17, EPA 1997, WHC-SD-EN-TI-220, WHC-SP-0331; construction drawings: G-7-215 and H-3-57210
116-C-3	Chemical waste tanks	2 in.	369 ft	Stainless steel	Effluent The site includes all underground pipelines between the 116-C-3 (105-C chemical waste tanks) and the 105-C Reactor building. Contaminants include undetermined radionuclides and inorganics.	DOE/RL-96-17, EPA 1996, EPA 1999, and WHC-SD-EN-TI-220
116-C-4	Outfall	2-48 in. 60 in. 60 in.	7,032 ft 1,498 ft 1,357 ft	Conc Stainless steel Stainless steel	Process sewer Effluent Effluent	DOE/RL-96-17, EPA 1999, and WHC-SP-0331
116-C-5 (107-C)	Retention basins	24 in. 24 in. 60 in. 60 in. 60 in. 60 in. 66 in.	944 ft 659 ft 262 ft 1,357 ft 1,498 ft 186 ft 238 ft	Steel Conc Steel Steel Steel Steel Steel	Effluent Effluent Effluent Effluent Effluent Effluent Effluent Radiological contaminants: ²⁴¹ Am, ⁶⁰ Co, ¹³⁷ Cs, ¹⁵² , ¹⁵⁴ , & ¹⁵⁵ Eu, ²³⁸ , ²³⁹ , & ²⁴⁰ Pu, ⁹⁰ Sr, ²³⁸ U, ⁹⁹ Tc, and ²²⁸ Th. Chemical contaminants: hexavalent chromium, Cu, Hg, Mn, Pb, Cd, Zn, SVOC, MEK, Sb, Fe, and Ba.	DOE/RL-90-07, DOE/RL-94-61, DOE/RL-94-99, DOE/RL-96-17, DOE/RL-96-22, EPA 1996, UNI-946, WHC-SP-0331, and WHC-SD-EN-TI-220; construction drawings: H-1-13050, H-1-13058, H-26055, H-1-80213, H-1-80214, M-1901 sh 3, M-1904 sh 3, P-3393, P-5533, P-5537, P-5540, P-5582, P-5595, and P-5944
116-C-6	Fuel storage basin cleanout percolation pit				Received treated water from the 105-C fuel storage basin cleanout project. Contaminants included Contaminants included ⁶⁰ Co, ⁹⁰ Sr, ¹³⁷ Cs, ¹⁵⁵ Eu, ²³⁸ Pu, and hexavalent chromium.	DOE/RL-96-17, EPA 1999, and WHC-SD-EN-TI-220

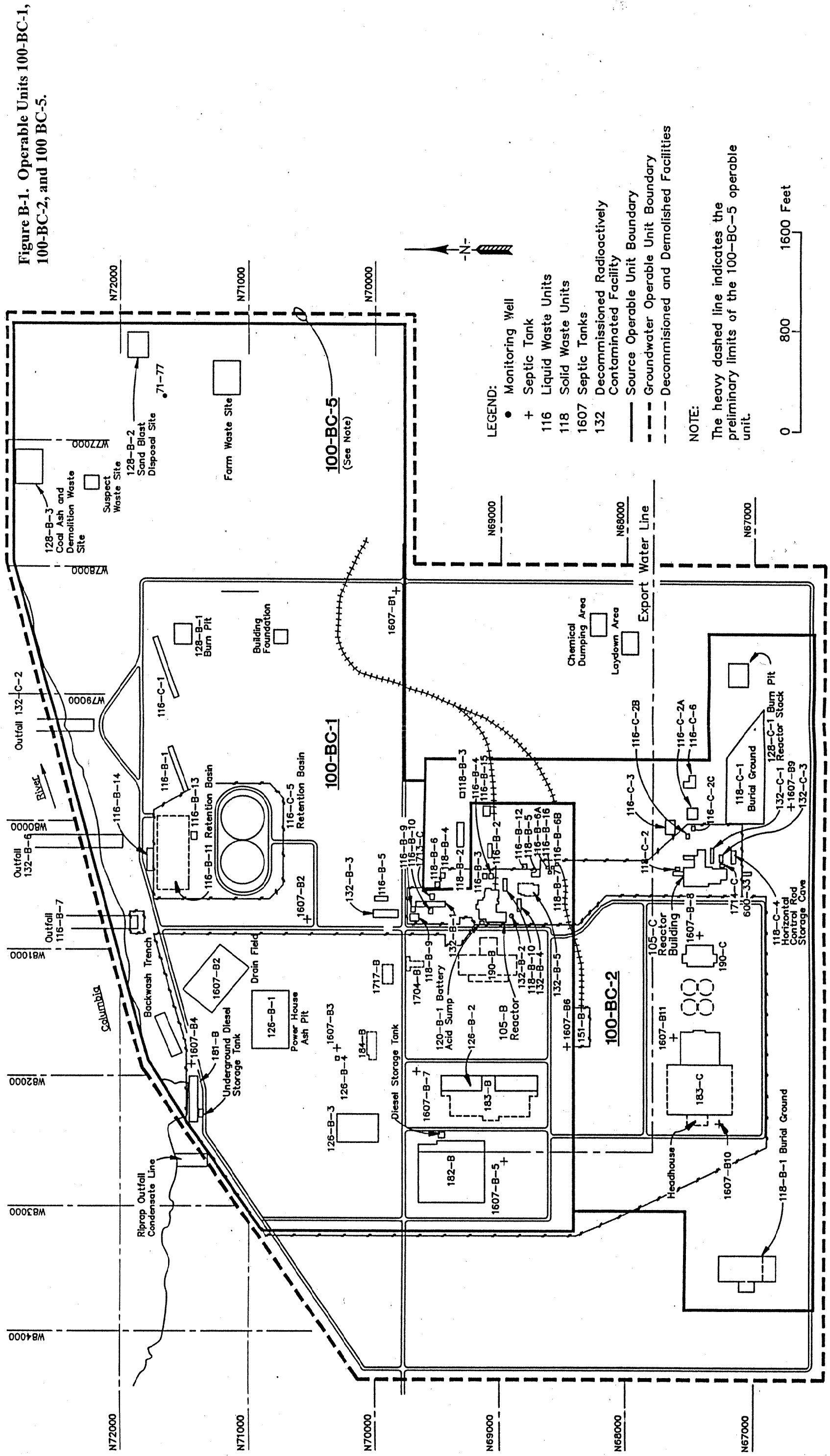
Appendix A – 100-B/C Reactor Area Underground Pipeline Historical Information Summary Table

