WHC-EP-0342
Addendum 27

284-W Powerplant Wastewater Stream-Specific Report

Prepared for the U.S. Department of Energy
Office of Environmental Restoration
and Waste Management

Westinghouse
Hanford Company Richland, Washington

Hanford Operations and Engineering Contractor for the
U.S. Department of Energy under Contract DE-AC06-87RL10930

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Operations Support Services Department

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284-W POWERPLANT WASTEWATER STREAM-SPECIFIC REPORT

OPERATIONS SUPPORT SERVICES DEPARTMENT

ABSTRACT

The proposed wastestream designation for the 284-W Powerplant Wastewater wastestream is that this stream is not a dangerous waste, pursuant to the Washington (State) Administration Code 173-303, Dangerous Waste Regulations.* *A combination of process knowledge and sampling data was used to make this determination.*

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*Ecology, 1989, *Dangerous Waste Regulations*, Washington (State) Administrative Code (WAC) 173-303, Washington State Department of Ecology, Olympia, Washington.

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EXECUTIVE SUMMARY

The proposed wastestream designation for the 284-W Powerplant Wastewater stream is that it is not a dangerous waste, pursuant to the Washington (State) Administrative Code (WAC) 173-303, *Dangerous Waste Regulations**. This proposed designation is based on applying both process knowledge and sample data to the WAC 173-303 requirements for the three types of dangerous waste: (1) listed, (2) criteria, and (3) characteristic dangerous waste. The "listed" dangerous waste determination was made with process knowledge supplemented with sampling data; the "criteria" and "characteristic" dangerous waste determinations were made with sampling data. Process knowledge was based on Material Safety Data Sheets and knowledge of all chemical products stored or used in the 284-W Powerplant. The proposed designation is made using validated data from routine operations samples taken from October 1989 through March 1990. Samples of the other two waste contributing activities, blowdown and softener regeneration, were taken before implementation of a data validation procedure. These data are included in Appendix A to further support the proposed designation.

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*Ecology, 1989, *Dangerous Waste Regulations*, WAC 173-303, Washington State Department of Ecology, Olympia, Washington.

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LIST OF TERMS

DOE	U.S. Department of Energy
EC%	percent equivalent concentration
Ecology	Washington State Department of Ecology
EP	extraction procedure
EPA	U.S. Environmental Protection Agency
HH	halogenated hydrocarbons
PAH	polycyclic aromatic hydrocarbons
SARA	*Superfund Amendments and Reauthorization Act*
Tri-Party Agreement	*Hanford Federal Facility Agreement and Consent Order*
WAC	Washington (State) Administrative Code

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STREAM-SPECIFIC CHARACTERIZATION REPORT FOR 248-W POWERPLANT WASTEWATER

1.0 INTRODUCTION

1.1 BACKGROUND

In response to the *Hanford Federal Facility Agreement and Consent Order* (Tri-Party Agreement) (Ecology et al. 1989), comments were received from the public regarding reduction of the discharge of liquid effluents into the soil column. As a result, the U.S. Department of Energy (DOE), with the concurrence of the Washington State Department of Ecology (Ecology) and the U.S. Environmental Protection Agency (EPA), committed to assess the contaminant migration potential of liquid discharges at the Hanford Site (Lawrence 1989).

This assessment is described in the *Liquid Effluent Study Project Plan* (WHC 1990), a portion of which characterizes 33 liquid effluent streams. This characterization consists of integrating the following elements, pursuant to the Washington (State) Administrative Code, (WAC) 173-303 (Ecology 1989): process data, sampling data, and dangerous waste regulations.

The results of the characterization study are documented in 33 separate reports, one report per wastestream. The complete list of stream-specific reports appears in Table 1-1. This document is one of the 33 reports.

These documents have been prepared to also support the assessment of relative priorities for treatment or alternative disposal practices for the wastestreams.

1.2 APPROACH

This report characterizes the 284-W Powerplant Wastewater stream in sufficient detail so that a wastestream designation, in accordance with WAC 173-303 *Dangerous Waste Regulations*, can be proposed.

The characterization is based on new data which has been obtained between October 1, 1989 and March 31, 1990. Data obtained previously was issued in *Waste Stream Characterization Report* (WHC 1989). For completeness, it is included in the Appendix of this report.

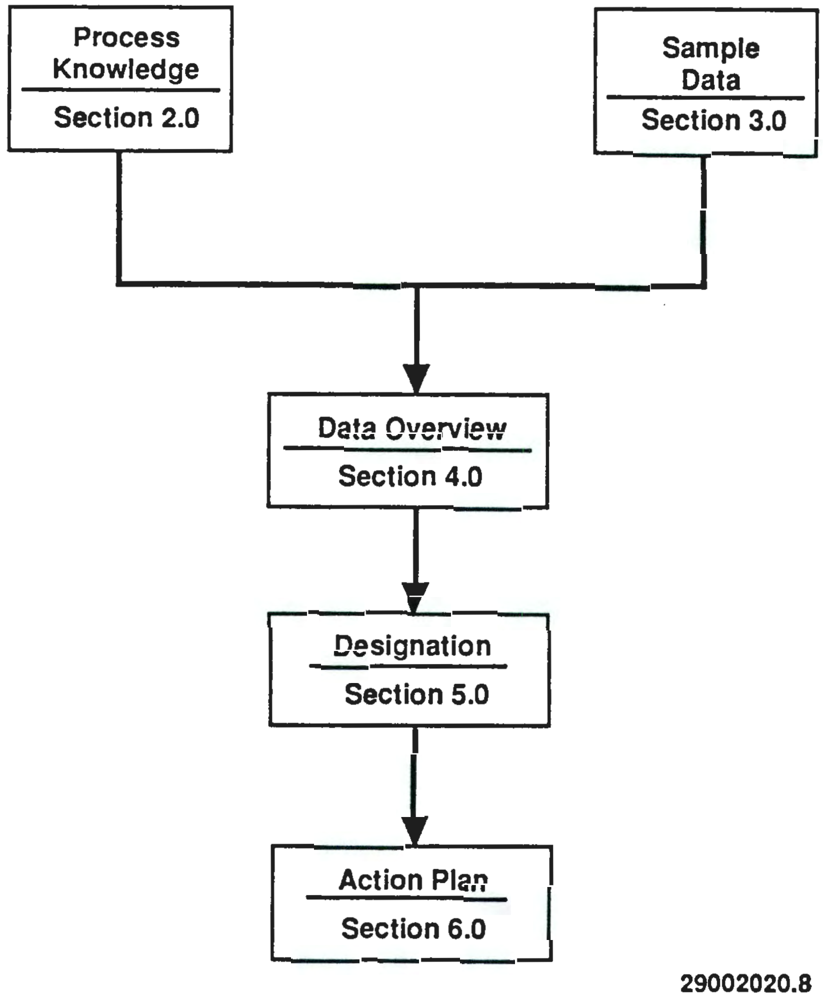
This characterization strategy (shown in Figure 1-1) is implemented by means of the following steps.

1. Describe both process and sampling data (Sections 2.0 and 3.0, respectively).

Table 1-1. Stream-Specific Characterization Reports.

WHC-EP-0342	Addendum 1	300 Area Process Wastewater
WHC-EP-0342	Addendum 2	PUREX Plant Chemical Sewer
WHC-EP-0342	Addendum 3	N Reactor Effluent
WHC-EP-0342	Addendum 4	163N Demineralization Plant Wastewater
WHC-EP-0342	Addendum 5	PUREX Plant Steam Condensate
WHC-EP-0342	Addendum 6	B Plant Chemical Sewer
WHC-EP-0342	Addendum 7	UO_3/U Plant Wastewater
WHC-EP-0342	Addendum 8	Plutonium Finishing Plant Wastewater
WHC-EP-0342	Addendum 9	S Plant Wastewater
WHC-EP-0342	Addendum 10	T Plant Wastewater
WHC-EP-0342	Addendum 11	2724-W Laundry Wastewater
WHC-EP-0342	Addendum 12	PUREX Plant Process Condensate
WHC-EP-0342	Addendum 13	222-S Laboratory Wastewater
WHC-EP-0342	Addendum 14	PUREX Plant Ammonia Scrubber Condensate
WHC-EP-0342	Addendum 15	242-A Evaporator Process Condensate
WHC-EP-0342	Addendum 16	B Plant Steam Condensate
WHC-EP-0342	Addendum 17	B Plant Process Condensate
WHC-EP-0342	Addendum 18	2101-M Laboratory Wastewater
WHC-EP-0342	Addendum 19	UO_3 Plant Process Condensate
WHC-EP-0342	Addendum 20	PUREX Plant Cooling Water
WHC-EP-0342	Addendum 21	242-A Evaporator Cooling Water
WHC-EP-0342	Addendum 22	B Plant Cooling Water
WHC-EP-0342	Addendum 23	241-A Tank Farm Cooling Water
WHC-EP-0342	Addendum 24	284-E Powerplant Wastewater
WHC-EP-0342	Addendum 25	244-AR Vault Cooling Water
WHC-EP-0342	Addendum 26	242-A Evaporator Steam Condensate
WHC-EP-0342	Addendum 27	284-W Powerplant Wastewater
WHC-EP-0342	Addendum 28	400 Area Secondary Cooling Water
WHC-EP-0342	Addendum 29	242-S Evaporator Steam Condensate
WHC-EP-0342	Addendum 30	241-AY/AZ Tank Farms Steam Condensate
WHC-EP-0342	Addendum 31	209-E Laboratory Reflector Water
WHC-EP-0342	Addendum 32	T Plant Laboratory Wastewater
WHC-EP-0342	Addendum 33	183-D Filter Backwash Wastewater

Figure 1-1. Characterization Strategy.



2. Propose a designation (Section 5.0).

3. Design an action plan, if needed, to obtain additional characterization data (Section 6.0).

1.3 SCOPE

The scope of this report is the characterization of the current 284-W Powerplant Wastewater effluent and a corresponding analysis to determine a waste designation for the effluent. The location of the facility on the Hanford Site is given in Figure 1-2.

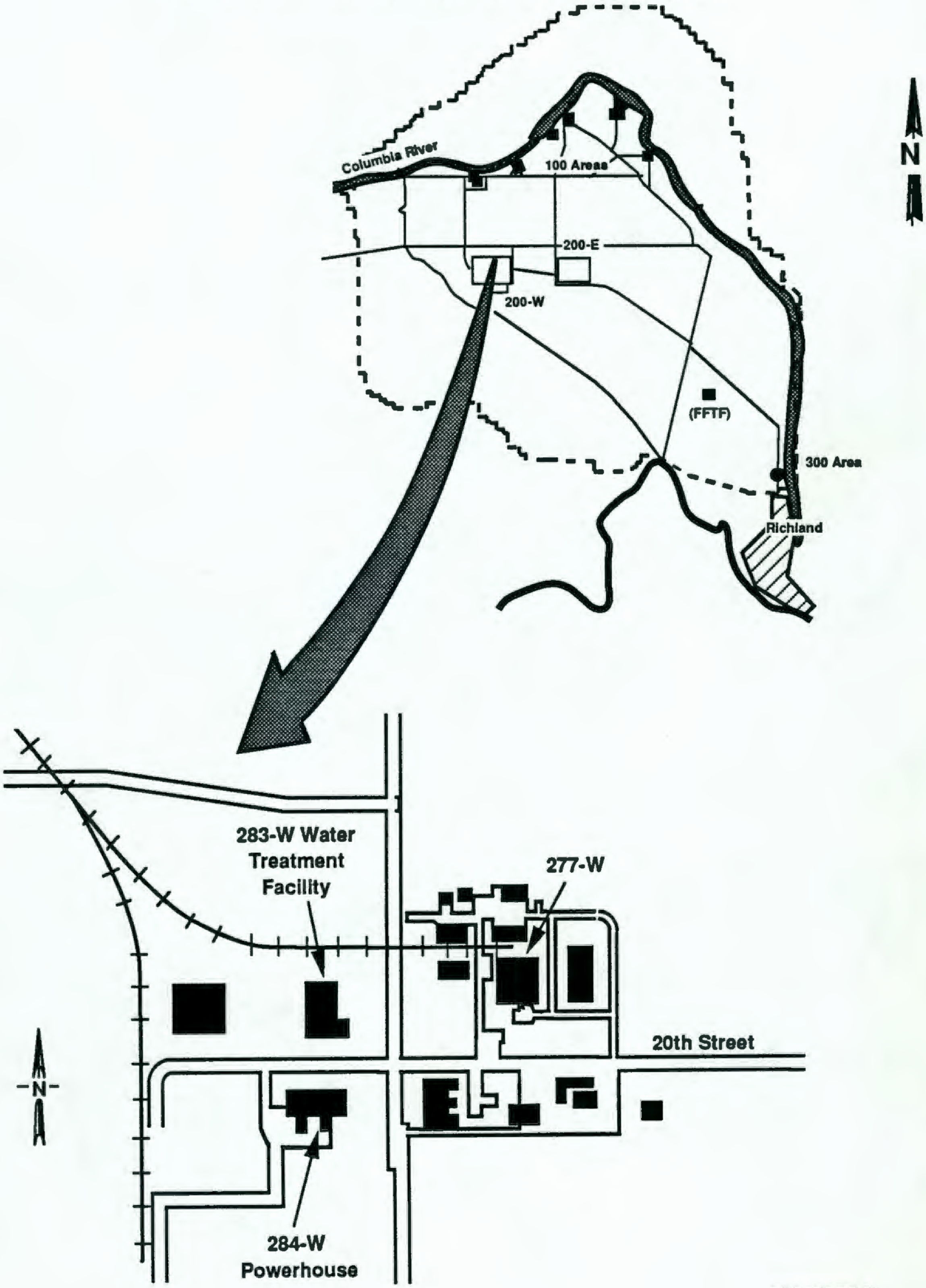
Stream designation involves the identification and characterization of all contributing sources of the effluent. Three contributing sources have been identified by reviewing available drawings and by completing a field inspection. They are indicated as follows:

1. 284-W Powerplant Wastewater, routine operation
2. 284-W Powerplant Wastewater, softener regeneration
3. 284-W Powerplant Wastewater, blowdown.

The scope of this report is restricted to these wastestream contributors and does not include any other wastestreams such as solid packaged waste, gaseous waste, or sanitary waste from the 284-W Powerplant.

The characterization samples used in the body of this report were collected from October 1989 to March 1990 and are for routine operation. The body of this report concerns only routine operation designation. The softener regeneration and blowdown activities were sampled before October 1989. While good data were collected from samples taken before October 1989, there was no data validation program in place at that time. For this reason, data collected before October 1989 are not used in making the proposed designation but are included in Appendix A for comparison and completeness.

Figure 1-2. Aerial View of 284-W Powerplant.



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2.0 PROCESS KNOWLEDGE

This section presents a qualitative and quantitative process knowledge based characterization of the chemical and radiological constituents of the 284-W Powerplant Wastewater stream. These process data are discussed in terms of the following factors:

1. Location and physical layout of the process facility
2. The identity of the wastestream contributors
3. A general description of the present, past, and future activities of the process and a description of the administrative controls put in place to regulate potentially hazardous materials
4. The identity of concentration of the constituents of each contributor.

Since no on-line monitoring capability exists for this waste stream, administrative control have been put in place to keep stream constituents to concentrations well within legal bounds. These administrative controls are also addressed in this section.

The physical layout of the 284-W Powerplant and effluent stream contributors is described in Section 2.1. A description of the contributors, in terms of their volumes and sources, is given in Section 2.2 and the process description and administrative controls are in Section 2.3. The constituents in the contributors are described in Section 2.4.

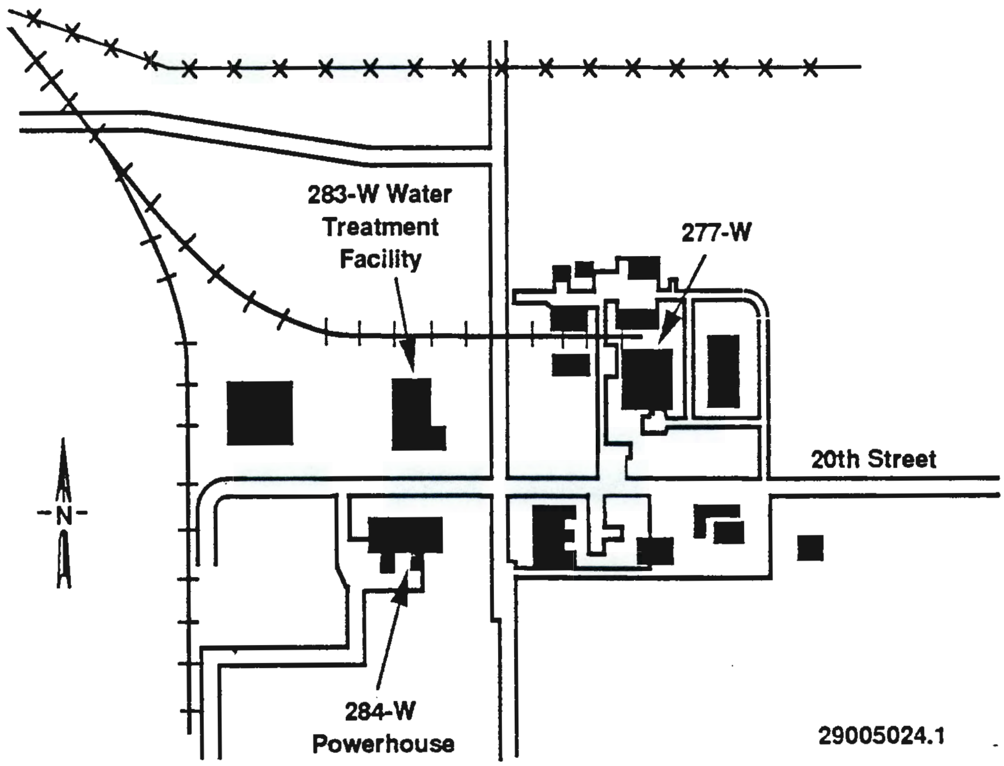
2.1 PHYSICAL LAYOUT

Figure 2-1 shows the location of the 284-W Powerplant in relation to surrounding buildings.

The 284-W Powerplant Wastewater has three contributors that correspond to different Powerplant operating configurations. These are wastewater discharged during routine operations, wastewater discharged during the batch process of water softener regeneration, and wastewater discharged during equipment blowdown. All three contributors of the 284-W Powerplant Wastewater are discharged to the soil column via a facility known as the 216-U-14 Percolation Pond.

A schematic drawing of the equipment and associated flowpaths in the 284-W Powerplant is shown in Figure 2-2. The figure depicts the overall flowpaths of the three contributors to the effluent as well as the point at which the samples were taken for the chemical analyses included in this report. It also depicts the 282-W Reservoir, the 283-W Water Treatment Facility, and their respective waste flows to the 216-U-14 Percolation Pond.

Figure 2-1. Building Schematics.



