United States Environmental Protection Agency

Region 10
1200 Sixth Avenue
Seattle WA 98101

Alaska
Idaho
Oregon
Washington

EPA

Incoming 9302986

SEP 18 1992

Reply to
Attn of: HW-106

Mr. Cliff Clark
U.S. Department of Energy
Richland Operations Office
825 Jadwin Avenue
Richland, Washington 99352

Re: Resource Conservation and Recovery Act (RCRA) Facility Assessments: Bonneville Power Administration and Washington Public Power Supply System Hanford Generating Station

Dear Mr. Clark:

Enclosed are the final Resource Conservation and Recovery Act (RCRA) Facility Assessments (RFAs) for the Bonneville Power Administration (BPA) Units and the Washington Public Power Supply System (WPPSS) Hanford Generating Station. The enclosed copies of the RFAs have been sent to BPA and WPPSS and are provided for your information.

The U.S. Environmental Protection Agency (EPA) Region 10 does not plan to subject the BPA Units to the corrective action provisions of the RCRA permit to be issued to the U.S. Department of Energy (DOE). EPA understands that BPA is performing voluntary corrective action at the Midway substation and Community under state oversight. In addition, while finalizing the RFA, EPA learned that the Hanford Substation, Ashe Substation, Benton Switch, U.S. Department of Energy 351 Substation, and White Bluffs Substation are operated under use permits rather than leases, and therefore are subject to the corrective action requirements of the Federal Facility Agreement and Consent Order (FFACO). A copy of the RFA is being provided to the EPA Hanford Project Office for determination of any further potential corrective action requirements. The WPPSS Hanford Generating Plant RFA identifies several solid waste management units which will require RCRA Facility Investigations under the corrective action provisions of the RCRA permit.

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If any additional information is required please contact Dan Duncan, at (206) 553-6693 or Christy Ahlstrom, at (206) 553-8506.

Sincerely,

Carrie Sikorski, Chief
RCRA Permits Section

Enclosures

cc: Ronald Brunke, WHC w/out encl.
Dave Jansen, Ecology w/out encl.
Paul Day, HPO (Administrative Record) w/out encl.

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HANFORD FEDERAL FACILITY
U.S. DEPARTMENT OF ENERGY
RICHLAND, WASHINGTON

WASHINGTON PUBLIC POWER SUPPLY SYSTEM
HANFORD GENERATING PLANT

RESOURCE CONSERVATION AND RECOVERY ACT FACILITY ASSESSMENT

FINAL REPORT

Prepared For

U.S. ENVIRONMENTAL PROTECTION AGENCY
Office of Waste Programs Enforcement
Washington, D.C. 20460

Work Assignment No.	:	R10058
EPA Region	:	10
Site Name	:	Hanford Generating Plant
EPA I.D. No.	:	WAD7890008967 (Dept. of Energy)
Date Prepared	:	August 18, 1992
Contract No.	:	68-W9-0009
Prepared by	:	PRC Environmental Management, Inc.
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TABLE OF CONTENTS

Section — Page

1.0 INTRODUCTION 1
- 1.1 PURPOSE OF THE RCRA FACILITY ASSESSMENT 1
- 1.2 REPORT CONTENT 2

2.0 ENVIRONMENTAL SETTING 3
- 2.1 LOCATION, CLIMATE, AND LAND USE 3
- 2.2 ENVIRONMENTAL RECEPTORS AND CONTAMINANT PATHWAYS 5
  - 2.2.1 Environmental Receptors 5
  - 2.2.2 Contaminant Pathways 5

3.0 FACILITY OPERATIONS 7
- 3.1 HANFORD FEDERAL FACILITY 7
- 3.2 HANFORD GENERATING PLANT 7

4.0 SOLID WASTE MANAGEMENT UNITS AND AREAS OF CONCERN 11
- 4.1 SOLID WASTE MANAGEMENT UNITS 11
  - 4.1.1 SWMU 1 - Transformer Yard 11
  - 4.1.2 SWMU 2 - HGP building oil storage area 12
  - 4.1.3 SWMU 3 - HGP Building Floor Drains, Sump, and All Piping to the Settling Pond and Outfall 13
  - 4.1.4 SWMU 4 - Turbine Oil Filter Unit 14
  - 4.1.5 SWMU 5 - Tile Field 15
  - 4.1.6 SWMU 6 - Settling Pond 16
  - 4.1.7 SWMU 7 - Outfall 17
  - 4.1.8 SWMU 8 - Maintenance Garage 18
  - 4.1.9 SWMU 9 - Wastewater Treatment Units 19
  - 4.1.10 SWMU 10 - Disposal and Storage Area 20
  - 4.1.11 SWMU 11 - Burn Pit 21
- 4.2 AREAS OF CONCERN 21

5.0 SUMMARY AND RECOMMENDATIONS 23

6.0 REFERENCES 29

APPENDIX

A PHOTOGRAPHS OF THE HANFORD GENERATING PLANT TAKEN DURING THE VISUAL SITE INSPECTION

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LIST OF TABLES

Section | Page

1 SWMU Summary 25

LIST OF FIGURES

Section | Page

1 Location of the HGP at the Hanford Federal Facility 4
2 N Reactor Coolant Diagram including the HGP 8
3 Hanford Generating Plant and Vicinity 9

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ACRONYMS AND ABBREVIATIONS

AOC	Area of Concern
BPA	Bonneville Power Administration
CFR	Code of Federal Regulations
COE	U.S. Army Corps of Engineers
DOE	U.S. Department of Energy
Ecology	Washington Department of Ecology
EPA	U.S. Environmental Protection Agency
HGP	Hanford Generating Plant
PCB	polychlorinated biphenyl
PNL	Pacific Northwest Laboratory
PRC	PRC Environmental Management, Inc.
RCRA	Resource Conservation and Recovery Act
RFA	RCRA facility assessment
RFI	RCRA facility investigation
SWMU	solid waste management unit
TPH	total petroleum hydrocarbons
VSI	Visual site inspection
WPPSS	Washington Public Power Supply System

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1.0 INTRODUCTION

PRC Environmental Management, Inc. (PRC) received work assignment R10058 from the U.S. Environmental Protection Agency (EPA) Region 10 to support enforcement of the Resource Conservation and Recovery Act (RCRA). This work assignment is to conduct a RCRA facility assessment (RFA) at selected areas of the U.S. Department of Energy's (DOE) Hanford federal facility located near Richland, Washington. This RFA report covers the Hanford Generating Plant (HGP) tract located adjacent to the N Reactor in the 100 N area of the Hanford federal facility.

The legal framework for most environmental cleanup and compliance activities at the Hanford facility is established in a tri-party agreement between the Washington Department of Ecology (Ecology), EPA, and DOE (Ecology et al. 1990). The tri-party agreement specifically excludes lands leased by DOE to other parties. The HGP tract (approximately 50 acres) is leased by DOE to the Washington Public Power Supply System (WPPSS).

PRC conducted a preliminary review and a visual site inspection (VSI) of the HGP as part of the RFA process. This RFA report presents the results of the preliminary review and the VSI, and recommends future action.

1.1 PURPOSE OF THE RCRA FACILITY ASSESSMENT

An RFA is a means of evaluating a facility's solid waste management practices. If these practices pose a threat to human health or the environment, corrective action is required. The RFA focuses on the solid waste management units (SWMU) at the facility. A SWMU includes any discernible unit at which solid wastes have been placed at any time, irrespective of whether the unit was intended for management of solid or hazardous waste. Such units include any area at the facility at which solid wastes have been routinely and systematically released (55 FR 30798). SWMUs are evaluated for past and potential releases of hazardous waste or hazardous constituents. A RCRA facility investigation (RFI) may then be required to define the nature and extent of release and determine the need for corrective action.

An RFA is the first step in implementing the corrective action provisions of the 1984 Hazardous and Solid Waste Amendments to RCRA. Specifically, Sections 3004(h), 3004(u), and 3004(v) grant EPA the authority to require corrective action for releases or potential releases of hazardous

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wastes from SWMUs at RCRA-regulated facilities. An RFA generally consists of a preliminary review, a VSI, and a sampling visit, if necessary. The purpose of the preliminary review and the VSI is to compile and evaluate available information on the facility to achieve the following objectives:

- Document releases or potential releases of hazardous waste or hazardous constituents from the facility
- Identify and evaluate SWMUs, regulated units, and other areas of concern (AOC) for releases or potential releases of hazardous waste or hazardous constituents to all environmental media
- Screen from further investigation those SWMUs that do not pose a threat to human health or the environment
- Determine the need for additional investigations, such as a sampling visit, and the need for interim measures at the facility

1.2 REPORT CONTENT

This report briefly describes the environmental setting of the HGP (Section 2.0); summarizes HGP operations (Section 3.0); describes the SWMUs and AOCs, including any associated environmental releases (Section 4.0); and presents a summary and recommendations for further action (Section 5.0). Section 6.0 contains references used to complete this RFA report.

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2.0 ENVIRONMENTAL SETTING

The following sections describe the geographic location, climate, land use, geology, and hydrology in the vicinity of the HGP.

2.1 LOCATION, CLIMATE, AND LAND USE

The Hanford federal facility occupies about 560 square miles in a rural region of southeastern Washington state. The HGP is located adjacent to the 100 N Area (Figure 1). The facility, located near the confluence of the Yakima and Columbia rivers, lies within the Pasco basin, one of many topographic and structural basins within the Columbia plateau. The Columbia River flows through the northern edge of the facility and forms part of the eastern boundary. The HGP tract is bordered to the northwest by the Columbia River, to the northeast by the N Reactor site, and to the southeast by the Bonneville Power Administration (BPA) Hanford Substation. The area to the southwest of the HGP tract is DOE land that has been graded many times since 1943.

The semiarid land on which the HGP is located has a sparse covering of desert shrubs and drought-resistant grasses (PNL 1990). The climate is dry and mild. The tract is located in the rain shadow of the Cascade Mountains. The HGP tract receives approximately 6.3 inches of precipitation annually, 40 percent of which occurs during November, December, and January, while 10 percent falls during July, August, and September. The average minimum and maximum temperatures in July are 60.8°F and 89.6°F. In January, the average minimum and maximum temperatures are 21.2°F and 37.4°F. The region is a typical desert basin, where frequent strong temperature inversions occur at night and break during the day, resulting in unstable and turbulent wind conditions. Monthly average wind speeds range from about 9.3 miles per hour in summer to 6.2 miles per hour in winter. The prevailing wind direction is from the northwest. Wind shifts are common during spring and fall (PNL 1990).

The HGP is adjacent to the Hanford reach of the Columbia River. This reach is accessible to the public and is used for a variety of recreational activities including fishing, hunting, boating, waterskiing, and swimming (PNL 1990).

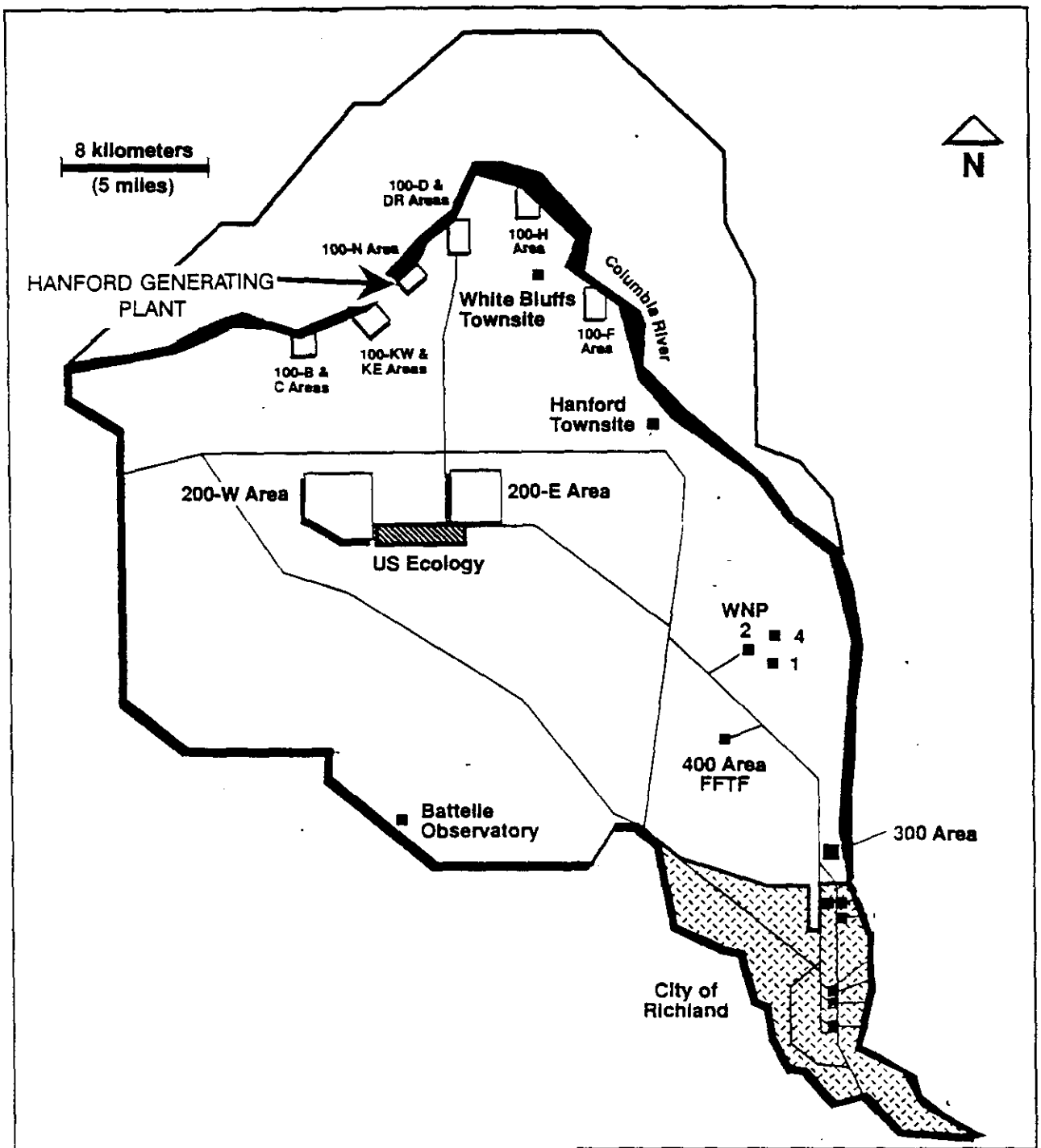

FIGURE 1

LOCATION OF THE HANFORD GENERATING PLANT AT THE HANFORD FEDERAL FACILITY

Source: Modified from DOE (1992)

PRC Environmental Management, Inc.

2.2 ENVIRONMENTAL RECEPTORS AND CONTAMINANT PATHWAYS

This section provides a general discussion of the environmental receptors and contaminant pathways within the entire Hanford facility and those specific to the HGP.

2.2.1 Environmental Receptors

There are no permanent human inhabitants at the Hanford facility. The nearest population center is the Tri-Cities (Richland, Pasco, and Kennewick, Washington), situated on the Columbia River approximately 38 river miles downstream from the site (DOE 1991) (Figure 1). The total population within a 50-mile radius of the 200 Area meteorological tower (approximately the center of the Hanford site) was 340,943 in 1980 (PNL 1989).

The desert shrubs and drought-resistant grasses on the site are dominated by cheatgrass, sagebrush, and bluegrass. The most abundant mammal is the great basin pocket mouse. Mule deer, cottontail rabbit, and coyote are also common on the site.

There is narrow riparian zone along the banks of the Columbia River, harboring grasses and herbs interspersed with scattered deciduous trees (COE 1991). The bald eagle is a regular winter visitor to the area along the Columbia River (PNL 1990). Anadromous fish swim upstream in the river to spawn. The HGP is located adjacent to the Columbia River.

2.2.2 Contaminant Pathways

A contaminant pathway consists of five elements: a source, a mechanism for release, an exposure medium, a route of exposure, and an exposure point (receptor). SWMUs are generally potential primary sources. Spills, leaks, and direct disposal are potential primary mechanisms for release. Because of the locations of the HGP, soils and surface water are the primary potential exposure media. Groundwater could become contaminated either directly or through contact with contaminated soils. Routes of contaminant exposure may include ingestion, inhalation, and direct contact with contaminated media. Exposure of receptors in the Columbia River is of primary concern since the river is the ultimate discharge point for groundwater.

The river is used as a source of drinking water for some on-site facilities and in communities located downstream of the Hanford facility. The Hanford reach of the Columbia River is also

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used for a variety of recreational activities including hunting, fishing, boating, waterskiing, and swimming. Columbia River water downstream of the Hanford facility is also used for crop irrigation (PNL 1990).

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3.0 FACILITY OPERATIONS

This section presents the operational history of the Hanford federal facility and the HGP.

3.1 HANFORD FEDERAL FACILITY

The Hanford facility was acquired by the federal government in 1943; its primary purpose was to produce plutonium for national defense and to manage the wastes generated during plutonium production. The N Reactor was the last major production reactor at the Hanford facility and was capable of producing special nuclear materials and steam when it began operation in 1963. The steam produced from the N Reactor core cooling systems was piped to the HGP and used for the production of electrical power. The N Reactor was placed on standdown status in December 1986, and its shutdown was ordered in October 1991 (DOE 1991).

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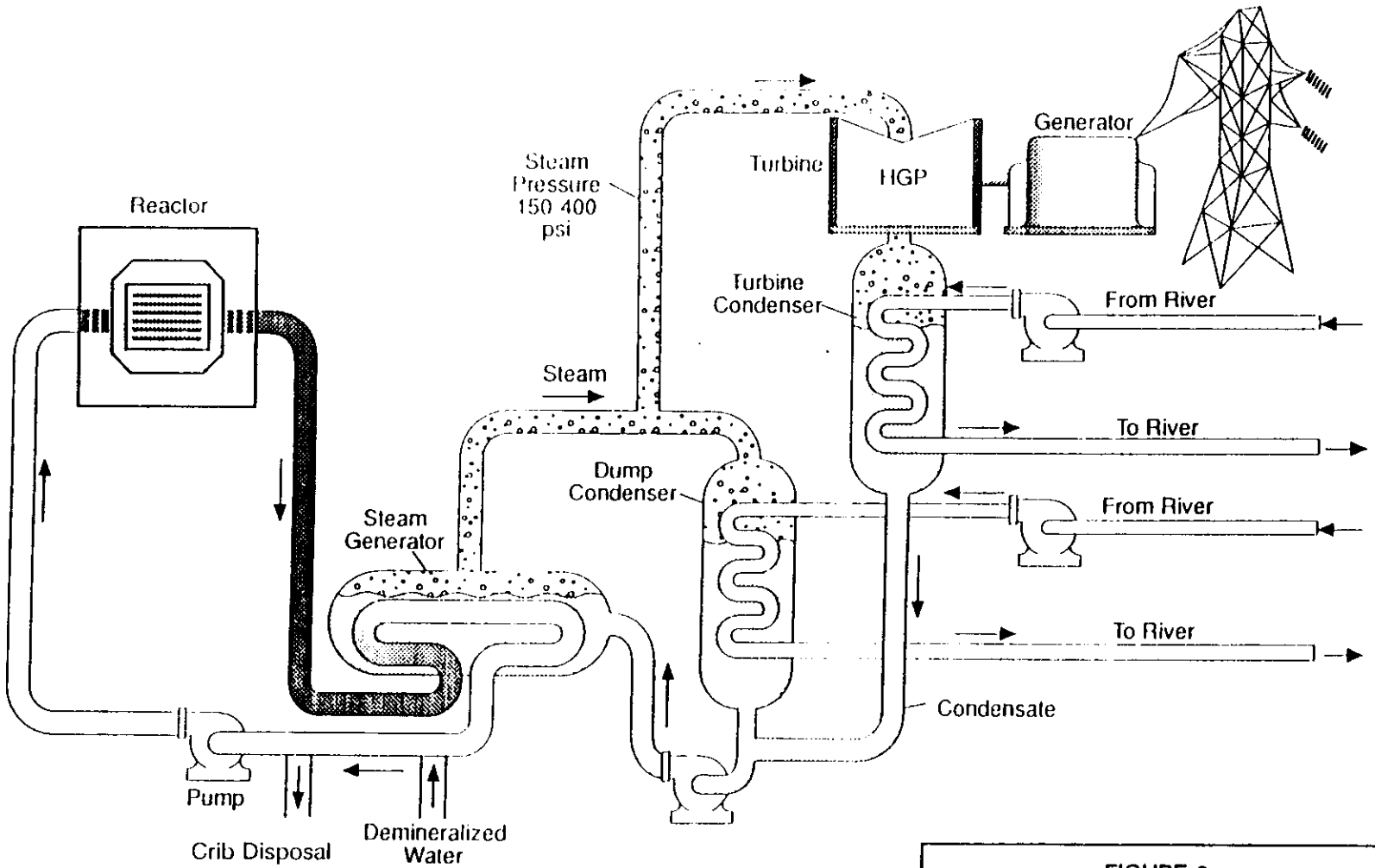
3.2 HANFORD GENERATING PLANT

The HGP consists of two 430-megawatt, low-pressure (150 to 400 pounds per square inch) turbine generators. The power produced by the HGP was used in the BPA power grid. Construction of the plant began in September 1963 and was completed in April 1966. The HGP operated continuously from April 1966 to December 1986, except for periodic maintenance and repairs. The HGP unit is currently inactive except for routine maintenance.

Steam from the N Reactor powered the HGP turbines before passing through the turbine condenser, where waste heat was transferred to the cooling water. The condensed steam was then returned to the N Reactor for reuse. This condenser and the auxiliary cooling systems were supplied with raw water from the Columbia River by the HGP pump house. The cooling water was discharged to the Columbia River through the HGP outfall (Figure 2).

The structures located on the approximate 50-acre HGP tract consist of the main HGP building, the pump house, outfall located on the Columbia River, maintenance garage, old construction storage building, and guardhouse (Figure 3). The boundaries for the HGP tract on Figure 3 are from hand-drawn lines on a map provided by WPPSS personnel. A map containing the exact boundaries of the HGP tract with survey points has not been received. Environmental compliance and cleanup activities for all waste units outside the HGP boundaries are subject to the tri-party



Source: Modified from DOE (1991)

FIGURE 2

N REACTOR COOLANT DIAGRAM INCLUDING THE HANFORD GENERATING PLANT

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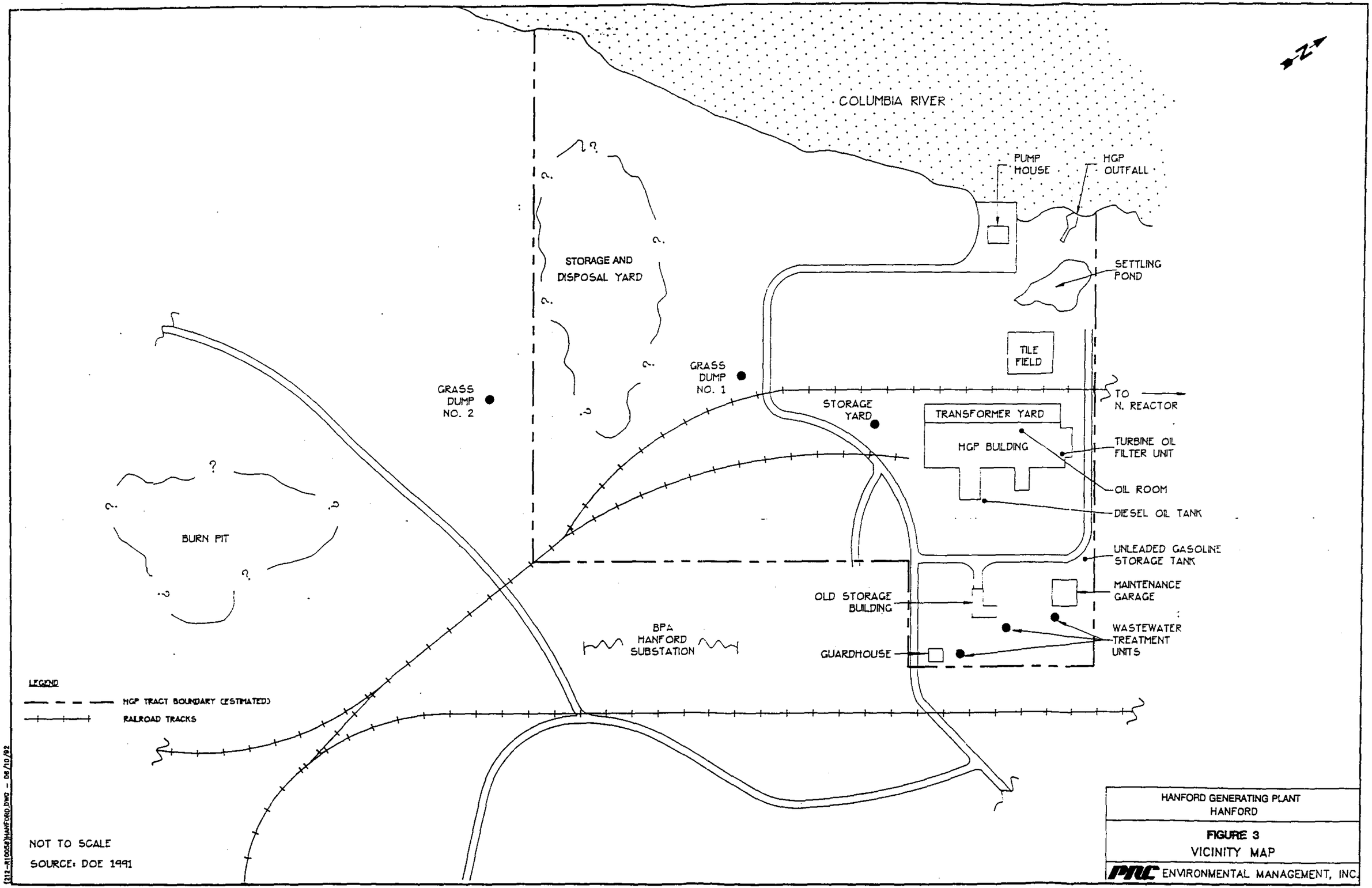
COLUMBIA RIVER
PUMP HOUSE
HGP OUTFALL
SETTLING POND
STORAGE AND DISPOSAL YARD
TILE FIELD
GRASS DUMP NO. 1
GRASS DUMP NO. 2
STORAGE YARD
TO N. REACTOR
TRANSFORMER YARD
HGP BUILDING
TURBINE OIL FILTER UNIT
OIL ROOM
DIESEL OIL TANK
UNLEADED GASOLINE STORAGE TANK
MAINTENANCE GARAGE
OLD STORAGE BUILDING
WASTEWATER TREATMENT UNITS
GUARDHOUSE
BPA HANFORD SUBSTATION
BURN PIT
LEGEND
HGP TRACT BOUNDARY (ESTIMATED)
RAILROAD TRACKS
NOT TO SCALE
SOURCE: DOE 1991
HANFORD GENERATING PLANT
HANFORD
FIGURE 3
VICINITY MAP
PRC ENVIRONMENTAL MANAGEMENT, INC.

agreement. Based on the boundaries in Figure 3 and the VSI, the burn pit (SWMU 11) mentioned in the next section is outside of the HGP boundaries. It is included for completeness.

