1 of 3

Groundwater Impact Assessment Report for the 216-S-26 Crib, 200 West Area

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EXECUTIVE SUMMARY

As required by the *Hanford Federal Facility Agreement and Consent Order*¹ (Tri-Party Agreement Milestone M-17-00A), this report assesses the impact of wastewater discharged to the 216-S-26 Crib on groundwater quality. The assessment reported herein expands upon the initial analysis conducted between 1989 and 1990 for the *Liquid Effluent Study Final Project Plan*.²

Facility Description

The 216-S-26 Crib, located in the southern 200 West Area, has been in use since 1984 to dispose of liquid effluents from the 222-S Laboratory Complex. The 222-S Laboratory Complex effluent stream includes wastewater from four sources: the 222-S Laboratory, the 219-S Waste Storage Facility, the 222-SA Chemical Standards Laboratory, and the 291-S Exhaust Fan Control House and Stack. The average flow rate, as of January 1993 was 4.1×10^4 L/month (1.1×10^4 gal/month) or 0.95 L/minute (0.26 gal/minute). Discharges to the crib are scheduled to cease by June 1995.

Impact Assessment

Based on assessment of groundwater chemistry and flow data, contaminant transport predictions, and groundwater chemistry data, the 216-S-26 Crib has minimal influence on groundwater contamination in the southern 200 West Area. Locally, groundwater is contaminated primarily with uranium, nitrate, tritium, and chloroform, which are attributed to upgradient past-practice sources other

¹Ecology, EPA, and DOE, 1990, *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.

²WHC, 1990, *Liquid Effluent Study Final Project Plan*, WHC-EP-0367, Westinghouse Hanford Company, Richland, Washington.

than the 216-S-26 Crib. The most likely sources are the 216-S-1, 216-S-2, 216-S-7, 216-S-13, and 216-S-25 Cribs, which are located to the northwest of the S-26 Crib. Other potential sources are the 216-S-22 Crib and 216-S-12 Trench, located to the north of the S-26 Crib.

Constituents of interest for the 216-S-26 Crib are manganese-54, cobalt-60, cesium-137, americium-241, strontium-90, aluminum, and uranium. Calculated travel times to the water table for all constituents except uranium, were more than 40 years. Therefore, any of these constituents present in the crib would be retained in the soil column. The calculated travel time for uranium was less than five years. Selenium was identified in this report as an additional constituent of interest, because it was detected in the groundwater in elevated concentrations. Travel time to groundwater for selenium was calculated at less than a year. Selenium has not been detected in the 216-S-26 Crib effluent; however, the analytical limit of detection is currently too high to rule out the presence of selenium in the effluent. There is no conclusive evidence that the uranium and selenium present in the groundwater at the 216-S-26 Crib came from discharges to the crib. It appears more likely that the source of these constituents is upgradient of the 216-S-26 Crib.

Conclusions

Continued short-term operation of the 216-S-26 Crib will have little effect on groundwater contamination in the southern 200 West Area. The groundwater monitoring well currently installed at the 216-S-26 Crib is adequate for use of the crib, under current operating conditions (September 1993), until the June 1995 cessation date. If discharges to the

216-S-26 Crib continue beyond June 1995, installation of additional groundwater monitoring wells for this site should be considered to better distinguish upgradient contaminant sources from the effects of discharge to the 216-S-26 Crib.

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1.0 INTRODUCTION

Groundwater impact assessments (GIA) are required for a number of liquid effluent receiving sites according to the *Hanford Federal Facility Agreement and Consent Order* (Tri-Party Agreement) Milestones M-17-00A and M-17-00B, as agreed upon by the U.S. Department of Energy (DOE), Washington State Department of Ecology (Ecology), and the U.S. Environmental Protection Agency (EPA) (Ecology et al. 1991). This report assesses the impacts to groundwater from the disposal of effluent to the 216-S-26 Crib (S-26 Crib) in the 200 West Area.

1.1 BACKGROUND

In response to public comments on the original Tri-Party Agreement and at the request of the signatories on the Tri-Party Agreement, the DOE, Richland Operations Office (RL) assessed the impact of liquid effluents discharged to the ground at the Hanford Site (WHC 1990b, 1990c). The EPA and Ecology expressed concerns regarding uncertainties in the evaluations made by RL. Foremost among these concerns were the lack of site-specific data, the need to consider interactions with adjacent liquid discharge facilities, and the need for more rigorous models of contaminant transport. Therefore, RL, Ecology, and EPA (the three parties) created a series of Tri-Party Agreement Milestones, including M-17-00A, M-17-00B, M-17-13, and M-17-13A, which pertain to GIAs.

Tri-Party Agreement Milestones M-17-00A and M-17-00B require impact assessments for Phase I and II waste streams (Stordeur and Flyckt 1988). Effluents discharged to the S-26 Crib were defined as a Phase I waste stream. Tri-Party Agreement Milestone M-17-13 required a methodology for assessing the impact of liquid effluent discharge on groundwater, which resulted in the document, *A Methodology for Assessing Impacts to Groundwater from Disposal of Liquid Effluent to the Soil at the Hanford Site* (Tyler 1991). Thirty days after regulatory approval of the methodology document, as required by Tri-Party Agreement Milestone M-17-13A, a schedule for performing assessments at thirteen receiving sites was completed. The S-26 Crib is identified as one of the receiving sites to undergo a GIA.

1.2 METHODOLOGY

The methodology presented in Tyler (1991) was followed in preparing the GIA for the S-26 Crib. Tyler (1991) included the categorization of each of the 13 receiving sites into 1 of 3 levels based on the effort needed to perform the assessment. A level 1 receiving site GIA relies on available information. A level 2 receiving site GIA may require nonintrusive field work to verify existing contamination. A level 3 site may require intrusive field work. If existing information is inadequate while performing a level 1 GIA, it may be raised to a level 2 or 3.

The methodology document (Tyler 1991) outlines several tasks to be conducted as part of the GIA for level 1 receiving sites:

- Prepare and present a plan describing how the GIA will be conducted
- Characterize the liquid effluent stream
- Evaluate the site-specific hydrogeology
- Develop a site conceptual model
- Assess the hydrologic impact of the liquid effluent stream
- Assess the contaminant impact of the liquid effluent stream
- Evaluate the adequacy of the existing monitoring well network
- Prepare a written report of the results.

The tasks required for level 2 and 3 receiving sites are similar to those outlined above, but also include field work-related activities. The S-26 Crib is categorized as a level 1 receiving site based on the moderate volume of liquids discharged at the site and the low loading rate of potential contaminants on the soil column (Tyler 1991).

Several key assumptions inherent to all GIAs are explained in the methodology document (Tyler 1991). For this GIA, the following assumptions are relevant.

- The expected level of impact from the receiving site determines how well the chemistry, geology, and hydrology need to be understood.
- Modeling sophistication is tailored to available information and the expected level of impact to the receiving site.
- Historical data are useable.

2.0 FACILITIES DESCRIPTION

2.1 LOCATION

The Hanford Site is a 1,450-km² (560-mi²) tract of land located in Benton, Franklin, and Grant Counties in the south-central portion of Washington State. The 200 West Area is located in the west-central part of the Hanford Site, approximately 37 km (23 mi) northwest of the city of Richland (Figure 1). The S-26 Crib and the 222-S Laboratory Complex (source of the wastewater to the crib) are located in the southeast corner of the 200 West Area. The 222-S Laboratory Complex is located within the 200 West Area perimeter fence and the S-26 Crib is located immediately outside the fence (Figure 2). The one groundwater monitoring well (299-W27-1) associated with the S-26 Crib, is located adjacent to and on the south side of the crib (see Figure 2).

2.2 HISTORY

The S-26 Crib was constructed in 1984 and has been in use since then. Before 1984, wastewater from the 222-S Laboratory Complex was discharged to the 216-S-19 Pond (S-19 Pond) (Figure 3) or the 216-S-20 Crib (S-20 Crib) (see Figures 2 and 3). From 1952 to 1973, discharges were to both S-19 Pond and S-20 Crib. From 1973 to 1984, only the S-19 Pond was used. Well 299-W27-1 was drilled and completed in 1984 (DOE-RL 1992). Figure 4 shows the well construction and completion summary.

2.3 FACILITIES

The S-26 Crib receives wastewater from the 222-S Laboratory Complex. The 222-S Laboratory provides analytical services to the 200 Areas operations analyzing nonradioactive and radioactive samples. The 222-S Laboratory supports efforts to characterize the waste stored in the 200 Areas single-shell tanks. In addition, analytical services are provided for the following waste management processing facilities:

- Tank Farms
- B Plant
- 242-A Evaporator Facility
- Plutonium-Uranium Extraction Plant
- Plutonium Finishing Plant (PFP)
- Uranium-Oxide Plant
- Waste Encapsulation Storage Facility
- Environmental monitoring and surveillance programs
- Activities involving essential materials, research, and development.