9 1 1 2 0 4 7 0 6 0 1

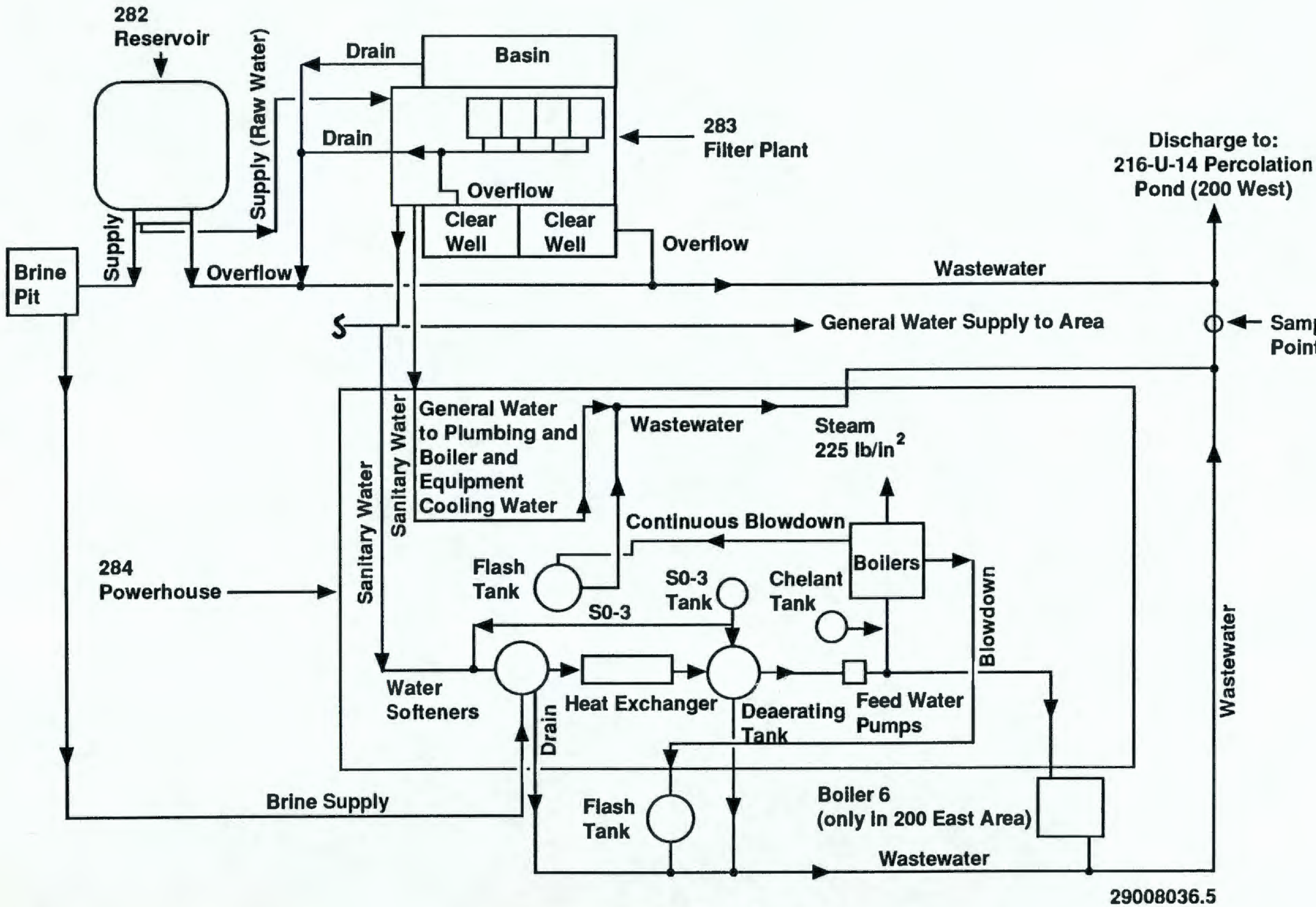


Figure 2-2. Flow Schematic of the 284-W Powerplant.

Water for the 284-W Powerplant is delivered from the 283-W Water Treatment Facility. In operation, the 283-W Water Treatment Facility filters river water supplied to it from the 100-B Area River Pumphouse. River water from the Columbia River is screened and then pumped to the 282-W Reservoir. This water is filtered by the 283-W Water Treatment Facility and has the chemicals alum and chlorine added to the water in the settling basin prior to filtration. This water is the source of sanitary water for all of the 200 West Area.

2.2 CONTRIBUTORS

Of the three contributors to the 284-W Powerplant Wastewater effluent, the "Routine Operation" contributor is the largest. It is a constant flow discharge and averages 3,250,000 gal/mo (12,300,000 L/mo) during routine operation with two boilers on line. Cooling water is used for such equipment as air compressors, turbines, generators, boiler water jackets, and feed pumps. The other two contributors are discharges from batch processes. The "softener regeneration" contributor is a spent brine solution that reconditions the zeolite water softener units. The softener regeneration contributor is the one with the highest concentration of dissolved solids, being about 9% sodium chloride by weight. The flowrate for the softener regeneration contributor averages about 150,000 gal/mo (568,000 L/mo). The "blowdown" contributor is a discharge from the operation of blowing down the boilers to remove scaling. It has an average monthly discharge of 50,000 gal/mo (189,000 L/mo) and contains boiler chemicals.

Contributor flowrates and constituent concentrations are variable, but predictable, if plant operation modes or configurations are considered. The 284-W Powerplant provides steam for heating of many 200 West Area buildings. Because of this, there is some seasonal variance in the flowrates, with winter flowrates being higher due to the increased demand for steam heating throughout the 200 Area during the colder months.

The janitorial sinks and drains in the 284-W Powerplant are not included in this effluent because they discharge to the sanitary sewer.

An engineering estimate can be made of the overall discharge flowrate based on operational and engineering knowledge. First, the flowrate of the softener regeneration is known because it is measured directly as an operational control parameter in the process of adding brine solution to the zeolite column. The other two contributors are not measured directly, but engineering estimates of their flowrate can be made based on powerplant production. Addition of these three flowrates gives a total estimated average monthly flowrate for the 284-W Powerplant Wastewater effluent of 3,450,000 gal/mo (13,100,000 L/mo).

2.3 PROCESS DESCRIPTIONS

The process associated with the 284-W Powerplant Wastewater is steam production. In this process, purified water from the 283-W Water Treatment Facility is heated in coal-fired boilers to produce steam. During this process, three major discharges of wastewater occur; these combine to make up the 284-W Power Wastewater effluent. The biggest single discharge is associated with the purified water used to cool various components in the powerplant. This discharge averages a flowrate of approximately 3,250,000 gal/mo (12,300,000 L/mo) over estimates. The most concentrated single discharge, in terms of dissolved solids, is the waste brine solution used to regenerate the zeolite water softener columns in the plant. This waste is approximately 9% sodium chloride by weight. Other minor constituents in it bring the total concentration of dissolved solids to almost 10% by weight. The discharge has an average monthly flowrate of 150,000 gal/mo (568,000 L/mo), although the source of it is a batch process. The remaining discharge comes from blowdown of scale from inside the boilers. This discharge is about 50,000 gal/mo (189,000 L/mo) and contains boiler scale mixed with dissolved residual oxygen scavenging chemicals (the latter being in very low concentrations). Sulfonated styrene copolymer phosphate is used as a scaling compound and sodium sulfite is used as an oxygen scavenging agent. The pressure of the effluent in the discharge piping is reduced from system pressure to atmospheric pressure in the flash tanks before the effluent is discharged.

For the purposes of this report, the discharge associated with the plant component cooling is referred to as 284-W Powerplant Wastewater, routine operations; the one associated with the zeolite regeneration is referred to as 284-W Powerplant Wastewater, softener regeneration; and the one associated with boiler blowdown is referred to as 284-W Powerplant Wastewater, blowdown. As stated in Section 1.3, the scope of this report is to propose a designation for the 284-W Powerplant based on routine operations samples drawn after October 1989.

2.3.1 Present Activities (October 1989--March 1990)

The 284-W Powerplant has steam production as its only function. In order to make steam, sanitary water is sent through a water softener to remove as many minerals and chlorine as possible. The softened water is then introduced into one of the 284-W Powerplant coal-fired boilers and boiled into steam. The steam is superheated 52 to 54° F (about 225 lb pressure) before being introduced into distribution piping for the entire 200 East Area.

Minerals remaining in the water are naturally concentrated into a sludge in the process of boiling off the water. This sludge is removed in a process called "blowdown." The water softener adsorption beds, made of zeolite, are regenerated by backwashing them with a 9% brine solution.

The 284-W Powerplant has four "D" configuration boilers.

Present activities associated with the combined discharges that make up the 284-W Powerplant Wastewater effluent are in support of steam production in the 284-W Powerplant. There are no major process changes planned for the future, although there could be minor changes made to improve operational performance of the powerplant.

2.3.2 Past Activities (before October 1989)

Past activities have been essentially the same as they are today (i.e., steam production). One change of regulatory significance was made in late 1989 when the brine concentration in the zeolite water softener regeneration solution was lowered to 9% by weight. The change was achieved by resetting plant valve adjustments and verifying the changes by obtaining brine level graphs of the input brine concentration. This change was implemented to give a high confidence level that the overall concentration of the waste solution from the process would always be well below environmental regulatory threshold limits.

2.3.3 Future Activities

Future plans for the 284-W Powerplant are for the continued operation of the powerplant as a steam production facility. There are no Tri-Party Agreement milestones associated with the 284-W Powerplant and there are no major changes planned that would significantly affect the effluent. One minor change is to replace sulfonated styrene copolymer phosphate with potassium hydroxide for scaling control in the boilers.

2.3.4 Administrative Controls

Administrative controls have been enacted to implement the overall policy of conducting operations to meet the requirements, intent, and spirit of all applicable federal, state, and local environmental laws, regulations, and standards. A program of regulatory compliance based on the requirements of applicable environmental laws and input from appropriate regulatory agencies has been developed.

2.3.4.1 General 284-W Powerplant Wastewater Management. Since current technology does not exist for on-line (real-time) monitoring for all regulated materials, the Steam and Water Utilities Management has incorporated administrative controls as an aid to regulate use of the 284-W Powerplant Wastewater.

2.3.4.2 General Requirements. The administrative controls have general requirements that apply to all activities associated with regulated materials.

Training is a very important function of the administrative controls. General training courses concerning hazardous materials are given to all employees, and specific training is given to employees working with regulated materials or in areas where they may come into contact with them. This training program includes annual refresher training, and is the first-line defense against an employee unknowingly disposing of regulated material in an unsafe manner.

A general requirement that acts as an important control is the system of frequent surveillances and inspections with the associated action findings and follow-up inspections. These are conducted on a regular basis and are supplemented with random surveillances.

2.3.4.3 Specific Requirements. Administrative Controls for materials regulated by Ecology, EPA, and DOE have the clear goal of assuring that no regulated dangerous (hazardous) material is released into Hanford sewer systems.

Specific activity control is maintained by the use of detailed, written procedures. These outline proper handling of materials as an aid to assure regulatory compliance. They are updated as needed when new regulatory requirements are mandated.

In terms of the management of sinks and drains, there are several stipulations. The most important one is that no dangerous (hazardous) waste shall be disposed of in drains. In the cases of new installations of floor drains or janitorial sinks, extra consideration is given to the location of them so that any accidental spills will not result in a prohibited discharge to the 284-W Powerplant Wastewater. Currently, there are no sink or floor drains which feed into the 284-W Powerplant Wastewater.

There are also several requirements for the acquisition, storage, use, and disposal of materials. They are to be physically controlled so that the risks of them entering the Hanford sewer systems are minimized. This is achieved by placing them, wherever possible, at distances removed from entry points to the sewer system. Also, physical barriers such as closed doors and dams are utilized wherever possible.

2.3.4.4 "Diligent Search". A very important new administrative control is a documented "diligent search." In this activity, a written record is maintained when an inspection is made of a facility for materials or activities that have a direct bearing on the environmental compliance of that facility. In the case of preparation of this report the "diligent search" encompassed review of appropriate documentation and inspection of selected operating activities for product and waste handling. This was to assure that an accurate proposed designation of the 284-W Powerplant Wastewater could be presented in this report.

Documentation reviewed included Material Safety Data Sheets, Superfund Amendments and Reauthorization Act (SARA) 312 inventory reports, dangerous waste shipping reports, and facility operating procedures. A facility inspection was made that covered inspection of activities associated with wastewater management as well as solid waste shipping. The inspection included discussions with facility staff on procedures relating to the 284-W Powerplant Wastewater contributor disposal practices that were not being conducted at the time of the visits.

Results of the "diligent search" and the potential for prohibited disposal of materials in the 284-W Powerplant Wastewater are incorporated in the discussions of Section 5.0.

2.4 PROCESS DATA

The chemical constituents of the wastewater are those normally associated with steam production. Although the 284-W Powerplant is located on the Hanford Site, there are no activities conducted in it that involve work with radioactive materials. A constituent of environmental regulatory interest is sodium chloride because of its high concentration. The concentration is controlled to ensure a high level of confidence that the concentration limit for a Category D toxic waste is not exceeded. Other constituents added to the process waters that become discharged in the waste effluent are sodium hydroxide, a caustic; sulfonated styrene copolymer phosphate a common solvating agent; and sodium sulfite, which acts as an oxygen scavenger.

Chemical reaction between the three contributors is of little regulatory significance because they are very unlikely to react together in a way that produces an effluent that will be more potentially harmful to the environment. There are two reasons for this. The first is that the concentrations of most of the constituents in the contributors are low, parts per million at most, so that reaction rates are very slow. The high concentration of sodium chloride is an exception to this, but as the compound is a neutral salt, it usually exhibits a benign chemistry. The second reason for little reaction to occur between contributors is that their chemistries are very compatible. For example, there is little difference in bulk oxidative potentials between them for a "redox" reaction of significance to occur. Also, there is not sufficient enough differences in any of their pH values to indicate a neutralization reaction of regulatory significance could occur.

Few products are warehoused in the 284-W Powerplant. For those that are, there is only a remote possibility they would ever be discharged in the effluent. They are stored at safe distances well removed from the few available points of entry to it. Liquid products are kept in storage areas with spill containment and solid products are generally in rooms with doors that are only opened when products are transferred. In the event of a spill, there is an applicable Building Emergency Plan for the 284-W Powerplant that contains instructions on spill response. The spill history for the facility indicates no spills of significant operational or environmental safety have occurred since it has been necessary to keep such records.

Based on process knowledge, all of the constituents of the contributors, except for sodium and chloride ions, are estimated to be found only in dilute (parts per million) concentrations. The basis for this is that they are added in small quantities and there is considerable dilution from the prime contributor, the cooling wastewater. Sodium and chloride ions are present in much higher concentrations because the brine solution used in zeolite water softener regeneration is at 9% sodium chloride concentration by weight.

Any variations in flowrate are can be related to the seasons of the year. The most significant correlation can be made for when the demand for steam heating increases during the cooler months. Otherwise, little variation in chemical constitution occurs because steam producing operations in the facility are similar throughout the year.

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3.0 SAMPLE DATA

This section provides an evaluation of the sampling data pertaining to the 284-W Powerplant Wastewater stream. These data contain both chemical data and radiological data.

3.1 DATA SOURCE

Only the "Routine Operations" data presented in the body of this report are new (October 1989 to March 1990). Data presented in Appendix A for "Softener Regeneration" and "Blowdown" activities pre-date the "Routine Operations" data and are not used in making the current waste designation proposal (Section 1.3).

3.1.1 Sample Data

The sampling data are made up of two distinct types, the chemical data set and the radiological data set, however both sets are reported together in this report. The new data utilized in this section which is associated with the "Routine Operations" plant configuration was obtained from samples taken after October 1, 1990 and are included in Appendix A. All old data utilized in this section, associated with the "Softener Regeneration" and "Blowdown" configurations, are also contained in Appendix A.

Table 3-1 is a listing of the different analytical methods used on each new sample. Table 3-2 is a listing of the statistics associated with each new sample.

3.1.1.1 Chemical. The new chemical data was obtained from four samples taken after October 1, 1989 and not reported previously. The samples were obtained from a common sampling point (Figure 2-2).

The samples were chemically analyzed at a contract laboratory. A description of the sampling techniques and analytical procedures is beyond the scope of this report. However, details of the sampling and analytical procedures used are described in Volume 4 of the *Waste Stream Characterization Report* (WHC 1989).

3.1.1.2 Radiological Data. The 284-W Powerplant is not in a radiation zone, and no radioactive processes or activities are conducted at the facility. However, routine radiological checks are made and radiological analyses are performed on the Hanford Site at the 222-S Laboratory.

The data analysis convention used in the 222-S Laboratory is as follows. The value reported represents a composite of two tests: the level of radionuclides found in the sediment and the level of radionuclides found in the

Table 3-1. Procedures for 284-W Powerplant Cooling Water--
Routine Operation Samples. (sheet 1 of 2)

LEAD# CofC#	50760 50760	50865 50865	50996 50996	51056 51056
Alkalinity	X	X	X	X
Alpha counting	X	X		
Ammonia	X	X	X	X
Arsenic	X	X	X	X
Atomic emission spectroscopy	X	X	X	X
Beta counting	X	X		X
Conductivity-field	X	X	X	X
Cyanide	X	X	X	X
Direct aqueous injection (GC)	X	X	X	X
Fluoride (LDL)	X	X	X	X
Gamma energy analysis	X	X		X
Hydrazine	X	X	X	X
Ion chromatography	X	X	X	X
Lead	X	X	X	X
Mercury	X	X	X	X
pH-field	X	X	X	X
Selenium	X	X	X	X
Semivolatile organics (GC/MS)	X	X	X	X
Sulfide	X	X	X	X
Suspended solids	X	X	X	X
Temperature-field	X	X	X	X
Thallium	X	X	X	X
Total carbon	X	X	X	X
Total dissolved solids	X	X	X	X
Total organic carbon	X	X	X	X
Total organic halides (LDL)	X	X	X	X
Total radium alpha counting		X		X
Tritium	X	X		X
Uranium	X	X		X
Volatile organics (GC/MS)	X	X	X	X
LEAD# CofC#	50760B 50761	50865B 50866	50996B 50997	51056B 51057
Volatile organics (GC/MS)	X	X	X	X
LEAD# CofC#	50760T 50762	50865T 50867	50996T 50998	51056T 51058
Volatile organics (GC/MS)	X	X	X	X

Table 3-1. Procedures for 284-W Powerplant Cooling Water--Routine Operation Samples. (sheet 2 of 2)

LEAD# CofC#	50760E 50763	50865E 50868	50996E 50999	51056E 51059
Atomic emission spectroscopy	X	X	X	X
Ignitability	X	X	X	X
Mercury (mixed matrix)	X	X	X	X
Reactive cyanide	X	X	X	X
Reactive sulfide	X	X	X	X

Notes: Procedures that were performed for a given sample are identified by an "X". Procedure references appear with the data. LEAD# is the Liquid Effluent Analytical Data number that appears in the data reports. CofC# is the chain-of-custody number. Abbreviations: gas chromatography (GC), low-detection limit (LDL), mass spectrometry (MS).