Also, within the HGP property are a gasoline filling area, a diesel storage tank and generator, and an equipment storage yard.

The gasoline filling area is located outside the northern corner of the maintenance garage. It consists of one 1,000 gallon underground storage tank installed in 1976 that contains unleaded gasoline. The tank was recently integrity tested and was found not to leak according to WPPSS personnel. A second tank, next to the existing one, was removed in October 1989 after 24 years of service. No documentation was found on this removal.

On the southeast side of the HGP Building, to the left as you face the control room, is a wing of the building that protrudes out into the parking lot. At the end of this wing is a room measuring about 20 feet by 40 feet, containing a diesel generator. There is one 20,000 gallon underground storage tank installed in 1965 outside the room. The tank supplies diesel oil to both the backup generator, and to a backup heating boiler. There is no indication of release from this tank. According to WPPSS personnel, a recent integrity test indicated this tank in good working order.

A small area, of less than an acre, is located at the southwest end of the HGP Building, at a distance of about 100 or 200 feet (Storage Yard in Figure 3). Various machinery parts and materials such as insulators and a backup transformer are stored on the ground. There is no documented history of a release from this area nor any visible leakage from the transformer seen during the VSI.

Two grass dumps were found during the VSI (Figure 3). One is located outside of the HGP boundaries. These dumps contain grass clippings from lawn maintenance activities in the HGP area and are not suspected to contain hazardous waste or hazardous constituents and therefore are not considered SWMUs.

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4.0 SOLID WASTE MANAGEMENT UNITS AND AREAS OF CONCERN

This section describes in detail the SWMUs and AOCs at the HGP.

4.1 SOLID WASTE MANAGEMENT UNITS

This section describes the SWMUs and documented releases from these units. The following list of units was compiled from a review of a DOE work plan (1991), discussions with WPPSS personnel responsible for the HGP, and information collected during the VSI. Figure 3 shows the location of these units. Appendix A contains photographs of the units taken during the VSI. The SWMUs identified are the following:

1. Transformer yard
2. HGP building oil storage
3. HGP building floor drains, and sumps, and all piping to the settling pond and outfall
4. Turbine oil filter unit
5. Tile field
6. Settling pond
7. Outfall
8. Maintenance garage
9. Wastewater treatment units
10. Disposal and storage area
11. Burn pit

4.1.1 SWMU 1 - Transformer Yard

Unit Description

Nine large transformers are arranged outside in a row along the northwest wall of the HGP building (about 400 feet in length). Each transformer is approximately 20 feet tall and 8 feet square and is placed on top of a concrete pad about 10 feet square. The bulk of the area is

unpaved and covered with crushed rock. Each transformer has a fluid pump attached to one side and a main valve on the adjacent side. The pumps and valves protrude beyond the transformer pads. The valves and pumps of several of the transformers have passive leaks, as indicated by fluids present on the outside of the transformer and oil stains on the concrete pads and crushed rock below (Photographs 1 and 2, Appendix A).

Dates of Operation

The transformers were used from 1966 to 1986.

Wastes Managed

Dielectric fluids consisting of mineral oil are used in the transformers as a coolant. WPPSS personnel verbally stated that polychlorinated biphenyls (PCB) were not part of the dielectric fluid. No analytical data were obtained to show whether PCBs were present in the fluid. However, based on the dates of operation for the transformers, PCBs are suspected.

Release Controls

None

History of Releases

Other than the observed leakage, there is no record of releases having occurred.

4.1.2 SWMU 2 - HGP building oil storage area

Unit Description

Inside the basement of the HGP building along the northwest wall is a cinder block room approximately 8 feet by 25 feet. The room has a fire sprinkler system, steel grate floor, and shelving along the walls. Drums and smaller containers of product (petroleum, oil, and lubricants) are stored on the floor and shelving. One drum is labeled for used oil. A blind concrete sump (no outlet) is located below the graded floor (Photograph 3, Appendix A).

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Dates of Operation

This facility has been in use since completion of the building in 1966 and is currently active.

Wastes Managed

Used oil and rags from maintenance activities are stored in drums inside the room.

Release Controls

The blind sump provides secondary containment.

History of Releases

No releases are known to have occurred. However, staining on the grate and sump floor indicates that minor leaks from containers have been contained within the unit.

4.1.3 SWMU 3 - HGP Building Floor Drains, and Sumps, and All Piping to the Settling Pond and Outfall

Unit Description

Several floor drains in the basement level of the HGP building collect spills, leaks, and any flood waters, and direct them to a central sump. (The elevation of the basement level of the HGP building is below the nearby Columbia River.) A pump discharges the sump content to the settling pond (SWMU 6). Prior to the late 1960s, this water was discharged directly to the HGP outfall, until concern about oil releases led the facility to permanently divert the discharge to the settling pond.

Dates of Operation

The floor drains and sumps have been in operation since the plant opened in 1966 and are currently active in case of floods or spills resulting from routine maintenence actvities.

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Wastes Managed

Any waste or product used at the facility that spills on the floor and washes into the floor drains and sump.

Release Controls

Prior to the late 1960s there were no discharge controls, and the collected water was directly discharged through the HGP outfall (SWMU 7). After the late 1960s the release of this waste stream to the river has been controlled by first discharging directly to the settling pond (SWMU 6).

History of Releases

No releases have been reported. However, since the discharge from the sump was changed from the outfall to the settling pond due to a concern about oil spills, releases have undoubtedly occurred.

4.1.4 SWMU 4 - Turbine Oil Filter Unit

Unit Description

The turbine oil cleaning system is in the basement of the HGP building along the northeast wall. It is a steel tank, approximately 4 feet high and 8 feet square. Steel lids cover much of the top of the tank. Under each lid is a series of filters through which the turbine oil flows after being piped directly from each turbine. The entire unit is surrounded by a concrete berm approximately 6 inches high (Photograph 4, Appendix A).

Dates of Operation

The turbine oil cleaning system operated from 1966 to 1986.

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Wastes Managed

The filters were periodically changed, but no information was available on the location of their disposal. This unit likely managed impurities in the turbine oil such as metals.

Release Controls

Small leaks would have been contained within the berm. Large spills could flow to the floor drains (SWMU 3) and be discharged to the settling pond (SWMU 6) or the outfall (SWMU 7).

History of Releases

No releases are known to have occurred from this unit.

4.1.5 SWMU 5 - Tile Field

Unit Description

The tile field is located behind the HGP building, between the northwest wall and the Columbia River, and consists of a 50-foot square, 10-foot depression with a flat bottom. The side walls slope up at a 2:1 (horizontal to vertical) ratio on three sides. The fourth side is open and the land drops off to the settling pond (SWMU 6) (Photograph 5, Appendix A). It receives sanitary and laboratory wastes from the HGP building. It is not connected to the floor drains or sumps (SWMU 3) in the HGP building.

Dates of Operation

The tile field has operated since the facility was first opened in 1966 and is still active.

Wastes Managed

The tile field contains sanitary sewage wastes and likely contains wastes from sinks in a water chemistry laboratory within the HGP building. Tests for the corrosion inhibitors hydrazine (RCRA Hazardous waste number U133) morpholine, (RCRA ignitability characteristic D001),

occurred in the laboratory. It is likely that hydrazine, morpholine and associated indicator reagents were discharged to the tile field.

Release Controls

None

History of Releases

This unit is designed to release wastewater by allowing it to percolate into the soil.

4.1.6 SWMU 6 - Settling Pond

Unit Description

The settling pond is located directly below the northwest edge of the tile field (SWMU 5) on a flat shelf of land about 25 feet below the surface level around the plant, and 15 feet lower than the bottom of the tile field. The settling pond is unlined and is approximately 100 feet long, 40 feet wide, and 5 feet deep. The north rim is only 2 feet to 3 feet high and drops off on the far side down the bank to the Columbia River 30 to 40 feet below. The remaining side walls rise to as much as 5 feet high, sloping at a 2:1 (horizontal to vertical) ratio. An outlet pipe drains the pond directly into the HGP outfall (Photograph 6, Appendix A).

Dates of Operation

The settling pond has been in operation since 1965 and is still active.

Wastes Managed

Wastewater was discharged from the "graver units," which filtered the condensate during HGP operation. This wastewater may have contained hydrazine, morpholine, and iron oxide (from rusty pipes). Waste liquids collected from the floor drains (SWMU 3) are currently discharged to the pond. The settling pond has been contaminated with low level radioactive waste, via an apparent release by the N Reactor to the steam supplied to HGP. Some of the resulting steam condensate was apparently discharged to the settling pond.

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Release Controls

This unit serves as a discharge control for the waste streams mentioned previously. The wastes are discharged to the pond to allow solids to settle out. Water also percolates into the underlying soil. An outlet pipe drains the pond directly into the HGP outfall, and a valve was installed on the outlet pipe to prevent the discharge of oil to the outfall. Cleanup procedures to be used in the event of an oil release to the pond are unknown.

History of Releases

Visible iron oxide stains and surface radiation markers seen during the VSI indicate that releases have occurred to the pond. Since the pond was dry during the VSI, it is apparent that liquid releases have occurred from the pond.

4.1.7 SWMU 7 - Outfall

Unit Description

There are two parts to this unit, a pipeline and a seal well. The pipeline has diffusers that extend along the bottom of the Columbia River, allowing discharge away from shore. This underwater pipeline was not visible during the VSI. The seal well consists of a large concrete structure on the river bank and extends 20 feet to 30 feet above the river's surface. The seal well is a chamber into which wastewater was dumped. The wastewater flowed into the Columbia River through the discharge pipe. The seal well also served as a sampling access point (Photograph 7, Appendix A). Currently, only discharges from the settling pond (SWMU 6) are released to the outfall.

Dates of Operation

The HGP outfall was used from 1966 to 1986.

Wastes Managed

Columbia River water, warmed from use as a coolant for the steam condenser was released to and from this SWMU. In addition, prior to the late 1960's, discharge from the main sump in the HGP building also entered this SWMU.

Release Controls

This unit is designed to provide controlled wastewater release. This discharge has a national pollution discharge elimination system (NPDES) permit. A copy of this permit was not provided during the VSI. A copy has been requested from WPPSS.

History of Releases

Releases to the HGP outfall include coolant water, any releases from the HGP building sump (before the late 1960s), and discharge from the settling pond.

4.1.8 SWMU 8 - Maintenance Garage

Unit Description

The maintenance garage is a separate building located approximately 350 feet east of the HGP building. The garage is similar in design to a commercial gasoline station, having a front office area, four vehicle bays with roll-up doors, and a back room in the northeast corner, used for storage of painting and maintenance supplies, used oil, and solvents (acetone, toluene, and methyl ethyl ketone) (Photograph 8, Appendix A). Inside the vehicle bays were several grounds maintenance items, a small boat, and pesticide supplies. Vehicle bays have floor drains and a sink with running water.

Dates of Operation

This building has been in use from 1965 to present.

Wastes Managed

Waste paints and solvents (RCRA hazardous waste number D001) and waste oil are stored in the room in the northeast corner.

Release Controls

None

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History of Releases

There is no record of releases from this unit. However the floor drains and sink discharge to one of the wastewater treatment units of SWMU 9.

4.1.9 SWMU 9 - Wastewater Treatment Units

Unit Description

Three wastewater treatment units are located east of the HGP building. Each consists of a square area of gravel about 10 feet on a side. One near the south corner of the maintenance garage (SWMU 8) contains a 4-foot-diameter steel lid. Another, adjacent to the southeast side of the old storage building contains a 6-inch-diameter capped pipe in the center. The third unit which is at the north corner of the guard house contains no visible pipe or tank (Photographs 9 through 11, Appendix A).

Dates of Operation

All units became operational in 1965. The unit at the garage is still in use, the one at the old storage building ceased operation in 1987, and the one at the guard house ceased operation when the plant closed in 1986.

Release Controls

There are no release controls for these units. They are designed to release wastewater to the subsoil.

History of Releases

There is no record of releases beyond those intended.

4.1.10 SWMU 10 - Disposal and Storage Area

Unit Description

Approximately 800 feet to 1,000 feet to the southwest of the HGP Building there is a large storage and disposal area (also known as the bone yard), defined by the bluff overlooking the Columbia River on the northwest side, the HGP property boundary on the southwest side, and the railroad tracks to the southeast. On the southeast side, there is an area of 2 to 5 acres containing scrap iron, electrical components, piping, cable, and miscellaneous pieces of metal equipment. The northwestern side contains another area of 2 to 5 acres with several spots of stressed or absent vegetation and deposits of oil-stained soil, sand blast grit, and ion exchange resin beads (Photographs 12 through 17, Appendix A).

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Dates of Operation

The storage and disposal yard has been in operation from an unknown date until the present.

Wastes Managed

The wastes observed during the VSI included scrap iron, piping, electrical components, cable, and many other pieces of equipment. Ion exchange resin beads, sandblast grit and oils have been dumped on the ground based on the VSI.

Release Controls

None

History of Releases

There are no records of releases from unit. Visual evidence suggests that past releases to the unit have occurred and it is likely that releases from the unit have also occurred.

4.1.11 SWMU 11 - Burn Pit

Unit Description

Also known as the "construction debris dump," this unit consists of a large borrow pit covering 5 to 10 acres, 1,000 feet south of the HGP property boundary. The pit has an irregular shape and is 20 to 30 feet deep in the center (Photograph 18, Appendix A). Unspecified burning occurred during an unknown time frame

Dates of Operation

Neither the date that the borrow pit was excavated nor the date when wastes were first placed in it is unknown. During the VSI, it appeared to have been recently used for dumping. However, no evidence of recent burning was seen.

Wastes Managed

Large blocks of concrete measuring over 1-yard each side are deposited in the center, and miscellaneous pieces of trash are strewn about. One empty drum and one pile of sand blast grit were observed during the VSI.

Release Controls

None

History of Releases

There are no records of releases from this unit.

4.2 AREAS OF CONCERN

There were no AOCs identified during the preliminary review or the VSI at the HGP.

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5.0 SUMMARY AND RECOMMENDATIONS

PRC performed an RFA of HGP, which is located on the Hanford federal facility near Richland, Washington. Table 1 summarizes the relevant information on the eleven SWMUs discovered during the VSI.

SWMU 1, the transformer yard, showed evidence that several of the transformers had released dielectric fluids onto the soil. Documentation was not received from WPPSS personnel to substantiate their statement that the dielectric fluids in the transformers do not contain PCBs. Based on the dates of operation of these transformers (1966-1986), it is strongly suspected the mineral oil spilled on the ground contains PCBs. An RFI is recommended to investigate PCBs in the soils.

SWMU 2, the HGP building oil storage area, is used to store both product and waste chemicals, some of which have hazardous constituents. The room is well designed for this purpose and gives no indication of any releases to the environment. No further actions are recommended at this SWMU.

SWMU 3, the HGP building floor drains, sump, and piping, function as a collection system for any leaks or spill that were on the basement floor. It is recommended that samples be collected from the sump and associated piping and analyzed for hazardous constituents during an RFI.

SWMU 4, the turbine oil filter unit was used to clean turbine oil during plant operation. The filters that contained waste are no longer in this inactive unit, and their disposal location is unknown. The unit is on a concrete floor surrounded by a concrete curb that should have contained any small leaks. No releases of hazardous constituents are likely from this unit (except for the filter units) and no further action is recommended.

SWMU 5, the tile field, receives sanitary wastes from HGP building toilets and sinks in addition to wastes from an on-site water chemistry laboratory. An RFI is recommended for the soils around the tile field.

SWMU 6, the setting pond, receives wastewater from the HGP floor drains. The pond is currently contaminated with low-level radioactive waste from N Reactor condensate. An RFI is

recommended to investigate the ways potential discharges to the pond impact soils and surface water (Columbia River).

SWMU 7, the outfall, was designed to transport river water, heated by its use as a coolant, back to the river. From plant startup until the late 1960s the central sump in the HGP building discharged directly into the outfall. An RFI is recommended to investigate surface water and sediments near the outfall diffuser ports.

SWMU 8, the maintenance garage, has been used for a variety of functions. Several of the functions including pesticide mixing, painting and vehicle maintenance, may have generated wastes with hazardous constituents. It is likely that some of these wastes may have been dumped into the sink and floor drains, and it is recommended that the wastewater treatment unit near the garage (part of SWMU 9) be sampled for petroleum hydrocarbons, pesticides, and solvents. The room that stores waste oil and solvents does not require further action.

SWMU 9, the wastewater treatment units, have been used to receive sanitary wastes that should not contain any hazardous constituents (with the exception of the unit behind the maintenance garage). Further action is only recommended for the unit near the maintenance garage.

SWMU 10, the disposal and storage yard, or bone yard has been used to store a wide variety of scrap materials and also to dispose of some wastes including sand blast grit, deionizer resin beads and oils. An RFI is recommended and should include sampling of stained soils. If PCBs are found in any of the transformers (SWMU 1) the soil should be analyzed for PCBs as well. It is also recommended that samples of the sand blast grit collected and analyzed for heavy metals.

SWMU 11, the burn pit, has been used to burn unspecified materials and dispose of concrete and sand blast grit. Since this unit is outside the boundary of the HGP tract, it is recommended that investigation of possible soil contamination be included in the tri-party agreement.

TABLE 1

SOLID WASTE MANAGEMENT UNIT SUMMARY

	SWMU 1 Transformer Yard	SWMU 2 HGP Building Oil Storage Area	SWMU 3 HGP Building Floor Drains and Sumps, and All Piping	SWMU 4 Turbine Oil Filter Unit
Description	Yard located along the northwest wall of the HGP building containing nine power transformers on concrete pads. Yard is unpaved and covered with crushed rock.	An enclosed room 8 feet by 25 feet with a blind floor sump and a fire sprinkler system. Located in the basement of the HGP building	The basement of the HGP building has several floor drains that empty into a central sump.	Filter unit used to clean turbine oil located in the basement of the HGP building. It is surrounded by a concrete berm.
Operating Status	Inactive	Active	Active	Inactive
Waste Type	PCBs suspected in transformer mineral oil	Waste oil and rags from maintenance activities	Any product or waste used in the HGP building that may have spilled in the floor	Impurities in turbine oil such as metals
Waste Management	Passive leaking from transformer parts	Waste oil and rags are stored in 55-gallon drums	Drainage from central sump was sent directly to the Columbia River via the outfall prior to the late 1960s. Since then the sump discharges to the settling pond.	Filters were disposed of at an unknown location during operation.
Release Controls	None	Blind floor sump below grated floor	None	Unit is surrounded by a concrete berm.
Release History	Visual evidence of many years of passive spills of mineral oil from transformers	None	Known discharge to river and settling pond	Filters disposed of at an unknown location
Release Potential	High	Low	High	Low
Reason for Release Potential	Visual evidence	Good secondary containment	System designed to release to river and settling pond	Area around unit is clean.
Potential Media of Concern	Soil and surface water	None	Soil and surface water	None
Recommendation	RFI to investigate soil and possible surface water contamination	No further action	RFI to investigate drains, sump, and all piping	No further action

TABLE 1 (continued)

SOLID WASTE MANAGEMENT UNIT SUMMARY

	SWMU 5 Tile Field	SWMU 6 Settling Pond	SWMU 7 Outfall	SWMU 8 Maintenance Garage
Description	A tile field approximately 50 feet square located between the HGP building and the settling pond	An unlined depression approximately 100 feet by 40 feet by 5 feet deep. Side slopes are approximately 2:1 (horizontal to vertical).	Large diameter pipe with diffusers that terminate near the middle of the Columbia River. A large concrete seal well is used as an inlet structure and sampling access point.	A 4 bay maintenance garage with floor drains and a separate room for paint supplies and wastes. This room has a concrete floor without secondary containment.
Operating Status	Active	Active	Inactive, except settling pond drainage	Active
Waste Type	Sanitary wastes and possibly laboratory wastes from the HGP building. Laboratory wastes may contain hydrazine, morpholine, and associated indicator reagents.	Filtrate from condensate that may contain hydrazine, morpholine, and iron oxide; discharge from central sump in HGP building and is downgradient from tile field (SWMU 5); Also, radioactive condensate from N Reactor	Prior to the late 1960s, any waste found in SWMU 3. After that time, primarily waste heat from the turbine condenser	Waste paints and solvents (D001) and likely pesticides, petroleum, oil, and lubricants from floor drains and sink
Waste Management	Wastewater percolates through from HGP building.	Waste discharged to pond via inlet structure, solids settled out, and outlet pipe drains to HGP outfall.	Effluent was emptied into the seal well from the turbine condenser and the settling pond and the flowed out into the Columbia River via the diffusers.	Waste paints and solvents stored in 55-gallon drums. When full, these drums are transferred to WNP-2 to await off-site transport.
Release Controls	None	Designed to catch solids prior to discharge to the river	After the late 1960's, contaminants from SWMU 3 were routed through the settling pond prior to entering the outfall.	None
Release History	Constant	Many discharges to river and soil column beneath pond.	Constant during operation	Floor drains in garage connect to SWMU 9.
Release Potential	High	High	High	Medium
Reason for Release Potential	Designed to release	Designed to release, visual evidence of soil staining and radiation protection - access restriction	Designed to release to the river	Concrete floor in waste storage area was not cracked or stained. Releases to floor drains likely
Potential Media of Concern	Soil and surface water	Soil and surface water	Surface water and sediments	Soil
Recommendation	**RFI to investigate soil and possible surface water contamination**	**RFI to investigate soil and possible surface water contamination**	**RFI to investigate surface water and sediments near the outfall diffuser ports**	**RFI to investigate piping from floor drains to SWMU number 9**

TABLE 1 (concluded)

SOLID WASTE MANAGEMENT UNIT SUMMARY

	SWMU 9 Wastewater Treatment Units	SWMU 10 Disposal and Storage Area	SWMU 11 Burn Pit
Description	Three units consisting of a square area of gravel about 10-feet on a side: one with a 4-foot diameter steel lid, one with a 6-inch diameter capped pipe at the center, and one with no visible evidence of a pipe or tank	A large area to the southwest of the HGP building used to store spare parts and dispose of unwanted material	Very large area likely and old gravel pit approximately 20 to 30 feet deep
Operating Status	One near garage is in use, and the others are inactive	Active	Active
Waste Type	Petroleum, oil, and lubricants from maintenance garage. Sanitary wastes in others	Scrap metal, wood, cable, old shipping containers, spent demineralizer resin beads, sandblast grit	Combustible wastes from plant construction and operation
Waste Management	Wastes discharged to units to percolate through soil column	Some waste is stacked in rows, other waste is spread all over the area.	Combustible wastes burned in the pit
Release Controls	None	None	None
Release History	Constant when in use	Several areas of stained and unvegetated soil seen during the VSI	None documented
Release Potential	High	High	High
Reason for Release Potential	Designed to release to soil column	Visual evidence of releases	Releases to air during burning
Potential Media of Concern	Soil and possibly groundwater	Soil and possibly ground and surface water	Air
Recommendation	RFI for unit near garage. No further action for others	RFI to investigate soil contamination and possible impact on ground and surface waters	Ensure this unit is included in the tri-party agreement

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6.0 REFERENCES

55 FR 30798. EPA Proposed Corrective Action Rule for Solid Waste Management Units. Federal Register. July 27, 1990.

55 FR 49623. Fish and Wildlife Service List of Endangered and threatened Wildlife and Plants. Federal Register, November 30, 1990.

COE 1991. Remedial Investigation/Feasibility Study Work Plan for the 100-FR-1 Operable Unit, Hanford Site. DOE-RL-90-33. U.S. Army Corps of Engineers. Walla Walla, Washington.

DOE 1991. RCRA Facility Investigation/Corrective Measures Study Work Plan for the 100-NR-2 Operable Unit. Hanford Site, Richland, Washington. DOE/RL-91-46 Draft A. U.S. Department of Energy. December.

DOE 1992. Who's Who Around Hanford. Document number 063-91-05-10-1731. U.S Department of Energy, office of Communications. Richland Washington.

Ecology et al. 1990. Hanford Federal Facility Agreement and Consent Order. 89-10 Revision 1. Washington Department of Ecology, U.S. Environmental Protection Agency, and U.S. Department of Energy.

PNL 1989. Hanford Site Environmental Report for Calendar Year 1988. PNL-6825. Pacific Northwest Laboratory. Richland, Washington.

PNL 1990. Hanford Site Environmental Report for Calendar Year 1989. PNL-7346. Pacific Northwest Laboratory. Richland, Washington.