Information about the S-26 Crib and the sources of wastewater to the crib is taken from the *222-S Laboratory Sampling and Analysis Plan* (Warwick 1992) for wastewater that comes from the 222-S Laboratory Complex and discharges to

Figure 1. Location of the 222-S Laboratory and 216-S-26 Crib.

H9306010.23

Figure 2. Site Map of the 216-S-26 Crib Showing Well Locations.

H9305023.1

Figure 3. Location of Geologic Cross Section and Nearby Facilities.

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Figure 4. As-Built for Well 299-W27-1, Monitoring Well for the 216-S-26 Crib.

the S-26 Crib. Information about the waste stream, such as flow rates and effluent constituents, is from the waste stream-specific report (Hall 1990).

The S-26 Crib is 128 by 3 m (420 by 10 ft). A 15-cm (0.5-ft) vitrified clay, perforated distribution pipe runs the length of the crib, 0.5 m (1.5 ft) above the bottom (see Figure 2). Lining the bottom of the S-26 Crib is 0.75 m (2.5 ft) of gravel covered with a membrane barrier and 2.9 m (9.5 ft) of earth. One gage well with a liquid-level indicator is located 30.5 m (100 ft) from the west end of the crib, and a vent riser is located at the east end. The S-26 Crib accommodates up to 283,905 L/day (75,000 gal/day), or 94,635 L/8 hours (25,000 gal/8 hours) per shift.

Wastewater that is discharged to the S-26 Crib comes from one or more of four sources (Figure 5):

- 222-S Laboratory
- 219-S Waste Storage Facility
- 222-SA Analytical Chemical Standards Laboratory
- 291-S Exhaust Fan Control House and Stack.

Wastewater from the 222-S Laboratory Complex and the 219-S Waste Storage Facility first goes to the 207-SL Retention Basin (Figure 6). The wastewater is held until it is sampled and analyzed and determined to comply with WHC-CM-7-5, *Environmental Compliance* (WHC 1988). If the wastewater meets compliance requirements (WHC 1988), it is sent to the S-26 Crib. Batches of effluent held that are not in compliance with radioactive and mixed-waste release criteria are pumped to the 219-S Waste Handling Facility for transfer to underground storage tanks. Batches of effluent held that are not in compliance with pH or total organic carbon (TOC) requirements are handled on a case-by-case basis; batches with too high or low of a pH value are neutralized before being sent to the S-26 Crib and batches that exceed the TOC requirements are sent to the underground storage tanks as described above.

The 207-SL Retention Basin consists of two 94,635-L (25,000-gal) belowgrade compartments. Samples of the retention basin wastewater used to determine disposal requirements are collected automatically as the effluent enters the basin (see Figure 6). If the samples meet release criteria, the effluent can be discharged to the S-26 Crib.

Wastewater from the 222-SA Standards Laboratory and 291-S Stack Fan House is not sent to the 207-SL Retention Basin, but goes straight to the S-26 Crib (see Figure 6). Wastewater from these two sources is nonradioactive and nonhazardous because the facilities have never contained radioactive materials and hazardous materials are administratively controlled.

2.4 ADJACENT FACILITIES

Several other facilities are located nearby (see Figure 3) that have discharged wastewater to the ground in the past. Descriptions of liquid effluents associated with nearby facilities and past-practice operations are summarized in Table 1. Discharges contained radioactive as well as hazardous contaminants. Although some of these discharges contained contamination, most

Figure 5. The 222-S Laboratory and Associated Facilities.

Figure 6. The 222-S Laboratory Wastewater System.

Table 1. Description of Effluents Disposed of to Nearby Facilities and Past-Practice Operations.
(4 sheets)

Facility (current status)	Years of service	Description of facility (waste description, if available)	Volume received
216-S-1 and 216-S-2 Cribs (inactive and stabilized)	1952 to 1956	Received cell drainage waste from the D-1 Receiver Tank and redistilled condensate from the D-2 Receiver Tank in the 202-S Building (wastes were radioactive and slight acidic)	1.6 E+08 L (4.2 E+08 gal)
216-S-7 Crib (inactive and stabilized)	1956 to 1965	Received cell drainage from the D-1 Receiver Tank, process condensate from the D-2 Receiver Tank, and condensate from the H-6 Condenser in the 202-S Building	3.9 E+08 L (1.0 E+08 gal)
216-S-9 Crib (inactive and stabilized)	1965 to 1969	Received process condensate from the D-2 Receiver Tank in the 202-S Building (primarily nitric acid/radioactive waste)	5.03 E+07 L (1.33 E+07 gal)
216-S-13 Crib (inactive and stabilized)	1952 to 1967	Received liquid waste from the 203-S Decontaminated Metal Storage Facility, the 204-S Uranyl Nitrate Hexahydrate Facility, and the 276-S Organic Solvent Make-Up Facility	5.0 E+06 L (1.3 E+06 gal)
	1967 to 1972	Received occasional sump waste from the 204-S Uranyl Nitrate Hexahydrate Facility (waste was low salt; neutral/basic; and mainly composed of nitrate, sodium, and sodium dichromate)	

Table 1. Description of Effluents Disposed of to Nearby Facilities and Past-Practice Operations.
(4 sheets)

Facility	Years of service	Description of facility (waste description, if available)	Volume received
216-S-20 Crib (inactive and stabilized)	1952 to 1953	Received miscellaneous waste from laboratory hoods and decontamination sinks in the S Plant via the 219-S Retention Basin	1.35 E+08 L (3.57 E+07 gal)
	1953 to 1963	Received same effluent as above except via pipelines from the 207-SL Retention Basin and 219-S Retention Basin	
		300 Area lab waste via tanker truck	
	1963 to 1969	Received miscellaneous waste from laboratory hoods and decontamination sinks in the 222-S Laboratory via the 219-S Retention Basin; 300 Area lab wastes were rerouted to 216-T-28 Crib	1.35 E+08 L (3.57 E+07 gal)
	1969 to 1972	Crib was inactive because the ground caved in above the crib	
	1972 to 1973	Crib stabilized and sinkholes filled in	
216-S-22 Crib (inactive and stabilized)	1957 to 1967	Received liquid waste from the acid recovery facility in the 293-S Building (contained nitrate and sodium)	9.84 E+04 L (2.6 E+04 gal)
216-S-25 Crib (active)	1973 to 1980	Received 242-S Evaporator process steam condensate through November 1980	3.0 E+08 L (8.0 E+07 gal)
	1980 to present	Received 241-SX Tank Farm cooling water; 242-S Evaporator in standby mode	

Table 1. Description of Effluents Disposed of to Nearby Facilities and Past-Practice Operations.
(4 sheets)

Facility	Years of service	Description of facility (waste description, if available)	Volume received
216-S-12 Trench (inactive and stabilized)	1954 to 1975	Received flush water from the 291-S Stack Complex (containing ammonium nitrate)	6.81 E+04 L (1.8 E+04 gal)
216-S-14 Trench (inactive and stabilized)	1951 to 1952	Received unknown quantity of contaminated (unirradiated uranium) MIBK from the initial test runs in the 202-S Building	Unknown
216-S-10D Ditch (inactive, partially stabilized)	1951 to 1991	Received liquid waste from 202-S Building drains, funnels, process vessel and cooling water, and chemical sewer lines. Also received liquid waste from the 241-S Tank Farm drains, overflow from 2901-S-901 Water Tower, 211-S Valve House station drains, and 276-S Solvent Handling Facility floor drains. The ditch transferred these liquid wastes to the 216-S-10P and 216-S-11 Ponds. (Wastes consisted of sodium nitrate, sodium hydroxide, aluminum nitrate nonahydrate; some wastes were radioactively contaminated; no hazardous wastes were disposed of to the ditch after February 1987)	4.34 E+09 L (1.16 E+09 gal)

Table 1. Description of Effluents Disposed of to Nearby Facilities and Past-Practice Operations.
(4 sheets)

Facility	Years of service	Description of facility (waste description, if available)	Volume received
216-S-19 Pond (inactive and stabilized)	1952 to 1954	Received effluent from the 222-S Laboratory ventilation cooling water and miscellaneous wastes from laboratory hoods and decontamination pond via the 207-SL Retention Basin	1.33 E+09 L (3.51 E+08 gal)
	1954 to 1955	Pond inactive because radionuclide concentration in the 207-SL Retention Basin liquid wastes was above the prescribed disposal guidelines; wastes rerouted to the 216-S-20 Crib	
	1955 to 1984	Received cooling water and miscellaneous wastes from laboratory hoods and decontamination sinks in the 222-S Laboratory	
2607-W6 Septic Tank and Drain Field	1951 to present	Receives sanitary wastewater and sewage	3.48 E+04 L/day (9.2 E+03 gal/day)
2607-WZ Septic Tank and Drain Field	1944 to present	Receives sanitary wastewater and sewage	2.26 E+04 L/day (5.97 E+03 gal/day)

NOTE: Stabilized = Clean fill and/or cover added to surface of facility.
MIBK = Methyl isobutyl ketone.

of the wastewater was uncontaminated process condensate. All other discharge sources were terminated by the time the S-26 Crib was put into service in 1984, except for the septic tanks and associated drain fields.