Table 3-2. Statistics for 284-W Powerplant Wastewater--
Routine Operation. (sheet 1 of 2)

Constituent	N	MDA	Method	Mean	StdErr	90%CILim	Maximum
Aluminum	4	1	DL	2.08E+02	5.11E+01	2.92E+02	3.61E+02
Arsenic (EP Toxic)	4	4	n/a	<5.00E+02	0.00E+00	<5.00E+02	<5.00E+02
Barium	4	0	n/a	2.43E+02	1.97E+02	5.65E+02	8.33E+02
Barium (EP Toxic)	4	3	DL	1.01E+03	1.00E+01	1.03E+03	1.04E+03
Boron	4	0	n/a	6.02E+01	3.07E+01	1.10E+02	1.50E+02
Cadmium	4	3	DL	4.25E+00	2.25E+00	7.94E+00	1.10E+01
Cadmium (EP Toxic)	4	4	n/a	<1.00E+02	0.00E+00	<1.00E+02	<1.00E+02
Calcium	4	0	n/a	1.98E+05	1.80E+05	4.93E+05	7.39E+05
Chloride	4	0	n/a	7.31E+05	7.26E+05	1.92E+06	2.91E+06
Chromium (EP Toxic)	4	4	n/a	<5.00E+02	0.00E+00	<5.00E+02	<5.00E+02
Cobalt	4	3	DL	2.65E+01	6.50E+00	3.71E+01	4.60E+01
Copper	4	2	DL	1.12E+01	1.25E+00	1.33E+01	1.50E+01
Fluoride	4	0	n/a	1.64E+02	4.13E+00	1.71E+02	1.74E+02
Iron	4	0	n/a	1.04E+02	3.28E+01	1.58E+02	1.71E+02
Lead (EP Toxic)	4	4	n/a	<5.00E+02	0.00E+00	<5.00E+02	<5.00E+02
Lithium	4	3	DL	1.72E+01	7.25E+00	2.91E+01	3.90E+01
Magnesium	4	0	n/a	7.23E+04	6.86E+04	1.85E+05	2.78E+05
Manganese	4	3	DL	9.50E+00	4.50E+00	1.69E+01	2.30E+01
Mercury	4	3	DL	4.10E-01	3.10E-01	9.18E-01	1.34E+00
Mercury (EP Toxic)	4	4	n/a	<2.00E+01	0.00E+00	<2.00E+01	<2.00E+01
Nitrate	4	3	DL	5.75E+02	7.50E+01	6.98E+02	8.00E+02
Potassium	4	0	n/a	8.74E+03	7.82E+03	2.16E+04	3.22E+04
Selenium (EP Toxic)	4	4	n/a	<5.00E+02	0.00E+00	<5.00E+02	<5.00E+02
Silicon	4	0	n/a	2.87E+03	2.08E+02	3.21E+03	3.22E+03
Silver (EP Toxic)	4	4	n/a	<5.00E+02	0.00E+00	<5.00E+02	<5.00E+02
Sodium	4	0	n/a	2.92E+05	2.73E+05	7.39E+05	1.11E+06
Strontium	4	0	n/a	1.01E+03	7.22E+02	2.20E+03	3.16E+03
Sulfate	4	0	n/a	2.68E+04	5.12E+03	3.52E+04	4.17E+04
Uranium	3	0	n/a	5.18E-01	7.40E-02	6.58E-01	6.15E-01
Vanadium	4	3	DL	5.00E+00	0.00E+00	5.00E+00	5.00E+00
Zinc	4	2	DL	2.20E+01	1.48E+01	4.62E+01	6.60E+01
Trichloromethane	4	2	DL	6.25E+00	1.25E+00	8.30E+00	1.00E+01
Alkalinity (Method B)	4	0	n/a	7.12E+04	3.20E+03	7.65E+04	7.80E+04
Beta Activity (pCi/L)	3	1	DL	3.15E+00	1.16E+00	5.33E+00	5.37E+00
Conductivity (uS)	4	0	n/a	4.14E+02	2.00E+02	7.42E+02	1.01E+03
Ignitability (degrees F)	4	0	n/a	2.05E+02	3.30E+00	2.00E+02	1.98E+02
pH (dimensionless)	4	0	n/a	9.04E+00	1.49E-01	9.29E+00	9.35E+00
Reactivity Cyanide (mg/kg)	4	4	n/a	<1.00E+02	0.00E+00	<1.00E+02	<1.00E+02
Reactivity Sulfide (mg/kg)	4	4	n/a	<1.00E+02	0.00E+00	<1.00E+02	<1.00E+02
Suspended Solids	4	3	DL	7.25E+03	2.25E+03	1.09E+04	1.40E+04
TDS	4	0	n/a	9.69E+05	8.57E+05	2.37E+06	3.54E+06
Temperature (degrees C)	4	0	n/a	1.39E+01	3.53E+00	1.97E+01	2.42E+01
TOC	2	0	n/a	1.30E+03	0.00E+00	1.30E+03	1.30E+03
Total Carbon	4	0	n/a	1.55E+04	5.31E+02	1.64E+04	1.68E+04
TOX (as Cl)	4	0	n/a	5.15E+01	1.38E+01	7.40E+01	7.70E+01

Table 3-2. Statistics for 284-W Powerplant Wastewater--
Routine Operation. (sheet 2 of 2)

STATISTICS REPORT FOOTNOTES

Mean values, standard errors, confidence interval limits and maxima are in ppb (parts per billion) unless indicated otherwise.

The column headed MDA (Minimum Detectable Amount) is the number of results in each data set below the detection limit.

The column headed Method shows the MDA replacement method used: replacement by the detection limit (DL), replacement of single-valued MDAs by the log-normal plotting position method (LM), or replacement of multiple valued MDAs by the normal plotting position method (MR).

The column headed "90%CILim" (90% Confidence Interval Limit) is the lower limit of the one-tailed 90% confidence interval for all ignitability data sets and pH data sets with mean values below 7.25. For all other data sets it is the upper limit of the one-tailed 90% confidence interval.

The column headed "Maximum" is the minimum value in the data set for ignitability, the value furthest from 7.25 for pH, and the maximum value for all other analytes.

filtrate portion of the sample. The following rule is applied to the data: if the contribution of either the sediment data or the filtrate data represents a fraction greater than 10% of the total and is at a lower limit of detection, then a less than (<) symbol precedes the result.

3.2 DATA PRESENTATION

The range of the data encompasses all of the chemical species for which the samples were analyzed. This wide range was possible because of the use of sophisticated, modern techniques of chemical analysis with computerized spectra comparison capability.

New data, taken after October 1, 1990, is only available for the "Routine Operations" plant configuration contributor to the 284-W Powerplant Wastewater. The proposed designation will be made based on the data for routine operations since that data comprises the whole of the new data received and since the volume of routine operations chemically overwhelms the other contributors.

One of the analytical techniques used was gas chromatography combined with mass spectrometry computer evaluation of the data. The spectra obtained from the mass spectrometry were compared to the combined libraries of known spectra cataloged by EPA, the National Institute of Occupational Safety and Health, and the National Bureau of Standards. These libraries have more than 40,000 different chemical species cataloged.

A second technique used involved inductive coupled plasma for the analysis of metals. This highly sensitive technique can detect most of the metals of regulatory interest.

It should be noted for the purposes of this report that detection is based on the contract laboratory contract detection limits. These limits are usually moderately higher than instrument detection limits or state-of-the-art detection limits in current scientific literature.

The data have been evaluated to determine what chemical compounds are present that could be subject to environmental regulation. The procedure used was to consider all the possible chemical compounds that could be made from the chemical species found in the four samples. This was accomplished by comparing all the possible cation-anion combinations of ions that could form compounds of potential regulatory interest. All of the organic compounds were then added to make up the final listing. The listing obtained is shown in Table 5-1 and comprises compounds or classes of compounds potentially subject to regulation as "dangerous wastes or dangerous waste constituents." There are six classes of compounds based on metals and compounds "not otherwise specified."

4.0 DATA OVERVIEW

This section presents a comparison of the sampling data set (see Section 3.0) with chemical background levels obtained by testing water from the 282-W Raw Water Reservoir. This section also presents calculated 284-W Powerplant Wastewater contaminant deposition rates to the 216-U-14 Percolation pond, and hence, to the soil column.

4.1 DATA COMPARISON

Table 4-1 compares the 284-E Powerplant Wastewater--Routine Operations with current drinking water standards for chemicals, and the Derived Concentrations Guides for radioactivity.

4.2 STREAM DEPOSITION RATES

Table 4-2 is a listing of the calculated stream contaminant deposition rates into the 216-U-14 Percolation Pond. Table entries are arrived at by multiplying the average contaminant concentrations by the average monthly flow of the three contributors to the 284-Powerplant Wastewater stream.

Table 4-1. Evaluation of 284-W Powerplant Wastewater--
Routine Operation.

Constituent	Result a	SV1 b	SV2 c
Aluminum	2.1E-01	5.0E-02 f *	
Barium	2.4E-01	5.0E+00 g	
Cadmium	4.3E-03	5.0E-03 e	
Chloride	7.3E+02	2.5E+02 h *	
Copper	1.1E-02	1.0E+00 h	
Fluoride	1.6E-01	2.0E+00 g	
Iron	1.0E-01	3.0E-01 h	
Manganese	9.5E-03	5.0E-02 h	
Mercury	4.1E-04	2.0E-03 g	
Nitrate	5.8E-01	4.5E+01 e	
Sulfate	2.7E+01	2.5E+02 h	
Zinc	2.2E-02	5.0E+00 h	
Trichloromethane (j)	6.3E-03	1.0E-01 g	
Beta Activity (pCi/L)	3.1E+00		1.0E+03
TDS	9.7E+02	5.0E+02 h *	

Footnotes:

(a) Units of results are mg/L unless indicated otherwise. The results are the mean values reported in the Statistics table of Chapter 3.

(b) Screening Value 1 (SV1) lists the value first, basis second and an asterisk (*) third if the result exceeds the regulatory value. The basis is the proposed primary MCL (e), the proposed secondary MCL (f), the primary MCL (g), or the secondary MCL (h). The value is the smaller of two MCLs: the proposed primary MCL (or the primary MCL as a default) or the proposed secondary MCL (or the secondary MCL as a default).

(c) Screening Value 2 (SV2) lists the value first and an asterisk (*) second if the result exceeds the SV2). These values are derived concentration guides obtained from Appendix A of WHC-CM-7-5, "Environmental Compliance Manual", Revision 1, January 1990.

(j) The SV1 value for trihalomethanes is used to evaluate trichloromethane results.

(o) The SV2 for Gross Beta is used to evaluate Beta Activity.

Table 4-2. Deposition Rate for 284-W Powerplant Wastewater--Routine Operation (Flowrate: 1.31E+07 L/mo).

Constituent	Kg/L*	Kg/mo*
Aluminum	2.08E-07	2.72E+00
Barium	2.43E-07	3.17E+00
Boron	6.02E-08	7.86E-01
Cadmium	4.25E-09	5.55E-02
Calcium	1.98E-04	2.59E+03
Chloride	7.31E-04	9.55E+03
Cobalt	2.65E-08	3.46E-01
Copper	1.12E-08	1.46E-01
Fluoride	1.64E-07	2.14E+00
Iron	1.04E-07	1.36E+00
Lithium	1.72E-08	2.25E-01
Magnesium	7.23E-05	9.44E+02
Manganese	9.50E-09	1.24E-01
Mercury	4.10E-10	5.35E-03
Nitrate	5.75E-07	7.51E+00
Potassium	8.74E-06	1.14E+02
Silicon	2.87E-06	3.75E+01
Sodium	2.92E-04	3.81E+03
Strontium	1.01E-06	1.32E+01
Sulfate	2.68E-05	3.50E+02
Uranium	5.18E-10	6.76E-03
Vanadium	5.00E-09	6.53E-02
Zinc	2.20E-08	2.87E-01
Trichloromethane	6.25E-09	8.16E-02
Beta Activity *	3.15E-12	4.11E-05
Suspended Solids	7.25E-06	9.47E+01
TDS	9.69E-04	1.27E+04
TOC	1.30E-06	1.70E+01
Total Carbon	1.55E-05	2.02E+02
TOX (as Cl)	5.15E-08	6.72E-01

Footnotes:

Data collected from October 1989 through March 1990.

Flow rate is the average of rates from Chapter 2.

Constituent concentrations are average values from the Statistics Report in Chapter 3.

Concentration units of flagged (*) constituents are reported as curies per liter.

Deposition rate units of flagged (*) constituents are reported as curies per month.

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5.0 DESIGNATION

This section proposes that the 284-W Powerplant Wastewater stream not be designated a dangerous waste. This proposed designation uses data from both the effluent source description and sample data (Sections 2.0 and 3.0) and complies with the designation requirements of WAC 173-303-070.

The Washington State Dangerous Waste Regulations (WAC 173-303-070) contains a procedure for determining if a waste is dangerous. This procedure is illustrated in Figure 5-1 and includes the following:

- Dangerous Waste Lists (WAC 173-303-080)
- Dangerous Waste Criteria (WAC 173-303-100)
- Dangerous Waste Characteristics (WAC 173-303-090).

5.1 DANGEROUS WASTE LISTS

A waste is considered a dangerous waste if it either contains a discarded chemical product (WAC 173-303-081) or originates from a dangerous waste source (per WAC 173-303-082). The proposed designation was based on a combination of process knowledge and sampling data.

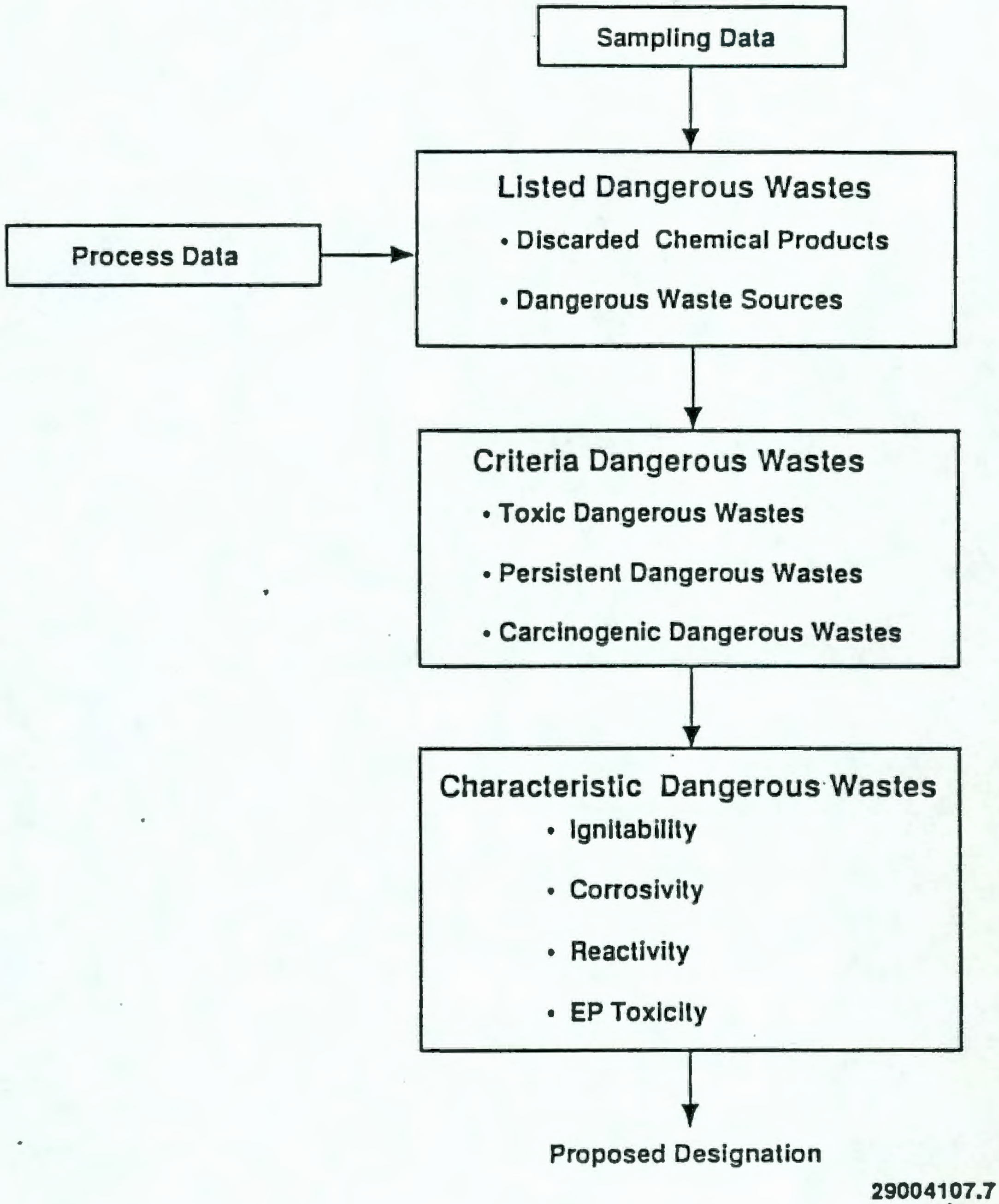
5.1.1 Discarded Chemical Products

A wastestream constituent is a discarded chemical product (WAC 173-303-081) if it is listed in WAC 173-303-9903 and is characterized by one or more of the following descriptions.

- The listed constituent is the sole active ingredient in a commercial chemical product which has been discarded. Commercial chemical products which, as purchased, contained two or more active ingredients were not designated as discarded chemical products. Products which contained nonactive components such as water, however, were designated if the sole active ingredient in the mixture was listed in WAC 173-303-9903.

- The constituent results from a spill of unused chemicals. (A spill of a discarded commercial chemical product would cause a wastestream to be designated during the time that the discharge is occurring. The approach taken is that the current wastestream would not be designated unless a review of past spill events indicates that the spills are predictable, systematic events that are ongoing or are reasonably anticipated to occur in the future. In this report, the evaluation of this criterion is based on a review of spill data reported to Ecology.)

Figure 5-1. Designation Strategy.



- The constituent is discarded in the form of a residue resulting from cleanup of a spill of an unused commercial chemical on the discarded commercial chemical products list. (A chemical product that is used in a process and then is released in a wastewater is not a discarded chemical product. Off-specification, unused chemicals, and chemicals that have exceeded a shelf life but have not been used are considered discarded chemical products.)

5.1.2 Dangerous Waste Sources

A list of dangerous waste sources is contained in WAC 173-303-9904, pursuant to WAC 173-303-082. There are three major categories of sources in WAC 173-303-9904. The first is nonspecific sources from routine operations occurring at many industries. The second is specific sources (e.g., wastes from ink formulation, etc.). The third is state sources, which are limited to polychlorinated biphenyl contaminated transformers and capacitors resulting from salvaging, rebuilding, or discarding.

Of the nonspecific sources, only F001 (specified spent halogenated degreasing solvents), F002 (specific spent halogenated solvents), F003 (specific spent nonhalogenated solvents), and F005 (specific spent nonhalogenated solvents) apply to the CBC stream.

5.2 LISTED WASTE DATA CONSIDERATIONS

The proposed designation of the wastestream described in this report is based on an evaluation of process and sampling data. The following sections describe the types of information used in this designation.

5.2.1 Process Evaluation

The process evaluation began with a thorough review of the processes contributing to the wastestream. Processes were reviewed and compared with the discarded chemical products list and the dangerous waste source list. This process evaluation is necessary because the stream could be a listed waste if a listed waste was known to have been added at any upstream location, even if a listed constituent was not detected at the sample point. The process evaluation included a review of the following information sources:

- Material Safety Data Sheets
- SARA Inventory reports
- Operating procedures
- Process chemical inventories
- Physical inspections, where possible.

Additionally, appropriate interviews with facility personnel were conducted to determine if there were any activities or laboratory processes that generated a listed waste which may not have been evident during other portions of the process evaluation.

If a listed chemical was identified, the specific use of the chemical was evaluated to determine if such use resulted in the generation of a listed waste.

5.2.2 Sampling Data

Sampling data were used as screening tools to enhance and support the results of the process evaluation. This screening compared the results of the sampling data with the WAC 173-303-9903 and -9904 lists. If a constituent was cited on one or both of these lists, an engineering evaluation was performed to determine if the constituent had entered the wastestream as a discarded chemical product or came from a dangerous waste source.

Screening organic constituents is a simple procedure because analytical data for organic constituents are reported as neutral substances and are easily compared to the WAC 173-303-9903 and -9904 lists. It is not as simple to screen inorganic analytical data because inorganic data are reported as ions rather than as neutral substances. For example, an analysis may show that a wastestream contains the cations sodium and calcium along with the anions chloride and nitrate. The possible combinations of neutral substances in this simple example include: sodium chloride, sodium nitrate, calcium chloride, and calcium nitrate. In a situation with many cation and anions, however, the list of possible combinations is extensive.