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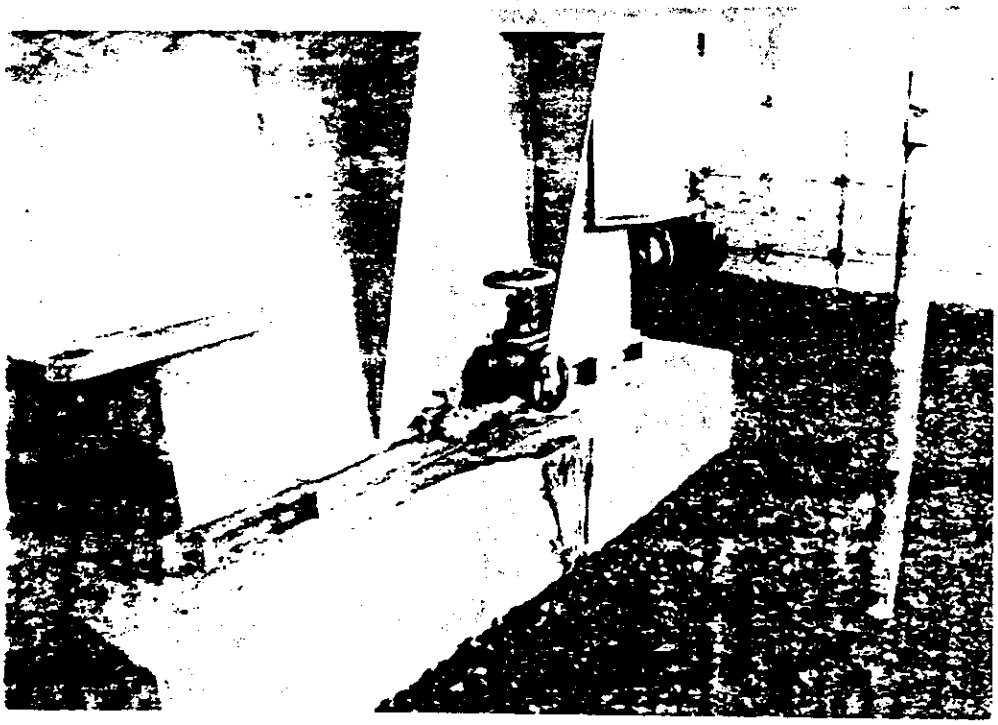
APPENDIX A

PHOTOGRAPHS OF THE HANFORD GENERATING PLANT TAKEN DURING THE VISUAL SITE INSPECTION

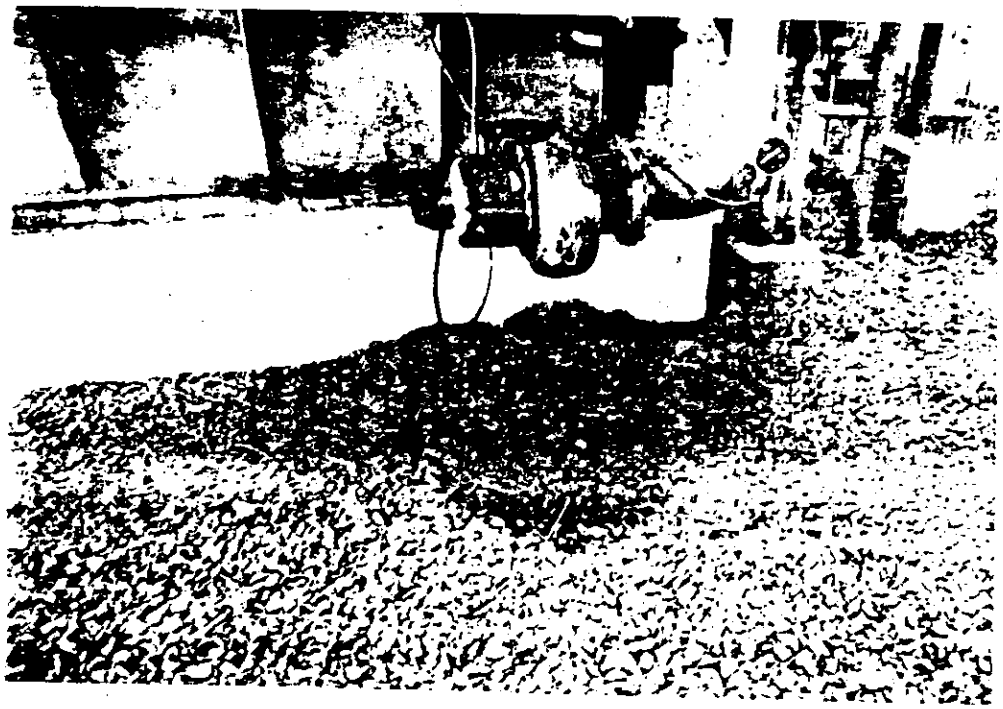
Photograph No. 1



Date: 7-17-92 Picture Taken By: JIS Direction Facing: East

Picture Description: SWMU [illegible] transformer yard - oil stains on concrete pad under valve

Photograph No. 2



Date: 7-17-92 Picture Taken By: JIS Direction Facing: North

Picture Description: SWMU [illegible] transformer yard - oil stains [illegible]

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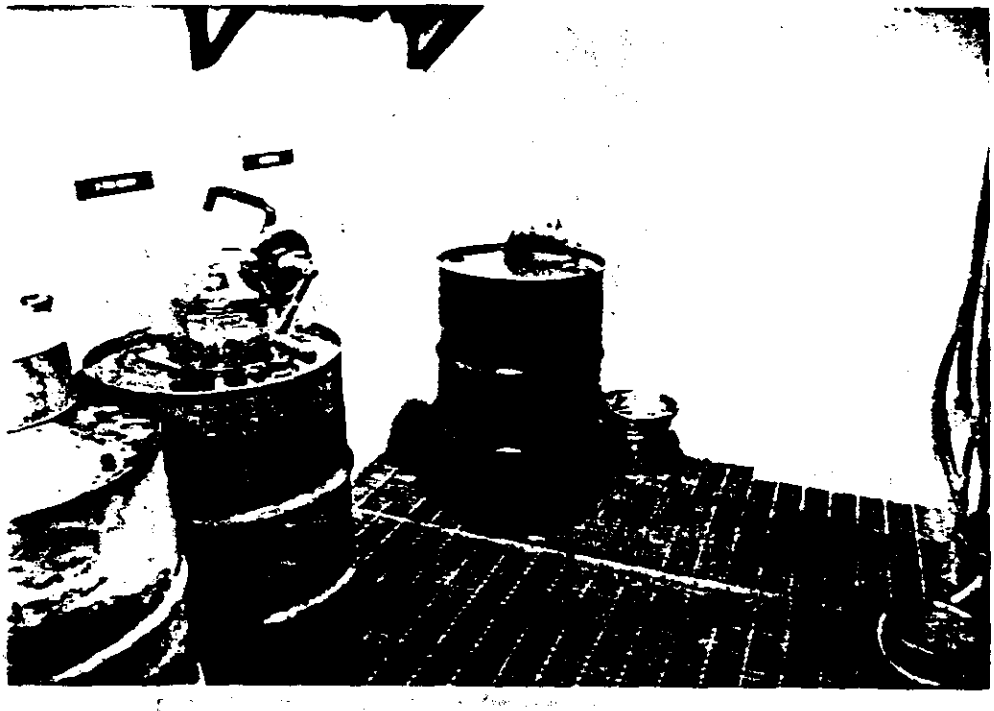
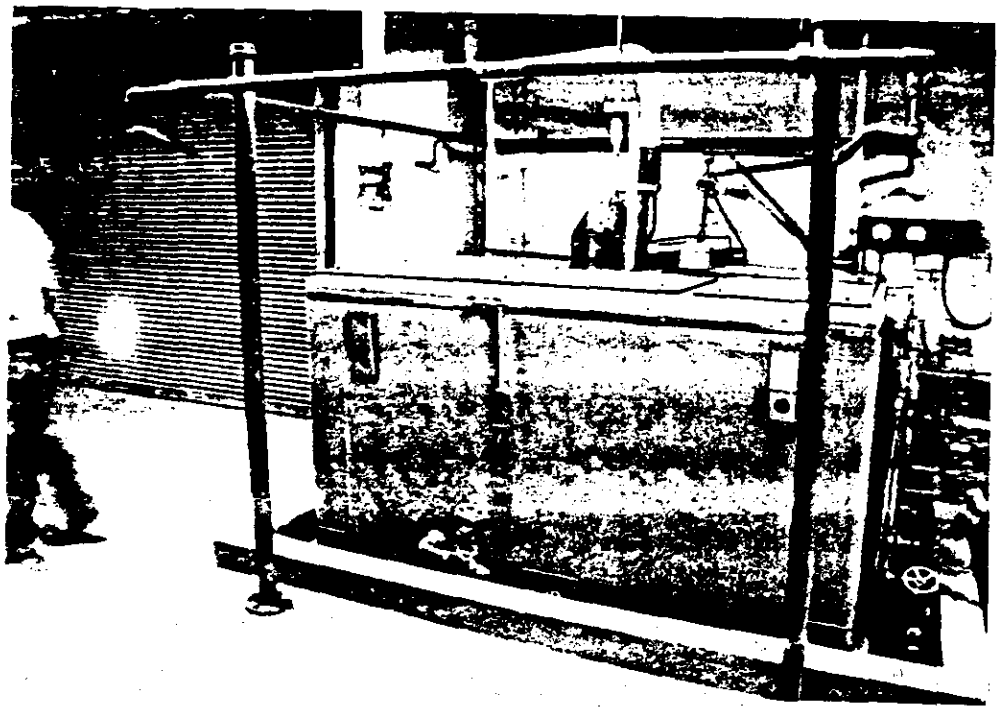
Photograph No. 3



Date: 7-17-92 Picture Taken By: JIS Direction Facing: North

Picture Description: SWMU 2, HGP oil storage area

Photograph No. 4



Date: 7-17-92 Picture Taken By: JIS Direction Facing: North

Picture Description: SWMU 4, Turbine oil filter unit

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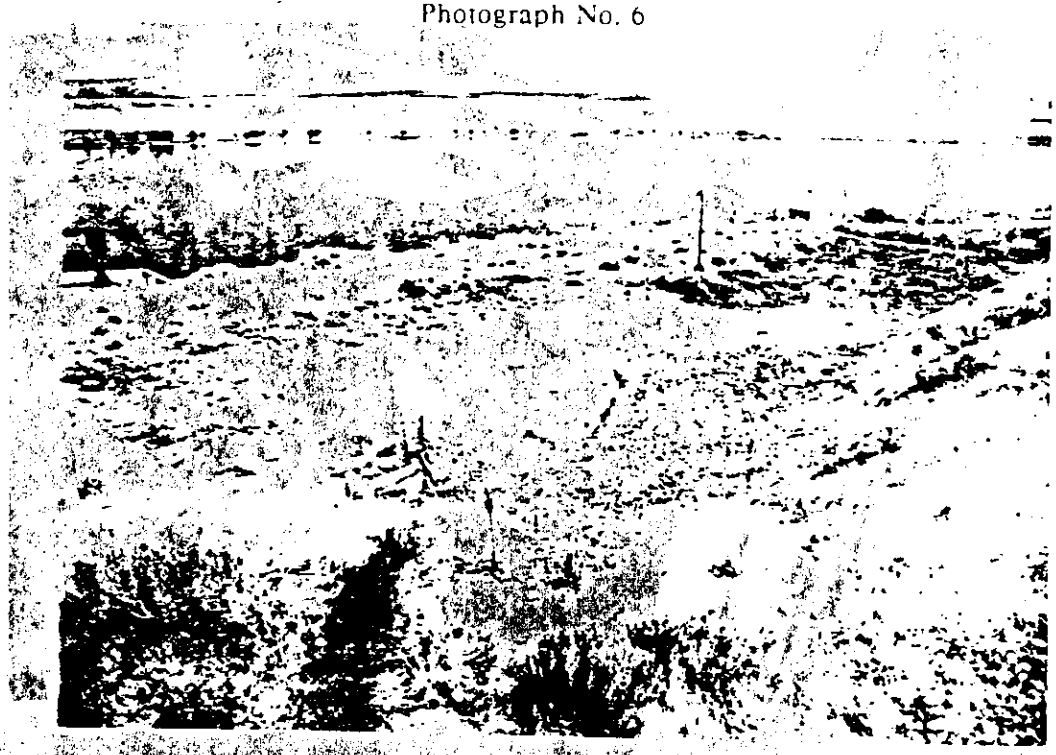
Photograph No. 5

Date: 7-17-92 Picture Taken By: JIS Direction Facing: Northwest

Picture Description: SWMU 5, tile field

Photograph No. 6



Date: 7-17-92 Picture Taken By: JIS Direction Facing: Northwest

Picture Description: SWMU 6, settling pond

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Photograph No. 7

Date: 7-17-92 Picture Taken By: JIS Direction Facing: North

Picture Description: SWMU 7, outfall and seal well

Photograph No. 8

Date: 7-17-92 Picture Taken By: JIS Direction Facing: South

Picture Description: SWMU 8, maintenance garage

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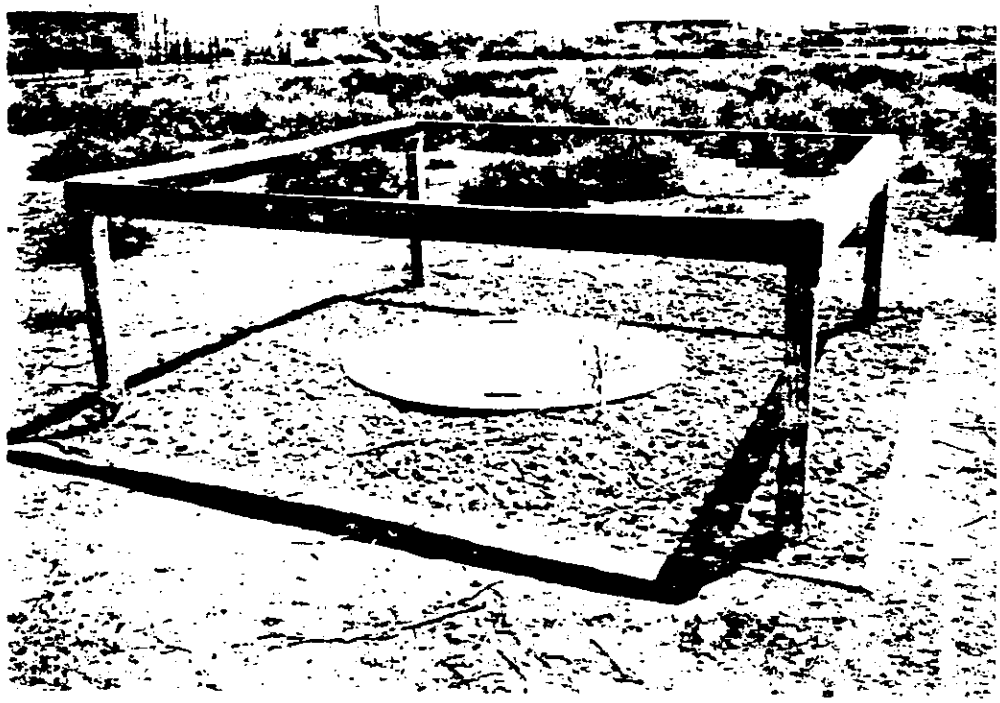
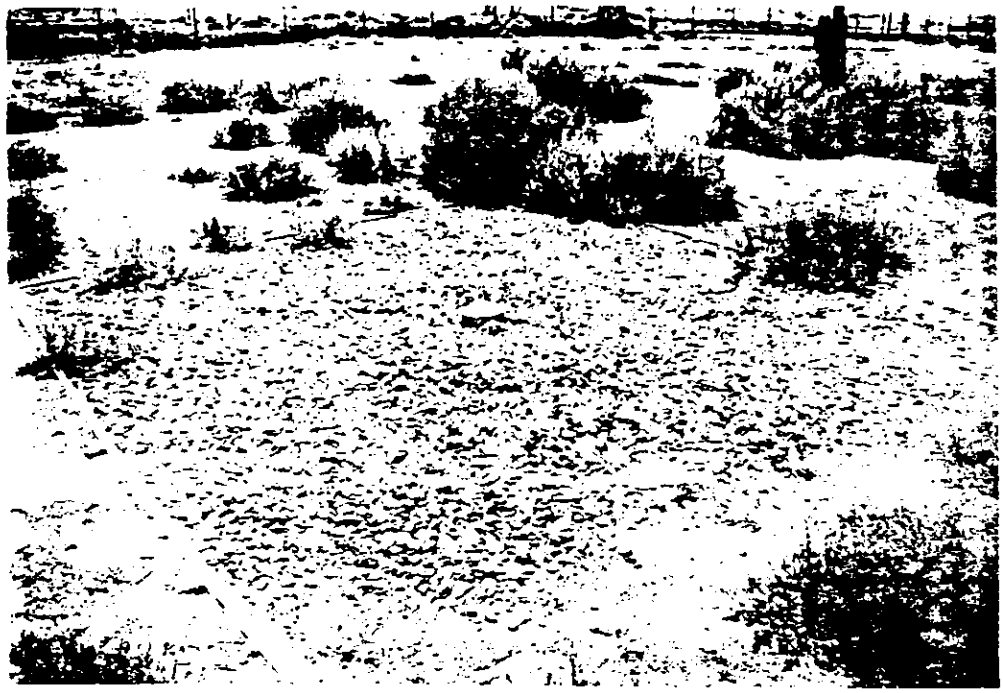
Photograph No. 9



Date: 7 17 92 Picture Taken By: JHS Direction Facing: East

Picture Description: SWMU 9, wastewater treatment unit, behind maintenance garage

Photograph No. 10



Date: 7 17 92 Picture Taken By: JHS Direction Facing: South

Picture Description: SWMU 9, wastewater treatment unit next to storage building

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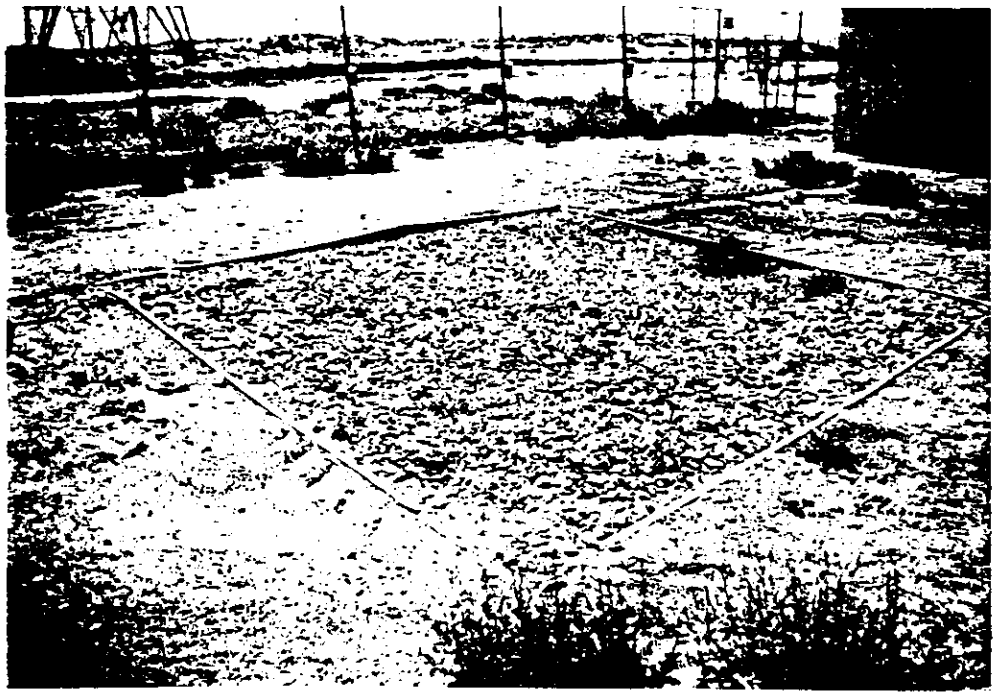
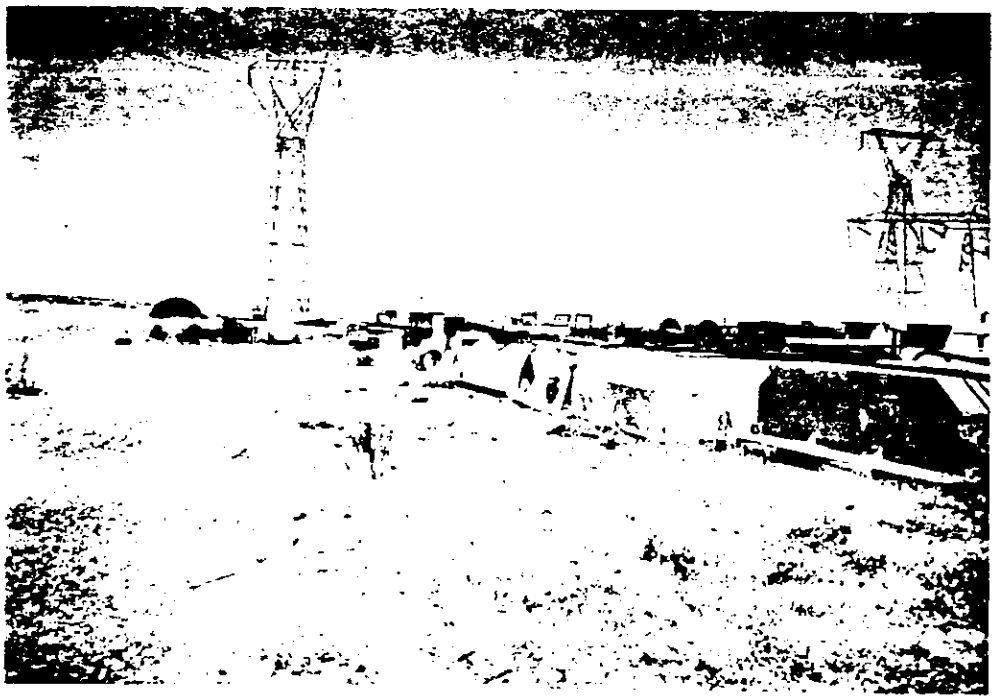
Photograph No. 11



Date: 7 17 92 Picture Taken By: JIS Direction Facing: South

Picture Description: SWMU 9, wastewater treatment unit next to guard house

Photograph No. 12



Date: 7 17 92 Picture Taken By: JIS Direction Facing: South

Picture Description: SWMU 10, Disposal and storage area, machinery and equipment parts

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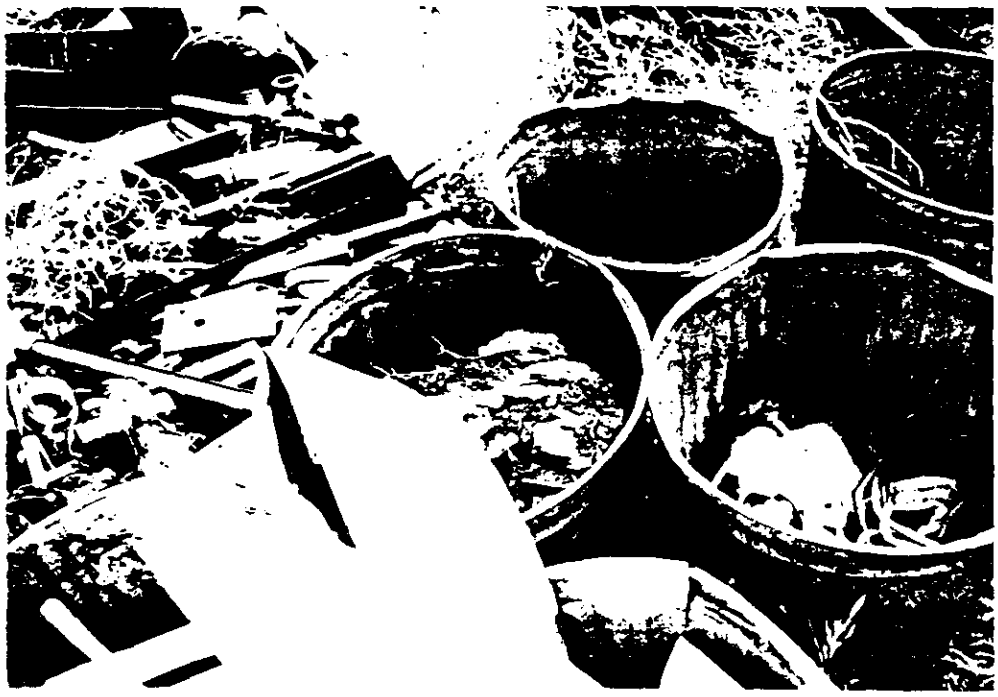
Photograph No. 13



Date: 7 17 92 Picture Taken By: JIS Direction Facing: _____

Picture Description: SWMU 13, Disposal and storage Area, scrap metal

Photograph No. 14

Date: 7 17 92 Picture Taken By: JIS Direction Facing: South

Picture Description: SWMU 13, Disposal and storage Area, sandblast grit

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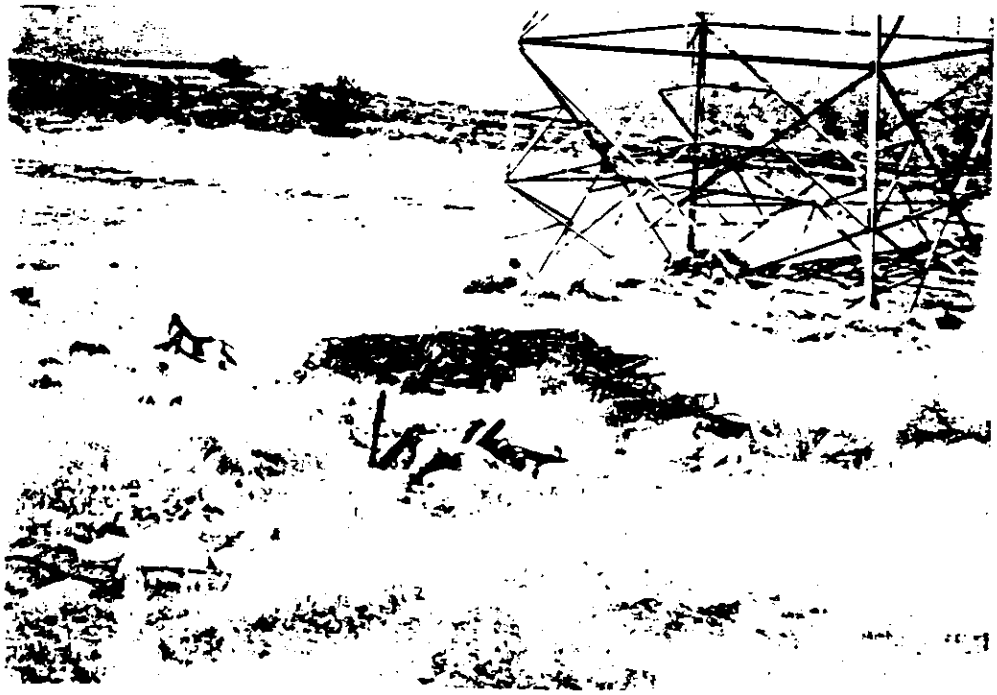
Photograph No. 15



Date: 7-17-92 Picture Taken By: JIS Direction Facing: West

Picture Description: SWMU 10, Disposal and storage Area, pile of steel bands

Photograph No. 16

Date: 7-17-92 Picture Taken By: JIS Direction Facing: South

Picture Description: SWMU 10, Disposal and storage Area, deionization resin drums

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Photograph No. 17

Date: 7 17 92 Picture Taken By: JIS Direction Facing: West

Picture Description: SWMU 10, Disposal and storage area, oil stained soil

Photograph No. 18

Date: 7 17 92 Picture Taken By: JIS Direction Facing: South

Picture Description: SWMU 11, burn pit

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HANFORD FEDERAL FACILITY
U.S. DEPARTMENT OF ENERGY
BONNEVILLE POWER ADMINISTRATION UNITS
RICHLAND, WASHINGTON

RCRA FACILITY ASSESSMENT

FINAL REPORT

Prepared For

U.S. ENVIRONMENTAL PROTECTION AGENCY
Office of Waste Programs Enforcement
Washington, D.C. 20460

Work Assignment No.	:	R10058
EPA Region	:	10
Site Name	:	Bonneville Power Administration Units
EPA I.D. Nos.	:	WA6891406344 (Midway) WA2891420042 (Ashe) WAD780008967 (Department of Energy)
Date Prepared	:	August 26, 1992
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Prepared by	:	PRC Environmental Management, Inc.
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TABLE OF CONTENTS