Unplanned releases that contained varying amounts of radioactive contamination, as well as intentional discharges, have also occurred near the S-26 Crib and the 222-S Laboratory Complex. Figure 7 shows the locations of these unplanned releases (DOE-RL 1992). Only the releases that occurred in the vicinity of the S-26 Crib are discussed in this document (Table 2).

Figure 7. Location of Unplanned Releases in the Vicinity of the 216-S-26 Crib (DOE-RL 1992).

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Table 2. Summary of Unplanned Releases (DOE-RL 1992). (5 sheets)

Unplanned release no.	Location	Date	Associated waste management unit	Reported waste - related history
UN-200-W-10	Near the 203-S Uranium Storage Tanks	1952	NA	An unknown source caused spotty uranium contamination.
				Maximum readings of 10,000 ct/min at 2 cm (1 in.) were noted.
				The contaminated area was covered with asphalt and posted with radiation zone signs.
UN-200-W-30	216-S-12 Trench	7/54	216-S-12 Trench	The contaminated area was limited to a pit near the northeast corner of the S Plant stack. The pit was covered with several feet of clean soil.
				Contamination consisted predominantly of ruthenium and zircon/niobium with approximately 5 Ci of beta activity and 2 to 3 Ci of gamma activity.
				This site is scheduled for deletion; it is a duplicate of the 216-S-12 Trench.
UN-200-W-32	Near the northwest corner of S Plant exclusion area	1954	NA	A ruptured transfer line from 224-U to S Plant spilled uranyl nitrate hexahydrate solution to the ground.
				No analytical data were provided on the level of contamination associated with this release.
				The contaminated area was covered with clean soil and the site removed from radiation zone status in February 1971.
UN-200-W-34	An area between the open ditch and the 202-S Chemical Sewer Trenches	5/55	NA	Release involved overflow from an open ditch and the 202-S Chemical Sewer Trenches, resulting in contamination of approximately 5,000 m ² (53,821 ft ²) between the open ditch and the trenches.
				Maximum exposure rate of 1 R/hour was recorded.
				The ditch was dredged and the sludge removed, placed in low spots on both sides of the ditch, and covered with 0.6 m (2 ft) of soil. The area was removed from radiation zone status in March 1971.
UN-200-W-35	Outside and north of S Plant exclusion area	9/55	NA	Release from a leak in the uranyl nitrate hexahydrate process line from S Plant to U Plant.
				Contamination was removed to the 200 West Area Burial Ground. The area was removed from radiation zone status in January 1972.

Table 2. Summary of Unplanned Releases (DOE-RL 1992). (5 sheets)

Unplanned release no.	Location	Date	Associated waste management unit	Reported waste - related history
UN-200-W-41	Right-of-way from the 202-S Building railroad cut to the burial ground	7/7/56	NA	Transport of a burial box caused ground contamination at the right-of-way from the 202-S Building railroad cut to the burial ground.
				Unknown beta/gamma emitter with readings to 1,000 mrad/hour recorded.
				Remedial actions not identified.
UN-200-W-42	Ground around a railroad shack near 202-S Building	2/3/57	NA	Contaminated spots from an unknown source were found in the S Plant Aggregate Area near a railroad shack.
				Contamination consisted of unknown beta/gamma readings to 500 mrad/hour.
				The site was cleaned and readings were reduced from 2,000 to 5,000 ct/min.
UN-200-W-43	Blacktop area near radiation zone east of 223-S Building	2/12/57	NA	Site originated from windblown contamination from a nearby radiation zone. Site is approximately 110 m ² (1,200 ft ²) with 4,500 kg (5 tons) of contaminated soil.
				Unknown alpha emitter with readings to 2,000 dis/min.
				Remedial actions not identified.
UN-200-W-52	South of the 241-S-151 Diversion Box toward 10th Street	9/15/58	207-S Retention Basin and 241-S-151 Diversion Box	Leakage from the 241-S-151 Diversion Box caused ground contamination in an oval-shaped area approximately 91 m (300 ft) wide, lying immediately south of the diversion box toward 10th Street, including the 207-S Retention Basin.
UN-200-W-56	Near the 202-S Column Carrier Trench	2/6/61	NA	Heavy rainfall washed contamination from a radiation zone (216-S-12) and contaminated 19 m ² (200 ft ²) of graveled surface and 5 m ² (50 ft ²) of blacktop.
				Unknown beta/gamma emitter readings of 30,000 ct/min on graveled surface and 80,000 ct/min on the blacktop were recorded.
				The contaminated area was roped off (at that time).

Table 2. Summary of Unplanned Releases (DOE-RL 1992). (5 sheets)

Unplanned release no.	Location	Date	Associated waste management unit	Reported waste - related history
UN-200-W-61	Near the southwest corner of the 202-S Building	4/24/66	NA	A firehose ruptured while flushing the H-10 Receiver Tank to the 241-SX transfer line, resulting in contamination of an area approximately 19 m ² (200 ft ²) and containing 9,000 kg (10 tons) of soil.
				Unknown beta/gamma emitter readings from 4,000 to 100,000 ct/min were recorded.
				Contaminated walkways were washed down and released from radiation zone status. The top 15 cm (6 in.) of contaminated soil were removed.
UN-200-W-69	Between the 204-S Building railroad spur and the S Plant railroad cut	3/2/73	NA	Numerous spots of ground contamination of 2,000 to 50,000 ct/min, with infrequent spots of 20 to 100 mrad/hour, were noted north and northeast from the 204-S Building Unloading Station and between the 204-S Building railroad spur and the S Plant railroad cut.
				Inside established radiation zone, the sump pit was found to be contaminated, with readings from 1,000 to 5,000 mrad/hour and the grating from the sump (stacked nearby) had readings of 800 mrad/hour.
				Extension of survey outside S Plant exclusion fence produced readings of 5,000 to 100,000 ct/min between the 204-S Building railroad spur and the S Plant railroad cut embankment.
				Remedial actions not identified.
UN-200-W-83	Vicinity of 204-S Building radiation zone	11/23/81	NA	An unknown amount of radioactive contamination was spilled on the ground in the vicinity of the 204-S Building radiation zone.

Table 2. Summary of Unplanned Releases (DOE-RL 1992). (5 sheets)

Unplanned release no.	Location	Date	Associated waste management unit	Reported waste - related history
UN-200-W-108	Underground crib waste line between 216-S-9 Crib and 216-S-23 Crib	1/8/69	NA	Ruptures in underground crib waste lines produced unknown beta/gamma emitters with exposure rates of 40 R/hour detected at the bottom of the waste line.
				Leakage occurred over an unknown time period releasing an unknown quantity of waste.
				Release was cleaned up by redirecting approximately 110 L (30 gal) of waste solution into a hole in the ground below the opening of the line and approximately 6 m (20 ft) below ground surface.
				Annual surface radiological monitoring is performed at this site; during the October 1990 survey, no contamination was detected. This was a decrease from the previous survey.
UN-200-W-109	Underground crib waste line between 216-S-9 Crib and 216-S-23 Crib	1/24/69	NA	Ruptures in underground crib waste lines resulted in wastewater bubbling to the surface; radiation exposure rates of unknown beta/gamma emitters were measured at 450 mR/hour and decreased to 20 mR/hour after the water sank back into the ground.
				Annual surface radiological monitoring is performed at the site; during the October 1990 survey, general contamination was detected from 200 to 6,000 ct/min, indicating no change from the previous survey.
				Remedial action not identified.
UN-200-W-116	91 m (300 ft) north of the 202-S Building	1968	NA	Site was contaminated with particulate matter spread by wind from the 204-S Waste Storage Tank exhaust and the related railroad tanker waste unloading station.
				General contamination was measured at 200 ct/min with isolated specks up to 2 mrem/hour, during surface radiation monitoring in October 1990.
UN-200-W-123	204-S Unloading Facility area	1/18/79	NA	Release of 73,000 L (19,300 gal) of radioactive liquid waste occurred at the 204-S Unloading Facility area, caused by a frozen discharge line.
				Contaminated ground beneath the tank car was cleaned up.

Table 2. Summary of Unplanned Releases (DOE-RL 1992). (5 sheets)

Unplanned release no.	Location	Date	Associated waste management unit	Reported waste - related history
UPR-200-W-57	233-S Building	1/6/63	233-S Building	A fire in the plutonium column at 233-S Building spread plutonium contamination throughout and in the immediate vicinity of the building.
				Parts of the building were cleaned of gross contamination and alpha contamination was remediated.
UPR-200-W-59	No. 1 Pond at 202-S Building	1/26/65	202-S Building	Failure of an F-1 process vessel coil in the 202-S Building allowed effluent to mix with cooling water.
				Unknown beta/gamma emitter readings with a maximum dose rate of 190 mrad/hour at the No. 1 Pond inlet.
				Remedial actions not identified.
UPR-200-W-87	291-S HEPA filter housing	1/28/92	291-S Stack Complex	Water leak from the 291-S HEPA filter housing contaminated the ground at its base.
				Readings to 2,000 ct/min were recorded.
				Remedial actions not identified.
UPR-200-W-96	Adjacent to and north of the 233-S Filter House	1/9/69	NA	Release consisted of 0.01 g of plutonium-239-contaminated water. Smear samples taken of the water and surfaces involved were as follows:
				<ul style="list-style-type: none"> • Water on the floor of the 233-S Filter House was greater than 40,000 dis/min • The concrete pad outside the filter house was 10,000 dis/min • The electric motor pad was 10,000 dis/min • The water in the overflow pool was 600 dis/min.
				The site was covered with 71 m (234 ft) of clean gravel.
				The October 1991 radiological survey detected contamination of 200 to 3,000 ct/min at the northwest corner of the site.