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Site ID	Pipeline Description	Pipe Diameter	Estimated Length	Pipe Material	Contaminants, Miscellaneous Waste, and/or Use	References
C Reactor Area Facilities						
105-C	Reactor building	4 in. 4 in. 4 in. 8 in. 8 in. 10 in. 12 in. 12 in. 12 in. 12 in. 2-15 in. 20 in. 24 in. 66 in. 66 in.	35 ft 406 ft 120 ft 115 ft 1,114 ft 3,999 ft 273 ft 365 ft 93 ft 97 ft 98 ft 148 ft 810 ft 3,193 ft 3,324 ft	SS AC Steel SS SS RCP Steel Steel Steel Steel Steel RCP NA Steel Steel	Effluent Effluent Water Effluent Sanitary sewer Water Effluent Effluent Effluent Effluent Water Service water Effluent Effluent	Construction drawings: H-1-13050, H-1-80213, H-1-80214, M-1904-B sh 8 & 9, P-8882, P-5528, P-5533, P-5579, P-5591, P-5595, P-6289, P-9135, and SK-1-3842
183-C	Head house	6 in. 8 in. 10 in. 16 in. 18 in. 24 in. 48 in. 48 in. 48 in.	247 ft 84 ft 3,999 ft 2,818 ft 7,032 ft 2,108 ft 5,428 ft 5,074 ft 5,284 ft	VCP VCP Steel CI CI Steel Steel Steel Steel	Process sewer Sanitary sewer Process sewer Water Process sewer Service water Service water Service water Service water	WHC-SD-EN-RPT-004; construction drawings: H-1-5668, H-1-13050, H-1-80213, H-1-80214, M-1901-B sh 8, M-1904-B sh 8, P-5528, P-5591, P-5648, P-5652, P-5653, P-5657, P-5658, P-5661, and P-5595
183-C	Sedimentation facility	4 in. 4 in. 4 in. 4x6 in.	153 ft 135 ft 135 ft 134 ft	CI CI CI Conc	Process sewer Process sewer Process sewer Process sewer	Construction drawings: M-1901 sh 8, P-5528, P-5591, P-5644, P-5645, and P-5649
183-C	Filter building	6 in. 6 in. 6 in. 24 in.	321 ft 150 ft 305 ft 1,887 ft	Conc VCP Steel NA	Process sewer Sanitary/ sewer Service water Fresh water	Construction drawings: M-1901 sh 8, P-5528, P-5591, P-5644, and P-5593
183-C	Clearwells	36 in. 48 in.	2,000 ft 800 ft	CI CI	Process sewer Process sewer	Construction drawings: H-1-13050, M-1904 sh 8, P-553, P-5528, P-5591, and P-5593
190-C	Pumphouse	4 in. 4x6 in. NA 6 in. 12 in. 24 in.	400 ft 286 ft 311 ft 115 ft 325 ft 317 ft	NA Conc NA VCP NA NA	Service water Process sewer Process sewer Sanitary sewer Service water Service water	BHI-01106, WHC-SD-EN-RPT-004; construction drawings: H-1-13050, H-1-80213, H-1-80214, M-1901-B sh 8, M-1904-B sh 8, P-5528, and P-5591

APPENDIX B
BUILDINGS AND WASTE SITE MAP



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