Section		Page
1.0	INTRODUCTION	1
1.1	PURPOSE OF THE RCRA FACILITY ASSESSMENT	1
1.2	REPORT CONTENT	3
2.0	PROCEDURES	5
2.1	PRELIMINARY REVIEW	5
2.2	VISUAL SITE INSPECTION	6
3.0	ENVIRONMENTAL SETTING	7
3.1	LOCATION, CLIMATE, AND LAND USE	7
3.2	GEOLOGY AND HYDROGEOLOGY	8
3.3	ENVIRONMENTAL RECEPTORS AND CONTAMINANT PATHWAYS	11
3.3.1	Environmental Receptors	11
3.3.2	Contaminant Pathways	11
4.0	FACILITY OPERATIONS AND REGULATORY STATUS	13
4.1	FACILITY OPERATIONS	13
4.2	REGULATORY STATUS	14
5.0	PROCESSES AND SOLID WASTE MANAGEMENT UNITS	15
5.1	MIDWAY SUBSTATION AND COMMUNITY	15
5.1.1	Operation and Hazardous Waste Management	16
5.1.2	Solid Waste Management Units and Area of Concern	20
5.2	HANFORD SUBSTATION	25
5.2.1	Operation and Hazardous Waste Management	25
5.2.2	Solid Waste Management Units and Areas of Concern	26
5.3	H.J. ASHE SUBSTATION AND MAINTENANCE HEADQUARTERS	26
5.3.1	Operation and Hazardous Waste Management	27
5.3.2	Solid Waste Management Units and Areas of Concern	28
5.4	BENTON SWITCH SUBSTATION	29
5.4.1	Operation and Hazardous Waste Management	29
5.4.2	Solid Waste Management Units and Areas of Concern	30
5.5	DOE 351 SUBSTATION	30
5.5.1	Operation and Hazardous Waste Management	30
5.5.2	Solid Waste Management Units and Areas of Concern	31
5.6	WHITE BLUFFS SUBSTATION	31
5.6.1	Operation and Hazardous Waste Management	31
5.6.2	Solid Waste Management Units and Areas of Concern	31
6.0	SUMMARY AND RECOMMENDATIONS	33
7.0	REFERENCES	39

Appendices

A INFORMATION REQUEST AND VISUAL SITE INSPECTION NOTIFICATION LETTER

B SUBSTATION SITE PLANS

C PHOTOGRAPHS OF THE BPA SUBSTATIONS TAKEN DURING THE VISUAL SITE INSPECTION

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LIST OF TABLES

Table		Page
1	SWMU Summary	35

LIST OF FIGURES

Figure		Page
1	Location of the BPA Substations, Hanford Federal Facility	2
2	Generalized Geologic Cross Section, Hanford Federal Facility	9

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ACRONYMS AND ABBREVIATIONS

AOC	Area of Concern
BPA	Bonneville Power Administration
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act
CFR	Code of Federal Regulations
COE	U.S. Army Corps of Engineers
DOE	U.S. Department of Energy
DOE-RL	U.S. Department of Energy-Richland Operations
Ecology	Washington Department of Ecology
EPA	U.S. Environmental Protection Agency
HSDB	Hazardous Substance Database
MCL	Maximum contaminant level
PCB	polychlorinated biphenyl
PNL	Pacific Northwest Laboratory
ppm	parts per million
PRC	PRC Environmental Management, Inc.
RCRA	Resource Conservation and Recovery Act
RFA	RCRA facility assessment
RHO	Rockwell Hanford Operations
SWMU	solid waste management unit
TCA	1,1,1-trichloroethane
TPH	total petroleum hydrocarbons
TSCA	Toxic Substance Control Act
UST	underground storage tank
VSI	Visual site inspection

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1.0 INTRODUCTION

PRC Environmental Management, Inc. (PRC) received work assignment R10058 from the U.S. Environmental Protection Agency (EPA) Region 10 to support enforcement of the Resource Conservation and Recovery Act (RCRA). This work assignment is to conduct a RCRA facility assessment (RFA) at selected areas of the U.S. Department of Energy's (DOE) Hanford federal facility located near Richland, Washington. This RFA report covers all Bonneville Power Administration (BPA) substations located on the Hanford facility, as well as those used to supply power for Hanford facility operations. BPA is one of four administrative units within DOE nationwide that distribute electrical power. The identified BPA substations included in this report are listed below.

- Midway substation and community
- Hanford substation
- H.J. Ashe substation and maintenance headquarters
- Benton Switch substation
- U.S. Department of Energy 351 substation
- White Bluffs substation

Figure 1 shows the location of these substations at the Hanford facility.

PRC conducted a preliminary review and a visual site inspection (VSI) of the BPA substations as part of the RFA process. This RFA report includes the results of the preliminary review and the VSI, and recommends future action.

The legal framework for environmental cleanup and compliance activities at the Hanford facility is established in a tri-party agreement between the Washington Department of Ecology (Ecology), EPA, and DOE (Ecology et al. 1990). The tri-party agreement specifically excludes lands owned by or leased to BPA. This report is for facilities operated by BPA at the Hanford federal facility.

1.1 PURPOSE OF THE RCRA FACILITY ASSESSMENT

An RFA is a means of evaluating a facility's solid waste management practices. If these practices pose a threat to human health or the environment, corrective action is required. The RFA focuses on the solid waste management units (SWMU) at the facility. A SWMU includes any discernible unit at which solid wastes have been placed at any time, irrespective of whether the unit was intended for management of solid or hazardous waste. Such units include any area at the facility at which solid wastes have been routinely and systematically released (55 FR 30798,

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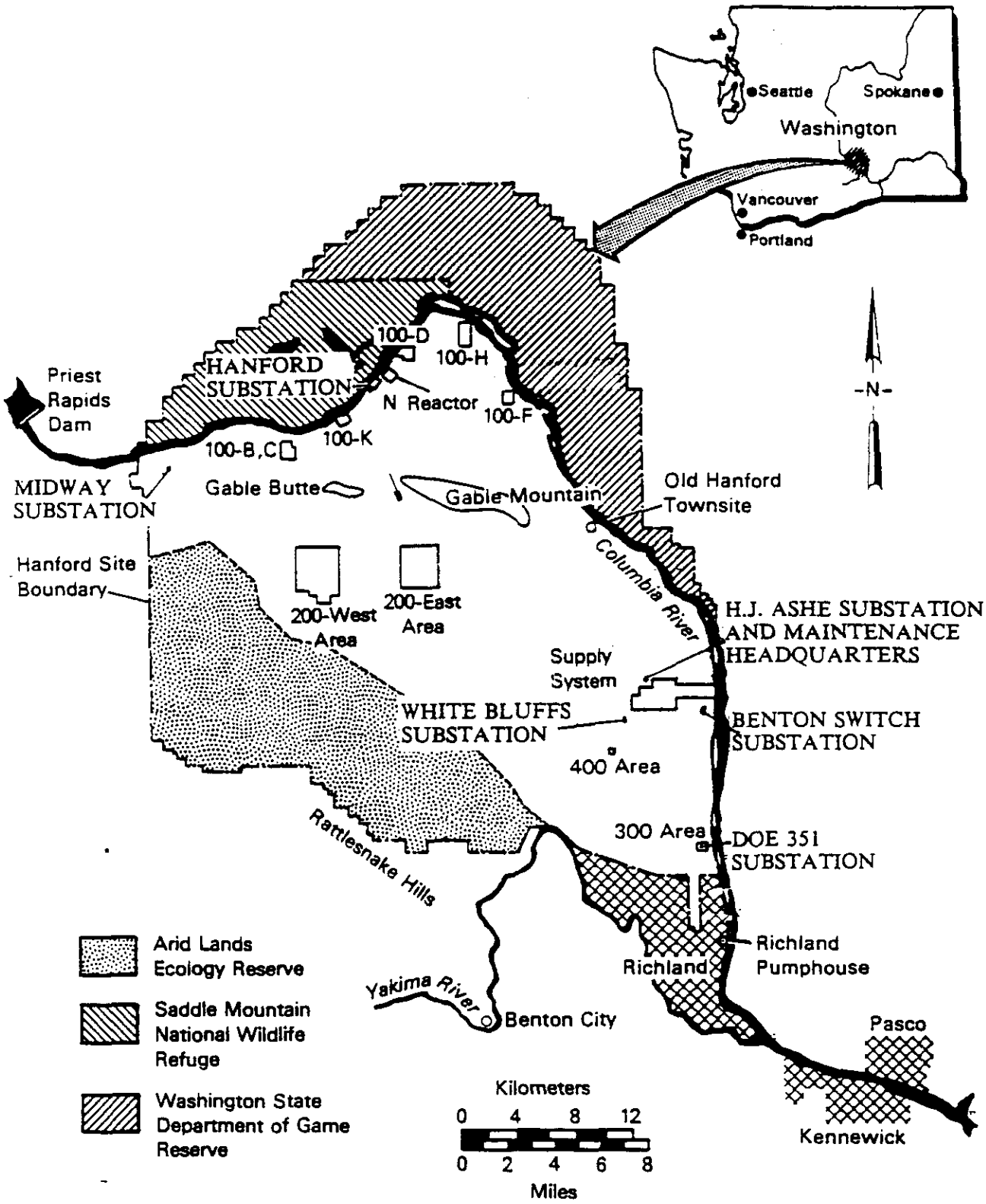

Figure 1

Location of BPA Substations

Hanford Federal Facility

Adapted from: PNL (1990)

PRC ENVIRONMENTAL MANAGEMENT, INC.

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July 27, 1990). SWMUs are evaluated for past and potential releases of hazardous waste or hazardous constituents. A RCRA facility investigation may then be required to define the nature and extent of release and determine the need for corrective action.

An RFA is the first step in implementing the corrective action provisions of the 1984 Hazardous and Solid Waste Amendments to RCRA. Specifically, Sections 3004(h), 3004(u), and 3004(v) grant EPA the authority to require corrective action for releases or potential releases of hazardous wastes from SWMUs at RCRA-regulated facilities. An RFA generally consists of a preliminary review, a VSI, and a sampling visit, if necessary. The purpose of the preliminary review and the VSI is to compile and evaluate available information on the facility to achieve the following objectives:

- Document releases or potential releases of hazardous waste or hazardous constituents from the facility
- Identify and evaluate SWMUs, regulated units, and other areas of concern for releases or potential releases of hazardous waste or hazardous constituents to all environmental media
- Screen from further investigation those SWMUs that do not pose a threat to human health or the environment
- Determine the need for additional investigations, such as a sampling visit, and the need for interim measures at the facility

1.2 REPORT CONTENT

This report describes the procedures used to obtain information during the preliminary review and VSI (Section 2.0); describes the environmental setting of the facility (Section 3.0); summarizes BPA substation operations and provides information on their current regulatory status (Section 4.0); describes the operations, processes, and SWMUs, including any associated environmental releases (Section 5.0); and presents a summary and recommendations for further action (Section 6.0). Section 7.0 contains references used to complete this RFA report.

2.0 PROCEDURES

This section presents the procedures used for the preliminary review and VSI at BPA substations associated with the Hanford facility.

2.1 PRELIMINARY REVIEW

The preliminary review was conducted in accordance with EPA (1986) guidance. Files were reviewed and interviews were held during the course of the preliminary review. Files were reviewed at the following locations:

- EPA Region 10
  RCRA Permits Section
  Federal Facilities and Air and Toxics Branches
  Seattle, Washington
- EPA Hanford Project Office
  Richland, Washington
- Washington Department of Ecology
  Nuclear and Mixed Waste Program Office
  Olympia, Washington

The following persons were interviewed:

- Dan Duncan, EPA
- Wayne Pierre, EPA
- William Hedgebeth, EPA
- Paul Stasch, Ecology
- Joe Witczak, Ecology

During the preliminary review, information was found for only the Midway substation. Therefore, except for the Midway substation, the VSI was performed without the benefit of operational, process, spill history, or other information pertaining to substations. After completing the preliminary review, PRC assisted EPA in drafting a letter notifying BPA of the VSI. Information regarding the other five substations was obtained from BPA after the VSI in response to the notification letter. The letter (Appendix A) described the purpose and outline of the VSI and summarized information needed from BPA to complete the RFA.

2.2 VISUAL SITE INSPECTION

PRC performed a VSI at the Hanford facility from November 18 through 22, 1991. The BPA substations were inspected on November 19. Appendices B and C contain site plans of the substations and a photographic log from the VSI, respectively. The following persons were present for the inspection:

Jerry Shuster, PRC
James Wright, PRC
Dan Duncan, EPA
Randy Krekel, DOE
Ron Brunke, Westinghouse Hanford Company
Mark Hermeston, BPA

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3.0 ENVIRONMENTAL SETTING

The following sections describe the geographic location, climate, land use, geology, and hydrology in the vicinity of the Hanford facility, which includes the BPA substations.

3.1 LOCATION, CLIMATE, AND LAND USE

The Hanford federal facility occupies about 560 square miles in a rural region of southeastern Washington state (Figure 1). The facility, located near the confluence of the Yakima and Columbia rivers, lies within the Pasco basin, one of many topographic and structural basins within the Columbia plateau. The Columbia River flows through the northern edge of the facility and forms part of the eastern boundary. The semiarid land on which the facility is located has a sparse covering of desert shrubs and drought-resistant grasses (PNL 1990).

The climate is dry and mild. The Pasco basin is located in the rain shadow of the Cascade Mountains. The Hanford facility receives approximately 6.3 inches of precipitation annually, 40 percent of which occurs during November, December, and January, while 10 percent falls during July, August, and September. The average minimum and maximum temperatures in July are 60.8°F and 89.6°F. In January, the average minimum and maximum temperatures are 21.2°F and 37.4°F. The region is a typical desert basin, where frequent strong temperature inversions occur at night and break during the day, resulting in unstable and turbulent wind conditions. Monthly average wind speeds range from about 9.3 miles per hour in summer to 6.2 miles per hour in winter. The prevailing wind direction is from the northwest. Wind shifts are common during spring and fall (PNL 1990).

Land surrounding the Hanford facility is used primarily for agriculture and livestock grazing. Agricultural lands are found north and east of the Columbia River and south of the Yakima River. These areas contain orchards, vineyards, and fields of alfalfa, wheat, and vegetables. A state wildlife management area and a federal wildlife refuge are located on Hanford property north of the Columbia River. Land on the northeast slope of Rattlesnake Hills along the southwestern facility boundary is designated as the Arid Lands Ecological Reserve by the DOE (Figure 1). The Hanford reach of the Columbia River is used for a variety of recreational activities including fishing, hunting, boating, waterskiing, and swimming. The river is also used to generate hydroelectric power (PNL 1990).

3.2 GEOLOGY AND HYDROGEOLOGY

Principal geologic units beneath the Hanford facility include, in ascending order, the Columbia River basalt group, the Ringold formation, and a series of deposits informally referred to as the Hanford formation. These units are covered locally by a few yards of recent alluvial or eolian deposits.

The Columbia River basalt group, which is composed of numerous basalt flows and interbedded sediments, is the bedrock unit in the Pasco basin. Emplacement of the Columbia River basalt flows occurred during the Miocene age and ended approximately 8.5 million years ago. The group as a whole covers a large area in eastern Washington, western Idaho, and northeastern Oregon. Basaltic accumulations within the downwarped Pasco basin extend to depths greater than 10,000 feet (DOE 1988).

The Saddle Mountains basalt formation is the youngest member of the Columbia River basalt group. Sedimentary units or interbeds of the Ellensburg formation within the Saddle Mountains basalt are the Grande Ronde and Wanapum basalt formations. The most recent basalt flow comprising the Saddle Mountains basalt formation in the eastern Pasco basin is the Ice Harbor member; in the western Pasco basin, the most recent flow is the Elephant Mountain member (DOE 1988).

A period of river and lake sedimentation followed the emplacement of the Columbia River basalts. These deposits, which belong to the Ringold formation, contain a wide range of sediment types with beds varying from weakly cemented sands and gravels to compacted silt and clay. The Hanford formation was deposited later as a result of giant floods associated with sudden releases from ancient glacial lakes. Within the Pasco basin, the Hanford formation consists mostly of coarse gravel and sand and overlies the eroded surface of the Ringold formation. In places, the Hanford formation directly overlies basalt (PNL 1990). Figure 2 shows a generalized geologic cross-section of the structural relationship of these units. In localized areas throughout the facility the Hanford and Ringold formations are separated by a well developed, buried soil (Plio-Pleistocene unit) and fine-grained eolian deposits (early Palouse soil) (PNL 1989 in PNL 1990).

Both confined and unconfined aquifers are present beneath the Hanford facility. Confined aquifers are mainly found within the Columbia River basalts. A multiple confined aquifer system occurs within the Columbia River basalt group (RHO 1979 in PNL 1990). The confined aquifers are hosted by interbeds within the basalt (DOE 1988). The interbeds, which occur at lava flow contacts, consist of the flow top of the lower flow, intervening sedimentary deposits, and the flow bottom of the upper flow (Graham 1983 in DOE 1990). The dense inner flow

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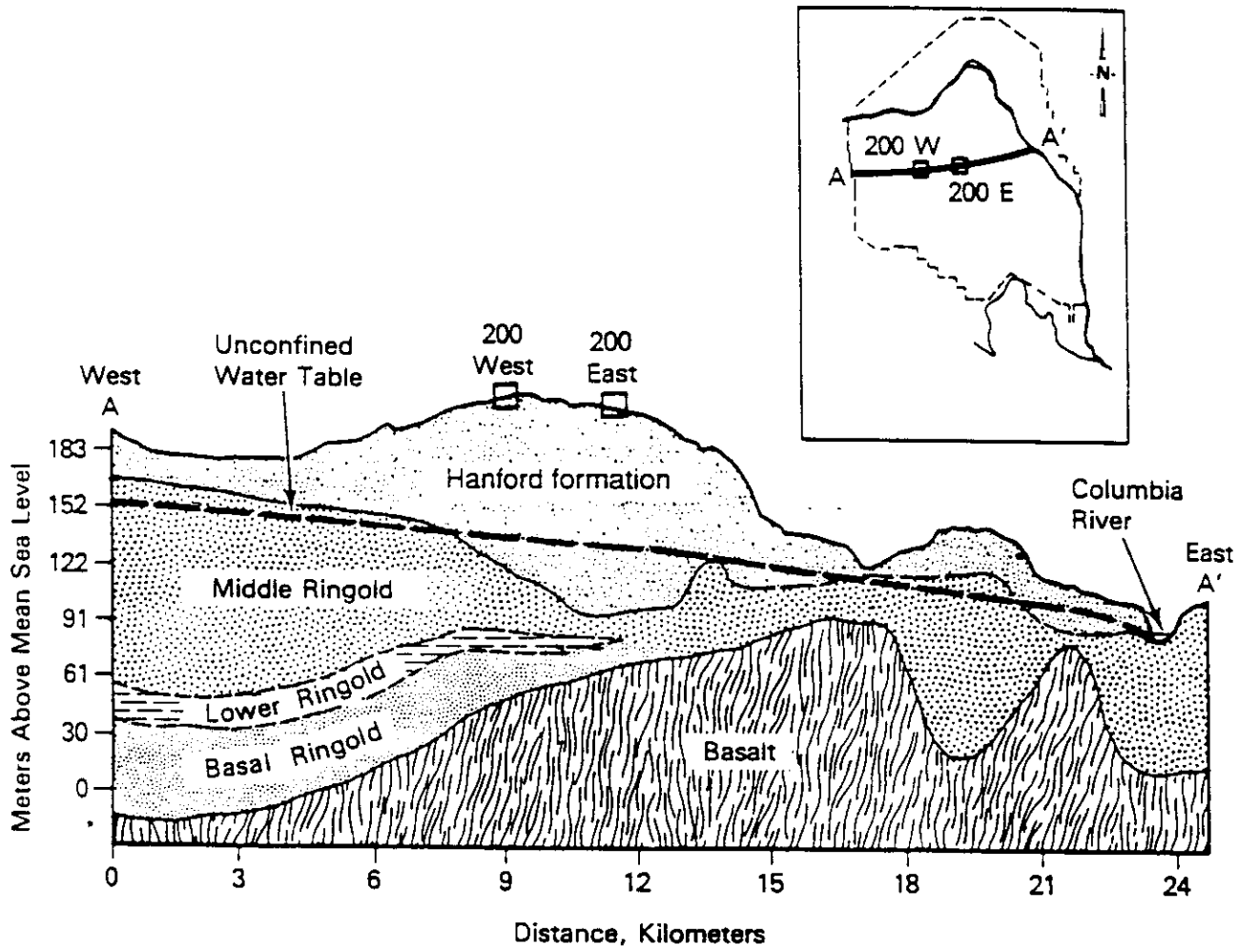

Figure 2

Generalized Geologic Cross

Hanford Federal Facility

(PNL 1990)

PRC ENVIRONMENTAL MANAGEMENT, INC.

materials form the aquitards separating interbed aquifers. The uppermost interbed aquifers are found in the Saddle Mountains basalt. Interbed aquifers range in thickness from 20 to 110 feet. Aquifers in the Saddle Mountains basalt are likely localized to the Pasco basin by geological structures along the basin margin (RHO 1979 in PNL 1990, DOE 1988). Deeper interbed aquifers in the Wanapum and Grande Ronde basalt formations appear to be hydrologically connected with regional flow systems outside the basin (DOE 1988). The Saddle Mountains interbeds are recharged by precipitation on formation outcrops surrounding and within the basin and by the overlying unconfined aquifer. Recharge to the deeper interbed aquifers comes from vertical leakage from upper interbeds and horizontal inflow from regions outside the basin. Groundwater flow in the confined aquifers is generally toward the Columbia River from the east and west (DOE 1988).

In general, the unconfined (or water table) aquifer is located in the Ringold formation and glaciofluvial sediments, as well as in more recent alluvial sediments in areas adjacent to the Columbia River (RHO 1979 in PNL 1990). This aquifer extends laterally below most of the Hanford facility and is bounded by basalt ridges that surround the basin and by the Yakima and Columbia rivers. Aquifer thickness varies from 50 to 200 feet; the top of the water table varies from about 1 foot, near the Columbia River, to over 348 feet below surface grade in the center of the Hanford site. The aquifer is recharged primarily by runoff from surrounding mountains, ridges, and hills (RHO 1979 in DOE 1990). The Yakima and Columbia rivers also contribute to the total natural recharge of the aquifer and, most likely, the deeper basalt aquifers (DOE 1988). Percolation of rainwater directly to the aquifer appears to contribute little recharge (Gee 1987 in PNL 1989, PNL 1990 in Delaney et al. 1991). Large scale artificial recharge occurs from off-site agricultural irrigation and liquid waste disposal in operating areas of the Hanford facility. Recharge to the groundwater from facilities in the 200 Area, located near the center of the Hanford site (including B Pond and various cribs and trenches), is estimated to add 10 times the volume of water to the unconfined aquifer as that contributed by natural inflow from precipitation and irrigation waters to the west (RHO 1981 in PNL 1990). Groundwater flow in the aquifer is predominantly horizontal from west to east (PNL 1986 in DOE 1990). Groundwater discharges from the unconfined aquifer to the Columbia River along the eastern and northeastern margins of the Pasco basin (RHO 1979 in DOE 1990). Toward the interior of the Pasco basin, groundwater discharges into underlying Columbia River basalt (Graham 1983 in DOE 1990, DOE 1988). Relatively small amounts of groundwater from the unconfined aquifer discharge to water supply wells, including municipal wells used by the city of Richland, Washington.

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3.3 ENVIRONMENTAL RECEPTORS AND CONTAMINANT PATHWAYS

This section provides a general discussion of the environmental receptors and contaminant pathways within the entire Hanford facility and those specific to the BPA substations.

3.3.1 Environmental Receptors

There are no permanent human inhabitants at the Hanford facility. The nearest population center is the Tri-Cities (Richland, Pasco, and Kennewick, Washington), situated on the Columbia River downstream from the site (Figure 1). The total population within a 50-mile radius of the 200 Area meteorological tower (approximately the center of the Hanford site) was 340,943 in 1980 (PNL 1989).

The dominant desert shrubs and drought-resistant grasses on the site are cheatgrass, sagebrush, and bluegrass. The most abundant mammal is the great basin pocket mouse. Mule deer, cottontail rabbit, and coyote are also common on the site.

There is narrow riparian zone along the banks of the Columbia River, harboring grasses and herbs interspersed with scattered deciduous trees (COE 1991). The bald eagle is a regular winter visitor to the area along the Columbia River (PNL 1990). The Midway, Hanford, DOE 351, and Benton Switch substations are all located within 1 mile of the Columbia River. The Ashe and White Bluffs substations are located approximately 3 and 4 miles west of the river, respectively (Figure 1). All substations are fenced, limiting access to both human and ecological receptors (except birds and small animals).

3.3.2 Contaminant Pathways

A contaminant pathway consists of five elements: a source, a mechanism for release, an exposure medium, a route of exposure, and an exposure point (receptor). SWMUs are generally potential primary sources. Spills, leaks, and direct disposal are potential primary mechanisms for release. Because of the locations of the substations, soils and groundwater are the primary potential exposure media. Routes of contaminant exposure may include ingestion, inhalation, and direct contact with contaminated media. Exposure of receptors in the Columbia River is of primary concern since the river is the ultimate discharge point for groundwater. Groundwater could become contaminated either directly or through contact with contaminated soils.

The river is used as a source of drinking water for some on-site facilities and in communities located downstream of the Hanford facility. The Hanford reach of the Columbia River is also

used for a variety of recreational activities including hunting, fishing, boating, waterskiing, and swimming. Columbia River water downstream of the Hanford facility is also used for crop irrigation (PNL 1990).

Groundwater in the vicinity of the Hanford facility is used to supplement municipal wate supply, irrigation, and direct domestic use. Of primary concern is the city of Richland pumphouse, which is located approximately 2,000 feet east of the Hanford facility (DOE 1990) (Figure 1).

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4.0 FACILITY OPERATIONS AND REGULATORY STATUS

The Hanford facility was acquired by the federal government in 1943; its primary purpose was to produce plutonium for national defense and to manage the wastes generated during plutonium production. The BPA substations described in this report are either located within or supplied operational power to the Hanford facility. Operations information is presented below:

Operator address:	Bonneville Power Administration Snake River Area Office 101 West Poplar Walla Walla, Washington 99362
Telephone:	509/522-6264
Contact:	Mark Hermeston
EPA identification nos:	WA6891406344 (Midway) WA2891420042 (Ashe) WAD7890008967 (Department of Energy)
Type of operation:	Power supply and generator storage area

4.1 FACILITY OPERATIONS

The substations described in this report are part of the BPA main transmission grid, which conducts electrical power from Columbia and Snake river dams to five states (Washington, Oregon, Idaho, western Montana, and northern California). The BPA transmission grid is divided into four subareas. The substations in this report are within the Snake River subarea.