A procedure was developed by Westinghouse Hanford Company for combining the inorganic constituents into neutral substances. This screening procedure is described in Jungfleisch (1990) and is intended to be a tool in the evaluation of a wastestream. The listing of the inorganic compounds developed by this screening procedure is not intended to be an indication that the compound was discharged to the wastestream, only that the necessary cations and anions are present and an investigation should be conducted to determine how they entered the wastestream. Table 5-1 documents how ion analytes were assigned to neutral substances which are required for designation. The table accounts for charge balancing the ion assemblage (from Table 3-2) and the subsequent formulation of neutral substances. A detailed discussion can be found in Jungfleisch (1990).

5.3 PROPOSED LISTED WASTE DESIGNATIONS

A "diligent search," as described in Section 2.3.4.4, was conducted at the 284-W Powerplant. One of the purposes of this search was to determine if any of the potentially discarded chemical products listed in the Waste Designation Report of Table 5-2 were indeed located or inventoried in the facilities that discharge wastewaters to the 284-W Powerplant Wastewater stream. Another purpose of the search was to verify that if such listed chemical products were found in the facilities, they were not being improperly disposed of into the wastewater. During the course of the search, no chemical products on the WAC 173-303-9903 "Discarded chemical products list" were discovered in the facilities.

Table 5-1. Inorganic Chemistry for 284-W Powerplant Wastewater--Routine Operation. (sheet 1 of 2)

CHARGE NORMALIZATION

Constituent	ppb	Ion	Eq/g	Normalized
Aluminum	2.92E+02	Al+3	3.25E-08	
Barium	5.65E+02	Ba+2	8.23E-09	
Boron	1.10E+02	B4O7-2	5.11E-09	6.72E-09
Cadmium	7.94E+00	Cd+2	1.41E-10	
Calcium	4.93E+05	Ca+2	2.46E-05	
Chloride	1.92E+06	Cl-1	5.42E-05	7.13E-05
Cobalt	3.71E+01	Co+2	1.26E-09	
Copper	1.33E+01	Cu+2	4.19E-10	
Fluoride	1.71E+02	F-1	9.00E-09	1.18E-08
Iron	1.58E+02	Fe+3	8.47E-09	
Lithium	2.91E+01	Li+1	4.20E-09	
Magnesium	1.85E+05	Mg+2	1.52E-05	
Manganese	1.69E+01	Mn+2	6.14E-10	
Mercury	9.18E-01	Hg+2	9.15E-12	
Nitrate	6.98E+02	NO3-1	1.13E-08	1.48E-08
Potassium	2.16E+04	K+1	5.51E-07	
Silicon	3.21E+03	SiO3-2	2.29E-07	3.01E-07
Sodium	7.39E+05	Na+1	3.21E-05	
Strontium	2.20E+03	Sr+2	5.02E-08	
Sulfate	3.52E+04	SO4-2	7.33E-07	9.64E-07
Uranium	6.58E-01	UO2+2	5.53E-12	
Vanadium	5.00E+00	V+5	4.91E-10	
Zinc	4.62E+01	Zn+2	1.41E-09	
Hydrogen Ion (from pH 9.3)		H+	(5.15E-13)	
Hydroxide Ion (from pH)		OH-	(1.94E-08)	
Cation total			7.26E-05	
Anion total			5.52E-05	

Anion normalization factor: 1.316

SUBSTANCE FORMATION

Substance	%	Cation Out	Anion Out
Cadmium chloride	1.29E-06	0.00E+00	7.13E-05
Copper(II) chloride	2.81E-06	0.00E+00	7.13E-05
Mercury(II) chloride	1.24E-07	0.00E+00	7.13E-05
Uranyl nitrate	1.09E-07	0.00E+00	1.48E-08
Vanadium(V) oxide	8.93E-07	0.00E+00	
Iron(III) fluoride	3.19E-05	0.00E+00	3.37E-09
Cobalt(II) fluoride	6.11E-06	0.00E+00	2.11E-09
Potassium fluoride	1.23E-05	5.49E-07	0.00E+00
Barium chloride	8.57E-05	0.00E+00	7.13E-05
Zinc nitrate	1.34E-05	0.00E+00	1.34E-08

Table 5-1. Inorganic Chemistry for 284-W Powerplant Wastewater--Routine Operation. (sheet 2 of 2)

SUBSTANCE FORMATION

Substance	%	Cation Out	Anion Out
Aluminum nitrate	1.67E-04	1.91E-08	0.00E+00
Magnesium chloride	7.23E-02	0.00E+00	5.61E-05
Potassium chloride	4.09E-03	0.00E+00	5.55E-05
Calcium tetraborate	6.57E-05	2.46E-05	0.00E+00
Manganese(II) chloride	3.86E-06	0.00E+00	5.55E-05
Sodium chloride	1.88E-01	0.00E+00	2.34E-05
Calcium chloride	1.30E-01	1.22E-06	0.00E+00
Aluminum sulfate	5.73E-05	0.00E+00	9.45E-07
Lithium sulfate	2.31E-05	0.00E+00	9.40E-07
Strontium sulfate	4.61E-04	0.00E+00	8.90E-07
Calcium sulfate	6.06E-03	3.26E-07	0.00E+00

CHEMISTRY REPORT FOOTNOTES

Statistics based on a single datum are noted by an asterisk (*). With the exception of hydrogen ion and hydroxide, others report the upper limit of the one-tailed 90% confidence interval. Hydrogen ion is based on the lower limit of the one-tailed 90% confidence interval for pH sets with mean values below 7.25 and on the upper limit of the one-tailed 90% confidence interval for pH data sets with mean values of 7.25 or higher. The hydroxide magnitude is equal to 1.00E-20 (Eq/g)**2 divided by the hydrogen ion value (in Eq/g).

Ion concentrations in equivalents per gram (Eq/g) are based on the statistic. Conversions include scale (ppb to g/g), molecular weight (constituent form to ionic form), and equivalents (charges per ion). The column headed "Normalized" shows normalized concentrations (also in Eq/g) calculated by increasing concentrations of cations, excluding Hydrogen ion, or anions, excluding hydroxide, by the normalization factor. The normalization factor is the larger of the cation total, including Hydrogen ion, or anion total, including hydroxide, divided by the smaller total.

Substance names may include MB (monobasic), DB (dibasic), TB (tribasic) to identify the equivalents of hydrogen ion that have been neutralized from polyprotic weak acids to form their conjugate bases.

Substances are formulated in the order listed. The column headed "%" is the percent of the substance in the waste (g/100g). Substances formulated with oxygen are based on the residual concentration of the counterion. Other substance concentrations are based on the limiting residual concentration of the cation or anion. The columns headed "Cation Out" and "Anion Out" indicate the residual concentrations (in Eq/g) of each ion after a substance concentration has been calculated.

Table 5-2. Dangerous Waste Designation Report--Routine Operation. (sheet 1 of 2)

Dangerous Waste Data Designation Report for 284-W Powerhouse Wastewater-Routine Operation

Finding: Undesignated

Discarded Chemical Products - WAC 173-303-081

Substance	Review Number	Status	DW Number
Hydrogen fluoride	U134(DW)	Not Discarded	Undesignated
Mercury	U151(EHW)	Not Discarded	Undesignated
Vanadium(V) oxide	P120(EHW)	Not Discarded	Undesignated
Trichloromethane	U044(EHW)	Not Discarded	Undesignated

Dangerous Waste Sources - WAC 173-303-082

Substance	Review Number	Status	DW Number
None	None	Not applicable	None

Infectous Dangerous Waste - WAC 173-303-083

No regulatory guidance

Dangerous Waste Mixtures - WAC 173-303-084

Substance	Toxic EC%	Persistant HH%	Persistant PAH%	Carcinogenic Total%
Aluminum nitrate	1.67E-07	0.00E+00	0.00E+00	0.00E+00
Aluminum sulfate	5.73E-09	0.00E+00	0.00E+00	0.00E+00
Barium chloride	8.57E-08	0.00E+00	0.00E+00	0.00E+00
Cadmium chloride	1.29E-08	0.00E+00	0.00E+00	1.29E-06
Calcium chloride	1.30E-05	0.00E+00	0.00E+00	0.00E+00
Calcium tetraborate	6.57E-09	0.00E+00	0.00E+00	0.00E+00
Cobalt(II) fluoride	6.11E-09	0.00E+00	0.00E+00	0.00E+00
Copper(II) chloride	2.81E-07	0.00E+00	0.00E+00	0.00E+00
Iron(III) fluoride	3.19E-07	0.00E+00	0.00E+00	0.00E+00
Magnesium chloride	7.23E-06	0.00E+00	0.00E+00	0.00E+00
Manganese(II) chloride	3.86E-10	0.00E+00	0.00E+00	0.00E+00
Mercury(II) chloride	1.24E-08	0.00E+00	0.00E+00	0.00E+00
Potassium chloride	4.09E-07	0.00E+00	0.00E+00	0.00E+00
Potassium fluoride	1.23E-08	0.00E+00	0.00E+00	0.00E+00
Sodium chloride	1.88E-05	0.00E+00	0.00E+00	0.00E+00
Uranyl nitrate	1.09E-09	0.00E+00	0.00E+00	0.00E+00
Vanadium(V) oxide	8.93E-09	0.00E+00	0.00E+00	0.00E+00
Zinc nitrate	1.34E-08	0.00E+00	0.00E+00	0.00E+00
Trichloromethane	8.30E-08	8.30E-07	0.00E+00	8.30E-07
Total	4.04E-05	8.30E-07	0.00E+00	2.12E-06
DW Number	Undesignated	Undesignated	Undesignated	Undesignated

Dangerous Waste Characteristics - WAC 173-303-090

Characteristic	Value	DW Number
Ignitability (Degrees F)	>200	Undesignated
Corrosivity-pH	9.29	Undesignated
Reactivity Cyanide (mg/kg)	<1.00E+02	Undesignated
Reactivity Sulfide (mg/kg)	<1.00E+02	Undesignated
EP Toxic Arsenic (mg/L)	<5.00E-01	Undesignated
EP Toxic Barium (mg/L)	1.03E+00	Undesignated
EP Toxic Cadmium (mg/L)	<1.00E-01	Undesignated
EP Toxic Chromium (mg/L)	<5.00E-01	Undesignated
EP Toxic Lead (mg/L)	<5.00E-01	Undesignated
EP Toxic Mercury (mg/L)	<2.00E-02	Undesignated
EP Toxic Selenium (mg/L)	<5.00E-01	Undesignated
EP Toxic Silver (mg/L)	<5.00E-01	Undesignated

Table 5-2. Dangerous Waste Designation Report--Routine Operation. (sheet 2 of 2)

Dangerous Waste Data Designation Report for 284-W Powerhouse Wastewater-Routine Operation

Dangerous Waste Characteristics - WAC 173-303-090 - Continued

Characteristic	Value	DW Number

Dangerous Waste Criteria - WAC 173-303-100

Substance	Toxic EC%	Persistant HH%	Persistant PAH%	Carcinogenic Total%	DW Number-Positive
Aluminum nitrate	1.67E-07	0.00E+00	0.00E+00	0.00E+00	
Aluminum sulfate	5.73E-09	0.00E+00	0.00E+00	0.00E+00	
Barium chloride	8.57E-08	0.00E+00	0.00E+00	0.00E+00	
Cadmium chloride	1.29E-08	0.00E+00	0.00E+00	1.29E-06	Undesignated
Calcium chloride	1.30E-05	0.00E+00	0.00E+00	0.00E+00	
Calcium tetraborate	6.57E-09	0.00E+00	0.00E+00	0.00E+00	
Cobalt(II) fluoride	6.11E-09	0.00E+00	0.00E+00	0.00E+00	
Copper(II) chloride	2.81E-07	0.00E+00	0.00E+00	0.00E+00	
Iron(III) fluoride	3.19E-07	0.00E+00	0.00E+00	0.00E+00	
Magnesium chloride	7.23E-06	0.00E+00	0.00E+00	0.00E+00	
Manganese(II) chloride	3.86E-10	0.00E+00	0.00E+00	0.00E+00	
Mercury(II) chloride	1.24E-08	0.00E+00	0.00E+00	0.00E+00	
Potassium chloride	4.09E-07	0.00E+00	0.00E+00	0.00E+00	
Potassium fluoride	1.23E-08	0.00E+00	0.00E+00	0.00E+00	
Sodium chloride	1.88E-05	0.00E+00	0.00E+00	0.00E+00	
Uranyl nitrate	1.09E-09	0.00E+00	0.00E+00	0.00E+00	
Vanadium(V) oxide	8.93E-09	0.00E+00	0.00E+00	0.00E+00	
Zinc nitrate	1.34E-08	0.00E+00	0.00E+00	0.00E+00	
Trichloromethane	8.30E-08	8.30E-07	0.00E+00	8.30E-07	Undesignated
Total	4.04E-05	8.30E-07	0.00E+00	2.12E-06	
DW Number	Undesignated	Undesignated	Undesignated	Undesignated	

Dangerous Waste Constituents - WAC 173-303-9905

Substance
Hydrogen fluoride
Trichloromethane
Barium and compounds,NOS
Cadmium and compounds,NOS
Mercury and compounds,NOS

Substance names may include MB (monobasic), DB (dibasic), or TB (tribasic) to identify the equivalence of hydrogen ion that have been nutralized from polyprotic weak acids to form their conjugate bases.

Results based on a single datum are noted by an asterisk (*). Others are based on the lower limit of the one-tailed 90% confidence interval for pH data sets with mean values below 7.25 or by the upper limit of the one-tailed 90% confidence interval for all other data sets.

EP Toxic contaminants, ignitability, and reactivity are reported by standard methods when available. In the absence of EP Toxicity data, total contaminant concentrations are evaluated. In lieu of closed cup ignition results, ignitability is estimated from the sum of the contributions of all substances that are ignitable when pure. A waste is flagged as dangerous if sum of the ignitable substances exceeds one percent. Reactivity is by SW-846: 250 mg of cyanide as hydrogen cyanide per kg of waste or 500 mg of sulfide as hydrogen sulfide per kg of waste. Total cyanide and total sulfide are used in lieu of amenable cyanide and amenable sulfide.

Inorganic substances are fomulated and their possible concentrations calculated for designation purposes only. The actual existance in the waste of these substances is not implied and should not be infered.

For the purposed of this addendum, if a normal facility activity was identified that routinely is a source of a constituent, it is considered as a "primary" source for that constituent. A "secondary" source for a constituent is one that is identified as a potential source for that constituent. A secondary source may be proposed on the basis of process knowledge, known chemistry, or chemical engineering principles.

5.3.1 Discarded Chemical Products

Table 5-2 contains a list of four chemical products identified from sampling data. For these four compounds, although none were identified as being present in the facility, an attempt has been made to address the most probable reason for the appearance of them in Table 5-2.

5.3.1.3 Hydrogen Fluoride. Fluoride ion was identified in the wastewater. Consequently, the compound hydrogen fluoride is presented in the computer listing of chemical products in Table 5-2. However, it is not used in the facilities associated with the wastewater.

A secondary source of fluoride ion in the 284-W Powerplant Wastewater is the Columbia River because the water treatment process does not remove it. Fluoride ion is found in the river and in the 284-W Powerplant Wastewater at comparable concentrations.

5.3.1.2 Mercury. Mercury was identified in the most recent sample taken from the wastewater at a concentration of 1.34 ppb. Mercury is used in instruments at the 284-W Powerplant, but is not discarded into the 284-W Powerplant wastewater stream.

A secondary source for mercury ion is elution from the zeolite water softener column. Mercury has a larger ionic radius than many of the common cations present in the supply water to the water softener. Hence, toward the end of the cycle of the column, mercury could be displaced by ions of similar ionic charge. It may then be released to the wastewater.

In cases such as this, in which the mercury is identified at low concentration in only one sample, it is prudent to have the sample re-analyzed at a collaborative laboratory. The need for this action was not recognized at the time the sample was available for further analysis.

5.3.1.3 Vanadium(V) oxide. Vanadium ion was identified in just one of the four samples, and then only at a concentration comparable to the instrument detection limit. Consequently, vanadium(V) oxide is presented in the computer listing of chemical products in Table 5-2. However, it is not used in the facilities associated with the wastewater.

Vanadium is found in Columbia River water. A secondary source of it in the sample is a deficiency in the water purification process that allowed a higher than normal vanadium concentration to occur.

5.3.1.4 Trichloromethane. Trichloromethane is not used in the facilities associated with the wastewater. However, it was found in all four of the samples taken for waste designation.

Trichloromethane appeared in all samples taken from the wastewater stream and ranged from 5 ppb to 10 ppb. The threshold limit for trichloromethane based on sanitary water supplied to the 284-E Powerplant is 50 ppb as presented in Section 5.2 of WHC-EP-0342. Because the concentration of trichloromethane seen in all samples of this wastewater stream is less than the threshold limit, these data will not be considered in the designation of the wastewater as it is likely that it is present in these wastewater samples due to the presence of trichloromethane in the facility water supply.

5.3.2 Dangerous Waste Sources

Another purpose of the "diligent search," as described in Section 2.3.4.4, was to determine if any of the waste sources of the 284-W Powerplant Wastewater included any specific waste sources (K and W wastes) or any nonspecific waste sources (F wastes) in the "Dangerous waste source list," WAC 173-303-9904. The search verified that no regulated sources exist at the 284-W Powerplant facility that generate wastes that are improperly disposed of in the wastewater.

There were no chemicals appearing in Table 5-2 under the heading "Dangerous Waste Sources" for this wastestream.

5.4 DANGEROUS WASTE CRITERIA

A waste is considered a dangerous waste if it meets any of the following criteria categories (WAC 173-303-100): toxic dangerous waste, persistent dangerous waste, or carcinogenic dangerous waste. A description of the methods used to test the sampling data against the criteria is contained in Jungfleisch (1990). Summaries of the methods, along with the results, are contained in the following sections.

Dangerous waste criteria are considered separately for each operating mode of the facilities. The routine operations mode includes all wastewater sources for the plant, excluding wastewaters from water softener regeneration and blowdown. The softener regeneration mode includes all sources except blowdown, and the blowdown mode includes all sources except softener regeneration.

5.4.1 Toxic Dangerous Wastes

The procedure for determining if a wastestream is a toxic dangerous waste is as follows (WAC 173-303-101).

- Collect and analyze multiple samples from the wastestream.

- Calculate the upper limit of the one-sided 90% confidence interval for each analyte in the wastestream.

- Formulate neutral substances from the analytical data.

  NOTE: This step is only required for inorganic analytes since it is not possible to complete the evaluation based on the concentration of cations and anions. This methodology is described in Jungfleisch (1990) and is based on an evaluation of the most toxic compounds that can exist in an aqueous environment under normal temperatures and pressures.

- Assign toxic categories to the neutral substances formulated for the wastestream.

- Calculate the percent equivalent concentration (EC%) for each chemical compound.

- Sum the resulting EC% contributions.

- Designate the wastestream as a toxic dangerous waste if the EC% sum is greater than 0.001%, per WAC 173-303-9906.

All three facility operating modes have some toxicity associated with them, but in each case the amount is very much less than the regulatory threshold of an equivalent concentration percentage of 0.001%. The sum value is:

- Routine operations = 0.0000404%
- Regulatory threshold = 0.001%.

Hence, on the basis of toxicity, the wastewater does not qualify as a dangerous waste.

5.4.2 Persistent Dangerous Wastes

The procedure for determining if a wastestream is a persistent dangerous waste is as follows (WAC 173-303-102).

- Collect multiple grab samples of the wastestream.

- Determine which chemical compounds in the wastestream are halogenated hydrocarbons (HH) and which are polycyclic aromatic hydrocarbons (PAH).

- Determine the upper limit of the one-sided 90%CI for the compounds of interest.

- Calculate HH% and PAH% separately.