Ci = Curie (unit of radiation).
 ct/min = Counts per minute.
 dis/min = Disintegrations per minute.
 HEPA = High-efficiency particulate air.
 mR/hour = Milliroentgen per hour.
 mrad/hour = Millirad per hour.
 NA = Not applicable.
 R/hour = Roentgen per hour.
 UN = Unplanned release considered a distinct waste management unit for remediation purposes.
 UPR = Unplanned releases from or within the operations of a specific waste management unit.

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3.0 EFFLUENT CHARACTERISTICS

3.1 222-S LABORATORY

3.1.1 Layout and System Operation

The 222-S Laboratory is a two-story structure with a basement 98 m long by 33 m wide (322 ft long by 107 ft wide). It was built in 1950 and 1951 to provide analytical services to the Reduction Oxidation Plant. The 222-S Laboratory now supports analytical characterization of waste stored in Hanford Site single-shell tanks. It also provides services to other miscellaneous waste management processing facilities.

The first level is divided into three separate sections: the west, central, and east. The lunchroom, offices, and locker rooms are located in the west area. The west side is free of radioactive and hazardous chemicals. The central section houses chemical laboratories and service areas. Work in this section involves low- to intermediate-level radioactive wastes and hazardous chemicals. Occasionally a high-level radioactive waste sample is located within the central portion. The east side (multicurie) section contains hot cells, chemical laboratories, and service areas for work with intermediate- to high-level radioactive wastes. The central and eastern sections have laboratory benches and hood drains supplied with electricity, water, compressed air, and process vacuums. Mixed-waste (radioactive and hazardous) effluents are separated from the nonradioactive and nonhazardous effluents. All sinks, drains, distilled water supplies, equipment cooling water, and steam condensate empty into the 207-SL Retention Basin.

The second level houses the glassblowing shop, ventilation fans, ductwork, and storage areas. The ventilation fans and ductwork area are posted as radioactive surface contamination zones. The sinks and drains from the glass shop, distilled water overflow, the Millipore¹ deionized water unit, flash tank overflow/drain lines, and the floordrain empty into the 207-SL Retention Basin. Overflow and drain lines from the nitric acid storage tank empty into a storage tank outside the 222-S Laboratory.

The basement houses the counting room, vacuum pumps, instrument maintenance shop, and the scanning electron microscope laboratory. The area is posted as a radioactive surface contamination zone. All effluent generated is analyzed for radioactivity and released to the 207-SL Retention Basin if results are below release criteria (WHC 1988).

The 222-S Laboratory has three main sources of supply water: raw, steam, and potable. The potable water is the primary source comprising 85% of the waste stream. The steam condensate supplies 15% of the waste stream flow; raw water (used in the fire protection sprinkler system) supplies less than 1%.

¹Millipore is a trademark of the Millipore Corporation.

3.1.2 Discharge Volume and Flow Regime

The 222-S Laboratory began discharging wastewater effluent to the S-26 Crib in October 1984. At that time, laboratory operations discharged on the average of 25,738 L (6,800 gal) of effluent per 8-hour shift. Table 3 describes historical effluent characteristics. The current discharge flow rate calculated from the available data (Table 4) as of the end of July 1993, is on the average of 4.1×10^4 L/month (1.1×10^4 gal/month), which works out to be 0.95 L/minute (0.26 gal/minute).

Table 3. Historical Effluent Stream Description (WHC 1990c).

Total volume of effluent discharged to subject receiving site (Coony and Thomas 1989) ^a	1.51 E+08 L from 10/84 to 12/88
Average effluent discharge rate, by operation mode (WHC 1990a) ^b	2.34 E +06 L/month
Effluent designation (WHC 1990a) ^b	Nondangerous, radioactive
Effluent status	Active discharge to 216-S-26 Crib

^aCoony, F. M., and S. P. Thomas, 1989, *Westinghouse Hanford Company Effluent Discharges and Solid Waste Management Report for Calendar Year 1988: 200/600 Areas*, WHC-EP-0141-1, Westinghouse Hanford Company, Richland, Washington.

^bWHC, 1990a, *222-S Laboratory Wastewater Stream-Specific Report*, WHC-EP-0342, Addendum 13, Westinghouse Hanford Company, Richland, Washington.

Figure 8 demonstrates that the volume of effluent discharged to the crib has decreased over the years. The volume continues to decrease as modifications are made to the 222-S Laboratory. The recent installation of a recirculating vacuum pump resulted in a 50% reduction in flow rate to the S-26 Crib.

3.1.3 Effluent Constituents

The 222-S Laboratory generates waste that is both radiological and hazardous. Table 5 (Klem 1990) is a list of chemicals that are or were used in the laboratory. The waste includes a variety of chemicals: acetone, nitrate, nitric acid, and lesser amounts of sulfuric and hydrofluoric acids. During the week of October 20, 1984, an unnamed spill event occurred at the 222-S Laboratory, which released wastewater contaminated with strontium-90 to the 207-SL Retention Basin. The concentration of strontium-90 did not exceed the DOE Administrative Control Limit (40 pCi/L), therefore, the wastewater was released to the S-26 Crib (DOE-RL 1992). Tables 6 through 8 summarize the effluent data available from 1985 to 1990 (WHC 1990a, Addendum 13). The tables provide an average value for each constituent per year. They also indicate that only aluminum and iron have exceeded the Washington Water Quality Standard (WWQS), WAC 173-200. Table 9 provides radiological and

Table 4. Partial Effluent Stream Volume Description (1993). (2 sheets)

Date	Volume (gal)	Volume (L)	Average volume (L)
1/1/93	12,300	4.7 E+04	4.7 E+04
1/2/93	11,400	4.3 E+04	
1/3/93	15,600	5.9 E+04	
1/4/93	16,200	6.1 E+04	
1/5/93	12,300	4.7 E+04	
1/6/93	12,300	4.7 E+04	
1/7/93	15,600	5.9 E+04	
1/8/93	12,800	4.8 E+04	
1/10/93	9,800	3.7 E+04	
1/10/93	11,700	4.4 E+04	
1/11/93	15,600	5.9 E+04	
1/12/93	16,200	6.1 E+04	
1/13/93	12,300	4.7 E+04	
1/14/93	12,000	4.5 E+04	
1/15/93	11,700	4.4 E+04	
1/16/93	11,700	4.4 E+04	
1/18/93	11,700	4.4 E+04	
1/19/93	10,600	4.0 E+04	
1/20/93	8,900	3.4 E+04	
1/22/93	10,000	3.8 E+04	
1/23/93	12,300	4.7 E+04	
1/26/93	10,600	4.0 E+04	
1/29/93	11,700	4.4 E+04	
1/31/93	10,000	3.8 E+04	
5/3/93	10,600	4.0 E+04	3.9 E+04
5/7/93	10,600	4.0 E+04	
5/29/93	10,000	3.8 E+04	

Table 4. Partial Effluent Stream Volume Description (1993). (2 sheets)

Date	Volume (gal)	Volume (L)	Average volume (L)
6/3/93	10,600	4.0 E+04	4.0 E+04
6/7/93	11,200	4.2 E+04	
6/10/93	11,200	4.2 E+04	
6/13/93	10,900	4.1 E+04	
6/17/93	9,500	3.6 E+04	
6/19/93	11,700	4.4 E+04	
6/21/93	10,300	3.9 E+04	
6/22/93	10,600	4.0 E+04	
6/24/93	10,600	4.0 E+04	
6/30/93	10,000	3.8 E+04	
7/8/93	11,200	4.2 E+04	3.7 E+04
7/12/93	10,000	3.8 E+04	
7/16/93	8,900	3.3 E+04	
7/22/93	9,500	3.6 E+04	
7/28/93	9,500	3.6 E+04	
Total	480,000	1.8 E+06	--

Note: Information obtained from 222-S Laboratory datasheets.

Figure 8. Total Volume of Effluent Discharged to the 216-S-26 Crib Through July 1993.