The substations use petroleum oil, primarily mineral oil, as insulation in electrical equipment. This includes transformers, coupling and potential devices, capacitors, circuit breakers, reclosers, voltage regulators, switches, and cable. Insulating oil is a highly refined, 10-weight petroleum oil with approximately 0.1 percent 2,6-di-tertbutyl-paracresol (an antioxidant known as BHT that is also used as a food additive [HSDB 1992]) and varying amounts of polychlorinated biphenyls (PCBs) to increase dielectric strength (BPA 1990). All of the substations have aboveground tanks of mineral oil, which is used as make-up oil for equipment maintenance or cleaning. Chlorinated solvents are used at all the substations for cleaning and maintenance of electrical equipment.

During the VSI, a BPA maintenance crew was observed working at the Benton Switch substation. Once maintenance was completed, rags soaked in solvent and all personal protective clothing were placed in drums for transport to the generator storage area at the Ashe substation.

All equipment filled with mineral oil is regularly analyzed for PCB concentration. PCBs are regulated under the federal Toxic Substances Control Act (TSCA); however, since PCBs are a hazardous constituent under RCRA (40 Code of Federal Regulations [CFR] 264, Appendix VIII), their potential release to the environment is evaluated during an RFA.

All untested and unmarked equipment is assumed to be PCB-contaminated, as defined in 40 CFR 761.3 (contains at least 50 parts per million [ppm] PCB but less than 500 ppm PCB), if the manufacturer's manuals or nameplates indicate it is filled with mineral oil. Electrical equipment fluid is assumed to be "PCB" (as defined in 40 CFR 761.3) if the manufacturer's manuals or nameplates do not identify the type of dielectric fluid in the equipment, or if the equipment is known to be "PCB" according to available information (BPA 1991a).

4.2 REGULATORY STATUS

In 1984 BPA notified EPA of hazardous waste activity at the Midway substation. The notification was for a generator storage area. A Notification of Dangerous Waste Activities (known as Form 2) was prepared for the H. J. Ashe substation and maintenance headquarters on August 1, 1986. The form notified EPA and Ecology that the H. J. Ashe Substation was a hazardous and dangerous waste generator. The mailing address is the BPA Snake River office; however, the substation is located 0.5 mile north of the Washington Public Power Supply System Nuclear Plant 2 in Richland, Washington.

The *1990 Generator Annual Dangerous Waste Report* for the Ashe substation (BPA 1991b) indicates that all hazardous wastes generated were transported to the BPA Ross complex in Vancouver, Washington, by BPA's Transportation Department. BPA operates the Pasco transmission line maintenance headquarters, located approximately 4 miles east of the Hanford facility, under EPA identification number WA7891490008.

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5.0 PROCESSES AND SOLID WASTE MANAGEMENT UNITS

This section describes the processes used and waste management practices in place at the BPA substations. Detailed process and waste management information was obtained for the Midway substation and community, though BPA provided little process and waste management information for the other five substations. The discussion of SWMUs is organized by substation. Site plans for each substation were provided by BPA and are presented in Appendix B of this report. However, the site plan received from BPA for the Benton Switch substation was not suitable for reproduction.

5.1 MIDWAY SUBSTATION AND COMMUNITY

The Midway substation and community consists of approximately 64 contiguous acres located about 35 miles northwest of Richland, Washington, in Benton County (Figure 1 and Appendix B). BPA (1990) gives the site address as follows:

Midway Substation and Community
Vernita Star Road, Box 47
Sunnyside, Washington 98944

The EPA identification number is WA6891406344.

The Midway facility is divided into three areas: a 22-acre substation site, a 24-acre community area, and an 18-acre transmission power line right-of-way. The substation contains the switchyard, an untanking tower and oil transfer system, a control house, and miscellaneous auxiliary facilities. The community area consists of approximately 25 buildings, including residences, dormitories, a fire house, and a post office. The houses and dormitory vacated in 1987, are being sold by the federal government to the highest bidder and will be removed from the site (DOE 1991).

The Midway facility is used as a point of distribution of electrical power to local customers and a sectionalizing point for power generated by the Bonneville and Grand Coulee dams. The facility used as a headquarters for electrical maintenance activities within the Midway district until 1986. Much of the hazardous waste associated with the facility was generated during maintenance activities. In-service electrical equipment in the switchyards includes circuit breakers and transformers.

BPA notified EPA under Section 103 of the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) and Sections 3010 and 3016 of RCRA that the

Midway substation and community handled hazardous waste. The Midway facility was listed on the *Federal Agency Hazardous Waste Compliance Docket* (53 FR 46364) as a facility required at minimum to submit a preliminary assessment pursuant to Section 120(d) of CERCLA (BPA 1990). BPA conducted a preliminary assessment of the Midway facility in accordance with CERCLA in 1990. EPA evaluated the preliminary assessment and concluded that the Midway substation did not score high enough on the hazard ranking system to be proposed for inclusion on the national priorities list. No further action was recommended on EPA's part in the Federal Agency Hazardous Waste Compliance Docket tracking system (EPA 1990). However, the Midway facility remained on the Washington state list of sites requiring further investigation (BPA 1991c). BPA has performed a site inspection with oversight by Ecology and a draft report was published in November 1991 (BPA 1991d). Possible remedial actions are currently being considered.

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Water at the Midway substation is obtained from two wells, Well 1 and Well 2, which were drilled in 1949 and 1951, respectively. Two additional water wells were abandoned in 1985 and closed in accordance with EPA regulations (BPA 1990). Both are 185 feet deep and used for drinking water, irrigation, and fire control. These wells are completed in the unconfined aquifer (BPA 1991c). The bottom of the unsaturated zone at Midway (located above the unconfined aquifer) is approximately 68 feet below ground surface according to well logs. Movement of water in the unsaturated zone is vertical, averaging approximately 2.7 inches per year according to data on the Hanford site (BPA 1990). Groundwater movement in the unconfined aquifer beneath Midway is horizontal with the gradient toward the Columbia River.

In 1981, as a matter of internal practice, BPA added chlorination to the water system. BPA documents indicate that two to six part-time employees are served by these wells (BPA 1990). In accordance with the state of Washington Safe Drinking Water Act, the water from Wells 1 and 2 is tested quarterly for bacteria, every 3 years for nitrate and inorganic chemicals, and every four years for radionuclides. The water has also been tested for PCBs and oil and grease. In 1988 BPA tested Wells 1 and 2 for primary and secondary drinking water contaminants. The test was repeated in January 1990. All test results to date indicate that water from these wells is within state and federal water quality standards, except for mercury. In January 1990, the mercury concentrations equalled the maximum contaminant level (MCL) of 0.002 mg/L. A retest in April 1990 showed mercury concentration to be one-tenth the MCL.

5.1.1 Operation and Hazardous Waste Management

This section describes the history and operational practices, waste management practices, and SWMUs identified at the Midway facility.

5.1.1.1 **History and Operations.** Before its acquisition by BPA in early 1940, the Midway substation and community area was used primarily for grazing with adjacent and nearby lands developed for apple and soft fruit production. By 1941 Midway was staffed 24 hours a day by seven operators. Construction of permanent government housing began in December 1941 on a contiguous 24-acre parcel east of the substation. The houses were fully occupied by July 1942. In 1943 the Midway facility was incorporated into the Hanford facility security zone, and a dormitory was added to house temporary employees and to provide food services. By 1944 the Midway facility was a major power supplier for nuclear materials production (BPA 1990).

In 1948 an annex was added to the dormitory to accommodate additional temporary employees. The south end of the main dormitory was cordoned off and became a schoolroom for children ages 1 through 6. As the Cold War intensified, activity increased at both the Hanford and Midway facilities. Six more permanent houses were added in 1949 to accommodate increased staff. In 1950 two more permanent houses were added; one was added in 1968. By the late 1970s there were no longer enough employees at Midway to fill all the houses. These houses were made available to Hanford employees. As more houses were vacated, they were made available to the general public rather than being left vacant. Between 1986 and 1987 BPA shifted its maintenance and operational activities to the Ashe Substation, and the Midway facility was automated. The community was vacated at that time (BPA 1990).

Most electrical equipment used at the substation is filled with mineral oil. Equipment not filled with oil is insulated by air, plastic, or porcelain. From the early 1940s until 1989 the oil room within the untanking tower building supplied oil to the switchyard equipment from six 10,000-gallon aboveground storage tanks. The oil was moved from the oil room to the switchyard through an underground network of steel pipe with welded joints (Hermeston 1992a). The underground piping system was installed in the early 1940s and was removed from service and sealed off in 1989. The piping system was removed in 1991 and appeared to be in good condition. BPA maintained accurate records of incoming and outgoing oil from the oil room through the piping system. Nothing in this record indicates that oil was lost from the piping system (BPA 1991b). The network also fed mineral oil back to the oil room filter press that was previously used in circuit breakers and transformers. Water and carbon were cleaned from the oil in the filter press. This cleaning increases the dielectric strength of the oil. The carbon in the oil is produced within the electrical components from arcing of electrical charges (Hermeston 1992a), water can condense into the oil when exposed to air. Currently, all mineral oil at this and all other substations is filtered using portable equipment. The oil room floor drain empties into nearby Dry Well Number 2 (Appendix A, Figure 1). The multi-story untanking tower is also used for transformer repairs.

5.1.1.2 **Waste Management.** Waste to be managed at the Midway facility can be divided into two categories: (1) waste associated with substation operation and maintenance and (2) waste generated by the community.

The maintenance and operational practices generated a diverse array of hazardous wastes. Chlorinated and nonchlorinated solvents were used to clean electrical equipment. Wastes included failed electrical parts (including PCB-containing items), waste compressor oils, other insulating compounds, solvent- and oil-soaked rags, spent titrating solutions, battery acid, chlorinated and nonchlorinated solvent-contaminated oils and rinse water, and mercury in switches and thermometers. It is suspected that the majority of these wastes were disposed of between 1941 and 1972 at the M-1 and M-2 landfills located along the southwest portion of the property. Between 1972 and 1984, waste generated at the Midway Substation was shipped to BPA's Ross Complex located in Vancouver, Washington. These wastes were disposed in a sanitary landfill operated by Clark county (BPA 1990). A third landfill, M-3, located directly south of the substation in a borrow area, has been used since 1980 to dispose of tree limbs, grass clippings, and other yard wastes. It is still in use today for yard waste only. No hazardous waste, hazardous constituents, or domestic garbage are suspected to be in this landfill (BPA 1990).

BPA used photographic fluids such as developers, fixers, stop baths, and clearing agents. Of primary concern are photographic fixer products that show an average level of 300 mg/L silver. According to BPA (1990), these wastes are suspected of being disposed of through the darkroom sink in the control house. The sink discharges into Dry Well Number 1. From the early 1940s to the early 1980s, approximately 5 gallons per year were disposed of down this drain. In the early 1980s BPA developed a manifest system for photographic fluids for silver recovery and disposal (BPA 1990).

Herbicides were used extensively at the Midway facility to control vegetation in the switchyard areas, and included Krovar (Bromacil and Diuron), Pramitol (Simazine), Princep, Rack (Atrazine), Spike (Tebuthiuron), and Telvar (Monuron). It is suspected that empty herbicide containers and miscellaneous contaminated materials were disposed of at the landfills (BPA 1990). A Quonset hut located in the southeast corner of the switchyard is currently used to store herbicides, tools, and lawn equipment. In the past it was used to store electrical equipment and grounds maintenance equipment (BPA 1991d).

Between 1954 and 1980, BPA has records of installing six underground storage tanks (USTs) in the community area for storage of diesel fuel and leaded and unleaded gasoline for use by Midway residents. One of the these tanks was filled with sand and abandoned in place in 1980;

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five tanks (including the sand-filled one) were removed in 1987 (BPA 1991e). The tanks were removed in accordance with the then-proposed EPA regulations for underground storage tanks. Soil testing related to the removal of these tanks did not indicate any contamination; the excavations were backfilled with native materials (BPA 1991d). The sixth tank is located in the substation switchyard and is still used to supply diesel fuel for the emergency power generator. This tank's integrity was tested in 1991; no leaks were found (BPA 1991c). According to BPA, none of these tanks was known to contain hazardous waste or hazardous constituents based on BPA (1991b,e).

During a site inspection in 1991, four previously unknown USTs were discovered and were designated USTs 1, 2, 3, and 4 (BPA 1991d). Three located in the residential community were used for storage of motor fuels for personal use. The fourth tank was located near the northwest corner of the untanking tower and was used for disposal of waste oils (UST 1). All four of these tanks were removed in 1991. No visible signs of petroleum releases from USTs 2, 3, or 4 were found. UST 1 had a hole approximately 18 inches below the top of the tank (BPA 1991e). Since this tank contained waste oil and solvents, it is further discussed in Section 5.1.1.3 as a SWMU.

Several dry wells are located at the substation. BPA (1990) identifies Dry Well Numbers 1, 2, and 3 as potential secondary contaminant sources because of known waste disposal practices and the possibility of these wells receiving wastes from nearby spills. The current policy is to allow only water (primarily runoff, roof drainage, and water from basement sumps) to enter these wells. This is an interim measure until a final decision is made on the disposition of the sumps (Hermeston 1992b).

An herbicide storage area is located in the southeast corner of the Midway facility. Because herbicides have been and currently are stored, transferred, and possibly mixed in the yard, spills may have occurred. The herbicides Diuron and 2,4-D were detected in surface soil samples collected during the site inspection. Maximum concentrations were 0.19 mg/kg for diuron and 0.24 mg/kg for 2,4-D. These concentrations are within the range of standard application (BPA 1991d).

Residents of the Midway community used typical household products containing hazardous constituents. These included acid-based drain cleaners, lead-containing paints, moth proofing, photographic fluids, herbicides, car batteries, and waste motor oil (BPA 1990). Between 1942 and 1970 domestic garbage was disposed of on site at either landfill M-1 or M-2. Before 1970, residents were required to separate combustible from noncombustible garbage. The combustible garbage was burned in an incinerator located just south of the community area (BPA 1990). No specific information was found on the type of incinerator used or on the disposal of the

incinerator ash. However, BPA believes that the ash was disposed of in maintenance landfills M-1 and M-2 (Hermeston 1992a).

Beginning in 1970 BPA operated a landfill east of the community. This landfill (referred to as the community landfill, SWMU 6) is located outside of the Midway property boundary on land that is owned and administered by the DOE, Richland operations (RL). The landfill was operated by BPA under a use permit from DOE-RL (BPA, 1990).

5.1.2 Solid Waste Management Units and Area of Concern

Ten SWMUs and one area of concern (AOC) were identified at the Midway substation and community, based on the information in BPA documents (1990; 1991c,d,e) from Ecology (Stasch 1991), and on the VSI.

SWMU Number 1 - Generator Storage Area

The former hazardous waste generator storage area at Midway is shown in Appendix C, photograph 5. It consists of a 200-square-foot, covered wood frame, open-sided building. The generator storage area has a concrete floor with secondary containment curbing and is enclosed by a chain link fence. It was used from 1984 to 1986. All wastes were transported to and disposed of at the BPA Ross complex treatment, storage, and disposal facility located in Vancouver, Washington. No stains or cracks in the concrete, or other evidence of release from this unit was noted during the VSI.

RCRA waste handled at the storage area totaled 189 gallons of solvent-contaminated waste. Non-RCRA waste included 165 pounds of PCB solids, 10 gallons of PCB-contaminated waste liquid, 790 gallons of insulating oil (less than 50 ppm PCB), 57 gallons of motor or compressor oil, and 100 pounds of BHT (Shell Ional antioxidizer) (BPA 1990).

SWMU Number 2 - Community Incinerator Pad

A 2-foot by 12-foot concrete pad is located in the southeast corner of the facility. This pad supported a trash incinerator that was used to burn combustible refuse from the community. The type of incinerator could not be determined from file information. The incinerator operated from the early 1940s until 1970 when it was removed (Hermeston 1992b). At that time BPA began operating the community landfill located just east of the community. No records of

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disposal practices were found for the incinerator ash. BPA believes that the ash was disposed of in one of the maintenance landfills, M-1 or M-2 (Hermeston 1992a).

SWMUs Number 3 and 4 - M-1 and M-2 Landfills

The M-1 and M-2 maintenance landfills were used by BPA to dispose of unknown amounts of electrical maintenance waste. The M-1 landfill consists of four trenches between 50 and 90 feet long by approximately 20 to 30 feet wide. Waste is buried 10 to 12 feet deep. M-2 is irregularly shaped with a surface area of approximately 5,000 square feet. There is no liner, leachate collection system, or cap on either landfill. Both landfills began accepting waste in 1943 and have been inactive since the early 1970s (BPA 1990). Currently both are surrounded by a chainlink fence to restrict access.

Materials deposited in the landfills include electrical waste, capacitors, concrete footings, solvents, insulating oil, and rags, as well as combustible and noncombustible domestic and nonhazardous waste. BPA records indicate that these materials may have contained the following hazardous constituents (BPA 1990):

- PCBs
- Trichlorobenzene
- Dichlorobenzene
- 1,1,1-Trichloroethane
- Trichloroethene
- Carbon tetrachloride
- Nonchlorinated solvents
- Herbicides

According to BPA, hazardous wastes or constituents placed in the landfills appear to be primarily PCBs and chlorinated solvents (BPA 1990). The landfills also accepted nonchlorinated solvents. These wastes, which resulted from substation activities and operations, include capacitors, concrete footings, and spill materials. Specifically, it is suspected that General Electric Pyranol capacitors are buried in the landfills. Pyranol contains high amounts of PCBs (up to 75 percent) and may also be mixed with a form of chlorobenzene (probably 1,2-dichlorobenzene or 1,2,4-trichlorobenzene). The chlorinated solvents (trichloroethane, trichloroethylene, and carbon tetrachloride) were used for cleaning electrical equipment and degreasing parts. BPA estimates that less than 500 pounds of solids and 150 gallons of contaminated insulating oil were generated and disposed of in the landfill annually, as well as miscellaneous contaminated rags, oil, and surface rocks or soil. Stoddard solvent (Chevron 325), which is not a RCRA listed waste, was the primary nonchlorinated solvent used by BPA, and wastes such as spent liquids and soaked rags were likely to have been disposed of in the landfills (BPA 1990).

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Petroleum oil, primarily mineral oil, was used by BPA in electrical equipment as insulation. According to BPA documentation (1991c), waste, such as oil-soaked rags and dirt, and water-contaminated oil, may have been disposed of in the landfills. Motor and compressor petroleum oils were also disposed of in the landfills. Combustible materials, both solid and liquid, were commonly burned in the landfill trenches prior to backfilling (BPA 1990, Hermeston 1992a).

It is suspected that an unknown amount of drained and undrained battery carcasses for emergency lighting, as well as car and truck batteries, were also disposed of in the landfills.

Because of the age of these units, it is unlikely that any waste management techniques or controls were used in conjunction with disposal. There is no evidence that release controls commonly available today, such as liners and leachate collection systems, were used at the landfills. Therefore, it can be assumed that no release controls are in place with the exception of the backfilled materials placed over the landfill surfaces.

The draft site inspection report (BPA 1991d) recommends excavating and disposing of soil contaminated with dioxins and furans (most likely from the burning of PCB-containing equipment) and PCBs from the M-1 landfill. Results from soil sampling show dioxin and furan levels as high as 65.3 nanograms per kilogram (ng/kg) and the PCB isomer Arochlor 1254 as high as 360 milligrams per kilogram (mg/kg) (Appendix C, photographs 1 and 2). The report also states that PCBs, dioxins, and furans do not move easily through the fine-grained soils located on site. The lack of appreciable amounts of total petroleum hydrocarbons (TPH) and volatile organic compounds coupled with the annual rainfall of 7 inches, make the potential for migration of theses contaminants from the landfills slight according to BPA information (1991d).

Soil samples from the M-2 landfill that were analyzed for volatiles, semivolatiles, metals, PCBs, and herbicides, showed detectable concentrations of 1,1,1-trichloroethane (TCA) (up to 1.6 μg/kg), trichloroethene (up to 1.2 μg/kg), and lead (up to 5.8 mg/kg). All concentrations were below state-mandated cleanup levels (BPA 1991d).

SWMU Number 5 - Landfill M-3

Landfill M-3 is located directly south of the substation in a borrow pit area. It is 300 feet long by 25 feet wide and approximately 4 feet deep. There is no liner, leachate collection system, or cap at this landfill. The waste is covered by native gravel. The landfill has been used since 1980 for disposal of tree limbs, grass clippings, and other yard wastes. No hazardous constituents or

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domestic garbage are believe to be deposited in this landfill (BPA 1990). No, evidence of release of hazardous materials to the environment has been documented.

SWMU Number 6 - Community Landfill

The community landfill consists of two cells: one 200 feet by 150 feet, the other 170 feet by 150 feet. According to BPA (1990) the landfill was used only for domestic garbage disposal. The community landfill began accepting waste in 1970 and was closed and inspected by Ecology in 1980. The state recorded that the landfill had been closed in accordance with existing regulations. Wastes were deposited in the landfill by community residents on the weekends and covered with soil Mondays (BPA 1990). BPA believes that there is no evidence of a release of hazardous material from this landfill (BPA 1990). However, this landfill likely received some household hazardous waste such as batteries and paints. This is likely since this landfill began accepting waste after the community incinerator that accepted combustible waste was closed. The landfill is located outside the Midway property boundary on land owned by DOE-RL.

SWMU Number 7 - Dry Well Number 1

Dry Well Number 1, built in 1941, is located northeast of the control house. It is circular and about 6.5 feet in diameter. The bottom 5 feet of the 19-foot deep well is lined with common brick; one 6-inch clay inlet pipe enters at 5 feet below grade. The well received all wastewater generated at the control house with the exception of sewage. Potential hazardous materials include battery acid and lead from the battery room sink, and photographic fluids that contained silver and small amounts of cadmium and chromium from the developing room sink (BPA 1991b).

During the site inspection, subsurface soil samples were collected from the dry well to assess potential contamination from battery acid, lead, and photographic fluids. The results indicated detectable concentrations of lead, chromium, and silver. Silver was detected at 11 mg/kg and lead at 8.8 mg/kg, which exceeded background concentration for both metals (BPA 1991d).

SWMU Number 8 - Dry Well Number 2

Dry Well Number 2 is located northwest of the untanking tower and accepts all wastewater generated inside and outside the tower. The top of the 6-foot-diameter bricked perimeter dry well is about 10 feet below grade, with two 6-inch clay pipes entering at 11 feet below grade. The total depth is 15 feet. Potential contaminants are insulating oil with PCB concentrations less

than 500 ppm, and chlorinated and nonchlorinated solvents. Sources of these materials are the floor drains in the assembling and oil rooms (BPA 1991c).

During the site inspection, subsurface soil samples were collected from the dry well to asse s potential contamination. The samples contained TPH at 50 mg/kg and chloromethane at µg/kg (BPA 1991d).

SWMU Number 9 - Dry Well Number 3

Dry Well Number 3 is located west of the oil storage tanks and south of the untanking tower. The well is 4 feet in diameter, 3 feet tall, and was constructed in 1941 of gravel covered with earth. One 4-inch-diameter steel inlet drains into this well. Two drains in the bottom of the oil storage tank pad are connected to this dry well. The potential contaminant is insulating oil with PCB concentrations of less than 500 ppm.

During the site inspection, subsurface soil samples were collected from the dry well to assess potential contamination. The results indicated TPH levels ranging from 1,800 to 5,800 mg/kg. The TPH levels exceed the Washington state cleanup level established under the Model Toxics Control Act of 200 mg/kg for industrial sites. Dry Well Number 3 could represent a potential conduit for contamination to migrate to and affect groundwater (BPA 1991d).

SWMU Number 10 - Underground Storage Tank Number 1

UST 1 was used for disposal of wastes generated in the untanking tower and the station switchyard. This UST was probably installed during construction of the Midway facility in the 1940s. No underground piping was found connected to this tank (BPA 1991e). Laboratory analysis of the tank contents showed waste oil components and high concentrations of 1,1,1-TCA (640,000 mg/L), indicating that this tank was also used for waste solvent disposal (BPA 1991e). Soil samples collected from the UST 1 excavation showed TPH concentrations of up to 52,000 mg/kg and lead of up to 1,000 mg/kg. Visibly contaminated soils around the tank were also removed and drummed during the site inspection for proper disposal (Appendix C, photographs 3 and 4).

AOC Number 1 - Midway Switchyard

The switchyard was constructed by cut-and-fill methods using native rock and soil obtained from south of the switchyard for fill. The surface was compacted to 95 percent and consists of a native material base followed by 6 to 12 inches of silty sand, topped with 3 inches of 1.5 to 0.75

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inch crushed basalt (BPA 1991c). (All BPA switchyards mentioned in this report are constructed similarly). The switchyard contains the main electrical equipment at the substation. A number of spills have been documented by BPA at the switchyard; the largest one was 515 gallons (BPA 1991b). These spills do not meet the "routine and systematic" criteria included in the definition of a SWMU since they resulted from passive equipment failure and not maintenance activities. For passive spills, the past practice was to remove or repair the damaged equipment and clean up all visible residue (BPA 1991c). However, it is suspected that some contaminants leaked to the ground or were washed into the ground with solvents and water used for cleanup.

Sampling results from the site inspection indicate concentrations of PCBs as high as 73 mg/kg in soil collected from and immediately adjacent to the capacitor house. TPH concentrations in the switchyard were found as high as 60,000 mg/kg. The concentration of the herbicide Diuron in one soil sample was 12 mg/kg. Concrete expansion joints in the switchyard showed PCB concentrations as high as 14,500 mg/kg (BPA 1991d). BPA is currently evaluating remedial options for this area.

5.2 HANFORD SUBSTATION

The Hanford substation is located in Section 28, Township 14 North, Range 26 East West Meridian, Benton County. The substation is approximately 1,000 feet south of the Columbia River, at the northern edge of the Hanford facility. The Hanford substation is currently active; operations began on July 12, 1971. The substation consists of a control house, maintenance building, microwave tower, and switchyard.

5.2.1 Operation and Hazardous Waste Management

Mineral oil containing PCB and solvents used during routine equipment maintenance are the only hazardous constituents found at the Hanford substation.

An internal BPA memorandum (1981) identified a construction dump at the Hanford substation as part of an inventory for "Superfund notification." The memorandum states that this dump most likely was used for construction debris; no known hazardous waste was placed in the dump. Since information on this disposal area at the Hanford substation was obtained after the VSI, the area was not inspected during the VSI. No other information was provided by BPA.

One documented release of oil from a piece of equipment (4001 MOD - BPA identification number) occurred on June 6, 1989. A hydraulic leak from a fitting on B-phase circuit breaker

was repaired on July 16, 1990. Soil sampled near the leak at various times showed PCB concentrations ranging from nondetected to 7 mg/kg (BPA 1991b).

In addition, asbestos has been identified in pipe elbow insulation samples taken from the basement of the mechanical room.