- Sum the resulting HH% and PAH% contributors separately.
- Designate the wastestream as persistent if the HH% concentration is greater than 0.01% or if the PAH% is greater than 1.0%, per WAC 173-303-9907.

Only one chemical compound (trichloromethane) potentially present in the 284-W Powerplant Wastewater stream was determined to be HH and no chemical compounds were determined to be PAH, as noted in Table 5-2. Since the HH% sum is the same as the HH% for trichloromethane (0.00000083HH%), the 284-W Powerplant Wastewater stream is not a persistent dangerous waste.

5.4.3 Carcinogenic Dangerous Wastes

The procedure for determining if a wastestream is a carcinogenic dangerous waste is as follows (WAC 173-303-103).

- Collect multiple grab samples of the wastestream.
- Determine the upper limit of the one-sided 90% confidence interval for the compounds of interest.
- Formulate neutral substances from the analytical data.

  NOTE: This step is only required for inorganic analytes since it is not possible to complete the evaluation based on the concentrations of cations and anions. This methodology is described in Jungfleisch (1990) and is based on an evaluation of the carcinogen compounds that can exist in an aqueous environment under normal temperatures and pressures.

- Determine which chemical compounds in the wastestream are human or animal carcinogens according to the International Agency for Research on Cancer.
- Calculate the weight percent concentration for each carcinogen.
- Sum the resulting weight percent contributors.
- Designate the wastestream as carcinogenic if any of the positive carcinogens are above 0.01% or if the total concentration of positive and suspected carcinogens is above 1.0%.

Only two potential compounds (cadmium chloride and trichloromethane) were found that have carcinogenic properties. The combined Carcinogenic Total%, as noted on Table 5-2, is 0.00000212%. This value is lower than the regulatory threshold of 1.0%, therefore, the wastewater does not qualify as a dangerous waste due to carcinogenicity.

5.5 DANGEROUS WASTE CHARACTERISTICS

A waste is considered a dangerous waste if it is ignitable, corrosive, reactive, or extraction procedure (EP) toxic (WAC 173-303-090). A description of the methods used to evaluate the data in terms of these characteristics is contained in Jungfleisch (1990). Summaries of the methods, along with the results, are contained in the following sections.

5.5.1 Ignitability

Pure substances with a flashpoint below 140° F are considered ignitable.

Since July 1989, flashpoint testing has been performed on the liquid effluent samples. All samples reached the boiling temperature of water without igniting. Therefore, the 284-W Powerplant Wastewater is not an ignitable dangerous waste.

5.5.2 Corrosivity

A waste is a corrosive dangerous waste if it has a pH of $\leq$2.0 or $\geq$12.5. Because the pH values observed during sampling were between 8.7 and 9.4, the wastestream is not a corrosive dangerous waste (WAC 173-303-090[6]).

5.5.3 Reactivity

An aqueous waste is reactive if the waste contains an amount of cyanide or sulfide under conditions near corrosivity sufficient to threaten human health or the environment (WAC 173-303-090[7]). A recent revision to *Test Methods for Evaluating Solid Waste* (EPA 1986) provides quantitative indicator levels for cyanide and sulfide. The method states that levels of (equivalent) hydrogen cyanide below 250 mg/kg or of (equivalent) H_2S below 500 mg/kg would not be considered reactive.

Both the cyanide reactivity test and the sulfide reactivity test were reported at less than the regulatory threshold values, therefore, the 284-W Powerplant Wastewater stream is not regulated due to reactivity.

5.5.4 Extraction Procedure Toxicity

A waste is an EP toxic dangerous waste if contaminant results from EP toxicity testing exceed the limits of WAC 173-303-090(8)(c). In the absence of specific EP toxicity test results, total analyte concentrations are used. Five analytes with concentrations above detection limits are on the EP toxic list and were found in the 284-W Powerplant Wastewater stream. The concentrations of these five analytes are listed in Table 5-2. The EP toxic data for the inorganic species regulated as EP Toxic were all below regulatory threshold, therefore, the 284-W Powerplant Wastewater stream is not an EP toxic dangerous waste.

5.6 PROPOSED DESIGNATIONS

Based on the data obtained during the October 1989 through March 1990 sampling, and because the 284-W Powerplant Wastewater stream does not contain any dangerous waste, as defined in WAC 173-303-070, it is proposed that the wastestream not be designated a dangerous waste.

6.0 ACTION PLAN

This chapter addresses recommendations for future waste characterization tasks for the liquid effluents that are within the scope of the Liquid Effluent Study. The final extent of and schedule for any recommended tasks are subject to negotiation between Ecology, EPA, and DOE. An implementation schedule for the completion of these tasks will give consideration to other compliance actions already under way as part of the Tri-Party Agreement (Ecology et al. 1989), and on the availability of funding. All effluent monitoring and sampling will be conducted according to DOE Order 5400.1 ("General Environmental Protection Program," issued November 9, 1988).

6.1 FUTURE SAMPLING

The random sampling conducted during the October 1989 through March 1990 period covered only routine operations. Softener regeneration and blowdown activities were not monitored during the sampling time frame for this report. It is recommended that future sampling be done to include the unsampled activities and verify this proposed designation.

6.2 TECHNICAL ISSUES

As described in Section 2.0, the effluent was sampled at a point which was accessible and downstream of all the contributing wastestreams.

The samples collected at this point are considered to be representative of the types of constituents present in the contributing wastestreams. As a result, the sample point is capable of producing characterization data considered to be representative of the effluent stream during all powerplant activities: routine operations, softener regeneration, and blowdown.

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7.0 REFERENCES

DOE, 1988, *General Environmental Protection Program*, DOE Order 5400.1, U.S. Department of Energy, Washington, D.C.

Ecology, 1989, *Dangerous Waste Regulations*, Washington (State) Administrative Code (WAC) 173-303, Washington State Department of Ecology, Olympia, Washington.

- 173-303-070, Designation of Dangerous Waste
- 173-303-080, Dangerous Waste Lists
- 173-303-081, Discarded Chemical Product
- 173-303-082, Dangerous Waste Sources
- 173-303-090, Dangerous Waste Characteristics
- 173-303-090(5), Characteristics of Ignitability
- 173-303-090(6), Characteristics of Corrosivity
- 173-303-090(7), Characteristics of Reactivity
- 173-303-090(8), Characteristics of Extraction Procedure Toxicity
- 173-303-100, Dangerous Waste Criteria
- 173-303-101, Toxic Dangerous Wastes
- 173-303-102, Persistent Dangerous Wastes
- 173-303-103, Carcinogenic Dangerous Wastes
- 173-303-9903, Discarded Chemical Products List
- 173-303-9904, Dangerous Waste Sources List
- 173-303-9905, Dangerous Waste Constituents List

Ecology, EPA, and DOE, 1989, *Hanford Federal Facility Agreement and Consent Order*, Washington State Department of Ecology, U.S. Environmental Protection Agency, and U.S. Department of Energy, Olympia, Washington.

EPA, 1986, *Test Methods for Evaluating Solid Wastes*, SW-846, Third Edition, U.S. Environmental Protection Agency, Washington, D.C.

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WAC 284-54-215.

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APPENDIX A

DETECTED ANALYTES

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NEW DATA

Data for 284-W Powerplant Wastewater--Routine Operation

Constituent	Sample #	Date	Method	Result
Aluminum	50760	11/13/89	ICP	3.61E+02
Aluminum	50865	1/02/90	ICP	<1.50E+02
Aluminum	50996	2/28/90	ICP	1.68E+02
Aluminum	51056	3/16/90	ICP	1.54E+02
Arsenic (EP Toxic)	50760E	11/13/89	ICP	<5.00E+02
Arsenic (EP Toxic)	50865E	1/02/90	ICP	<5.00E+02
Arsenic (EP Toxic)	50996E	2/28/90	ICP	<5.00E+02
Arsenic (EP Toxic)	51056E	3/16/90	ICP	<5.00E+02
Barium	50760	11/13/89	ICP	6.20E+01
Barium	50865	1/02/90	ICP	3.30E+01
Barium	50996	2/28/90	ICP	4.30E+01
Barium	51056	3/16/90	ICP	8.33E+02
Barium (EP Toxic)	50760E	11/13/89	ICP	<1.00E+03
Barium (EP Toxic)	50865E	1/02/90	ICP	<1.00E+03
Barium (EP Toxic)	50996E	2/28/90	ICP	<1.00E+03
Barium (EP Toxic)	51056E	3/16/90	ICP	1.04E+03
Boron	50760	11/13/89	ICP	1.50E+02
Boron	50865	1/02/90	ICP	1.20E+01
Boron	50996	2/28/90	ICP	4.40E+01
Boron	51056	3/16/90	ICP	3.50E+01
Cadmium	50760	11/13/89	ICP	<2.00E+00
Cadmium	50865	1/02/90	ICP	<2.00E+00
Cadmium	50996	2/28/90	ICP	<2.00E+00
Cadmium	51056	3/16/90	ICP	1.10E+01
Cadmium (EP Toxic)	50760E	11/13/89	ICP	<1.00E+02
Cadmium (EP Toxic)	50865E	1/02/90	ICP	<1.00E+02
Cadmium (EP Toxic)	50996E	2/28/90	ICP	<1.00E+02
Cadmium (EP Toxic)	51056E	3/16/90	ICP	<1.00E+02
Calcium	50760	11/13/89	ICP	1.35E+04
Calcium	50865	1/02/90	ICP	1.96E+04
Calcium	50996	2/28/90	ICP	1.88E+04
Calcium	51056	3/16/90	ICP	7.39E+05
Chloride	50760	11/13/89	IC	4.60E+03
Chloride	50865	1/02/90	IC	8.40E+03
Chloride	50996	2/28/90	IC	2.70E+03
Chloride	51056	3/16/90	IC	2.91E+06
Chromium (EP Toxic)	50760E	11/13/89	ICP	<5.00E+02
Chromium (EP Toxic)	50865E	1/02/90	ICP	<5.00E+02
Chromium (EP Toxic)	50996E	2/28/90	ICP	<5.00E+02
Chromium (EP Toxic)	51056E	3/16/90	ICP	<5.00E+02
Cobalt	50760	11/13/89	ICP	<2.00E+01
Cobalt	50865	1/02/90	ICP	<2.00E+01
Cobalt	50996	2/28/90	ICP	<2.00E+01
Cobalt	51056	3/16/90	ICP	4.60E+01
Copper	50760	11/13/89	ICP	1.00E+01
Copper	50865	1/02/90	ICP	<1.00E+01
Copper	50996	2/28/90	ICP	<1.00E+01

Data for 284-W Powerplant Wastewater--Routine Operation

Constituent	Sample #	Date	Method	Result
Copper	51056	3/16/90	ICP	1.50E+01
Fluoride	50760	11/13/89	IC	<5.00E+02
Fluoride	50760	11/13/89	ISE	1.56E+02
Fluoride	50865	1/02/90	IC	<5.00E+02
Fluoride	50865	1/02/90	ISE	1.74E+02
Fluoride	50996	2/28/90	IC	<5.00E+02
Fluoride	50996	2/28/90	ISE	1.59E+02
Fluoride	51056	3/16/90	IC	<5.00E+02
Fluoride	51056	3/16/90	ISE	1.68E+02
Iron	50760	11/13/89	ICP	1.71E+02
Iron	50865	1/02/90	ICP	4.10E+01
Iron	50996	2/28/90	ICP	1.49E+02
Iron	51056	3/16/90	ICP	5.50E+01
Lead (EP Toxic)	50760E	11/13/89	ICP	<5.00E+02
Lead (EP Toxic)	50865E	1/02/90	ICP	<5.00E+02
Lead (EP Toxic)	50996E	2/28/90	ICP	<5.00E+02
Lead (EP Toxic)	51056E	3/16/90	ICP	<5.00E+02
Lithium	50760	11/13/89	ICP	<1.00E+01
Lithium	50865	1/02/90	ICP	<1.00E+01
Lithium	50996	2/28/90	ICP	<1.00E+01
Lithium	51056	3/16/90	ICP	3.90E+01
Magnesium	50760	11/13/89	ICP	2.46E+03
Magnesium	50865	1/02/90	ICP	4.32E+03
Magnesium	50996	2/28/90	ICP	4.33E+03
Magnesium	51056	3/16/90	ICP	2.78E+05
Manganese	50760	11/13/89	ICP	<5.00E+00
Manganese	50865	1/02/90	ICP	<5.00E+00
Manganese	50996	2/28/90	ICP	<5.00E+00
Manganese	51056	3/16/90	ICP	2.30E+01
Mercury	50760	11/13/89	CVAA	<1.00E-01
Mercury	50865	1/02/90	CVAA	<1.00E-01
Mercury	50996	2/28/90	CVAA	<1.00E-01
Mercury	51056	3/16/90	CVAA	1.34E+00
Mercury (EP Toxic)	50760E	11/13/89	CVAA/M	<2.00E+01
Mercury (EP Toxic)	50865E	1/02/90	CVAA/M	<2.00E+01
Mercury (EP Toxic)	50996E	2/28/90	CVAA/M	<2.00E+01
Mercury (EP Toxic)	51056E	3/16/90	CVAA/M	<2.00E+01
Nitrate	50760	11/13/89	IC	<5.00E+02
Nitrate	50865	1/02/90	IC	8.00E+02
Nitrate	50996	2/28/90	IC	<5.00E+02
Nitrate	51056	3/16/90	IC	<5.00E+02
Potassium	50760	11/13/89	ICP	8.70E+02
Potassium	50865	1/02/90	ICP	1.04E+03
Potassium	50996	2/28/90	ICP	8.67E+02
Potassium	51056	3/16/90	ICP	3.22E+04
Selenium (EP Toxic)	50760E	11/13/89	ICP	<5.00E+02
Selenium (EP Toxic)	50865E	1/02/90	ICP	<5.00E+02

Data for 284-W Powerplant Wastewater--Routine Operation

Constituent	Sample #	Date	Method	Result
Selenium (EP Toxic)	50996E	2/28/90	ICP	<5.00E+02
Selenium (EP Toxic)	51056E	3/16/90	ICP	<5.00E+02
Silicon	50760	11/13/89	ICP	3.22E+03
Silicon	50865	1/02/90	ICP	3.06E+03
Silicon	50996	2/28/90	ICP	2.92E+03
Silicon	51056	3/16/90	ICP	2.27E+03
Silver (EP Toxic)	50760E	11/13/89	ICP	<5.00E+02
Silver (EP Toxic)	50865E	1/02/90	ICP	<5.00E+02
Silver (EP Toxic)	50996E	2/28/90	ICP	<5.00E+02
Silver (EP Toxic)	51056E	3/16/90	ICP	<5.00E+02
Sodium	50760	11/13/89	ICP	3.27E+04
Sodium	50865	1/02/90	ICP	1.42E+04
Sodium	50996	2/28/90	ICP	1.30E+04
Sodium	51056	3/16/90	ICP	1.11E+06
Strontium	50760	11/13/89	ICP	5.73E+02
Strontium	50865	1/02/90	ICP	1.01E+02
Strontium	50996	2/28/90	ICP	2.22E+02
Strontium	51056	3/16/90	ICP	3.16E+03
Sulfate	50760	11/13/89	IC	4.17E+04
Sulfate	50865	1/02/90	IC	2.18E+04
Sulfate	50996	2/28/90	IC	1.88E+04
Sulfate	51056	3/16/90	IC	2.49E+04
Uranium	50760	11/13/89	FLUOR	3.73E-01
Uranium	50865	1/02/90	FLUOR	5.67E-01
Uranium	51056	3/16/90	FLUOR	6.15E-01
Vanadium	50760	11/13/89	ICP	5.00E+00
Vanadium	50865	1/02/90	ICP	<5.00E+00
Vanadium	50996	2/28/90	ICP	<5.00E+00
Vanadium	51056	3/16/90	ICP	<5.00E+00
Zinc	50760	11/13/89	ICP	1.20E+01
Zinc	50865	1/02/90	ICP	<5.00E+00
Zinc	50996	2/28/90	ICP	<5.00E+00
Zinc	51056	3/16/90	ICP	6.60E+01
2-Butanone	50760	11/13/89	VOA	<1.00E+01
2-Butanone	50760B	11/13/89	VOA	<1.00E+01
2-Butanone	50760T	11/13/89	VOA	<1.00E+01
2-Butanone	50865	1/02/90	VOA	<1.00E+01
2-Butanone	50865B	1/02/90	VOA	1.60E+01
2-Butanone	50865T	1/02/90	VOA	1.10E+01
2-Butanone	50996	2/28/90	VOA	<1.00E+01
2-Butanone	50996B	2/28/90	VOA	<1.00E+01
2-Butanone	50996T	2/28/90	VOA	<1.00E+01
2-Butanone	51056	3/16/90	VOA	<1.00E+01
2-Butanone	51056B	3/16/90	VOA	<1.00E+01
2-Butanone	51056T	3/16/90	VOA	<1.00E+01
Trichloromethane	50760	11/13/89	VOA	1.00E+01
Trichloromethane	50760B	11/13/89	VOA	<3.00E+00

Data for 284-W Powerplant Wastewater--Routine Operation

Constituent	Sample #	Date	Method	Result
Trichloromethane	50760T	11/13/89	VOA	<4.00E+00
Trichloromethane	50865	1/02/90	VOA	5.00E+00
Trichloromethane	50865B	1/02/90	VOA	<5.00E+00
Trichloromethane	50865T	1/02/90	VOA	<4.00E+00
Trichloromethane	50996	2/28/90	VOA	<5.00E+00
Trichloromethane	50996B	2/28/90	VOA	<5.00E+00
Trichloromethane	50996T	2/28/90	VOA	<5.00E+00
Trichloromethane	51056	3/16/90	VOA	<5.00E+00
Trichloromethane	51056B	3/16/90	VOA	<5.00E+00
Trichloromethane	51056T	3/16/90	VOA	<5.00E+00
Alkalinity (Method B)	50760	11/13/89	TITRA	6.80E+04
Alkalinity (Method B)	50865	1/02/90	TITRA	7.80E+04
Alkalinity (Method B)	50996	2/28/90	TITRA	7.50E+04
Alkalinity (Method B)	51056	3/16/90	TITRA	6.40E+04
Beta Activity (pCi/L)	50760	11/13/89	Beta	2.61E+00
Beta Activity (pCi/L)	50865	1/02/90	Beta	<1.47E+00
Beta Activity (pCi/L)	51056	3/16/90	Beta	5.37E+00
Conductivity (uS)	50760	11/13/89	COND-Fld	2.66E+02
Conductivity (uS)	50865	1/02/90	COND-Fld	2.24E+02
Conductivity (uS)	50996	2/28/90	COND-Fld	1.58E+02
Conductivity (uS)	51056	3/16/90	COND-Fld	1.01E+03
Ignitability (degrees F)	50760E	11/13/89	IGNIT	>2.10E+02
Ignitability (degrees F)	50865E	1/02/90	IGNIT	>2.12E+02
Ignitability (degrees F)	50996E	2/28/90	IGNIT	>2.02E+02
Ignitability (degrees F)	51056E	3/16/90	IGNIT	>1.98E+02
pH (dimensionless)	50760	11/13/89	PH-Fld	9.35E+00
pH (dimensionless)	50865	1/02/90	PH-Fld	8.67E+00
pH (dimensionless)	50996	2/28/90	PH-Fld	8.96E+00
pH (dimensionless)	51056	3/16/90	PH-Fld	9.20E+00
Reactivity Cyanide (mg/kg)	50760E	11/13/89	DSPEC	<1.00E+02
Reactivity Cyanide (mg/kg)	50865E	1/02/90	DSPEC	<1.00E+02
Reactivity Cyanide (mg/kg)	50996E	2/28/90	DSPEC	<1.00E+02
Reactivity Cyanide (mg/kg)	51056E	3/16/90	DSPEC	<1.00E+02
Reactivity Sulfide (mg/kg)	50760E	11/13/89	DTITRA	<1.00E+02
Reactivity Sulfide (mg/kg)	50865E	1/02/90	DTITRA	<1.00E+02
Reactivity Sulfide (mg/kg)	50996E	2/28/90	DTITRA	<1.00E+02
Reactivity Sulfide (mg/kg)	51056E	3/16/90	DTITRA	<1.00E+02
Suspended Solids	50760	11/13/89	SSOLID	1.40E+04
Suspended Solids	50865	1/02/90	SSOLID	<5.00E+03
Suspended Solids	50996	2/28/90	SSOLID	<5.00E+03
Suspended Solids	51056	3/16/90	SSOLID	<5.00E+03
TDS	50760	11/13/89	TDS	1.18E+05
TDS	50865	1/02/90	TDS	1.26E+05
TDS	50996	2/28/90	TDS	9.30E+04
TDS	51056	3/16/90	TDS	3.54E+06
Temperature (degrees C)	50760	11/13/89	TEMP-Fld	2.42E+01
Temperature (degrees C)	50865	1/02/90	TEMP-Fld	1.22E+01

Data for 284-W Powerplant Wastewater--Routine Operation

Constituent	Sample #	Date	Method	Result
Temperature (degrees C)	50996	2/28/90	TEMP-Fld	8.40E+00
Temperature (degrees C)	51056	3/16/90	TEMP-Fld	1.07E+01
TOC	50760	11/13/89	TOC	<1.40E+03
TOC	50865	1/02/90	TOC	<1.50E+03
TOC	50996	2/28/90	TOC	1.30E+03
TOC	51056	3/16/90	TOC	1.30E+03
Total Carbon	50760	11/13/89	TC	1.42E+04
Total Carbon	50865	1/02/90	TC	1.68E+04
Total Carbon	50996	2/28/90	TC	1.55E+04
Total Carbon	51056	3/16/90	TC	1.56E+04
TOX (as Cl)	50760	11/13/89	LTOX	6.90E+01
TOX (as Cl)	50865	1/02/90	LTOX	4.40E+01
TOX (as Cl)	50996	2/28/90	LTOX	1.60E+01
TOX (as Cl)	51056	3/16/90	LTOX	7.70E+01

DATA REPORT FOOTNOTES

Sample# is the number of the sample. See chapter three for corresponding chain-of-custody number. Date is the sampling date. Results are in ppb (parts per billion) unless otherwise indicated. The following table lists the methods that are coded in the method column.