Table 5. List of Chemicals Used in the 222-S Laboratory
(adapted from DOE-RL 1992). (2 sheets)

Compound name	Chemical formula
Acetone	$\text{CH}_3\text{C}_2\text{OH}_3$
Aluminum nitrate nonahydrate	$\text{Al}(\text{NO}_3)_3 \cdot 9\text{H}_2\text{O}$
Ammonium hydroxide	NH_4OH
Ammonium oxalate	$(\text{NH}_4)_2\text{C}_2\text{O}_4 \cdot \text{H}_2\text{O}$
Bromonaphthalene	$\text{C}_{10}\text{H}_7\text{Br}$
Butylated hydroxytoluene	2,6-di- <i>tert</i> -butyl-4-methylphenol
Ceric sulfate	$\text{Ce}(\text{SO}_4)_2$
Di-2-ethyl hexyl phosphoric acid	$\text{C}_{16}\text{H}_{34}\text{POOH}$
Ferrous sulfamate	$\text{Fe}(\text{SO}_3\text{NH}_2)_2$
Ferrous sulfate	FeSO_4
Hydrazine	$\text{H}_2\text{NNH}_2 \cdot \text{H}_2\text{O}$
Hydrochloric acid	HCl
Hydroxylamine hydrochloride	$\text{NH}_2\text{OH} \cdot \text{HCl}$
Hydroxyquinoline	$\text{C}_9\text{H}_6\text{NOH}$
Lead nitrate	$\text{Pb}(\text{NO}_3)_2$
Mercuric thiocyanate	$\text{Hg}(\text{SCN})_2$
Methyl ethyl ketone	$\text{CH}_3\text{COC}_2\text{H}_5$
Methyl isobutyl ketone	$\text{CH}_3\text{COC}_4\text{H}_9$
Mineral oil	Light hydrocarbons
Nitrate	NO_3
Nitric acid	HNO_3
Normal paraffin hydrocarbon (kerosene)	$\text{C}_{10}\text{H}_{22}$ to $\text{C}_{14}\text{H}_{30}$
O-phenanthroline	$\text{C}_{12}\text{H}_8\text{N}_2$
Potassium fluoride	KF
Potassium oxalate	$\text{K}_2\text{C}_2\text{O}_4$
Potassium permanganate	KMnO_4
S-diphenyl carbazide	$\text{C}_{13}\text{H}_{14}\text{N}_4\text{O}$
Sodium dichromate	$\text{Na}_2\text{Cr}_2\text{O}_7 \cdot 2\text{H}_2\text{O}$

Table 5. List of Chemicals Used in the 222-S Laboratory
(adapted from DOE-RL 1992). (2 sheets)

Compound name	Chemical formula
Sodium fluoride	NaF
Sodium hydroxide	NaOH
Sodium nitrite	NaNO ₂
Sulfate	SO ₃
Sulfuric acid	H ₂ SO ₄
Tetrabromomethane	(CHBr ₂) ₂
Tetraphenyl boron	(C ₆ H ₅)B
Thenoyltrifluoroacetone	C ₇ H ₅ SO ₂ F ₃
Tributyl phosphate	(C ₄ H ₉) ₃ PO ₄
Trichloromethane (chloroform)	CHCl ₃
Titanium chloride	TiCl ₄
Tri-iso-octylamine	C ₂₄ H ₅₁ N
Vanadium	V
Xylene	C ₆ H ₄ (CH ₃) ₂
Zinc amalgam	ZnHg

Note: Source of original table (Klem 1990).

Table 6. Summary of Inorganic Chemical Constituent Concentrations (ppb) in Effluent Discharged to the 216-S-26 Crib (WHC 1990a, Addendum 13). (2 sheets)

Constituent	1985	1986	1987	1988	1989	1990
Aluminum	300	1,300 ^a	<150	<150	<150	<150
Arsenic (EP toxic)	--	--	--	--	<150	<500
Barium	32	30	24	23	24	25
Barium (EP toxic)	--	--	--	--	470 ^a	<1,000
Beryllium	<5	<5	<5	5 ^a	<5	<5
Boron	--	--	--	--	12 ^a	23
Cadmium	<2	<2	<2	2 ^a	<2	<2
Cadmium (EP toxic)	--	--	--	--	41 ^a	<100
Calcium	18,000	18,000	17,000	17,000	17,000	16,000
Chloride	2,200	13,000	2,000	2,000	2,300	2,200
Chromium	11	16 ^a	<10	<10	<10	<10
Chromium (EP toxic)	--	--	--	--	<200	<500
Copper	120	62	200	130	160	170
Fluoride (IC)	<500	<500	<500	<500	<500	<500
Fluoride (ISE)	--	--	--	220	130	100
Iron	630	180	56	70	100	130
Lead (EP toxic)	--	--	--	--	<200 ^a	<500
Magnesium	3,800	4,100	3,900	3,600	4,000	3,800
Manganese	20	12	5	6 ^a	6 ^a	<5
Mercury	0.1	1.3 ^a	0.1	0.1 ^a	<0.1	<0.1
Nickel	<10	<11	<10	<10	<10	<10
Nitrate	630	1,100 ^a	1,600	970 ^a	680 ^a	800
Potassium	960	990	1,100	680	720	660

Table 6. Summary of Inorganic Chemical Constituent Concentrations (ppb) in Effluent Discharged to the 216-S-26 Crib (WHC 1990a, Addendum 13). (2 sheets)

Constituent	1985	1986	1987	1988	1989	1990
Selenium (EP toxic)	--	--	--	--	<200	<500
Silicon	--	--	--	--	1,600	1,700
Sodium	2,600	3,200	2,600	2,200	2,000	1,800
Strontium (nr)	<300	<300	<300	92	93	83
Sulfate	20,000	13,000	13,000	14,000	15,000	12,000
Uranium (nr)	0.33	0.60	0.25	0.60 ^a	0.43	0.31
Vanadium	22	<5	<5	5 ^a	5 ^a	<5
Zinc	68	60 ^a	14	20	18 ^a	15

^aAverages include less than (<) results.

EP = Extraction Procedure.

IC = Ion chromatography.

ISE = Ion-specific electrode.

nr = Nonradiological.

ppb = Parts per billion.

Table 7. Summary of Organic Constituent Concentrations (ppb) in Effluent Discharged to the 216-S-26 Crib (MHC 1990a, Addendum 13).

Constituent	1985	1986	1987	1988	1989	1990
Acetone	--	60	--	20	11 ^a	<9
2-Acethiophene	--	12	--	--	--	--
Ammonia	250	230 ^a	<50	51 ^a	150 ^a	<50
Benzene	<10	<10	<10	<5	<5	<5
Bis (2-ethylhexyl) phthalate	<10	<10	<10	<10	11 ^a	<10
Chlorobenzene	<10	<10	<10	<5	<5	<5
Chloroethane	--	--	--	--	<10	<10
1,2-Dichloroethene	<10	<10	<10	<10	<5	<5
Dichloromethane	<10	<10	<10	<10	<5	<5
Ethanol	--	--	--	4	<10,000	<10,000
Ethylbenzene	--	--	--	3	<5	<5
2-Hexanone	--	--	--	<5	<5	<5
MIBK (Hexone)	--	--	--	<10	<10	<10
Tetrahydrofuran	--	--	--	<10	<10	<10
Trichloromethane	<10	16 ^a	12	10 ^a	11 ^a	13
1-4/1-2-Xylene	<10	<10	17	<5	<5	<5
1-3-Xylene	<10	<10	<10	<5	<5	<5

^aAverages include less than (<) results.

MIBK = Methyl isobutyl ketone.

ppb = Parts per billion.

Table 8. Summary of Physical and Radiological Constituent Concentrations (ppb, except where otherwise indicated) in Effluent Discharged to the 216-S-26 Crib (WHC 1990a, Addendum 13). (2 sheets)

Constituent	1985	1986	1987	1988	1989	1990
Alkalinity (Method B)	--	--	--	--	48,000	46,000
Gross alpha (pCi/L)	10.0	3.8	0.79	1.0 ^a	1.1 ^a	<0.29
Gross beta (pCi/L)	29	4.7	5.6	3.6 ^a	1.7 ^a	3.9
Conductivity (μS)	140	100	140	130	150	140
Ignitability (°F)	--	--	--	--	21	21
pH	7.6	6.3	6.4	6.3	6.4	7.3
Reactivity cyanide (mg/kg)	--	--	--	--	<100	<100
Reactivity sulfide (mg/kg)	--	--	--	--	<100	<100
Suspended solids	--	--	--	--	7,000 ^a	<5,000
Total dissolved solids	--	--	--	--	72,000	34,000
Temperature (°C)	21	28	17	20	23	17
Total organic carbon	<980	2,800	<880	1,200	1,200	1,100
Total carbon	--	--	--	--	12,000	13,000
Total organic halides (as chloride)	<28	94 ^a	83	73	75	84
Americium-241 (pCi/L)	--	--	--	--	1.0	0.074

Table 8. Summary of Physical and Radiological Constituent Concentrations (ppb, except where otherwise indicated) in Effluent Discharged to the 216-S-26 Crib (WHC 1990a, Addendum 13). (2 sheets)

Constituent	1985	1986	1987	1988	1989	1990
Carbon-14 (pCi/L)	--	--	--	--	3.0 ^a	<1.55
Tritium (pCi/L)	--	--	--	--	190 ^a	>137
Plutonium-238 (pCi/L)	--	--	--	--	0.021	<0.0018
Plutonium-239/240 (pCi/L)	--	--	--	--	0.28	0.038
Radium-Total (pCi/L)	--	--	--	--	0.14 ^a	<0.0045
Strontium-90 (pCi/L)	--	--	--	--	0.13 ^a	<0.099
Uranium-234 (pCi/L)	--	--	--	--	0.089	0.16
Uranium-238 (pCi/L)	--	--	--	--	0.092	0.13

^aAverages include less than (<) results.

pCi/L = Picocuries per liter.

ppb = Parts per billion.