5.2.2 Solid Waste Management Units and Areas of Concern

One SWMU was identified at the Hanford substation. No AOC's were identified.

SWMU Number 11 - Construction Dump

The former construction dump at the Hanford substation is SWMU number 11. No other information was found on this disposal area to allow an evaluation of the potential for release of hazardous waste or hazardous constituents.

5.3 H.J. ASHE SUBSTATION AND MAINTENANCE HEADQUARTERS

The H.J. Ashe substation is located within the southern one-half of Section 32, Township 12 North, Range 28 East West Meridian, Benton County. The Ashe substation is northwest of and adjacent to the Washington Public Power Supply System property, approximately 0.5 mile north of nuclear power plant number 2, off of Route 4 south. The Ashe facility consists of two large structures, a control house and a maintenance building, and yard areas with smaller buildings used for dry chemical storage. The substation and maintenance facilities encompass approximately 30 acres and are 2.75 miles west of the Columbia River.

The substation was first energized on December 3, 1976. The following structures and equipment are present:

- Oil-filled circuit breaker (7,600 gallons)
- Two underground gasoline tanks (4,000 gallons each)
- Four mineral oil storage tanks (5,000 gallons)
- Hazardous waste, flammable materials, and herbicide storage building (1,000 lb maximum)
- Oil and water separator connected to gas pump island and garage drains

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5.3.1 Operation and Hazardous Waste Management

The generator storage area within the hazardous waste, flammable materials, and herbicide storage building contains a sump to catch any spill or other releases (Appendix C, photograph 8). Annual hazardous waste reports indicate that the following wastes are generated at the Ashe substation:

- 1,1,1-Trichloroethane mixture
- 1,1,1-Trichloroethane-contaminated soils
- Acetone waste mixture
- Spent photographic fluids, fixer, and developer
- Battery acid and fluid mixture
- Ferric chloride etching solution waste
- Methanol waste mixture (Karl Fisher reagent)
- Pentachlorophenol and sodium pentachlorophenol
- Solvent compound-thinner waste
- Toluene-isopropanol with potassium hydroxide (titrating solution)

Ashe substation personnel have completed and submitted the underground storage tank self-certification of compliance form required by Ecology, for the two underground gasoline storage tanks. These tanks were installed in April 1989 and replace two tanks that were removed on January 30, 1989. No leaks, hydrocarbon deposits, or odors were observed at the time of tank excavation (BPA 1991e).

The following releases were identified in the switchyard (BPA 1991b):

Location	Date Reported	Release
Reactor #1 C-phase	9/13/90	Insulating oil leak
CT4885 B-phase	9/13/90	Insulating oil leak
Reactor #1 I-428	10/2/90	Insulating oil leak
PCB 0-1026	4/26/91	Insulating oil leak
Reactor #2 I-429	11/20/90 and 2/20/91	Insulating oil leak

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During an environmental appraisal conducted at the Ashe substation, BPA (1991a) noted several compliance-related issues. For example, one drum had been in the generator storage facility longer than 90 days.

Drainage from an oil/water separator located adjacent to the fuel island, and from the runoff intercepted by two catch basins located south of the maintenance headquarters building, flow into a dry well located approximately 250 feet south of the maintenance headquarters building. The oil water separator was installed in 1988, has a 120 gallon capacity, and is constructed of precast concrete. The separator is designed to remove petroleum, oil, and lubricants from incoming water. Currently, this oil/water separator is connected to eight floor drains in the maintenance headquarters building shop and equipment storage area. The environmental appraisal conducted by BPA also noted that no maintenance schedule was in place for this unit (BPA 1991a). In the event of a spill of hazardous waste or hazardous constituents in the parking lot or a spill that exceeds the capacity or the design of the oil/water separator contaminants could be released to the soil column. However, no documented spills have occurred. Two other dry wells receive runoff from the paved (blacktop) areas of the Ashe substation. The environmental appraisal recommended that as a best management practice, a revision to the current spill prevention and countermeasures plan be implemented to prevent the infiltration of contaminants to these dry wells (BPA, 1991a).

The Ashe substation has two grounding wells that are approximately 360 feet deep, consisting of a copper wire conductor weighted at the bottom with lead. These wells are backfilled with sand and gravel tailings (both in the well and around the annulus) instead of with a bentonite grout mixture that would limit surface infiltration. The sand and gravel backfill could potentially provide a pathway for contaminants to reach the groundwater (BPA 1991a). The dry wells at the substation could also act as a contaminant transport pathway if a spill occurred. However, no documented spills have occurred in the grounding wells. The environmental appraisal also recommended a revision to the current spill prevention and countermeasures plan be implemented to prevent the infiltration of contaminants to the grounding wells (BPA, 1991a).

5.3.2 Solid Waste Management Units and Areas of Concern

Two SWMUs were identified at the Ashe substation. No AOCs were identified.

SWMU Number 12 - Ashe Generator Storage Area

The generator storage area is SWMU number 12 (Appendix C, photographs 7 and 8). It is a part of the Flammable, Herbicide,and Toxic Waste Storage building located southwest of the

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maintenance headquarters building. The generator storage area is approximately 20 feet wide by 15 feet deep with a containment sump with no outlet located under a graded portion of the floor. During the VSI the unit was clean and well maintained. No evidence of a release to the environment of hazardous waste or hazardous constituents was found.

SWMU Number 13 - Dry Well Connected to Oil/Water Separator

This dry well is precast concrete with a bottom elevation approximately 15 feet below ground surface. The oil/water separator located upgradient of this dry well has not been cleaned out since its installation in 1988 (BPA 1991a). Therefore, it is likely that both oil phase and water phase effluent has been discharged to this dry well.

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5.4 BENTON SWITCH SUBSTATION

The Benton Switch substation is located in the northwest quarter of Section 11, Township 11 North, Range 28 East West Meridian, Benton County. The substation is currently active and began operations on November 18, 1948. During the VSI, the substation was clean, orderly and well maintained.

5.4.1 Operation and Hazardous Waste Management

Mineral oil containing PCBs and solvents used during routine equipment maintenance are the only hazardous constituents at this substation (Appendix C, photograph 9).

The following releases to the switchyard have been identified (BPA 1991b):

Location	Date Reported	Release
Power circuit breaker 0-514	11/13/90	Insulating oil leak
Transformer T-1587	11/13/90	Insulating oil leak
C-phase bushing Power circuit breaker B 0-587	2/20/91	Insulating oil leak
Power circuit breaker CB 0-1958	3/21/91	Insulating oil leak

Soils were sampled for PCB in March 1985. The results from 11 of the 12 samples indicate no PCBs at or above the detection limit of 0.1 ppm. One sample collected next to the oil leak showed 0.12 ppm of PCB (Arochlors 1254 and 1260). A transformer gauge was found to be leaking during the VSI (Appendix C, photograph 10).

5.4.2 Solid Waste Management Units and Areas of Concern

The switchyard has had past mineral oil spills and detections of PCBs in the soil. However, the low concentrations of PCBs in the soil do not warrant further investigation. Therefore, no SWMUs or AOCs were identified at the Benton Switch substation.

5.5 DOE 351 SUBSTATION

The DOE 351 substation is located within the 300 Area of the Hanford facility. It was operated by BPA from March 30, 1973 until February 11, 1991, when all BPA equipment was removed. The remaining equipment at the substation is currently being operated by DOE-Richland operations (DOE-RL).

5.5.1 Operation and Hazardous Waste Management

Mineral oil containing PCBs, and solvents used during routine equipment maintenance are the only hazardous constituents used by BPA at this substation. No spills to the soil have been documented by BPA. However, during a routine TSCA inspection in 1987, 19 soil samples were collected and analyzed for PCB content. Four of the samples contained PCBs in the range of 1 to 3 mg/kg (BPA 1989). This evidence suggests the potential for spillage of PCB-contaminated oil.

According to BPA documentation (1991b), four capacitors (capacitors 3 and 31 north phase and capacitors 17 and 18 middle phase) were de-energized and removed in August 1989 because of insulating oil leaks. There is no evidence, however, that fluid leaked onto the ground from any of the removed capacitors. All soil samples collected at that time showed PCB concentrations of less than 2 mg/kg.

On October 17, 1990, removal of all BPA equipment associated with the 24.3 MVAR Shunt Capacitor Group No. 1 began. On October 18, 1990 the removal crew discovered radioactive yellow cake uranium clinging to the below ground portions of the footings (BPA 1991b) (Appendix A, photographs 11 -13). The uranium is most likely associated with DOE-RL's fuel fabrication activities in the 300 area and not with any BPA-related activities. Work was suspended until the area could be evaluated; removal of the items (except the uranium-contaminated footings) was completed on February 11, 1991. All capacitors were labeled with PCB stickers, and the four capacitors suspected of leaking were placed in drums. They were all transported to the BPA Ross complex in Vancouver, Washington.

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The most recent soil sampling, conducted in October 1990, indicated that 14 samples contained no PCBs; one contained 2 ppm and another contained 62 ppm PCBs (BPA 1991b).

Information from DOE-RL pertaining to the disposition of the uranium contamination has been requested. This information has not been received.

5.5.2 Solid Waste Management Units and Areas of Concern

No SWMUs were identified at the DOE 351 substation. Yellow cake uranium is not a hazardous waste or a hazardous constituent under RCRA. The switchyard is designated as AOC number 2 because of the yellow cake uranium contamination.

AOC Number 2 - DOE 351 Switchyard

The switchyard at the Hanford substation has been contaminated with yellow cake uranium. The uranium contamination should be investigated and remediated. If this site is not included in the tri-party agreement, it should be added.

5.6 WHITE BLUFFS SUBSTATION

The White Bluffs substation is located in the southwest quarter of Section 7, Township 10 North, Range 28 East, Benton County. The substation is located off Horn Rapids Road. It is currently active, with operations beginning on September 13, 1976 (Appendix C, photos 14 and 15).

5.6.1 Operation and Hazardous Waste Management

Mineral oil containing PCBs and any solvents used during routine equipment maintenance are the only hazardous constituents found at the White Bluffs substation.

One release, from storage tank No. 2, has been documented by BPA (1991b). On July 30, 1990, PCB-contaminated oil (51 ppm) was removed from the tank. Two drums of oil-soaked earth were removed from under the tank access valve. Eighteen soil samples were collected after cleanup; the soil samples contained less than 1 ppm PCBs.

5.6.2 Solid Waste Management Units and Areas of Concern

The switchyard has had past mineral oil spills and detections of PCBs in the soil. However, the low concentrations of PCBs in the soils do not warrant further investigation. Therefore, no

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SWMUs or AOCs were identified at the White Bluffs substation.

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6.0 SUMMARY AND RECOMMENDATIONS

This RFA report presents information on the potential for release of hazardous waste and hazardous constituents from six substations operated by BPA. Table 1 summarizes the unit characteristics, the release potential and recommendations for the SWMUs and AOCs at the BPA substations.

An RFI is recommended for seven of the 10 SWMUs and the AOC at the Midway substation (Table 1). This is based upon known soil contamination. Currently, the substation and the maintenance landfills are surrounded by chain link fences that restrict access and, therefore limit potential exposures to surface contamination. No monitoring wells exist at this substation to assess the potential impact on groundwater quality in the unsaturated zone. Based on data from on-site water supply wells, groundwater in the unsaturated zone is located approximately 68 feet below ground surface (BPA 1990). The low annual rainfall (7 inches) coupled with the high annual pan evaporation rate (50 to 60 inches) (BPA 1990), provide little or no driving force for transport of contaminants in the soil to the unsaturated zone. Combustible liquids disposed of in maintenance landfills M-1 and M-2 were routinely burned, thus reducing their potential for directly affecting groundwater. However, the dry wells provide a potential conduit to groundwater. Therefore, the groundwater should be investigated. The extent of soil contamination at Midway also should be determined.

The community landfill lies outside of the Midway property boundary. Nonetheless, this landfill received domestic garbage for a period of approximately 10 years and may contain metals from batteries or organics from paints. A soil gas survey is recommended to detect organic compounds that may migrate from the landfill.

An RFI is recommended for the dry well connected to the oil/water separator at the Ashe substation. The oil/water separator has not been maintained since it was installed in 1980. The dry well also receives runoff from catch basins that drain a large paved area. Any spills that may occur would flow into the dry well. Two grounding wells have the potential to become conduits to the groundwater should a spill that contains hazardous waste or hazardous constituents occur. BPA is currently changing its management practices and plans to remove any materials stored or used near the dry and grounding wells that may results in migration of contaminants to the groundwater (BPA 1991a). BPA is also scheduled to determine the grounding well construction details and pathway potential and to develop a design standard (BPA 1991f).

Footings at the DOE 351 substation were contaminated with yellow cake uranium. This substation is located within the 300 Area of the Hanford facility. Access to the 300 Area is

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tightly restricted by DOE-RL. The substation is also surrounded by a chain link fence with appropriate warning signs. No further action at this site is recommended under RCRA corrective action.

The Hanford, Benton Switch, and White Bluff substations should be inspected by BPA for dry wells and grounding wells similar to those found at the Midway and Ashe substations. Otherwise, no further action is recommended at these substations. The spills documented in the switch yards of the Hanford, Benton Switch and White Bluffs substations are relatively small compared to those at Midway. All three of these substations are located in remote parts of the Hanford facility. They are all fenced and do not have workers permanently on site. Therefore, BPA maintenance personnel would be the only likely receptors at these substations.

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TABLE 1

SWMU AND AOC SUMMARY

	SWMU 1 Midway Substation Generator Storage Area	SWMU 2 Midway Substation Community Incinerator Pad	SWMU 3 Midway Substation M-1 Landfill	SWMU 4 Midway Substation M-2 Landfill
Description	A 200-square-foot bermed concrete pad, covered by a wood frame, and surrounded by a chain link fence. Used from 1985 to 1986.	A 2-foot by 12-foot concrete pad, located in the southeast corner of the Midway facility. Used from the early 1940s until 1970.	Four trenches between 50 and 90 feet long by 20 to 30 feet wide. Waste buried approximately 10 to 12 feet. No liner, leachate collection system, or cap. Began receiving waste about 1943.	Irregularly shaped, 5,000 square feet in area. No liner, leachate collection system or cap. Began receiving waste about 1943.
Operating Status	Inactive. No waste currently stored.	Inactive	Inactive. Last trench backfilled in 1972.	Inactive. Used until 1971.
Waste Type	Waste chlorinated and nonchlorinated solvents, PCB contaminated waste liquid, waste materials and mineral oil.	Combustible residential garbage burned, ash generated.	Unknown amount of electrical-related maintenance waste and noncombustible domestic waste. Possible hazardous materials include PCBs, chlorinated and nonchlorinated solvents, mineral oil, and herbicides. Likely received ash from community incinerator.	Unknown amount of electrical-related maintenance waste and noncombustible domestic waste. Possible hazardous materials include PCBs, chlorinated and nonchlorinated solvents, mineral oil, and herbicides. Likely received ash from community incinerator.
Waste Management	Former generator storage area	No records found. BPA believes ash was disposed of in maintenance landfills M-1 and M-2.	Combustible materials, both solid and liquid, burned in the trenches prior to backfilling. Landfill is covered with native soils.	Combustible material, both liquid and solid, burned in the trenches prior to backfilling. Landfill is covered with native soils.
Release Controls	Bermed concrete pad	None	None	None
Release History	None documented.	None documented, most likely past releases to air.	Dioxins, furans, PCBs in soil.	Chlorinated solvents found in soils.
Release Potential	Low	High during past operation, none now.	High	High
Reason for Release Potential	Good release controls, no stains or cracks in concrete pad.	Unknown type of incinerator in the past, inactive since 1970.	Documented sampling results showing contaminated soil.	Documented sampling results showing contaminated soil.
Potential Media of Concern	None	None	Soil, possibly groundwater.	Soil, possibly groundwater.
Recommendation	No further action	No further action	RFI to determine extent of soil and possible groundwater contamination.	RFI to determine extent of soil and possible groundwater contamination.

TABLE 1 (continued)

SWMU AND AOC SUMMARY

	SWMU 5 Midway Substation M-3 Landfill	SWMU 6 Midway Substation Community Landfill	SWMU 7 Midway Substation Dry Well 1	SWMU 8 Midway Substation Dry Well 2
Description	300 feet long, 25 feet wide, waste approximately 4 feet deep. Located in borrow pit area. The waste covered by native gravel. No liner, leachate collection, or cap.	Two cells, one 200 feet by 150 feet; the other 170 feet by 150 feet. No cap, liner, or leachate collection system.	Located just northeast of the control house. Six feet in diameter, 19 feet total depth. Bottom 5 feet lined with bricks.	Northwest of the untanking tower. Total depth 15 feet, bottom 5 feet lined with brick, 5 feet in diameter.
Operating Status	Active since 1980.	Inactive. Used between 1970 and 1980.	Active	Active
Waste Type	Tree limbs, grass clippings, weeds, and other landscape-type waste.	Based on available information, only domestic type solid waste is suspected as being disposed of in this landfill. This may include batteries and paints.	In the past, battery acid, lead, spent photographic fluids containing silver, cadmium, and chromium.	In the past, PCB-containing mineral oil, and chlorinated and nonchlorinated solvents.
Waste Management	Waste placed in landfill and covered.	Waste deposited on weekends and covered with soil every Monday.	Accepts all wastewater generated in control house except sewage.	Accepts all wastewater from untanking tower (except sewage), including floor drums.
Release Controls	None	None	None	None
Release History	None documented	None documented	Lead and silver in soils above background.	TPH and chloromethane in soils and in well.
Release Potential	Low	Medium	High	High
Reason for Release Potential	No records of hazardous waste or constituents.	May contain hazardous constituents associated with batteries (metals) and paints (paint waste).	Documented contamination	Documented contamination
Potential Media of Concern	None	Soil	Soil and possibly groundwater	Soil and possibly groundwater
Recommendation	No further action	Soil gas survey for volatile organics.	RFI to investigate soil and possible groundwater contamination	RFI to investigate soil and possible groundwater contamination

TABLE 1 (continued)

SWMU AND AOC SUMMARY

	SWMU 9 Midway Substation Dry Well 3	SWMU 10 Midway Substation Underground Storage Tank 1	SWMU 11 Hanford Substation Construction Dump	SWMU 12 Ashe Substation Generator Storage Area
Description	Located west of the mineral oil storage tanks and south of the untanking tower. Four feet in diameter. Gravel soil backfilled total depth 6.5 feet.	A 300-gallon capacity tank 60 inches long and 38.5 inches in diameter.	Dump used during substation construction	Generator storage area, secure and well constructed. Wastes are stored in drums with good secondary containment.
Operating Status	Active	Removed	Inactive	Active
Waste Type	PCBs and TPH from insulating oils.	Waste oil and solvents	Only construction debris	TCE, TCA, acetone, spent photographic fluids, used battery acid, ferric chloride, etching solution waste, methanol, pentachlorophenol, solvent-thinner waste, and titrating solution.
Waste Management	Two drains on the bottom of the oil storage tank and are connected to this dry well.	Used liquid generated in untanking tower and switchyard disposed of in tank.	Unknown	Generator storage
Release Controls	None	None	Most likely none	Sump and berms to control any spills
Release History	TPH in soil up to 5,800 mg/kg.	TPH up to 52,000 mg/kg; lead up to 1,000 mg/kg.	None documented	None documented
Release Potential	High	High	Low	Low
Reason for Release Potential	Documented contamination	Documented contamination	Little information found	Good release controls and housekeeping
Potential Media of Concern	Soil, possibly groundwater	Soil, possibly groundwater	None	None
Recommendation	RFI to investigate extent of soil and possible groundwater contamination.	RFI to confirm removal of TPH by BPA in 1991 and possibility of groundwater contamination	No further action	No further action

TABLE 1 (continued)

SWMU AND AOC SUMMARY

	SWMU 13 Ashe Substation Dry Well Connected to Oil/Water Separator	AOC 1 Midway Substation Switchyard	AOC 2 DOE 351 Substation Switchyard
Description	Precast concrete dry well with bottom elevation 15 feet below ground surface.	The area of the substation containing all the outdoor electrical equipment. The surface soils were compacted to 95 percent, covered with 3 inches of crushed basalt.	The area of the substation containing all outdoor electrical equipment. The surface soils were compacted to 95 percent and covered with 3 inches of crushed basalt.
Operating Status	Active	Active	Active
Waste Type	Most likely petroleum-related	Mineral oil containing PCBs and possible solvents.	Yellow cake uranium
Waste Management	Receives effluent from an oil/water separator and several catch basins.	Passive equipment failures and solvents used to clean up spills and leaks.	Unknown
Release Controls	None	None	None
Release History	Designed to release	Documented releases up to 515 gallons of mineral oil.	Documented contamination
Release Potential	High	High	High
Reason for Release Potential	No maintenance on oil\water separator since 1980.	Documented soil contamination	Soil contaminated with yellow cake uranium.
Potential Media of Concern	Soil	Soil, possibly groundwater	Soil, possibly groundwater
Recommendation	RFI to investigate the dry well as a source of petroleum-related contaminants.	RFI to investigate extent of soil contamination and possible groundwater contamination.	The extent of the yellow cake uranium contamination should be investigated.

7.0 REFERENCES

BPA 1981. Memorandum from Fred Johnson, Area Operations and Maintenance Manager, to Dan Waller, Hazardous Material Program Manager, Bonneville Power Administration. Walla Walla, Washington. May 29, 1981.

BPA 1989. BPA TSCA Inspection, DOE 351 Substation. April 11, 1989.

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BPA 1991a. Environmental Appraisal Report, H.J. Ashe Substation and Maintenance Headquarters. U.S. Department of Energy, Bonneville Power Administration Environmental Office. Portland, Oregon. January 1991.

BPA 1991b. Response to RFA Letter, from Mark W. Hermeston, Bonneville Power Administration, Area Environmental Coordination to Daniel Duncan, Hanford RCRA Program Manager, U.S. Environmental Protection Agency, Region 10. December 12, 1991.

BPA 1991c. CERCLA Site Inspection Final Draft Work Plan, Midway Substation. U.S. Department of Energy, Bonneville Power Administration. Prepared by International Technology Corporation. Richland, Washington. January 28, 1991.

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PNL 1990. Hanford Site Environmental Report for Calendar Year 1989. PNL-7346. Pacific Northwest Laboratory. Richland, Washington. May 1990.

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APPENDIX A

INFORMATION REQUEST AND VISUAL SITE INSPECTION NOTIFICATION LETTER

Facility Agreement and Consent Order. **This includes all Bonneville Power Administration substations on the Hanford Site and those used to supply power for Hanford operations (e.g., Midway Substation).** This letter is to notify you of a visua site inspection (VSI) scheduled for November 19, 1991, beginning at 9:00 a.m. The VSI will be performed by PRC, Environmental Management, Inc. (PRC) contractor to EPA. PRC is an authorized contractor of EPA (Contract No. 68-W9-0009) and is acting on EPA's behalf as field investigators. The two (2) investigators may be accompanied by other representatives from EPA, the Washington Department of Ecology, or both.

Enclosed are an agenda for the VSI, including a proposed VSI schedule and a preliminary list of SWMUs and areas of concern to be inspected as identified during our file review (Enclosure 1), and a list of information needs for the areas of interest for you to provide to the inspection team (Enclosure 2).

Section 3007 of RCRA, 42 U.S.C. § 6927, authorizes EPA to request certain information from handlers of hazardous waste. Pursuant to § 3007 of RCRA (and to facilitate the RFA process), you are requested to provide the information listed on Enclosure 2. All facility records should be reviewed in obtaining the requested information, including the personal recollections of longtime employees and past owners and operators. The requested information must be sent to EPA within thirty (30) days of the receipt of this letter. Please send all information to the following address:

Daniel Duncan
U.S. Environmental Protection Agency
Hanford RCRA Program Manager
1200 Sixth Avenue, HW-074
Seattle, WA 98101

If any information or records are not in your possession, please provide the current location and custodian of such records.

The facility may assert a claim of confidentiality for any information entitled to protection under 40 C.F.R., Part 2, Subpart B, by designating the information you believe is entitled to such protection.

We will be contacting you in the next two weeks to confirm the inspection and make any necessary final arrangements.

9213044.2808

United States
Environmental Protection
Agency

Region 10
1200 Sixth Avenue
Seattle WA 98101

Alaska
Idaho
Oregon
Washington

EPA

November 5, 1991

Reply To
Attn Of: HW-074

CERTIFIED MAIL - RETURN RECEIPT REQUESTED

Mr. Mark Hermeston
Bonneville Power Administration
Snake River Area Office
101 West Poplar
Walla Walla, Washington 99362

Re: RCRA Facility Assessment at Hanford Federal Facility
EPA ID Number: WA 7890008967
Bonneville Power Administration
EPA ID Number: WA 6891406344

Dear Mr. Hermeston:

The Hazardous and Solid Waste Amendments of 1984 (HSWA) establish the authority in the Resource Conservation and Recovery Act (RCRA) program to address releases of hazardous waste or hazardous constituents from solid waste management units (SWMUs). This program applies to operating, closed, or closing RCRA facilities. The RCRA Facility Assessment (RFA) is a mechanism which the U.S. Environmental Protection Agency (EPA) utilizes to carry out the corrective action authorities of HSWA.

Specifically, the RFA is the initial step in the corrective action process. In the RFA, EPA identifies all solid waste management units at a facility and determines the potential for releases of waste from the units. The corrective action authorities allow the RCRA program to detect and correct releases from regulated waste management units, as well as those units resulting from past waste management practices at RCRA regulated facilities. Releases to all media (air, soils, and surface and ground waters) from all waste units are within the jurisdiction of the RCRA corrective action program. EPA is currently responsible for implementing this program in Washington, Oregon, and Alaska; Idaho is authorized to implement its own corrective action program.

EPA is currently conducting an RFA for the Hanford Federal Facility. The scope of the RFA covers those SWMUs at the Hanford Facility that are not included under the current Hanford Federal

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ENCLOSURE 1

RCRA FACILITY ASSESSMENT
VISUAL SITE INSPECTION AGENDA

FACILITY: HANFORD FEDERAL FACILITY
BONNEVILLE POWER ADMINISTRATION SUBSTATIONS

EPA ID NUMBERS: WA 7890008967
WA 6891406344

FACILITY CONTACT: Cliff Clark, Department of Energy
Mark Hermeston, Bonneville Power Administration

EPA/CONTRACTOR/STATE PERSONNEL:

Dan Duncan, EPA
Paul Stasch, Ecology
Jerry Shuster, PRC
Jim Wright, PRC

PURPOSE OF INSPECTION:

The Hazardous and Solid Waste Amendments of 1984 (HSWA) broaden the scope of EPA's authority under RCRA by requiring corrective action for releases of hazardous wastes and hazardous constituents at facilities that manage hazardous wastes. The RCRA Facility Assessment (RFA) is conducted to evaluate the potential for releases to the environment and the need for corrective action.