Code	Analytical Method	Reference
ABN	Semivolatile Organics (GC/MS)	USEPA-8270
AEA	Americium-241	UST-20Am01
AEA	Curium Isotopes	UST-20Am/Cm01
AEA	Plutonium Isotopes	UST-20Pu01
AEA	Uranium Isotopes	UST-20U01
ALPHA	Alpha Counting	EPA-680/4-75/1
ALPHA-Ra	Total Radium Alpha Counting	ASTM-D2460
BETA	Beta Counting	EPA-680/4-75/1
BETA	Strontium-90	UST-20Sr02
COLIF	Coliform Bacteria	USEPA-9131
COLIFMF	Coliform Bacteria (Membrane Filter)	USEPA-9132
COND-Fld	Conductivity-Field	ASTM-D1125A
COND-Lab	Conductivity-Laboratory	ASTM-D1125A
CVAA	Mercury	USEPA-7470
CVAA/M	Mercury-Mixed Matrix	USEPA-7470
DIGC	Direct Aqueous Injection (GC)	UST-70DIGC
DIMS	Direct Aqueous Injection (GC/MS)	"USEPA-8240"
DSPEC	Reactive Cyanide (Distillation, Spectroscopy)	USEPA-CHAPTER 7
DTITRA	Reactive Sulfide (Distillation, Titration)	USEPA-CHAPTER 7
FLUOR	Uranium (Fluorometry)	ASTM-D2907-83
GEA	Gamma Energy Analysis Spectroscopy	ASTM-D3649-85
GFAA	Arsenic (AA, Furnace Technique)	USEPA-7060
GFAA	Lead (AA, Furnace Technique)	USEPA-7421
GFAA	Selenium (AA, Furnace Technique)	USEPA-7740

Data for 284-W Powerplant Wastewater--Routine Operation

DATA REPORT FOOTNOTES (continued)

GFAA	Thallium (AA, Furnace Technique)	USEPA-7841
IC	Ion Chromatography	EPA-600/4-84-01
ICP	Atomic Emission Spectroscopy (ICP)	USEPA-6010
ICP/M	Atomic Emission Spectroscopy (ICP)-Mixed Matrix	USEPA-6010
IGNIT	Pensky-Martens Closed-Cup Ignitability	USEPA-1010
ISE	Fluoride-Low Detection Limit	ASTM-D1179-80-B
ISE	Ammonium Ion	ASTM-D1426-D
LALPHA	Alpha Activity-Low Detection Limit	EPA-680/4-75/1
LEPD	Iodine-129	UST-20I02
LSC	C-14	UST-20C01
LSC	Tritium	UST-20H03
LTOX	Total Organic Halides-Low Detection Limit	USEPA-9020
PH-Fld	pH-Field	USEPA-9040
PH-Lab	pH-Laboratory	USEPA-9040
SPEC	Total and Amenable Cyanide (Spectroscopy)	USEPA-9010
SPEC	Hydrazine-Low Detection Limit (Spectroscopy)	ASTM-D1385
SSOLID	Suspended Solids	SM-208D
TC	Total Carbon	USEPA-9060
TDS	Total Dissolved Solids	SM-208B
TEMP-Fld	Temperature-Field	Local
TITRA	Alkalinity-Method B (Titration)	ASTM-D1067B
TITRA	Sulfides (Titration)	USEPA-9030
TOC	Total Organic Carbon	USEPA-9060
TOX	Total Organic Halides	USEPA-9020
VOA	Volatile Organics (GC/MS)	USEPA-8240

Analytical Method Acronyms:
atomic absorption spectroscopy (AA), gas chromatography (GC), mass spectrometry (MS), inductively-coupled plasma spectroscopy (ICP)

References:

ASTM - "1986 Annual Book of ASTM Standards", American Society for Testing and Materials, Philadelphia, Pennsylvania.

EPA - Various methods of the U.S. Environmental Protection Agency, Washington, D.C.

UST - Methods of the United States Testing Company, Incorporated, Richland, Washington.

SM - "Standard Methods for the Examination of Water and Wastewater", 16th ed., American Public Health Association, American Water Works Association and Water Pollution Control Federation, Washington, D.C.

USEPA- "Test Methods for Evaluating Solid Waste Physical/Chemical Methods", 3rd ed., SW-846, U.S. Environmental Protection Agency, Washington, D.C.

ALL DATA

Data for 284-W Powerplant Wastewater--Blowdown

Constituent	Sample #	Date	Method	Result
Aluminum	50018	9/16/85	ICP	2.76E+02
Aluminum	50035	4/29/86	ICP	7.10E+02
Aluminum	50099	7/28/86	ICP	2.22E+02
Aluminum	50192	12/03/86	ICP	1.62E+02
Aluminum	50212	1/06/87	ICP	<1.50E+02
Barium	50018	9/16/85	ICP	3.40E+01
Barium	50035	4/29/86	ICP	3.70E+01
Barium	50099	7/28/86	ICP	2.70E+01
Barium	50192	12/03/86	ICP	3.00E+01
Barium	50212	1/06/87	ICP	4.00E+01
Cadmium	50018	9/16/85	ICP	4.00E+00
Cadmium	50035	4/29/86	ICP	<2.00E+00
Cadmium	50099	7/28/86	ICP	<2.00E+00
Cadmium	50192	12/03/86	ICP	<2.00E+00
Cadmium	50212	1/06/87	ICP	<2.00E+00
Calcium	50018	9/16/85	ICP	1.86E+04
Calcium	50035	4/29/86	ICP	1.85E+04
Calcium	50099	7/28/86	ICP	1.52E+04
Calcium	50192	12/03/86	ICP	1.75E+04
Calcium	50212	1/06/87	ICP	2.15E+04
Chloride	50018	9/16/85	IC	2.96E+03
Chloride	50035	4/29/86	IC	3.53E+03
Chloride	50099	7/28/86	IC	5.55E+03
Chloride	50192	12/03/86	IC	4.93E+03
Chloride	50212	1/06/87	IC	2.22E+03
Chromium	50018	9/16/85	ICP	<1.00E+01
Chromium	50035	4/29/86	ICP	<1.00E+01
Chromium	50099	7/28/86	ICP	<1.00E+01
Chromium	50192	12/03/86	ICP	1.30E+01
Chromium	50212	1/06/87	ICP	<1.00E+01
Copper	50018	9/16/85	ICP	<1.00E+01
Copper	50035	4/29/86	ICP	1.48E+02
Copper	50099	7/28/86	ICP	7.30E+01
Copper	50192	12/03/86	ICP	5.04E+02
Copper	50212	1/06/87	ICP	<1.00E+01
Iron	50018	9/16/85	ICP	2.82E+02
Iron	50035	4/29/86	ICP	9.87E+02
Iron	50099	7/28/86	ICP	5.28E+02
Iron	50192	12/03/86	ICP	1.31E+03
Iron	50212	1/06/87	ICP	6.00E+01
Lead	50018	9/16/85	ICP	<3.00E+01
Lead	50192	12/03/86	GFAA	5.60E+00
Lead	50212	1/06/87	GFAA	<5.00E+00
Magnesium	50018	9/16/85	ICP	3.65E+03
Magnesium	50035	4/29/86	ICP	5.19E+03
Magnesium	50099	7/28/86	ICP	3.34E+03
Magnesium	50192	12/03/86	ICP	3.99E+03

Data for 284-W Powerplant Wastewater--Blowdown

Constituent	Sample #	Date	Method	Result
Magnesium	50212	1/06/87	ICP	4.64E+03
Manganese	50018	9/16/85	ICP	1.70E+01
Manganese	50035	4/29/86	ICP	2.40E+01
Manganese	50099	7/28/86	ICP	1.40E+01
Manganese	50192	12/03/86	ICP	3.60E+01
Manganese	50212	1/06/87	ICP	<5.00E+00
Mercury	50018	9/16/85	CVAA	<1.00E-01
Mercury	50035	4/29/86	CVAA	2.75E-01
Mercury	50099	7/28/86	CVAA	2.80E-01
Mercury	50192	12/03/86	CVAA	<1.00E-01
Mercury	50212	1/06/87	CVAA	<1.00E-01
Nitrate	50018	9/16/85	IC	5.00E+02
Nitrate	50035	4/29/86	IC	<5.00E+02
Nitrate	50099	7/28/86	IC	1.56E+03
Nitrate	50192	12/03/86	IC	<1.00E+03
Nitrate	50212	1/06/87	IC	6.53E+02
Phosphate	50018	9/16/85	IC	1.30E+03
Phosphate	50035	4/29/86	IC	<1.00E+03
Phosphate	50099	7/28/86	IC	1.42E+03
Phosphate	50192	12/03/86	IC	2.75E+03
Phosphate	50212	1/06/87	IC	<1.00E+03
Potassium	50018	9/16/85	ICP	9.29E+02
Potassium	50035	4/29/86	ICP	1.58E+03
Potassium	50099	7/28/86	ICP	2.07E+03
Potassium	50192	12/03/86	ICP	2.39E+03
Potassium	50212	1/06/87	ICP	1.25E+03
Sodium	50018	9/16/85	ICP	2.37E+04
Sodium	50035	4/29/86	ICP	5.31E+04
Sodium	50099	7/28/86	ICP	4.35E+04
Sodium	50192	12/03/86	ICP	5.50E+04
Sodium	50212	1/06/87	ICP	1.63E+04
Sulfate	50018	9/16/85	IC	2.89E+04
Sulfate	50035	4/29/86	IC	1.71E+04
Sulfate	50099	7/28/86	IC	4.01E+04
Sulfate	50192	12/03/86	IC	4.05E+04
Sulfate	50212	1/06/87	IC	2.13E+04
Uranium	50018	9/16/85	FLUOR	4.09E-01
Uranium	50035	4/29/86	FLUOR	1.30E+00
Uranium	50099	7/28/86	FLUOR	3.82E-01
Uranium	50192	12/03/86	FLUOR	2.40E+00
Uranium	50212	1/06/87	FLUOR	6.16E-01
Zinc	50018	9/16/85	ICP	3.50E+01
Zinc	50035	4/29/86	ICP	3.40E+01
Zinc	50099	7/28/86	ICP	2.00E+01
Zinc	50192	12/03/86	ICP	5.40E+01
Zinc	50212	1/06/87	ICP	6.00E+00
Ammonia	50018	9/16/85	ISE	<5.00E+01
Ammonia	50035	4/29/86	ISE	<5.00E+01
Ammonia	50099	7/28/86	ISE	<5.00E+01

Data for 284-W Powerplant Wastewater--Blowdown

Constituent	Sample #	Date	Method	Result
Ammonia	50192	12/03/86	ISE	<5.00E+01
Ammonia	50212	1/06/87	ISE	7.10E+01
Dichloromethane	50018	9/16/85	VOA	<1.00E+01
Dichloromethane	50035	4/29/86	VOA	<1.00E+01
Dichloromethane	50099	7/28/86	VOA	<1.00E+01
Dichloromethane	50192	12/03/86	VOA	<1.00E+01
Dichloromethane	50192B	12/03/86	VOA	5.70E+01
Dichloromethane	50212	1/06/87	VOA	<1.00E+01
Dichloromethane	50212B	1/06/87	VOA	4.50E+01
Trichloromethane	50018	9/16/85	VOA	<1.00E+01
Trichloromethane	50035	4/29/86	VOA	1.85E+01
Trichloromethane	50099	7/28/86	VOA	1.40E+01
Trichloromethane	50192	12/03/86	VOA	<1.00E+01
Trichloromethane	50192B	12/03/86	VOA	<1.00E+01
Trichloromethane	50212	1/06/87	VOA	<1.00E+01
Trichloromethane	50212B	1/06/87	VOA	<1.00E+01
Alpha Activity (pCi/L)	50018	9/16/85	Alpha	7.59E+00
Alpha Activity (pCi/L)	50099	7/28/86	Alpha	6.55E-01
Alpha Activity (pCi/L)	50192	12/03/86	Alpha	1.08E+00
Alpha Activity (pCi/L)	50212	1/06/87	Alpha	1.45E-01
Beta Activity (pCi/L)	50018	9/16/85	Beta	7.61E+00
Beta Activity (pCi/L)	50035	4/29/86	Beta	7.65E+00
Beta Activity (pCi/L)	50099	7/28/86	Beta	3.41E+00
Beta Activity (pCi/L)	50192	12/03/86	Beta	5.40E+00
Beta Activity (pCi/L)	50212	1/06/87	Beta	4.29E+00
Conductivity (uS)	50018	9/16/85	COND-Fld	2.38E+02
Conductivity (uS)	50035	4/29/86	COND-Fld	3.00E+01
Conductivity (uS)	50099	7/28/86	COND-Fld	1.79E+02
Conductivity (uS)	50192	12/03/86	COND-Fld	2.84E+02
Conductivity (uS)	50212	1/06/87	COND-Fld	1.77E+02
pH (dimensionless)	50018	9/16/85	PH-Fld	9.91E+00
pH (dimensionless)	50035	4/29/86	PH-Fld	1.01E+01
pH (dimensionless)	50099	7/28/86	PH-Fld	8.85E+00
pH (dimensionless)	50192	12/03/86	PH-Fld	1.10E+01
pH (dimensionless)	50212	1/06/87	PH-Fld	7.50E+00
Temperature (degrees C)	50018	9/16/85	TEMP-Fld	2.06E+01
Temperature (degrees C)	50035	4/29/86	TEMP-Fld	2.08E+01
Temperature (degrees C)	50099	7/28/86	TEMP-Fld	2.26E+01
Temperature (degrees C)	50192	12/03/86	TEMP-Fld	1.07E+01
Temperature (degrees C)	50212	1/06/87	TEMP-Fld	9.10E+00
TOC	50018	9/16/85	TOC	3.18E+03
TOC	50035	4/29/86	TOC	4.45E+03
TOC	50099	7/28/86	TOC	2.46E+03
TOC	50192	12/03/86	TOC	1.42E+03
TOC	50212	1/06/87	TOC	1.79E+03
TOX (as Cl)	50018	9/16/85	TOX	<1.85E+01
TOX (as Cl)	50035	4/29/86	TOX	<6.94E+01
TOX (as Cl)	50099	7/28/86	TOX	<7.86E+01
TOX (as Cl)	50192	12/03/86	LTOX	3.78E+01

Data for 284-W Powerplant Wastewater--Blowdown

Constituent	Sample #	Date	Method	Result
TOX (as Cl)	50212	1/06/87	LTOX	<2.00E+01

Data for 284-W Powerplant Wastewater--Water Softener Regenerate

Constituent	Sample #	Date	Method	Result
Aluminum	50358	11/16/87	ICP	<7.80E+03
Aluminum	50392	3/08/88	ICP	<1.50E+02
Aluminum	50402	3/21/88	ICP	8.25E+02
Aluminum	50412	4/18/88	ICP	<3.27E+03
Barium	50358	11/16/87	ICP	1.11E+05
Barium	50392	3/08/88	ICP	2.90E+01
Barium	50402	3/21/88	ICP	4.38E+03
Barium	50412	4/18/88	ICP	1.18E+04
Cadmium	50358	11/16/87	ICP	<2.00E+02
Cadmium	50392	3/08/88	ICP	<2.00E+00
Cadmium	50402	3/21/88	ICP	3.00E+00
Cadmium	50412	4/18/88	ICP	3.00E+00
Calcium	50358	11/16/87	ICP	7.59E+07
Calcium	50392	3/08/88	ICP	1.99E+04
Calcium	50402	3/21/88	ICP	5.37E+06
Calcium	50412	4/18/88	ICP	8.80E+06
Chloride	50358	11/16/87	IC	5.11E+07
Chloride	50392	3/08/88	IC	1.21E+06
Chloride	50402	3/21/88	IC	7.19E+06
Chloride	50412	4/18/88	IC	7.12E+07
Copper	50358	11/16/87	ICP	<3.00E+02
Copper	50392	3/08/88	ICP	<1.00E+01
Copper	50402	3/21/88	ICP	8.10E+01
Copper	50412	4/18/88	ICP	4.57E+02
Fluoride	50358	11/16/87	IC	<5.00E+02
Fluoride	50358	11/16/87	ISE	<2.00E+01
Fluoride	50392	3/08/88	IC	2.25E+04
Fluoride	50392	3/08/88	ISE	1.12E+02
Fluoride	50402	3/21/88	IC	9.67E+04
Fluoride	50402	3/21/88	ISE	<2.00E+01
Fluoride	50412	4/18/88	IC	1.37E+05
Fluoride	50412	4/18/88	ISE	<2.00E+01
Iron	50358	11/16/87	ICP	<3.00E+02
Iron	50392	3/08/88	ICP	2.13E+02
Iron	50402	3/21/88	ICP	<3.00E+01
Iron	50412	4/18/88	ICP	<3.00E+01
Lead	50358	11/16/87	GFAA	6.00E+00
Lead	50392	3/08/88	GFAA	<5.00E+00
Lead	50402	3/21/88	GFAA	<2.00E+01
Lead	50412	4/18/88	GFAA	8.60E+01
Magnesium	50358	11/16/87	ICP	1.33E+06
Magnesium	50392	3/08/88	ICP	4.58E+03
Magnesium	50402	3/21/88	ICP	9.09E+05
Magnesium	50412	4/18/88	ICP	1.77E+06