Table 9. Radiological and Chemical Loading Rates for Historical Discharges to the 216-S-26 Crib (adapted from WHC 1990c).
(2 sheets)

Flow Rate: 2.34 E+06 L/month

Constituent	kg/L ^a	kg/month ^a
Barium	2.82 E-08	6.60 E-02
Boron	1.65 E-08	3.86 E-02
Calcium	1.69 E-05	3.95 E+01
Chloride	3.70 E-06	8.66 E+00
Copper	1.52 E-07	3.56 E-01
Fluoride	1.25 E-07	2.92 E-01
Iron	1.26 E-07	2.95 E-01
Magnesium	3.94 E-06	9.22 E+00
Manganese	7.25 E-09	1.70 E-02
Nitrate	5.75 E-07	1.35 E+00
Potassium	7.64 E-07	1.79 E+00
Silicon	1.95 E-06	4.56 E+00
Sodium	2.13 E-06	4.98 E+00
Strontium (nr)	9.15 E-08	2.14 E-01
Sulfate	1.31 E-05	3.07 E+01
Uranium (nr)	5.24 E-10	1.23 E-03
Vanadium	5.50 E-09	1.29 E-02
Zinc	1.52 E-08	3.56 E-02
Acetone	1.02 E-08	2.39 E-02
Ammonia	6.72 E-08	1.57 E-01
Trichloromethane (chloroform)	1.97 E-08	4.61 E-02
Unknown amide	2.60 E-08	6.08 E-02
Alpha activity ^a	2.00 E-12	4.68 E-06
Beta activity ^a	2.60 E-12	6.08 E-06
Suspended solids	9.25 E-06	2.16 E+01
Total dissolved solids	5.82 E-05	1.36 E+02
Total organic carbon	1.05 E-06	2.46 E+00

Table 9. Radiological and Chemical Loading Rates for Historical Discharges to the 216-S-26 Crib (adapted from WMC 1990c).
(2 sheets)

Flow Rate: 2.34 E+06 L/month

Constituent	kg/L ^a	kg/month ^a
Total carbon	1.25 E-05	2.92 E+01
Total organic halides (as Cl)	1.14 E-07	2.67 E-01
Americium-241 ^a	7.86 E-13	1.84 E-06
Carbon-14 ^a	2.61 E-12	6.11 E-06
Tritium ^a	1.75 E-10	4.09 E-04
Plutonium-238 ^a	1.61 E-14	3.77 E-08
Plutonium-239/240 ^a	2.21 E-13	5.17 E-07
Radium-total ^a	9.45 E-14	2.21 E-07
Strontium-90 ^a	1.24 E-13	2.90 E-07
Uranium-234 ^a	1.05 E-13	2.46 E-07
Uranium-238 ^a	1.02 E-13	2.39 E-07

^aConcentrations units of these constituents are reported as curies per liter; loading units of these constituents are reported as curies per month.
nr = Nonradiological.

Notes:

- (1) Data collected from October 1989 through March 1990.
- (2) Flow rate is the average of rates from the *Hanford Site Stream-Specific Reports* (WMC 1990a, Addendum 13).
- (3) Constituent concentrations are average values from the statistics in the *Hanford Site Stream-Specific Reports* (WMC 1990a, Addendum 13).

chemical loading rates for historical discharges. At the time of this report, there are no new chemical or radiological data available other than routine analytical data used to determine if wastewater is below release criteria (WAC 173-303, WHC 1988).

Environmental Assurance publishes a yearly report (Environmental Releases for Calendar Year 1984 through 1992) with total volumes and radiological loading for specific release sites. Figure 9 summarizes the yearly results for the radionuclides released to the S-26 Crib.

3.1.4 Constituents of Interest and Key Indicators

The 207-SL Retention Basin effluent is routinely analyzed for constituents of interest that are the most probable contaminants generated by the 222-S Laboratory process. The *222-S Laboratory Sampling and Analysis Plan* (Warwick 1992) designated the following list of key indicators for detection of the constituents of interest. The key indicators are as follows:

- Gross alpha
- Gross beta
- TOC
- Nitrate
- pH.

The following radionuclides are analyzed for and reported on a monthly basis:

- Strontium-90
- Cesium-137
- Total uranium
- Plutonium-239/240
- Americium-241.

The *222-S Laboratory Sampling and Analysis Plan* (Warwick 1992) will periodically analyze a more extensive list of constituents. Currently no new data were available for use from the extended analyte list. The revised list includes the following analytes:

- Inductively coupled plasma metals
- Organochlorine and polychlorinated bihphenyls
- Organophosphorus herbicides
- Chlorinated herbicides
- Volatile organic analysis
- Semivolatile organics
- Sulfides
- TOC
- Total oil and grease
- Chemical oxygen demand
- Anions and cations
- Alkalinity
- Total dissolved solids
- pH
- Specific conductance.

Figure 9. Summary of the Yearly Results for (a) Gross Alpha and Gross Beta and (b) Radionuclides Released to the 216-S-26 Crib.

3.2 219-S WASTE STORAGE FACILITY, 222-SA ANALYTICAL CHEMICAL STANDARDS LABORATORY, AND 291-S EXHAUST FAN CONTROL HOUSE AND STACK

The 219-S Waste Storage Facility, 222-SA Analytical Chemical Standards Laboratory, and the 291-S Exhaust Fan Control House and Stack are discussed together in this section because the amount of wastewater and potential wastewater contamination is very low compared to the 222-S Laboratory discussed in Section 3.1.

3.2.1 Layout and System Operation

Originally the 219-S Waste Storage Facility discharged cooling water from Tanks 101, 102, and 103 cooling water jackets, operating gallery sump number 8, and steam condensate from the operation gallery to the 207-SL Retention Basin. Cooling water outlets from Tanks 101, 102, and 103 cooling water jackets has been disconnected and no longer discharge to the 207-SL Retention Basin. The effluent was nonradioactive and nonhazardous when it was being discharged (Warwick 1992).

The 222-SA Analytical Chemical Standards Laboratory (222-SA) is a five-unit wide trailer. The laboratory contains two sections: preparation of nonradioactive standards and nonradioactive process development. The wastewater stream is considered nonradioactive and nonhazardous and comes from laboratory sinks, fume hoods, safety eyewash, and glass washers. The wastewater is discharged into the S-26 Crib system downstream from the 207-SL Retention Basin. Therefore, the wastewater stream is not routinely sampled and analyzed (WHC 1990a, Addendum 13). Administrative controls are in place to help prevent discharges of hazardous waste to the stream. Operating procedures for disposal of liquid waste to laboratory sinks and drains specifically state that hazardous chemicals may not be disposed of to the effluent stream. It was demonstrated that the potential exists for a *Comprehensive Environmental Response, Compensation, and Liability Act of 1980* (CERCLA) reportable spill to occur to the 222-SA wastewater stream; therefore, the stream will be redirected to the 207-SL Retention Basin (Warwick 1992).

The 291-S Waste Storage Facility discharges cooling water and steam condensate from the emergency exhaust fan to the 207-SL Retention Basin after bypassing the sampling unit. This wastewater has no credible potential for containing radioactive or hazardous wastes. During warmer periods of the year, the valve is kept closed except when the fan is running. The emergency fan only operates about 30 hours/yr. When cooler weather arrives, the valve is left partially open to allow a small continuous flow to prevent the line from freezing. There is little potential for contamination by radioactive or hazardous wastes, so the waste stream is not sampled.

3.2.2 Discharge Volume and Flow Regime

Discharges from the 219-S Waste Storage Facility that are routed to the 207-SL Retention Basin are small in volume compared to the volume of wastewater from the 222-S Laboratory. The volume is estimated at 3,785 L/yr (1,000 gal/yr) (Warwick 1992).

Discharges routed directly to the crib from the 222-SA Analytical Chemical Standards Laboratory and 291-S Exhaust Control House and Stack are 1,381,525 and 52,990 L/yr (365,000 and 14,000 gal/yr), respectively.

3.2.3 Effluent Constituents

Wastewater from the 219-S Waste Storage Facility is combined with wastewater for the 222-S Laboratory in the 207-SL Retention Basin before sampling and routing to the S-26 Crib. Effluent data that apply to the 222-S Laboratory also apply to the 219-S Waste Storage Facility (see Section 3.1.3).