The RFA includes a preliminary review of available file information, a visual site inspection (VSI) of the facility and, if necessary, a sampling visit.

The purpose of the VSI is to:

(1) Identify solid waste management units (SWMUs) and other areas of concern. **A SWMU is defined as any discernible unit at which solid wastes have been placed at any time, irrespective of whether the unit was intended for the management of solid or hazardous waste. Such units include any area at a facility at which solid wastes have been routinely and systematically released.**

(2) Interview site representatives and review or collect facility information provided by site representatives.

(3) Perform visual inspection with the site representative.

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If you have any questions regarding this letter or the RFA process, please contact Dan Duncan at (206) 553-6693.

Sincerely,

Randall F. Smith, Acting Director
Hazardous Waste Division

Enclosures

cc: Paul Stasch/Toby Michelena, Ecology
Vicky Tapang, EPA
Dan Duncan, EPA Region 10
Gwen Herron, PRC

93120441 28N

III. Closing Meeting

The inspection team will meet with facility personnel to conclude the VSI activities.

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(4) Take photographs of the site, including photographs of all SWMUs and other areas of concern.

PROPOSED VSI SCHEDULE:

I. Introductory Meeting

The inspection team will meet with facility personnel to discuss:

- Purpose of visit
- Agenda
- Safety and health considerations
- Facility history and operations
- Additional information needs pertaining to the SWMUs identified during the preliminary review including processes which may result in the generation of waste streams.

II. Inspection Tour

The inspection team will tour the facility and examine potential SWMUs and areas of concern, listed below, identified during the preliminary file review. Additional SWMUs and areas of interest will be identified during the inspection, based on the team's tour and review of the facility information.

SWMUs and Areas of Concern Previously Identified:

- Midway Substation and landfills
- All Bonneville Power Administration substations on the Hanford Site and those used to supply power for Hanford operations (e.g., Midway Substation). These include but are not limited to:
  - Ashe substation located near Washington Public Power Supply System nuclear plant number 2
  - A substation near the N-reactor/Hanford Generating Project
  - A substation near the 200-West Area

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ENCLOSURE 2

RFA INFORMATION NEEDS
HANFORD FEDERAL FACILITY
BONNEVILLE POWER ADMINISTRATION SUBSTATIONS

(1) Provide a map which identifies the location of facility property boundaries and all SWMUs (at a scale of 1" = 200').

(2) Provide the following information for all SWMUs:

(a) Unit description:
- Location
- Construction details
- Engineering drawings (as builts, if available)
- Capacity

(b) Dates of operation.
(c) Operational status (active, inactive, closed).
(d) Waste types, quantities, sources, and disposition.
(e) Release controls.
(f) History of leaks, spills, or other uncontrolled releases.
(g) Description of inspection and maintenance procedures to assure integrity of the unit.

(3) Provide a detailed topographic map of the facility.

(4) Provide any groundwater, air, soil sampling data collected at the facility.

(5) Provide current and historical aerial photographs of the facility.

(6) Provide copies of applications and permits for disposal of solid wastes within the facility boundary, to the extent such records exist.

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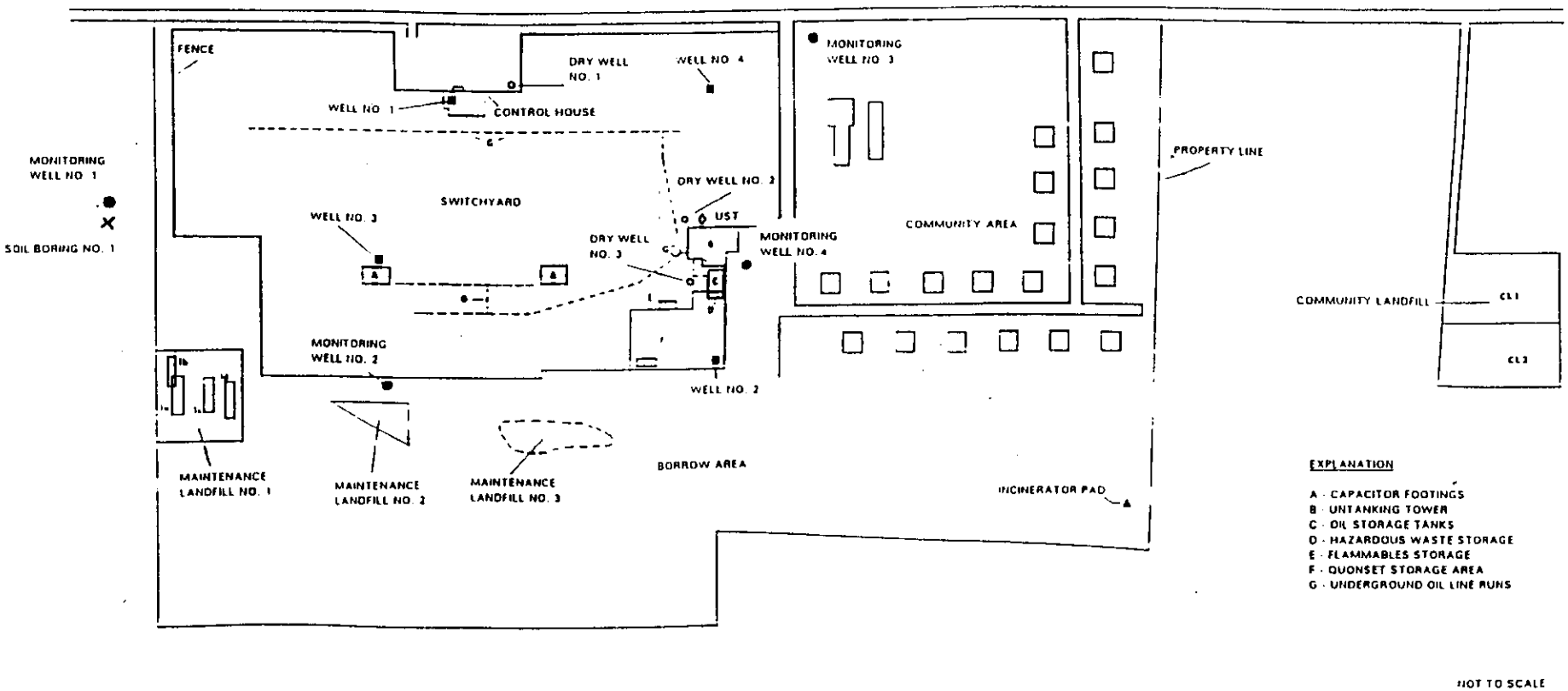
APPENDIX B

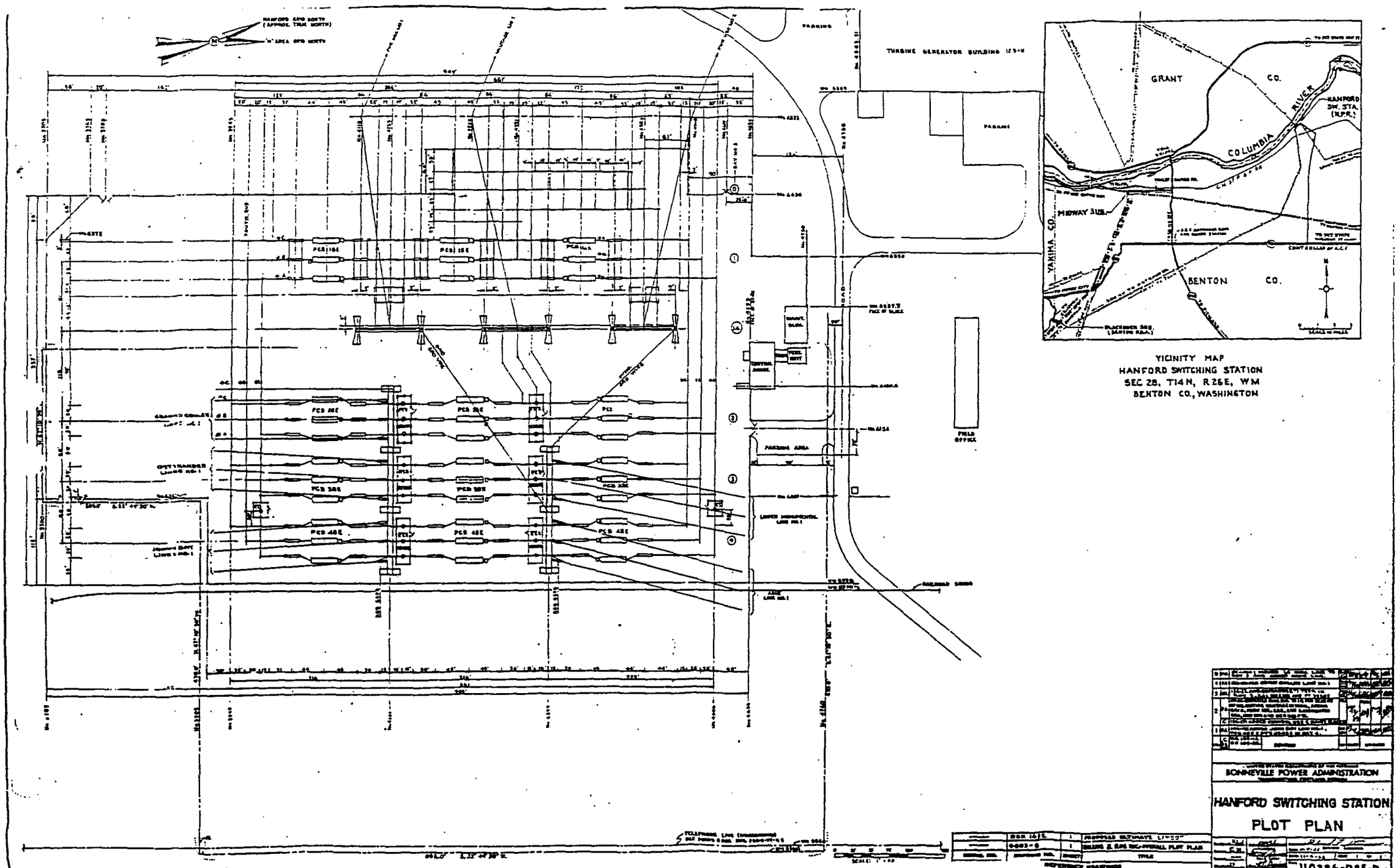
SUBSTATION SITE PLANS

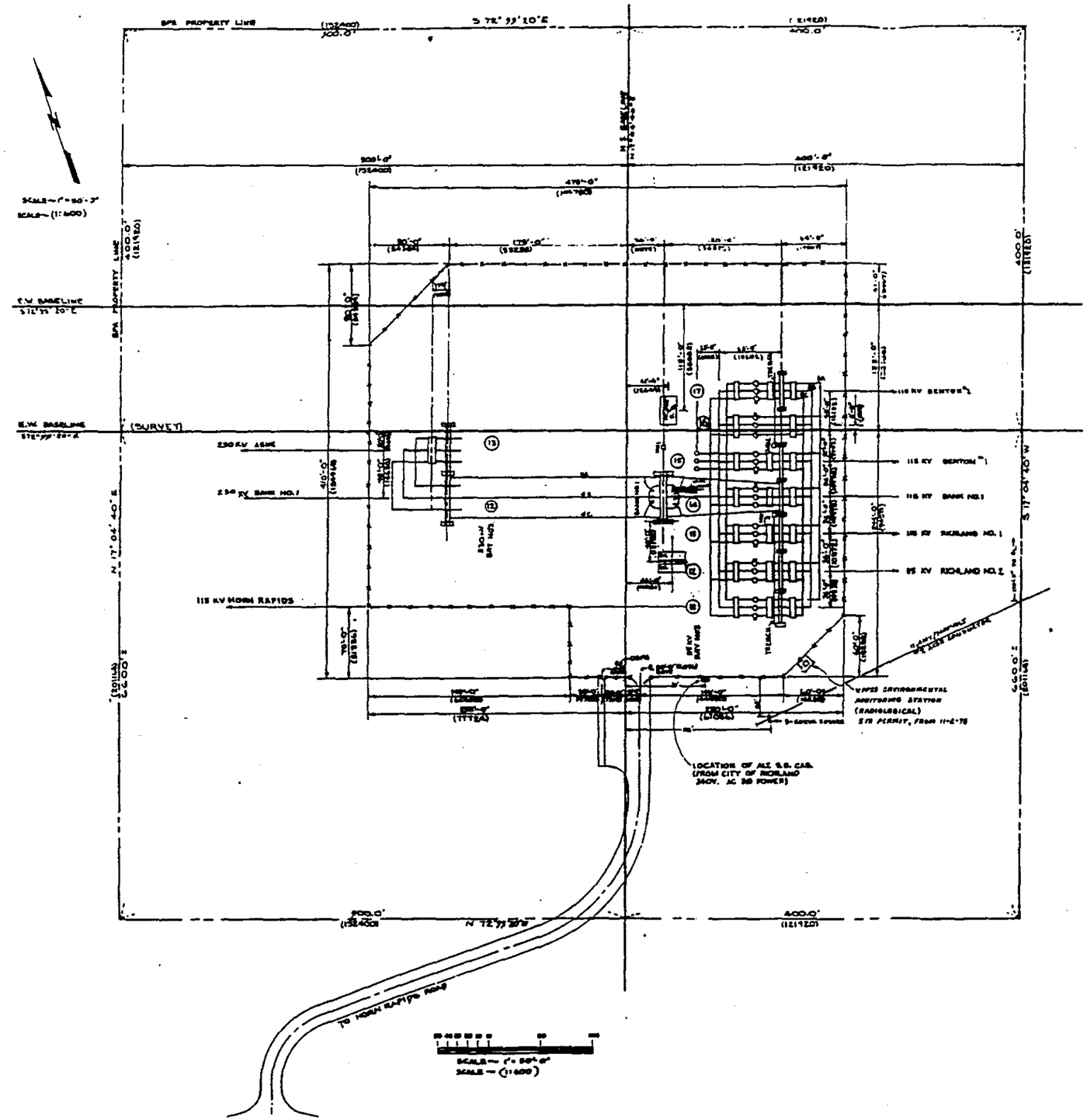


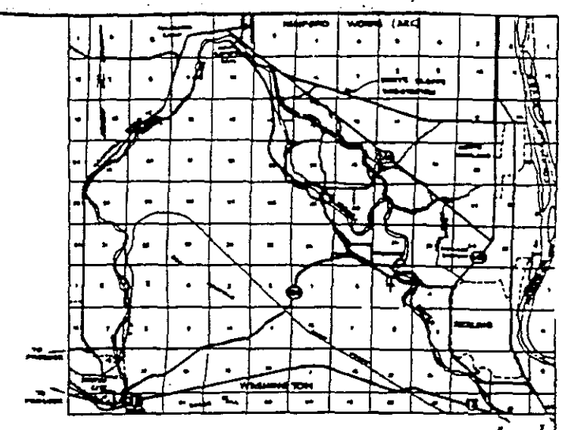
BPA Midway
Substation and Community

Source: BPA (1991b)

PRC ENVIRONMENTAL MANAGEMENT, INC.


TURBINE GENERATOR BUILDING
PARKING
GRANT CO.
COLUMBIA RIVER
HANFORD SW. STA. (KLPR.)
MIDWAY SUB.
YAKIMA CO.
BENTON CO.
VICINITY MAP
HANFORD SWITCHING STATION
SEC 28, T14N, R26E, WM
BENTON CO., WASHINGTON
FIELD OFFICE
BONNEVILLE POWER ADMINISTRATION
HANFORD SWITCHING STATION
PLOT PLAN
110326-095-9





VICINITY MAP
T10N, R28E, SW ¼, SEC 7
BENTON CO. WASH.
SCALE — 1" = 1.5 MILES

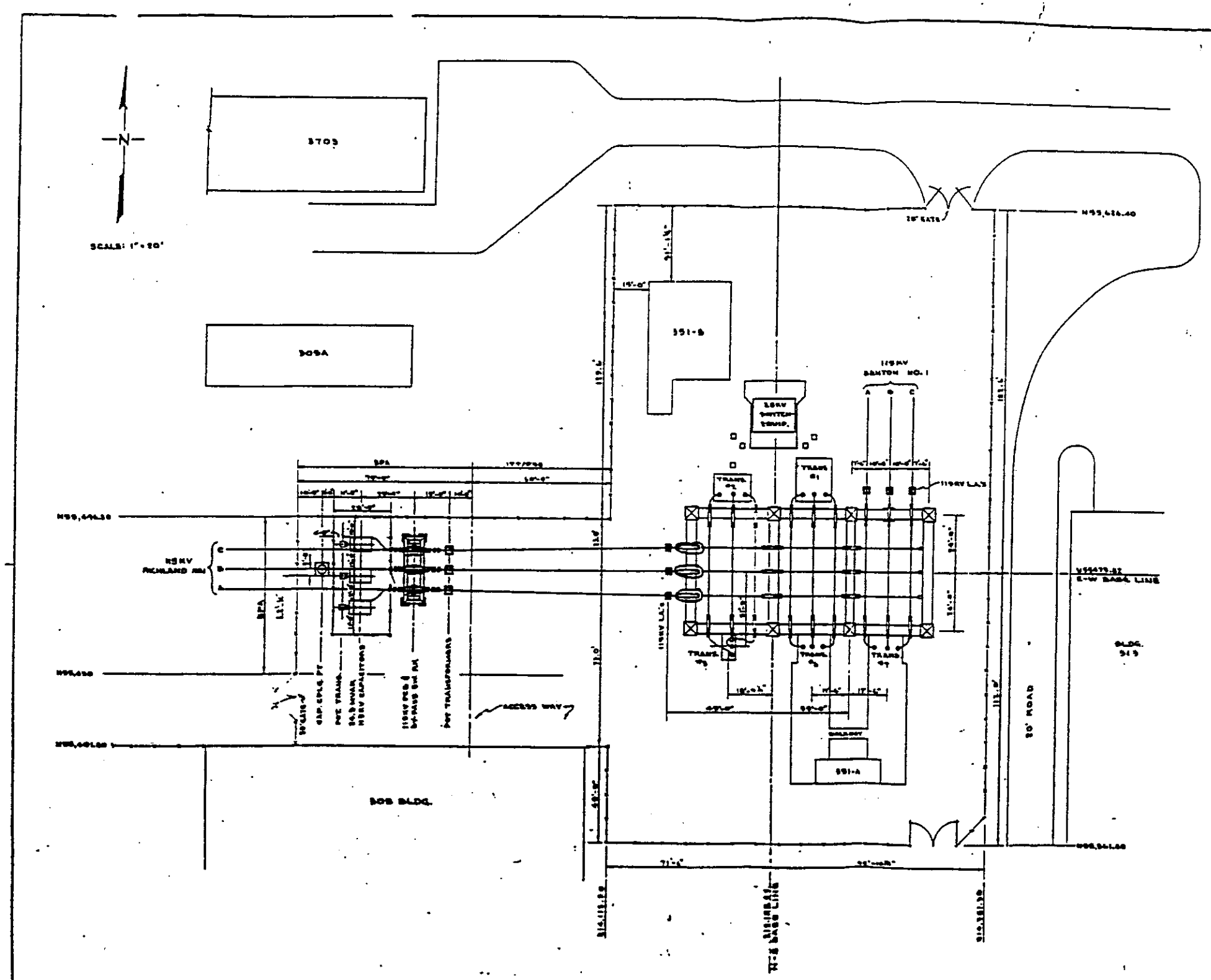
NOTE:
"METRIC" DIMENSIONS IN PARENTHESES ARE IN MILLIMETERS ROUNDED TO THE NEAREST MILLIMETER, UNLESS OTHERWISE SPECIFIED.

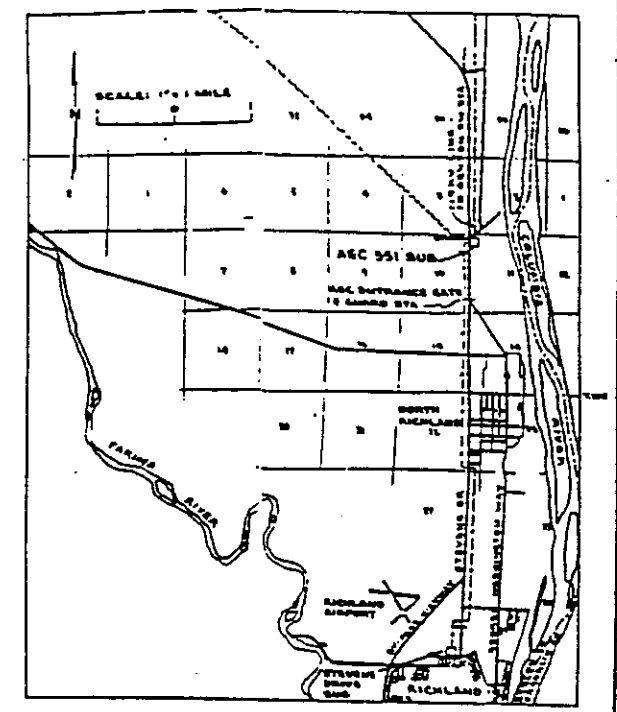
4	C	110-704: ADDED BAY 16 TO BAY 15	
3	C	114-704: ADDED BUS, PCB 14K, DISC SW & BAY 12	
2		99-9011 ADDED BAY 17	
1			

BONNEVILLE POWER ADMINISTRATION

WHITE BLUFFS SUBSTATION PLOT PLAN

219253-DSE-D



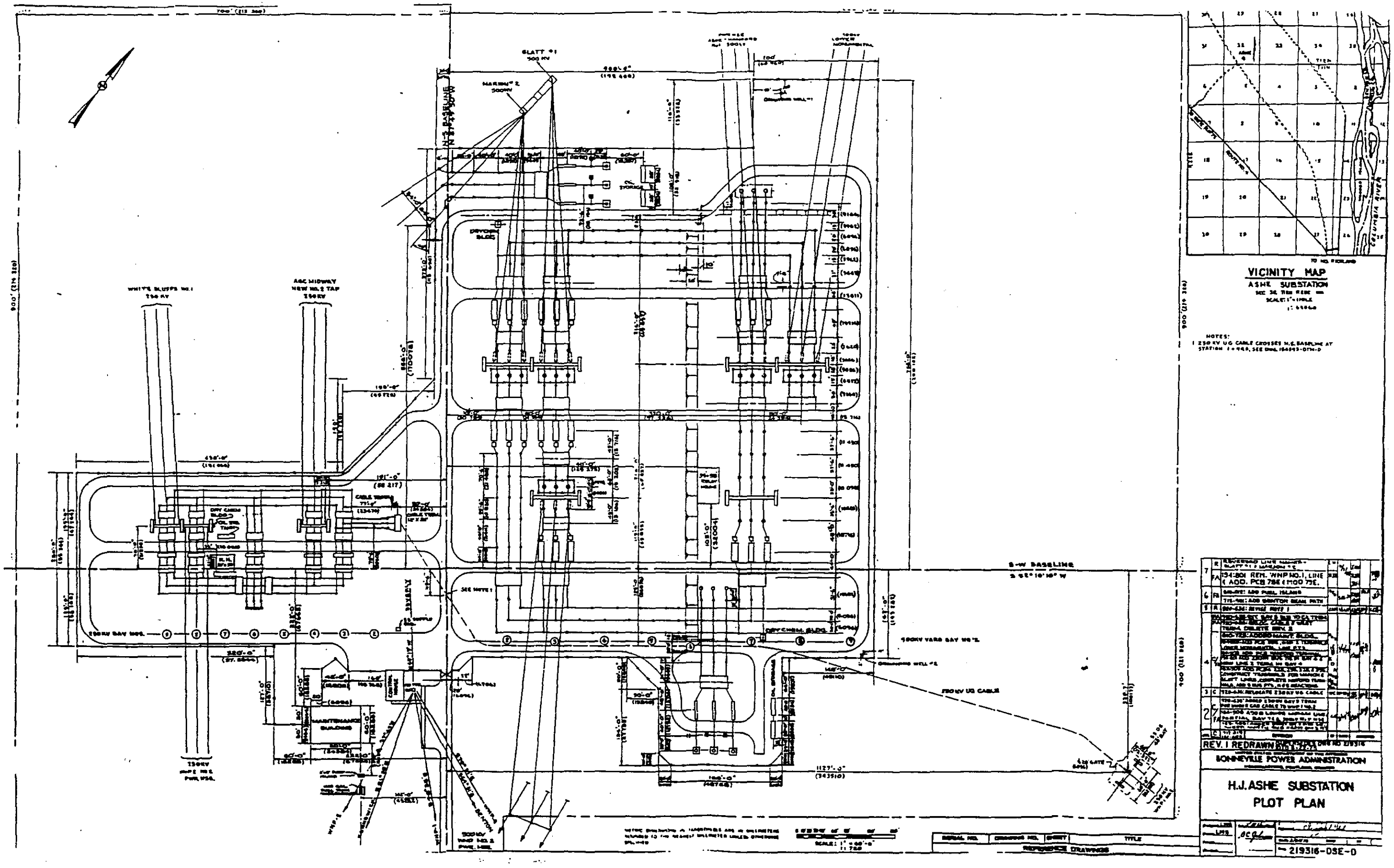


VICINITY MAP
SEC. 10 & 11 T 10N R 28E
BENTON CO., WASHINGTON

BONNEVILLE POWER ADMINISTRATION

DOE 351 SUBSTATION
PLOT PLAN

211207


VICINITY MAP
ASHE SUBSTATION
NOTES:
1 230 KV U.G. CABLE CROSSES H.E. BASELINE AT STATION 1+965, SEE DWG. 184893-DTM-D
S-W BASELINE
S 62°10'10" W
230KV U.G. CABLE
230KV YARD BAY NO'S.
WHITE BLUFFS NO. 1
230 KV
ASC MIDWAY
NEW NO. 2 TAP
230 KV
BLATT #1
500 KV
MARION #2
500KV
N-S BASELINE
N 31°21'50" W
DRYCHEM BLDG.
STORAGE
MAINTENANCE BUILDING
CONTROL CENTER
OIL STORAGE
SEE NOTE 1
REV. 1 REDRAWN
BONNEVILLE POWER ADMINISTRATION
H.J. ASHE SUBSTATION
PLOT PLAN
219316-DSE-D