Data for 284-W Powerplant Wastewater--Water Softener Regenerate

Constituent	Sample #	Date	Method	Result
Manganese	50358	11/16/87	ICP	<4.00E+02
Manganese	50392	3/08/88	ICP	1.10E+01
Manganese	50402	3/21/88	ICP	7.20E+01
Manganese	50412	4/18/88	ICP	3.90E+02
Nickel	50358	11/16/87	ICP	<1.00E+03
Nickel	50392	3/08/88	ICP	<1.00E+01
Nickel	50402	3/21/88	ICP	1.10E+01
Nickel	50412	4/18/88	ICP	1.70E+01
Potassium	50358	11/16/87	ICP	2.88E+05
Potassium	50392	3/08/88	ICP	2.42E+03
Potassium	50402	3/21/88	ICP	1.80E+05
Potassium	50412	4/18/88	ICP	2.29E+05
Sodium	50358	11/16/87	ICP	2.95E+08
Sodium	50392	3/08/88	ICP	2.54E+06
Sodium	50402	3/21/88	ICP	2.52E+07
Sodium	50412	4/18/88	ICP	3.55E+07
Strontium	50358	11/16/87	ICP	4.63E+04
Strontium	50392	3/08/88	ICP	1.83E+02
Strontium	50402	3/21/88	ICP	2.80E+04
Strontium	50412	4/18/88	ICP	4.22E+04
Sulfate	50358	11/16/87	IC	5.70E+04
Sulfate	50392	3/08/88	IC	2.90E+04
Sulfate	50402	3/21/88	IC	9.62E+04
Sulfate	50412	4/18/88	IC	7.95E+04
Uranium	50358	11/16/87	FLUOR	1.87E+00
Uranium	50392	3/08/88	FLUOR	6.13E-03
Uranium	50402	3/21/88	FLUOR	1.32E+00
Uranium	50412	4/18/88	FLUOR	1.17E+00
Zinc	50358	11/16/87	ICP	8.00E+02
Zinc	50392	3/08/88	ICP	1.60E+01
Zinc	50402	3/21/88	ICP	5.78E+02
Zinc	50412	4/18/88	ICP	3.27E+03
Ammonia	50358	11/16/87	ISE	1.33E+02
Ammonia	50392	3/08/88	ISE	<5.00E+01
Ammonia	50402	3/21/88	ISE	9.40E+01
Ammonia	50412	4/18/88	ISE	2.00E+02
Diacetone alcohol	50358	11/16/87	ABN	1.05E+02
Dichloromethane	50358	11/16/87	VOA	<1.00E+01
Dichloromethane	50358B	11/16/87	VOA	<1.00E+01
Dichloromethane	50392	3/08/88	VOA	2.90E+01
Dichloromethane	50392B	3/08/88	VOA	2.70E+01
Dichloromethane	50402	3/21/88	VOA	<1.00E+01
Dichloromethane	50402B	3/21/88	VOA	<2.00E+00
Dichloromethane	50412	4/18/88	VOA	<1.00E+01
Dichloromethane	50412B	4/18/88	VOA	<1.00E+01
1,1,1-Trichloroethane	50358	11/16/87	VOA	<5.00E+00
1,1,1-Trichloroethane	50358B	11/16/87	VOA	1.10E+01
1,1,1-Trichloroethane	50392	3/08/88	VOA	<5.00E+00
1,1,1-Trichloroethane	50392B	3/08/88	VOA	<5.00E+00

Data for 284-W Powerplant Wastewater--Water Softener Regenerate

Constituent	Sample #	Date	Method	Result
1,1,1-Trichloroethane	50402	3/21/88	VOA	<5.00E+00
1,1,1-Trichloroethane	50402B	3/21/88	VOA	<5.00E+00
1,1,1-Trichloroethane	50412	4/18/88	VOA	<5.00E+00
1,1,1-Trichloroethane	50412B	4/18/88	VOA	<5.00E+00
Trichloromethane	50358	11/16/87	VOA	1.40E+01
Trichloromethane	50358B	11/16/87	VOA	1.80E+01
Trichloromethane	50392	3/08/88	VOA	7.00E+00
Trichloromethane	50392B	3/08/88	VOA	<5.00E+00
Trichloromethane	50402	3/21/88	VOA	1.00E+01
Trichloromethane	50402B	3/21/88	VOA	<5.00E+00
Trichloromethane	50412	4/18/88	VOA	<3.00E+00
Trichloromethane	50412B	4/18/88	VOA	6.00E+00
Alpha Activity (pCi/L)	50392	3/08/88	Alpha	4.74E+00
Alpha Activity (pCi/L)	50402	3/21/88	Alpha	1.96E+02
Beta Activity (pCi/L)	50392	3/08/88	Beta	5.57E+00
Beta Activity (pCi/L)	50402	3/21/88	Beta	2.24E+02
Beta Activity (pCi/L)	50412	4/18/88	Beta	5.87E+02
Conductivity (uS)	50358	11/16/87	COND-Fld	4.35E+03
Conductivity (uS)	50392	3/08/88	COND-Fld	4.46E+03
Conductivity (uS)	50402	3/21/88	COND-Fld	1.35E+04
pH (dimensionless)	50358	11/16/87	PH-Fld	6.62E+00
pH (dimensionless)	50392	3/08/88	PH-Fld	7.13E+00
pH (dimensionless)	50402	3/21/88	PH-Fld	6.13E+00
pH (dimensionless)	50412	4/18/88	PH-Fld	4.91E+00
Temperature (degrees C)	50358	11/16/87	TEMP-Fld	1.43E+01
Temperature (degrees C)	50392	3/08/88	TEMP-Fld	8.70E+00
Temperature (degrees C)	50402	3/21/88	TEMP-Fld	8.60E+00
Temperature (degrees C)	50412	4/18/88	TEMP-Fld	1.29E+01
TOC	50358	11/16/87	TOC	<1.00E+03
TOC	50392	3/08/88	TOC	1.15E+03
TOX (as Cl)	50358	11/16/87	LTOX	5.87E+02
TOX (as Cl)	50392	3/08/88	LTOX	1.30E+02
TOX (as Cl)	50402	3/21/88	LTOX	7.35E+03
TOX (as Cl)	50412	4/18/88	LTOX	6.63E+03

Data for 284-W Powerplant Wastewater--Routine

Constituent	Sample #	Date	Method	Result
Aluminum	50438	7/20/88	ICP	1.63E+02
Aluminum	50452	8/30/88	ICP	<1.50E+02
Aluminum	50504	12/07/88	ICP	<1.50E+02
Aluminum	50516	12/27/88	ICP	<1.50E+02
Aluminum	50546	3/06/89	ICP	<1.50E+02
Aluminum	50760	11/13/89	ICP	3.61E+02
Aluminum	50865	1/02/90	ICP	<1.50E+02
Aluminum	50996	2/28/90	ICP	1.68E+02
Aluminum	51056	3/16/90	ICP	1.54E+02
Arsenic (EP Toxic)	50760E	11/13/89	ICP	<5.00E+02
Arsenic (EP Toxic)	50865E	1/02/90	ICP	<5.00E+02

Data for 284-W Powerplant Wastewater--Routine

Constituent	Sample #	Date	Method	Result
Arsenic (EP Toxic)	50996E	2/28/90	ICP	<5.00E+02
Arsenic (EP Toxic)	51056E	3/16/90	ICP	<5.00E+02
Barium	50438	7/20/88	ICP	2.10E+01
Barium	50452	8/30/88	ICP	2.70E+01
Barium	50504	12/07/88	ICP	2.30E+01
Barium	50516	12/27/88	ICP	3.00E+01
Barium	50546	3/06/89	ICP	2.20E+01
Barium	50760	11/13/89	ICP	6.20E+01
Barium	50865	1/02/90	ICP	3.30E+01
Barium	50996	2/28/90	ICP	4.30E+01
Barium	51056	3/16/90	ICP	8.33E+02
Barium (EP Toxic)	50760E	11/13/89	ICP	<1.00E+03
Barium (EP Toxic)	50865E	1/02/90	ICP	<1.00E+03
Barium (EP Toxic)	50996E	2/28/90	ICP	<1.00E+03
Barium (EP Toxic)	51056E	3/16/90	ICP	1.04E+03
Boron	50546	3/06/89	ICP	4.00E+01
Boron	50760	11/13/89	ICP	1.50E+02
Boron	50865	1/02/90	ICP	1.20E+01
Boron	50996	2/28/90	ICP	4.40E+01
Boron	51056	3/16/90	ICP	3.50E+01
Cadmium	50438	7/20/88	ICP	<2.00E+00
Cadmium	50452	8/30/88	ICP	<2.00E+00
Cadmium	50504	12/07/88	ICP	<2.00E+00
Cadmium	50516	12/27/88	ICP	<2.00E+00
Cadmium	50546	3/06/89	ICP	<2.00E+00
Cadmium	50760	11/13/89	ICP	<2.00E+00
Cadmium	50865	1/02/90	ICP	<2.00E+00
Cadmium	50996	2/28/90	ICP	<2.00E+00
Cadmium	51056	3/16/90	ICP	1.10E+01
Cadmium (EP Toxic)	50760E	11/13/89	ICP	<1.00E+02
Cadmium (EP Toxic)	50865E	1/02/90	ICP	<1.00E+02
Cadmium (EP Toxic)	50996E	2/28/90	ICP	<1.00E+02
Cadmium (EP Toxic)	51056E	3/16/90	ICP	<1.00E+02
Calcium	50438	7/20/88	ICP	1.48E+04
Calcium	50452	8/30/88	ICP	1.62E+04
Calcium	50504	12/07/88	ICP	1.83E+04
Calcium	50516	12/27/88	ICP	1.85E+04
Calcium	50546	3/06/89	ICP	1.67E+04
Calcium	50760	11/13/89	ICP	1.35E+04
Calcium	50865	1/02/90	ICP	1.96E+04
Calcium	50996	2/28/90	ICP	1.88E+04
Calcium	51056	3/16/90	ICP	7.39E+05
Chloride	50438	7/20/88	IC	3.82E+03
Chloride	50452	8/30/88	IC	2.56E+03
Chloride	50504	12/07/88	IC	3.30E+03
Chloride	50516	12/27/88	IC	3.70E+03
Chloride	50546	3/06/89	IC	2.30E+03
Chloride	50760	11/13/89	IC	4.60E+03
Chloride	50865	1/02/90	IC	8.40E+03

Data for 284-W Powerplant Wastewater--Routine

Constituent	Sample #	Date	Method	Result
Chloride	50996	2/28/90	IC	2.70E+03
Chloride	51056	3/16/90	IC	2.91E+06
Chromium (EP Toxic)	50760E	11/13/89	ICP	<5.00E+02
Chromium (EP Toxic)	50865E	1/02/90	ICP	<5.00E+02
Chromium (EP Toxic)	50996E	2/28/90	ICP	<5.00E+02
Chromium (EP Toxic)	51056E	3/16/90	ICP	<5.00E+02
Cobalt	50546	3/06/89	ICP	<2.00E+01
Cobalt	50760	11/13/89	ICP	<2.00E+01
Cobalt	50865	1/02/90	ICP	<2.00E+01
Cobalt	50996	2/28/90	ICP	<2.00E+01
Cobalt	51056	3/16/90	ICP	4.60E+01
Copper	50438	7/20/88	ICP	1.50E+01
Copper	50452	8/30/88	ICP	<1.00E+01
Copper	50504	12/07/88	ICP	<1.00E+01
Copper	50516	12/27/88	ICP	<1.00E+01
Copper	50546	3/06/89	ICP	<1.00E+01
Copper	50760	11/13/89	ICP	1.00E+01
Copper	50865	1/02/90	ICP	<1.00E+01
Copper	50996	2/28/90	ICP	<1.00E+01
Copper	51056	3/16/90	ICP	1.50E+01
Fluoride	50438	7/20/88	IC	<5.00E+02
Fluoride	50438	7/20/88	ISE	9.70E+01
Fluoride	50452	8/30/88	IC	<5.00E+02
Fluoride	50452	8/30/88	ISE	1.39E+02
Fluoride	50504	12/07/88	IC	<5.00E+02
Fluoride	50504	12/07/88	ISE	1.20E+02
Fluoride	50516	12/27/88	IC	<5.00E+02
Fluoride	50516	12/27/88	ISE	1.60E+02
Fluoride	50546	3/06/89	IC	<5.00E+02
Fluoride	50546	3/06/89	ISE	1.10E+02
Fluoride	50760	11/13/89	IC	<5.00E+02
Fluoride	50760	11/13/89	ISE	1.56E+02
Fluoride	50865	1/02/90	IC	<5.00E+02
Fluoride	50865	1/02/90	ISE	1.74E+02
Fluoride	50996	2/28/90	IC	<5.00E+02
Fluoride	50996	2/28/90	ISE	1.59E+02
Fluoride	51056	3/16/90	IC	<5.00E+02
Fluoride	51056	3/16/90	ISE	1.68E+02
Iron	50438	7/20/88	ICP	2.81E+02
Iron	50452	8/30/88	ICP	7.50E+01
Iron	50504	12/07/88	ICP	<3.00E+01
Iron	50516	12/27/88	ICP	9.90E+01
Iron	50546	3/06/89	ICP	3.20E+01
Iron	50760	11/13/89	ICP	1.71E+02
Iron	50865	1/02/90	ICP	4.10E+01
Iron	50996	2/28/90	ICP	1.49E+02
Iron	51056	3/16/90	ICP	5.50E+01
Lead	50438	7/20/88	GFAA	6.40E+00
Lead	50452	8/30/88	GFAA	<5.00E+00

Data for 284-W Powerplant Wastewater--Routine

Constituent	Sample #	Date	Method	Result
Lead	50504	12/07/88	GFAA	<5.00E+00
Lead	50516	12/27/88	GFAA	<5.00E+00
Lead	50546	3/06/89	GFAA	<5.00E+00
Lead	50760	11/13/89	GFAA	<5.00E+00
Lead	50865	1/02/90	GFAA	<5.00E+00
Lead	50996	2/28/90	GFAA	<5.00E+00
Lead	51056	3/16/90	GFAA	<5.00E+00
Lead (EP Toxic)	50760E	11/13/89	ICP	<5.00E+02
Lead (EP Toxic)	50865E	1/02/90	ICP	<5.00E+02
Lead (EP Toxic)	50996E	2/28/90	ICP	<5.00E+02
Lead (EP Toxic)	51056E	3/16/90	ICP	<5.00E+02
Lithium	50546	3/06/89	ICP	<1.00E+01
Lithium	50760	11/13/89	ICP	<1.00E+01
Lithium	50865	1/02/90	ICP	<1.00E+01
Lithium	50996	2/28/90	ICP	<1.00E+01
Lithium	51056	3/16/90	ICP	3.90E+01
Magnesium	50438	7/20/88	ICP	3.04E+03
Magnesium	50452	8/30/88	ICP	3.66E+03
Magnesium	50504	12/07/88	ICP	3.54E+03
Magnesium	50516	12/27/88	ICP	4.54E+03
Magnesium	50546	3/06/89	ICP	3.98E+03
Magnesium	50760	11/13/89	ICP	2.46E+03
Magnesium	50865	1/02/90	ICP	4.32E+03
Magnesium	50996	2/28/90	ICP	4.33E+03
Magnesium	51056	3/16/90	ICP	2.78E+05
Manganese	50438	7/20/88	ICP	7.00E+00
Manganese	50452	8/30/88	ICP	<5.00E+00
Manganese	50504	12/07/88	ICP	<5.00E+00
Manganese	50516	12/27/88	ICP	<5.00E+00
Manganese	50546	3/06/89	ICP	<5.00E+00
Manganese	50760	11/13/89	ICP	<5.00E+00
Manganese	50865	1/02/90	ICP	<5.00E+00
Manganese	50996	2/28/90	ICP	<5.00E+00
Manganese	51056	3/16/90	ICP	2.30E+01
Mercury	50438	7/20/88	CVAA	<1.00E-01
Mercury	50452	8/30/88	CVAA	<1.00E-01
Mercury	50504	12/07/88	CVAA	<1.00E-01
Mercury	50516	12/27/88	CVAA	<1.00E-01
Mercury	50546	3/06/89	CVAA	<1.00E-01
Mercury	50760	11/13/89	CVAA	<1.00E-01
Mercury	50865	1/02/90	CVAA	<1.00E-01
Mercury	50996	2/28/90	CVAA	<1.00E-01
Mercury	51056	3/16/90	CVAA	1.34E+00
Mercury (EP Toxic)	50760E	11/13/89	CVAA/M	<2.00E+01
Mercury (EP Toxic)	50865E	1/02/90	CVAA/M	<2.00E+01
Mercury (EP Toxic)	50996E	2/28/90	CVAA/M	<2.00E+01
Mercury (EP Toxic)	51056E	3/16/90	CVAA/M	<2.00E+01
Nitrate	50438	7/20/88	IC	<5.00E+02
Nitrate	50452	8/30/88	IC	<5.00E+02

Data for 284-W Powerplant Wastewater--Routine

Constituent	Sample #	Date	Method	Result
Nitrate	50504	12/07/88	IC	6.00E+02
Nitrate	50516	12/27/88	IC	8.00E+02
Nitrate	50546	3/06/89	IC	1.30E+03
Nitrate	50760	11/13/89	IC	<5.00E+02
Nitrate	50865	1/02/90	IC	8.00E+02
Nitrate	50996	2/28/90	IC	<5.00E+02
Nitrate	51056	3/16/90	IC	<5.00E+02
Potassium	50438	7/20/88	ICP	9.45E+02
Potassium	50452	8/30/88	ICP	7.73E+02
Potassium	50504	12/07/88	ICP	7.83E+02
Potassium	50516	12/27/88	ICP	1.65E+03
Potassium	50546	3/06/89	ICP	9.09E+02
Potassium	50760	11/13/89	ICP	8.70E+02
Potassium	50865	1/02/90	ICP	1.04E+03
Potassium	50996	2/28/90	ICP	8.67E+02
Potassium	51056	3/16/90	ICP	3.22E+04
Selenium (EP Toxic)	50760E	11/13/89	ICP	<5.00E+02
Selenium (EP Toxic)	50865E	1/02/90	ICP	<5.00E+02
Selenium (EP Toxic)	50996E	2/28/90	ICP	<5.00E+02
Selenium (EP Toxic)	51056E	3/16/90	ICP	<5.00E+02
Silicon	50546	3/06/89	ICP	2.25E+03
Silicon	50760	11/13/89	ICP	3.22E+03
Silicon	50865	1/02/90	ICP	3.06E+03
Silicon	50996	2/28/90	ICP	2.92E+03
Silicon	51056	3/16/90	ICP	2.27E+03
Silver (EP Toxic)	50760E	11/13/89	ICP	<5.00E+02
Silver (EP Toxic)	50865E	1/02/90	ICP	<5.00E+02
Silver (EP Toxic)	50996E	2/28/90	ICP	<5.00E+02
Silver (EP Toxic)	51056E	3/16/90	ICP	<5.00E+02
Sodium	50438	7/20/88	ICP	2.39E+04
Sodium	50452	8/30/88	ICP	1.06E+04
Sodium	50504	12/07/88	ICP	1.67E+04
Sodium	50516	12/27/88	ICP	3.05E+04
Sodium	50546	3/06/89	ICP	1.73E+04
Sodium	50760	11/13/89	ICP	3.27E+04
Sodium	50865	1/02/90	ICP	1.42E+04
Sodium	50996	2/28/90	ICP	1.30E+04
Sodium	51056	3/16/90	ICP	1.11E+06
Strontium	50438	7/20/88	ICP	7.30E+01
Strontium	50452	8/30/88	ICP	9.20E+01
Strontium	50504	12/07/88	ICP	9.70E+01
Strontium	50516	12/27/88	ICP	9.30E+01
Strontium	50546	3/06/89	ICP	9.10E+01
Strontium	50760	11/13/89	ICP	5.73E+02
Strontium	50865	1/02/90	ICP	1.01E+02
Strontium	50996	2/28/90	ICP	2.22E+02
Strontium	51056	3/16/90	ICP	3.16E+03
Sulfate	50438	7/20/88	IC	2.36E+04
Sulfate	50452	8/30/88	IC	1.92E+04