Wastewater from the 222-SA Analytical Chemical Standards Laboratory and the 291-S Exhaust Fan Control House and Stack are not sampled. These facilities discharge to the system downstream of the 207-SL Retention Basin; therefore, data about effluent constituents from these sources are unavailable. Table 10 is a list of 222-SA Laboratory chemical stock. The only chemicals routinely discharged from the 222-SA Laboratory are soaps used in cleaning used glassware. Used glassware is triple rinsed into accumulation containers that are managed and disposed of in labpacks according to WAC 173-303 requirements. The glassware is then washed in ultrasonic cleaners. This ultrasonic cleaning solution is discharged to the S-26 Crib. Table 11 lists the commercial cleaners used (WHC 1990a, Addendum 13).

3.2.4 Constituents of Interest and Key Indicators

Because the wastewater for the 219-S Waste Storage Facility is combined with the wastewater from 222-S Laboratory, the constituents of interest and key indicators will be the same ones as discussed in Section 3.1.4.

In the spring of 1994 all effluents from the 222-SA Analytical Chemical Standards Laboratory and the 291-S Exhaust Fan Control House and Stack will be rerouted to the 207-SL Retention Basin. At this time, the effluents will be sampled and analyzed for the following constituents:

- Gross alpha
- Gross beta
- TOC
- Nitrate
- pH.

The samples will also be analyzed for specific radionuclides on a monthly basis. Currently the effluent (wastewater streams) from these two facilities is nonradioactive and nonhazardous.

Table 10. 222-SA Laboratory Chemical Stock
(WHC 1990a, Addendum 13). (5 sheets)

Chemical name	Number of containers	Total amount
Acetic acid, glacial	1	500 mL
Agar	1	5,000 g
Ethyl alcohol	1	250 mL
Methyl alcohol (anhydrous)	1	300 mL
Aluminum (granular)	1	450 g
Aluminum (shot)	2	4,000 g
Aluminum nitrate (nonahydrate)	8	4,000 g
Aluminum sulfate	1	500 g
Ammonium bicarbonate	1	453 g
Ammonium carbonate	1	300 g
Ammonium citrate (dibasic)	1	5,000 g
Ammonium fluoride	1	250 g
Ammonium nitrate	3	1,500 g
Ammonium oxalate	1	300 g
Ascarite II (SiO ₂ coated with NaOH)	1	500 g
Ascorbic acid	2	400 g
Barium chloride	1	300 g
Barium nitrate	2	1,000 g
Bismuth phosphate	3	1,500 g
Boric acid	1	200 g
Calcium carbonate	1	300 g
Calcium chloride	1	400 g
Calcium fluoride	1	250 g
Calcium hydroxide	2	600 g
Calcium nitrate	2	600 g
Carbon tetrachloride	1	30 mL
Cesium nitrate	4	400 g

Table 10. 222-SA Laboratory Chemical Stock
(WHC 1990a, Addendum 13). (5 sheets)

Chemical name	Number of containers	Total amount
Chromic acid	1	NA
Chromium nitrate	1	300 g
Citric acid	2	500 g
Cobalt chloride	1	200 g
Cupric nitrate	1	100 g
Diatomaceous earth	1	100 g
5-(4-Dimethylaminobenzilidene)-rhodamine	1	10 g
Dowex 1-X8, Dowex-1-chloride	1	450 g
EDTA (acid form)	6	2,400 g
EDTA disodium	3	150 g
EDTA tetrasodium	2	1,500 g
Ferric nitrate (iron III)	1	500 g
Ferric oxide (iron III)	2	800 g
Ferric sulfate	1	100 g
Ferrous sulfate (iron II)	1	100 g
Fluorescein	1	500 g
Fluorescein disodium salt, 2-hydrate	2	1,000 g
Glycolic acid	2	350 g
Hexane (HPLC grade)	1	100 mL
Hydrofluoric acid 48%	2	NA
Hydroxylamine hydrochloride	4	1,700 g
HEDTA trisodium salt	1	1,500 g
Iminodiacetic acid	1	400 g
Iodine	1	500 g
Iron (metal)	1	500 g
Lanthanum nitrate (hexahydrate)	3	1,200 g
Lead nitrate	8	4,000 g
Lithium metaborate	1	500 g

Table 10. 222-SA Laboratory Chemical Stock
(WHC 1990a, Addendum 13). (5 sheets)

Chemical name	Number of containers	Total amount
Magnesium hydroxide	3	700 g
Magnesium nitrate (hexahydrate)	1	300 g
Magnesium sulfate (anhydrous)	1	500 g
Manganese II nitrate 50%	1	300 g
Marble (CaCO_3 chips)	1	500 g
Mercury	2	235 mL
Mercury indicator	1	100 g
Mercurous nitrate	1	200 g
Methyl isobutyl ketone (hexone)	1	250 mL
Methyl red	1	25 g
Molybdenum trioxide (VI oxide)	1	170 g
Nickel nitrate	1	100 g
Nitrilotriacetic acid (trisodium)	1	500 g
Nitroethane	2	6,000 g
Normal paraffin hydrocarbon	1	500 mL
Oxalic acid	1	10 g
Potassium chromate	1	12 g
Potassium fluoride	4	1,600 g
Potassium hydroxide	2	600 g
Potassium iodide	1	100 g
Potassium nitrate	3	1,200 g
Potassium nitrite	1	300 g
Potassium permanganate	2	700 g
Potassium acid phthalate	1	100 g
Rare earth nitrate ($\text{La,Nd})(\text{NO}_3)_3$	1	250 g
Silica gel	1	500 g
Silicic acid, N-hydrate	1	400 g
Soda and lime (Na_2CO_3 and CaO)	1	2,500 g

Table 10. 222-SA Laboratory Chemical Stock
(WHC 1990a, Addendum 13). (5 sheets)

Chemical name	Number of containers	Total amount
Sodium acetate (trihydrate)	3	5,500 g
Sodium aluminate	1	1,500 g
Sodium borate (tetraborate, decahydrate)	1	500 g
Sodium carbonate	2	600 g
Sodium chloride	1	2,500 g
Sodium chloride	1	200 g
Sodium citrate	3	1,500 g
Sodium chromate	1	400 g
Sodium fluoride	1	250 g
Sodium hydroxide	2	800 g
Sodium iodide	1	250 g
Sodium Meta-bisulfate	2	1,000 g
Sodium nitrate	1	2,500 g
Sodium nitrite	2	193 kg
Sodium phosphate (dibasic, anhydrous)	3	1,500 g
Sodium phosphate (monobasic)	1	300 g
Sodium phosphate (tribasic, dodecahydrate)	2	500 g
Sodium sulfate	2	2,600 g
Sodium sulfite	1	500 g
Sodium sulfide, 9-hydrate	1	500 g
Sodium tartrate	2	1,000 g
Sodium thiosulfate	1	500 g
Starch (amylum)	2	500 g
Strontium fluoride	1	500 g
Sucrose	4	2,000 g
Sulfuric acid, ultrex grade	1	NA

Table 10. 222-SA Laboratory Chemical Stock
(WHC 1990a, Addendum 13). (5 sheets)

Chemical name	Number of containers	Total amount
Tributylphosphate	1	500 mL
1,1,2-Trichlorotrifluoroethane	2	2 L
Triethanolamine	1	500 g
Tris(hydroxymethyl)aminoethane	1	300 g
Urea	1	500 g
Vanadyl sulfate trihydrate	2	50 g
p-Xylene	1	1 L
Zinc acetate	NA	NA
Zinc metal	1	500 g
Zinc chloride	1	50 mL
Zirconium nitrate	1	200 g

EDTA = Ethylenediametetraacetic acid.

HEDTA = N-(hydroxyethyl)-ethylenediaminetriacetic acid.

HPLC = High pressure liquid chromatography.

NA = Not applicable (at this time).

Table 11. Commercial Cleaners Used in the 222-SA Analytical Chemical Standards Laboratory (WHC 1990a, Addendum 13).

ultrasonic cleaning solution (Generic)
Markson ^a All-Purpose Detergent
Markson ^a Ammoniated Detergent
Markson ^a Sonic Phosphoric Detergent
ESPI DeContam ^b

ESPI = Electronic Space Products, Inc., Los Angeles, California.

^aMarkson is a trademark of Markson Science Incorporated.

^bDeContam is a trademark of Electronic Space Products, Inc., Los Angeles, California. It is an alkaline cleaning solution of pH = 12 at full strength.

4.0 CONCEPTUAL MODEL OF HYDROLOGIC RESPONSE AND CONTAMINANT MIGRATION

4.1 HYDROGEOLOGIC FRAMEWORK

4.1.1 Regional and Hanford Site Geology

The Pasco Basin and the Hanford Site are underlain by pre-Miocene sedimentary and crystalline rocks (Campbell 1989), Miocene-aged (17.5 to 6 Ma) basalts of the Columbia River Basalt Group (CRBG) (Myers et al. 1979; Reidel and Fecht 1981; DOE 1988; Tolan et al. 1989; Reidel et al. 1989, 1992), interbedded sediments of the Ellensburg Formation (Reidel and Fecht 1981; DOE 1988; Smith 1988), and a late-Miocene- to Holocene-aged (<8.5 Ma to present) suprabasalt sediment sequence (Myers et al. 1979; Tallman et al. 1981; DOE 1988; Smith et al. 1989; Lindsey 1991a, 1991b; Reidel et al. 1992).