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APPENDIX C

PHOTOGRAPHS OF THE BPA SUBSTATIONS TAKEN DURING THE VISUAL SITE INSPECTION

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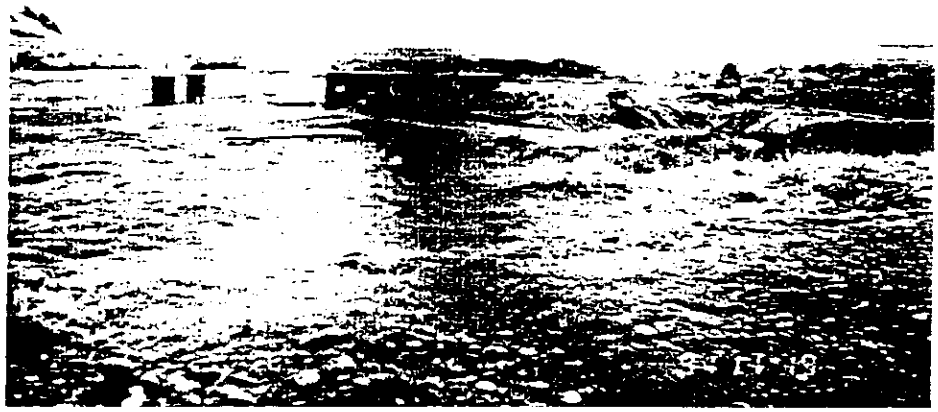
Photo No. 1



Date: 11/19/91 Picture Taken By: JIS Direction Facing: West

Picture Description: Midway Substation - Decontamination pad and drummed cuttings from site inspection

Photo No. 2

Date: 11/19/91 Picture Taken By: JIS Direction Facing: Southwest

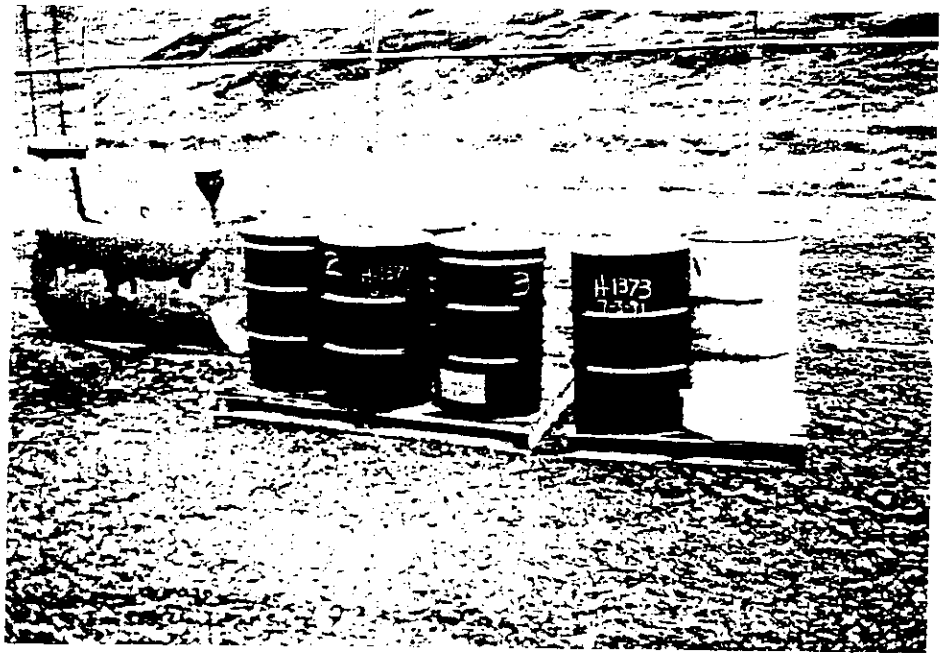
Picture Description: Midway Substation - Excavated soil from Landfill M-1 containing elevated levels of dioxin, furans, and PCBs

Photo No. 3

Date: 11/19/91 Picture Taken By: JIS Direction Facing: Northeast

Picture Description: Midway Substation - Area where waste oil tank was recently removed north of untanking tower

Photo No. 4



Date: 11/19/91 Picture Taken By: JIS Direction Facing: South

Picture Description: Midway Substation - Waste oil tank recently removed near untanking tower and soil from excavation awaiting removal

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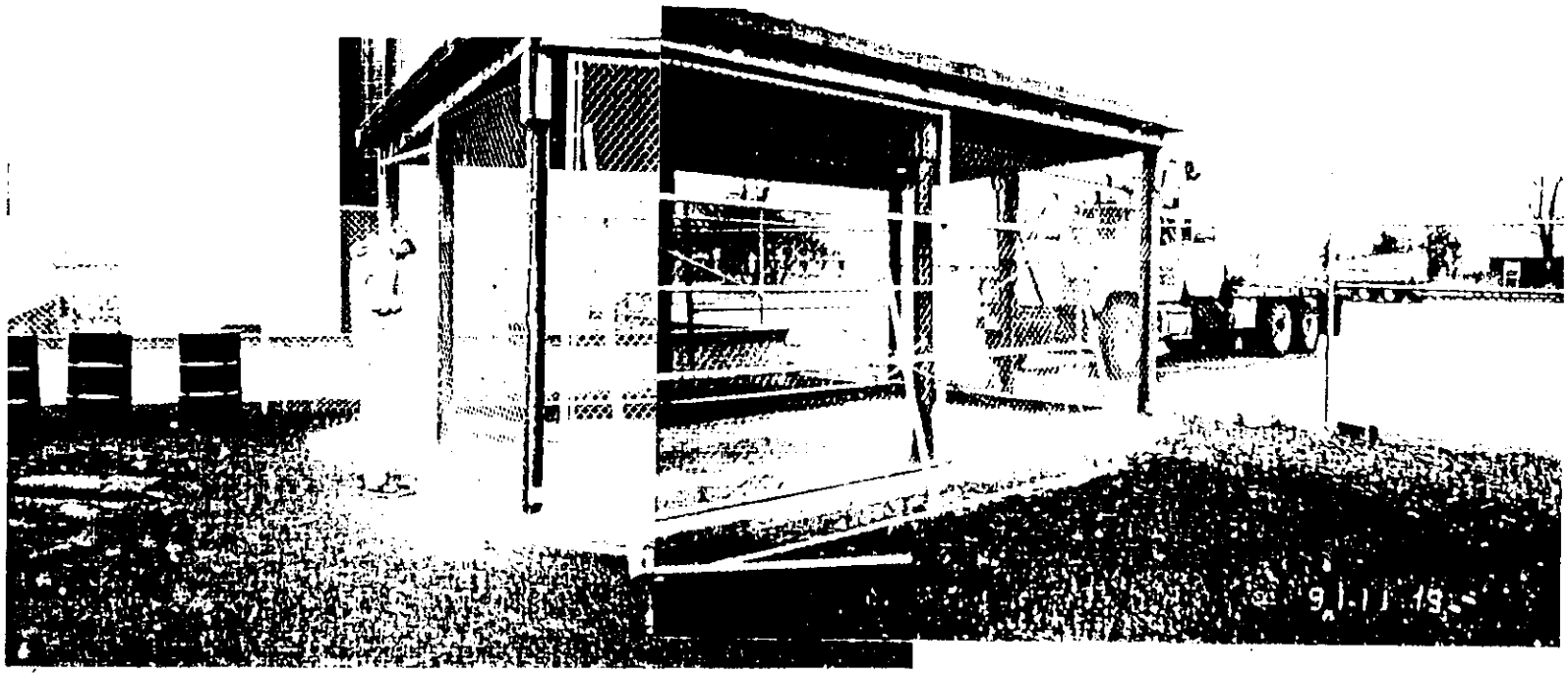
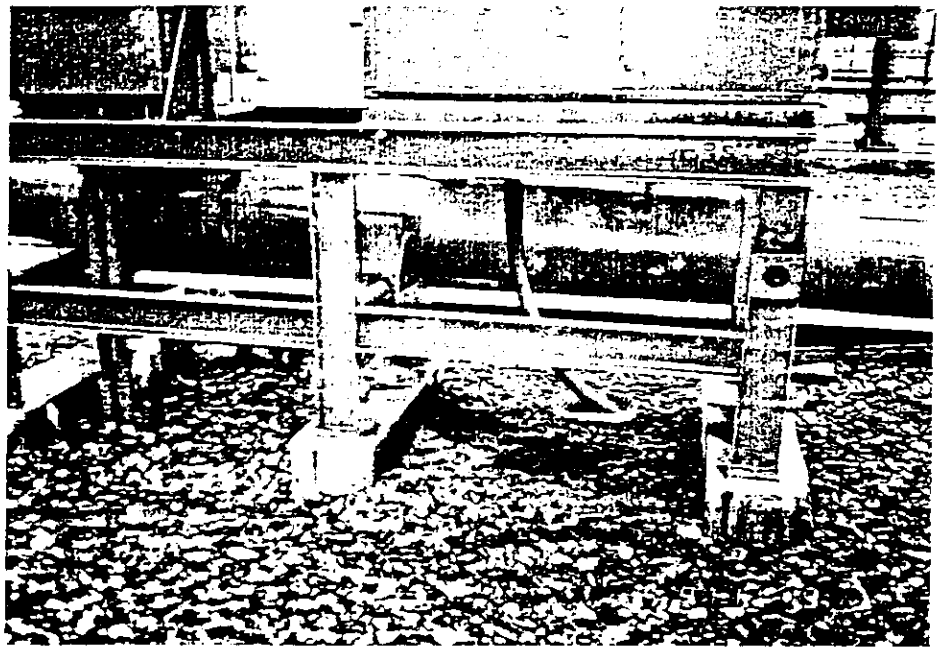
Photo No. 5



Date: 11/19/91 Picture Taken By: JIS Direction Facing: Northeast

Picture Description: Midway Substation - Former hazardous waste generator storage area

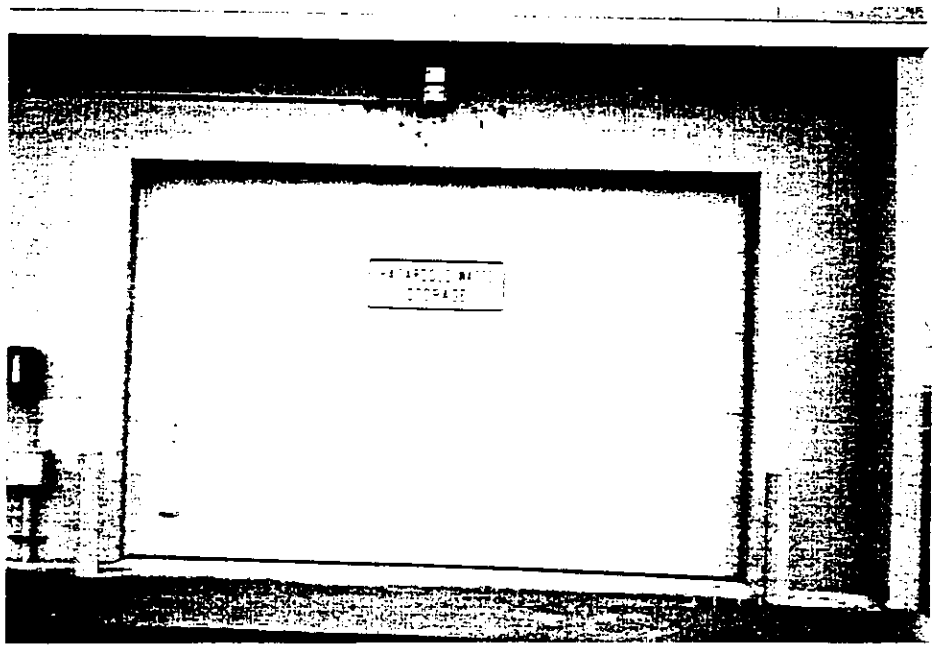
Photo No. 6



Date: 11/19/91 Picture Taken By: JIS Direction Facing: West

Picture Description: Hanford Substation - Compressor pump blowoff

Photo No. 7



Date: 11/19/91 Picture Taken By: JIS Direction Facing: South

Picture Description: H.J. Ashe Substation - Hazardous waste generator storage building

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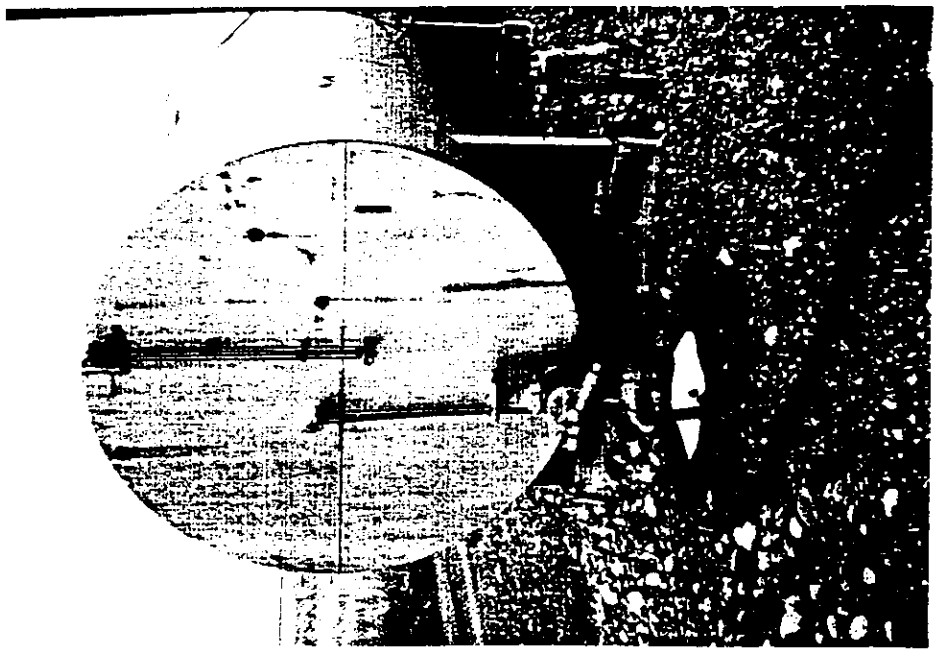
Photo No. 8

Date: 11/19/91 Picture Taken By: JIS Direction Facing: Southeast

Picture Description: Ashe Substation - Inside generator storage building

Photo No. 9



Date: 11 19/91 Picture Taken By: JIS Direction Facing: Southwest

Picture Description: Benton Switch Substation - Storage of make-up mineral oil

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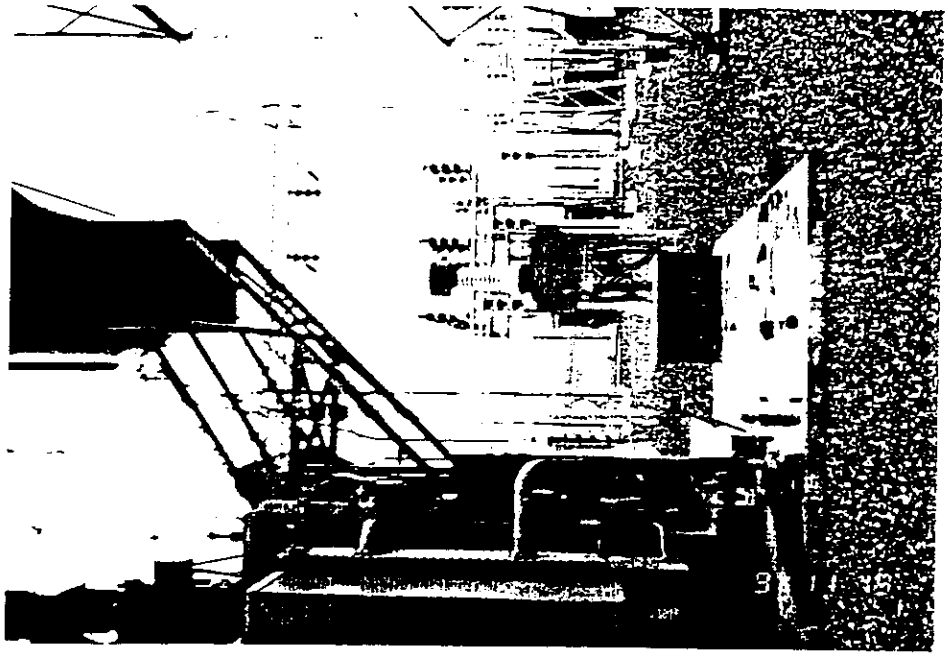
Photo No. 10



Date: 11/19/91 Picture Taken By: JIS Direction Facing: East

Picture Description: Benton Switch Substation - Mineral oil leak from transformer gauge

Photo No. 11

Date: 11/19/91 Picture Taken By: JIS Direction Facing: East

Picture Description: DOE 351 Substation - Entrance gate

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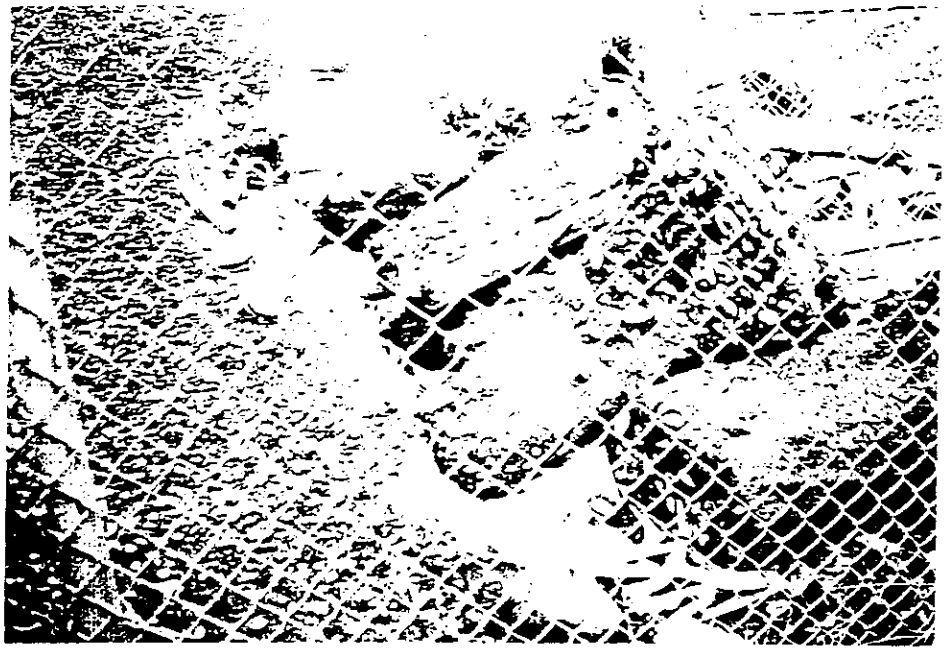
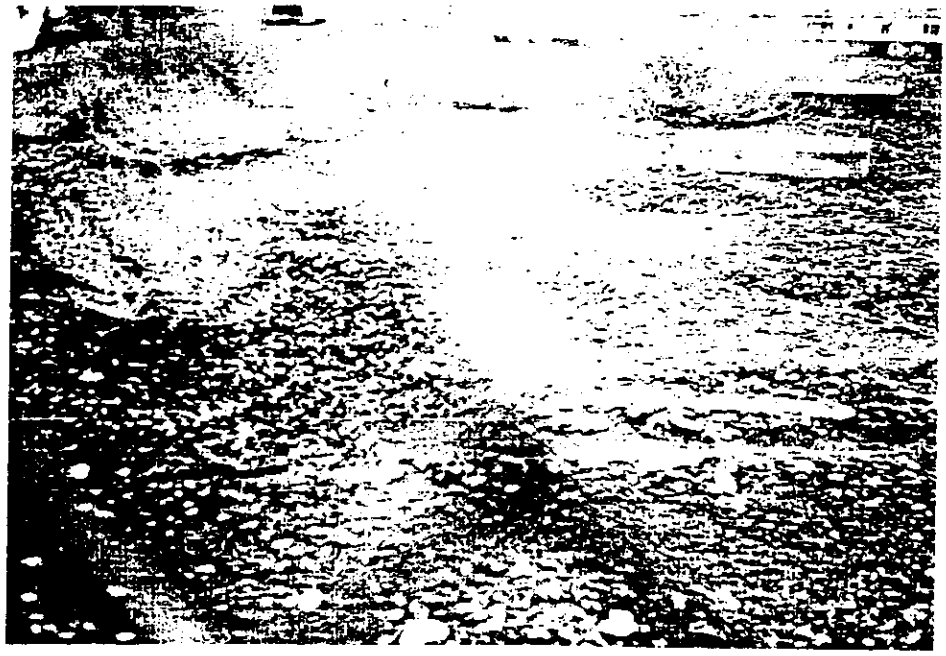
Photo No. 12



Date: 11/19/91 Picture Taken By: JIS Direction Facing: East

Picture Description: DOE 351 Substation - Footings found to contain uranium oxide during excavation by BPA

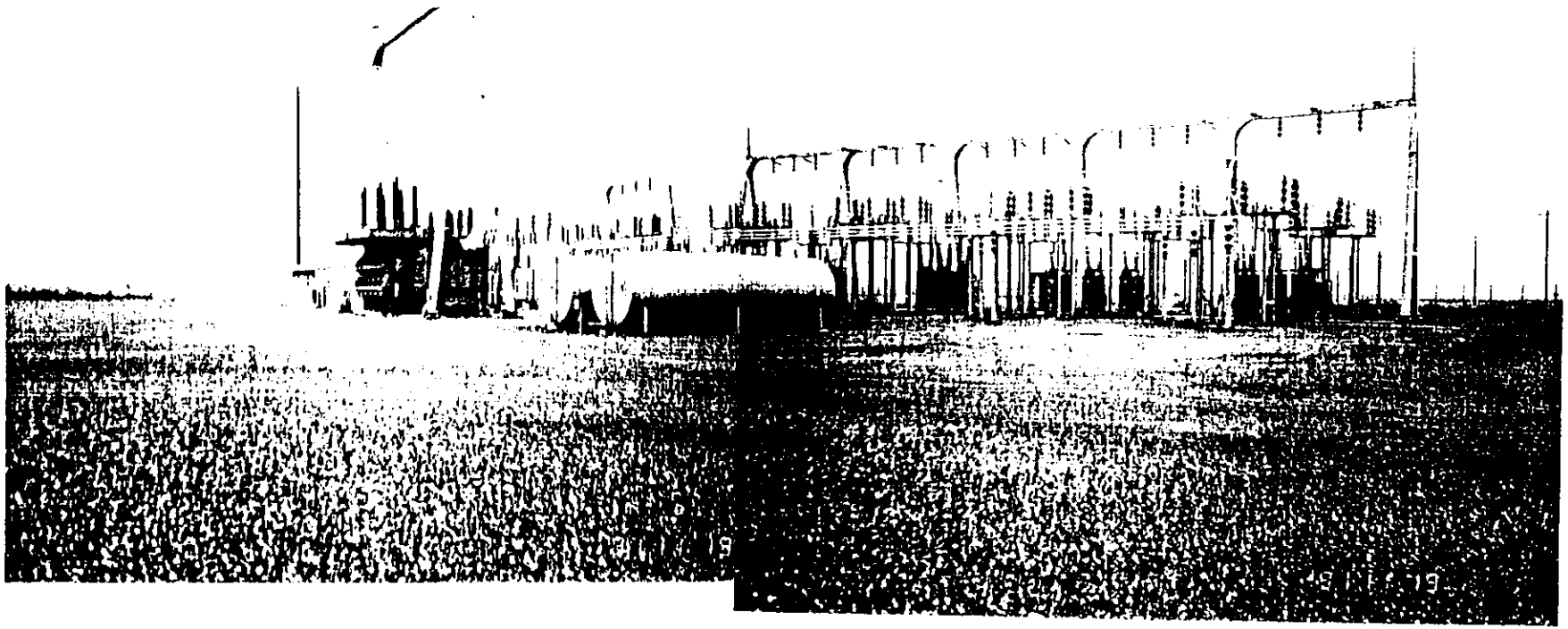
Photo No. 13



Date: 11/19/91 Picture Taken By: JIS Direction Facing: East

Picture Description: DOE 351 Substation - Area where uranium-oxide-contaminated footings were removed

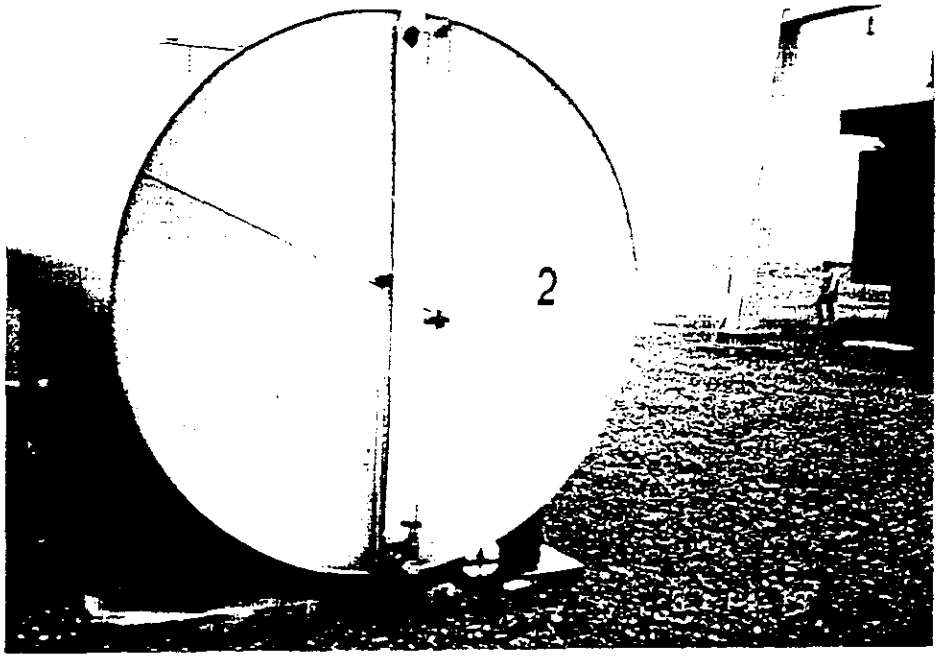
Photo No. 14



Date: 11/19/91 Picture Taken By: JIS Direction Facing: Northwest

Picture Description: White Bluffs Substation

Photo No. 15



Date: 11/19/91 Picture Taken By: JIS Direction Facing: West

Picture Description: White Bluffs Substation - Make-up mineral oil tank

93130144.2830

CORRESPONDENCE DISTRIBUTION COVERSHEET

Author	Addressee	Correspondence No.
C. Sikorski	C. E. Clark	Incoming 9302986

Subject: RESOURCE CONSERVATION AND RECOVERY ACT (RCRA) FACILITY ASSESSMENTS: BONNEVILLE POWER ADMINISTRATION AND WASHINGTON PUBLIC POWER SUPPLY SYSTEM HANFORD GENERATING STATION

INTERNAL DISTRIBUTION

Approval	Date	Name	Location	w/att
		Correspondence Control	A3-01	X
		R. C. Brunke	H6-23	
		G. W. Jackson, Assignee	H6-21	
		H. E. McGuire, Level 1	B3-63	
		S. R. Moreno	B3-06	
		S. M. Price	H6-23	
		E. P. Vodney	B3-50	
		EPIC	H6-08	
		RCRA File/GHL	H6-23	

9302986.2284