Data for 284-W Powerplant Wastewater--Routine

Constituent	Sample #	Date	Method	Result
Sulfate	50504	12/07/88	IC	2.27E+04
Sulfate	50516	12/27/88	IC	2.96E+04
Sulfate	50546	3/06/89	IC	2.35E+04
Sulfate	50760	11/13/89	IC	4.17E+04
Sulfate	50865	1/02/90	IC	2.18E+04
Sulfate	50996	2/28/90	IC	1.88E+04
Sulfate	51056	3/16/90	IC	2.49E+04
Uranium	50438	7/20/88	FLUOR	<1.52E-01
Uranium	50452	8/30/88	FLUOR	4.70E-01
Uranium	50504	12/07/88	FLUOR	3.03E-01
Uranium	50516	12/27/88	FLUOR	3.78E-01
Uranium	50546	3/06/89	FLUOR	2.00E-01
Uranium	50760	11/13/89	FLUOR	3.73E-01
Uranium	50865	1/02/90	FLUOR	5.67E-01
Uranium	51056	3/16/90	FLUOR	6.15E-01
Vanadium	50438	7/20/88	ICP	<5.00E+00
Vanadium	50452	8/30/88	ICP	<5.00E+00
Vanadium	50504	12/07/88	ICP	<5.00E+00
Vanadium	50516	12/27/88	ICP	<5.00E+00
Vanadium	50546	3/06/89	ICP	<5.00E+00
Vanadium	50760	11/13/89	ICP	5.00E+00
Vanadium	50865	1/02/90	ICP	<5.00E+00
Vanadium	50996	2/28/90	ICP	<5.00E+00
Vanadium	51056	3/16/90	ICP	<5.00E+00
Zinc	50438	7/20/88	ICP	1.60E+01
Zinc	50452	8/30/88	ICP	5.00E+00
Zinc	50504	12/07/88	ICP	6.00E+00
Zinc	50516	12/27/88	ICP	7.00E+00
Zinc	50546	3/06/89	ICP	6.00E+00
Zinc	50760	11/13/89	ICP	1.20E+01
Zinc	50865	1/02/90	ICP	<5.00E+00
Zinc	50996	2/28/90	ICP	<5.00E+00
Zinc	51056	3/16/90	ICP	6.60E+01
Ammonia	50438	7/20/88	ISE	5.10E+01
Ammonia	50452	8/30/88	ISE	<5.00E+01
Ammonia	50504	12/07/88	ISE	<5.00E+01
Ammonia	50516	12/27/88	ISE	<5.00E+01
Ammonia	50546	3/06/89	ISE	<5.00E+01
Ammonia	50760	11/13/89	ISE	<5.00E+01
Ammonia	50865	1/02/90	ISE	<5.00E+01
Ammonia	50996	2/28/90	ISE	<5.00E+01
Ammonia	51056	3/16/90	ISE	<5.00E+01
2-Butanone	50438	7/20/88	VOA	<1.00E+01
2-Butanone	50438B	7/20/88	VOA	<1.00E+01
2-Butanone	50452	8/30/88	VOA	<1.00E+01
2-Butanone	50452B	8/30/88	VOA	<1.00E+01
2-Butanone	50504	12/07/88	VOA	<1.00E+01
2-Butanone	50504B	12/07/88	VOA	<1.00E+01
2-Butanone	50516	12/27/88	VOA	<1.00E+01

Data for 284-W Powerplant Wastewater--Routine

Constituent	Sample #	Date	Method	Result
2-Butanone	50516B	12/27/88	VOA	<1.00E+01
2-Butanone	50546	3/06/89	VOA	<1.00E+01
2-Butanone	50546B	3/06/89	VOA	<1.00E+01
2-Butanone	50760	11/13/89	VOA	<1.00E+01
2-Butanone	50760B	11/13/89	VOA	<1.00E+01
2-Butanone	50760T	11/13/89	VOA	<1.00E+01
2-Butanone	50865	1/02/90	VOA	<1.00E+01
2-Butanone	50865B	1/02/90	VOA	1.60E+01
2-Butanone	50865T	1/02/90	VOA	1.10E+01
2-Butanone	50996	2/28/90	VOA	<1.00E+01
2-Butanone	50996B	2/28/90	VOA	<1.00E+01
2-Butanone	50996T	2/28/90	VOA	<1.00E+01
2-Butanone	51056	3/16/90	VOA	<1.00E+01
2-Butanone	51056B	3/16/90	VOA	<1.00E+01
2-Butanone	51056T	3/16/90	VOA	<1.00E+01
Hexadecanoic acid	50516	12/27/88	ABN	4.00E+01
Pentachloroethane	50438	7/20/88	VOA	<1.00E+01
Pentachloroethane	50438B	7/20/88	VOA	<1.00E+01
Pentachloroethane	50452	8/30/88	VOA	<1.00E+01
Pentachloroethane	50452B	8/30/88	VOA	<1.00E+01
Pentachloroethane	50504	12/07/88	VOA	<1.00E+01
Pentachloroethane	50504B	12/07/88	VOA	<1.00E+01
Pentachloroethane	50516	12/27/88	VOA	<1.00E+01
Pentachloroethane	50516B	12/27/88	VOA	<1.00E+01
Pentachloroethane	50546	3/06/89	VOA	<1.00E+01
Pentachloroethane	50546	3/06/89	ABN	1.18E+02
Pentachloroethane	50546B	3/06/89	VOA	<1.00E+01
Pentachloroethane	50760	11/13/89	VOA	<1.00E+01
Pentachloroethane	50760B	11/13/89	VOA	<1.00E+01
Pentachloroethane	50760T	11/13/89	VOA	<1.00E+01
Pentachloroethane	50865	1/02/90	VOA	<1.00E+01
Pentachloroethane	50865B	1/02/90	VOA	<1.00E+01
Pentachloroethane	50865T	1/02/90	VOA	<1.00E+01
Pentachloroethane	50996	2/28/90	VOA	<1.00E+01
Pentachloroethane	50996B	2/28/90	VOA	<1.00E+01
Pentachloroethane	50996T	2/28/90	VOA	<1.00E+01
Pentachloroethane	51056	3/16/90	VOA	<1.00E+01
Pentachloroethane	51056B	3/16/90	VOA	<1.00E+01
Pentachloroethane	51056T	3/16/90	VOA	<1.00E+01
1,2,3,3-Tetrachloropropene	50546	3/06/89	ABN	2.30E+01
Trichloromethane	50438	7/20/88	VOA	1.40E+01
Trichloromethane	50438B	7/20/88	VOA	<5.00E+00
Trichloromethane	50452	8/30/88	VOA	1.50E+01
Trichloromethane	50452B	8/30/88	VOA	<5.00E+00
Trichloromethane	50504	12/07/88	VOA	<3.00E+00
Trichloromethane	50504B	12/07/88	VOA	<5.00E+00
Trichloromethane	50516	12/27/88	VOA	<2.00E+00
Trichloromethane	50516B	12/27/88	VOA	<5.00E+00
Trichloromethane	50546	3/06/89	VOA	<3.00E+00

Data for 284-W Powerplant Wastewater--Routine

Constituent	Sample #	Date	Method	Result
Trichloromethane	50546B	3/06/89	VOA	<4.00E+00
Trichloromethane	50760	11/13/89	VOA	1.00E+01
Trichloromethane	50760B	11/13/89	VOA	<3.00E+00
Trichloromethane	50760T	11/13/89	VOA	<4.00E+00
Trichloromethane	50865	1/02/90	VOA	5.00E+00
Trichloromethane	50865B	1/02/90	VOA	<5.00E+00
Trichloromethane	50865T	1/02/90	VOA	<4.00E+00
Trichloromethane	50996	2/28/90	VOA	<5.00E+00
Trichloromethane	50996B	2/28/90	VOA	<5.00E+00
Trichloromethane	50996T	2/28/90	VOA	<5.00E+00
Trichloromethane	51056	3/16/90	VOA	<5.00E+00
Trichloromethane	51056B	3/16/90	VOA	<5.00E+00
Trichloromethane	51056T	3/16/90	VOA	<5.00E+00
Unknown	50516	12/27/88	ABN	3.60E+01
Unknown	50546	3/06/89	ABN	3.07E+03
Alkalinity (Method B)	50760	11/13/89	TITRA	6.80E+04
Alkalinity (Method B)	50865	1/02/90	TITRA	7.80E+04
Alkalinity (Method B)	50996	2/28/90	TITRA	7.50E+04
Alkalinity (Method B)	51056	3/16/90	TITRA	6.40E+04
Beta Activity (pCi/L)	50438	7/20/88	Beta	<2.47E+01
Beta Activity (pCi/L)	50452	8/30/88	Beta	<1.07E+01
Beta Activity (pCi/L)	50516	12/27/88	Beta	1.27E+02
Beta Activity (pCi/L)	50546	3/06/89	Beta	<4.34E+01
Beta Activity (pCi/L)	50760	11/13/89	Beta	2.61E+00
Beta Activity (pCi/L)	50865	1/02/90	Beta	<1.47E+00
Beta Activity (pCi/L)	51056	3/16/90	Beta	5.37E+00
Conductivity (uS)	50438	7/20/88	COND-Fld	2.33E+02
Conductivity (uS)	50452	8/30/88	COND-Fld	1.73E+02
Conductivity (uS)	50504	12/07/88	COND-Fld	2.22E+02
Conductivity (uS)	50516	12/27/88	COND-Fld	2.61E+02
Conductivity (uS)	50546	3/06/89	COND-Fld	1.51E+02
Conductivity (uS)	50760	11/13/89	COND-Fld	2.66E+02
Conductivity (uS)	50865	1/02/90	COND-Fld	2.24E+02
Conductivity (uS)	50996	2/28/90	COND-Fld	1.58E+02
Conductivity (uS)	51056	3/16/90	COND-Fld	1.01E+03
Ignitability (degrees F)	50760E	11/13/89	IGNIT	>2.10E+02
Ignitability (degrees F)	50865E	1/02/90	IGNIT	>2.12E+02
Ignitability (degrees F)	50996E	2/28/90	IGNIT	>2.02E+02
Ignitability (degrees F)	51056E	3/16/90	IGNIT	>1.98E+02
pH (dimensionless)	50438	7/20/88	PH-Fld	9.47E+00
pH (dimensionless)	50452	8/30/88	PH-Fld	6.64E+00
pH (dimensionless)	50504	12/07/88	PH-Fld	9.37E+00
pH (dimensionless)	50516	12/27/88	PH-Fld	9.72E+00
pH (dimensionless)	50546	3/06/89	PH-Fld	8.53E+00
pH (dimensionless)	50760	11/13/89	PH-Fld	9.35E+00
pH (dimensionless)	50865	1/02/90	PH-Fld	8.67E+00
pH (dimensionless)	50996	2/28/90	PH-Fld	8.96E+00
pH (dimensionless)	51056	3/16/90	PH-Fld	9.20E+00
Reactivity Cyanide (mg/kg)	50760E	11/13/89	DSPEC	<1.00E+02

Data for 284-W Powerplant Wastewater--Routine

Constituent	Sample #	Date	Method	Result
Reactivity Cyanide (mg/kg)	50865E	1/02/90	DSPEC	<1.00E+02
Reactivity Cyanide (mg/kg)	50996E	2/28/90	DSPEC	<1.00E+02
Reactivity Cyanide (mg/kg)	51056E	3/16/90	DSPEC	<1.00E+02
Reactivity Sulfide (mg/kg)	50760E	11/13/89	DTITRA	<1.00E+02
Reactivity Sulfide (mg/kg)	50865E	1/02/90	DTITRA	<1.00E+02
Reactivity Sulfide (mg/kg)	50996E	2/28/90	DTITRA	<1.00E+02
Reactivity Sulfide (mg/kg)	51056E	3/16/90	DTITRA	<1.00E+02
Suspended Solids	50760	11/13/89	SSOLID	1.40E+04
Suspended Solids	50865	1/02/90	SSOLID	<5.00E+03
Suspended Solids	50996	2/28/90	SSOLID	<5.00E+03
Suspended Solids	51056	3/16/90	SSOLID	<5.00E+03
TDS	50760	11/13/89	TDS	1.18E+05
TDS	50865	1/02/90	TDS	1.26E+05
TDS	50996	2/28/90	TDS	9.30E+04
TDS	51056	3/16/90	TDS	3.54E+06
Temperature (degrees C)	50438	7/20/88	TEMP-Fld	3.03E+01
Temperature (degrees C)	50452	8/30/88	TEMP-Fld	2.71E+01
Temperature (degrees C)	50504	12/07/88	TEMP-Fld	1.46E+01
Temperature (degrees C)	50516	12/27/88	TEMP-Fld	1.20E+01
Temperature (degrees C)	50546	3/06/89	TEMP-Fld	1.20E+01
Temperature (degrees C)	50760	11/13/89	TEMP-Fld	2.42E+01
Temperature (degrees C)	50865	1/02/90	TEMP-Fld	1.22E+01
Temperature (degrees C)	50996	2/28/90	TEMP-Fld	8.40E+00
Temperature (degrees C)	51056	3/16/90	TEMP-Fld	1.07E+01
TOC	50438	7/20/88	TOC	1.96E+03
TOC	50452	8/30/88	TOC	1.49E+03
TOC	50504	12/07/88	TOC	1.00E+03
TOC	50516	12/27/88	TOC	1.20E+03
TOC	50546	3/06/89	TOC	<1.20E+03
TOC	50760	11/13/89	TOC	<1.40E+03
TOC	50865	1/02/90	TOC	<1.50E+03
TOC	50996	2/28/90	TOC	1.30E+03
TOC	51056	3/16/90	TOC	1.30E+03
Total Carbon	50760	11/13/89	TC	1.42E+04
Total Carbon	50865	1/02/90	TC	1.68E+04
Total Carbon	50996	2/28/90	TC	1.55E+04
Total Carbon	51056	3/16/90	TC	1.56E+04
TOX (as Cl)	50438	7/20/88	LTOX	6.30E+01
TOX (as Cl)	50452	8/30/88	LTOX	1.14E+02
TOX (as Cl)	50504	12/07/88	LTOX	2.20E+01
TOX (as Cl)	50516	12/27/88	LTOX	2.20E+01
TOX (as Cl)	50546	3/06/89	LTOX	2.70E+01
TOX (as Cl)	50760	11/13/89	LTOX	6.90E+01
TOX (as Cl)	50865	1/02/90	LTOX	4.40E+01
TOX (as Cl)	50996	2/28/90	LTOX	1.60E+01
TOX (as Cl)	51056	3/16/90	LTOX	7.70E+01

Data for 284-W Powerplant Wastewater--Routine

DATA REPORT FOOTNOTES

Sample# is the number of the sample. See chapter three for corresponding chain-of-custody number.
Date is the sampling date.
Results are in ppb (parts per billion) unless otherwise indicated.
The following table lists the methods that are coded in the method column.

Code	Analytical Method	Reference
ABN	Semivolatile Organics (GC/MS)	USEPA-8270
AEA	Americium-241	UST-20Am01
AEA	Curium Isotopes	UST-20Am/Cm01
AEA	Plutonium Isotopes	UST-20Pu01
AEA	Uranium Isotopes	UST-20U01
ALPHA	Alpha Counting	EPA-680/4-75/1
ALPHA-Ra	Total Radium Alpha Counting	ASTM-D2460
BETA	Beta Counting	EPA-680/4-75/1
BETA	Strontium-90	UST-20Sr02
COLIF	Coliform Bacteria	USEPA-9131
COLIFMF	Coliform Bacteria (Membrane Filter)	USEPA-9132
COND-Fld	Conductivity-Field	ASTM-D1125A
COND-Lab	Conductivity-Laboratory	ASTM-D1125A
CVAA	Mercury	USEPA-7470
CVAA/M	Mercury-Mixed Matrix	USEPA-7470
DIGC	Direct Aqueous Injection (GC)	UST-70DIGC
DIMS	Direct Aqueous Injection (GC/MS)	"USEPA-8240"
DSPEC	Reactive Cyanide (Distillation, Spectroscopy)	USEPA-CHAPTER 7
DTITRA	Reactive Sulfide (Distillation, Titration)	USEPA-CHAPTER 7
FLUOR	Uranium (Fluorometry)	ASTM-D2907-83
GEA	Gamma Energy Analysis Spectroscopy	ASTM-D3649-85
GFAA	Arsenic (AA, Furnace Technique)	USEPA-7060
GFAA	Lead (AA, Furnace Technique)	USEPA-7421
GFAA	Selenium (AA, Furnace Technique)	USEPA-7740
GFAA	Thallium (AA, Furnace Technique)	USEPA-7841
IC	Ion Chromatography	EPA-600/4-84-01
ICP	Atomic Emission Spectroscopy (ICP)	USEPA-6010
ICP/M	Atomic Emission Spectroscopy (ICP)-Mixed Matrix	USEPA-6010
IGNIT	Pensky-Martens Closed-Cup Ignitability	USEPA-1010
ISE	Fluoride-Low Detection Limit	ASTM-D1179-80-B
ISE	Ammonium Ion	ASTM-D1426-D
LALPHA	Alpha Activity-Low Detection Limit	EPA-680/4-75/1
LEPD	Iodine-129	UST-20I02
LSC	C-14	UST-20C01
LSC	Tritium	UST-20H03
LTOX	Total Organic Halides-Low Detection Limit	USEPA-9020
PH-Fld	pH-Field	USEPA-9040
PH-Lab	pH-Laboratory	USEPA-9040
SPEC	Total and Amenable Cyanide (Spectroscopy)	USEPA-9010
SPEC	Hydrazine-Low Detection Limit (Spectroscopy)	ASTM-D1385
SSOLID	Suspended Solids	SM-208D

Data for 284-W Powerplant Wastewater--Routine

DATA REPORT FOOTNOTES

TC	Total Carbon	USEPA-9060
TDS	Total Dissolved Solids	SM-208B
TEMP-Fld	Temperature-Field	Local
TITRA	Alkalinity-Method B (Titration)	ASTM-D1067B
TITRA	Sulfides (Titration)	USEPA-9030
TOC	Total Organic Carbon	USEPA-9060
TOX	Total Organic Halides	USEPA-9020
VOA	Volatile Organics (GC/MS)	USEPA-8240

Analytical Method Acronyms:
atomic absorption spectroscopy (AA), gas chromatography (GC), mass spectrometry (MS), inductively-coupled plasma spectroscopy (ICP)

References:

ASTM - "1986 Annual Book of ASTM Standards", American Society for Testing and Materials, Philadelphia, Pennsylvania.

EPA - Various methods of the U.S. Environmental Protection Agency, Washington, D.C.

UST - Methods of the United States Testing Company, Incorporated, Richland, Washington.

SM - "Standard Methods for the Examination of Water and Wastewater", 16th ed., American Public Health Association, American Water Works Association and Water Pollution Control Federation, Washington, D.C.

USEPA- "Test Methods for Evaluating Solid Waste Physical/Chemical Methods", 3rd ed., SW-846, U.S. Environmental Protection Agency, Washington, D.C.