4.1.1.1 Columbia River Basalt Group. The CRBG is an assemblage of tholeiitic, continental flood basalts that cover an area of more than 163,157 km² (63,000 mi²) in Washington, Oregon, and Idaho and have an estimated volume of about 174,356 km³ (40,800 mi³) (DOE 1988; Reidel and Hooper 1989; Tolan et al. 1989). The CRBG is divided into five formations, from oldest to youngest: Imnaha Basalt, Picture Gorge Basalt, Grande Ronde Basalt, Wanapum Basalt, and Saddle Mountains Basalt (DOE 1988; Tolan et al. 1989) (Figure 10). The Saddle Mountains Basalt (the uppermost basalt at the Hanford Site) is divided into (from oldest to youngest) the Umatilla, Wilbur Creek, Asotin, Esquatzel, Pomona, Elephant Mountain, and Ice Harbor Members (Reidel and Fecht 1981).

4.1.1.2 Ellensburg Formation. The Ellensburg Formation consists of volcaniclastic and siliciclastic deposits that occur between CRBG basalt flows (DOE 1988; Smith 1988). The three uppermost units of the Ellensburg Formation at the Hanford Site are, from oldest to youngest: the Selah interbed, the Rattlesnake Ridge interbed, and the Levy interbed. A detailed discussion of the Ellensburg Formation at the Hanford Site is given in Reidel and Fecht (1981). Smith (1988) and Smith et al. (1989) discuss the Ellensburg Formation and correlative units throughout the region.

4.1.1.3 Suprabasalt Sediments. Discussions of various aspects of suprabasalt sediment geology are found in Myers et al. (1979), Tallman et al. (1979, 1981), PSPL (1982), Bjornstad (1984), Fecht et al. (1987), DOE (1988), Baker et al. (1991), Smith et al. (1989), Delaney et al. (1991), Lindsey (1991a, 1992), Lindsey et al. (1991), and Reidel et al. (1992). Delaney et al. (1991), Lindsey (1991a), and Reidel et al. (1992) provide the most recent synopsis of suprabasalt sediment geology for the Hanford Site. The following discussion is summarized from these recent reports.

The suprabasalt sedimentary sequence (Figure 11) is up to 229 m (750 ft) thick at the Hanford Site. It is dominated by the laterally extensive late-Miocene to Pliocene Ringold Formation and the Pleistocene Hanford formation. Laterally discontinuous units, referred to as the Plio-Pleistocene unit, early

Figure 10. Generalized Stratigraphy of the Pasco Basin and Surrounding Area.

Period		Epoch	Group	Formation	Isotopic Age Dates Years x 10 ⁶	Member (Formal and Informal)	Sediment Stratigraphy or Basalt Flows					
QUATERNARY							Loess	Sand Dunes	Alluvium and Alluvial Fans	Landslides	Talus	Colluvium
TERTIARY	Miocene	Pleistocene	Columbia River Basalt Group			Surficial Units	Hanford formation					
							Pilo-Pleistocene/early Palouse/pre-Missoula Interval					
							Ringold Formation					
		Saddle Mountains Basalt	8.5	Ice Harbor Member	basalt of Goose Island							
					basalt of Martindale							
					basalt of Basin City							
					Levey Interbed							
					10.5	Elephant Mountain Member	basalt of Ward Gap					
							basalt of Elephant Mountain					
12.0	Pomona Member				Rattlesnake Ridge Interbed							
					basalt of Pomona							
Selah Interbed												
Esquatzel Member	basalt of Gable Mountain											
	Cold Creek Interbed											
13.5	Asotin Member				basalt of Huntzinger							
					basalt of Lapwai							
Wilbur Creek Member	basalt of Wahluke											
	basalt of Sillust											
Umatilla Member	basalt of Umatilla											
	Wanapum Basalt	14.5	Priest Rapids Member	Mabton Interbed								
basalt of Lolo												
basalt of Rosalia												
Quincy Interbed												
Roza Member				basalt of Roza								
				Squaw Creek Interbed								
Frenchman Springs Member				basalt of Lyons Ferry								
				basalt of Sentinel Gap								
				basalt of Sand Hollow								
				basalt of Silver Falls								
	basalt of Ginkgo											
	basalt of Palouse Falls											
Grande Ronde Basalt*	15.6	Sentinel Bluffs Unit	Vantage Interbed									
			basalt of Museum									
			basalt of Rocky Coulee									
			basalt of Levering									
			basalt of Cohasset									
			basalt of Birkett									
			basalt of McCoy Canyon									
			basalt of Umtanum									
			N ₂	basalt of Benson Ranch								
			R ₂	Grouse Creek Unit								
				Wapshilla Ridge Unit								
Mt. Horrible Unit												
China Creek Unit												
N ₁	Teepee Butte Unit											
	Buckhorn Springs Unit											
R ₁												
Imnaha	16.5	Rock Creek Unit										
	17.5	American Bar Unit										

*The Grande Ronde Basalt consists of at least 120 major basalt flows. Only a few flows have been named. N₂, R₂, N₁ and R₁ are magnetostratigraphic units.

H9102029.6b

Figure 11. Generalized Stratigraphy of the Suprabasalt Sediments in the Pasco Basin.

H9112007.1

"Palouse" soil, and pre-Missoula gravels, separate the Hanford formation and Ringold Formation locally. Holocene-aged alluvial and eolian deposits cap the suprabasalt sequence.

The Ringold Formation is up to 183 m (600 ft) thick within the Pasco Basin; it pinches out against basalt ridges around the edge of and within the basin and consists of semi-indurated clay, silt, fine- to coarse-grained sand, and pebble to cobble gravel. Ringold deposits are grouped into five sediment facies associations (fluvial gravel, fluvial sand, overbank-paleosol, lacustrine, basaltic alluvium) that are defined on the basis of lithology, petrology, stratification, and pedogenic alteration. The associations are summarized below.

1. Fluvial gravel--Consists of clast and lesser matrix-supported pebble to cobble gravel with a fine- to medium-grained sand matrix. Grain size distributions tend to be bimodal with granules and coarse-grained sand being rare. Crude to well-defined stratification and low-angle, lenticular bedding geometries generally dominate.
2. Fluvial sand--Fine- to coarse-grained quartzo-feldspathic sands displaying well-defined stratification dominate. Fining upward packages less than one to several meters thick are common.
3. Overbank-Paleosol--Laminated to massive silty sand, silt, and clay displaying evidence of pedogenic alteration dominates.
4. Lacustrine--Characterized by well-stratified clay with interbedded silt and silty sand.
5. Basaltic alluvium--Massive to crudely stratified, weathered to unweathered, basaltic, pebble to cobble gravel, commonly with a mud-rich matrix dominates.

The distribution of facies associations within the Ringold Formation forms the basis for a stratigraphic subdivision (Lindsey 1991a, 1991b). The lower half of the Ringold Formation is characterized by fluvial gravel and sand-dominated intervals designated units A, B, C, D, and E (Figures 11 and 12) that interfinger with fine-grained deposits typical of the overbank-paleosol and lacustrine facies associations. The lowest of these fine-grained intervals is designated the lower mud unit (see Figures 11 and 12). Interstratified deposits of the fluvial sand and overbank-paleosol facies associations and strata dominated by the lacustrine facies association form the upper half of the Ringold Formation (commonly referred to as the upper Ringold).

Several localized, informal units separate the Ringold Formation from the Hanford formation. These units are the (1) Plio-Pleistocene unit, (2) pre-Missoula gravels, and (3) early "Palouse" soil (see Figures 10 through 12) (Myers et al. 1979; Tallman et al. 1979, 1981; DOE 1988; Reidel et al. 1992). The Plio-Pleistocene unit and early "Palouse" soil consist of loess, pedogenic calcium carbonate (CaCO_3), and basaltic sands and gravels. Uncemented mixed-lithology gravel with a quartzo-feldspathic matrix dominates the pre-Missoula gravels.

Figure 12. Generalized Stratigraphic Column
for the Southern 200 West Area.

H9310020.1

The Hanford formation consists of uncemented gravel, sand, and silt deposited by Pleistocene cataclysmic flood waters (Fecht et al. 1987; DOE 1988; Baker et al. 1991). The Hanford formation is thickest in the vicinity of the 200 West and 200 East Areas where it can be up to 107 m (350 ft) thick. The Hanford formation is divided into three facies (gravel, sand, and silt dominated) that are gradational and interfinger with each other. The facies are summarized below:

1. Gravel-dominated facies--Generally consist of cross-stratified, coarse-grained sand and granule to boulder gravel that contain minor intercalated silt-rich horizons. Generally these gravels are uncemented and matrix poor, displaying an open-framework texture.
2. Sand-dominated facies--Well-stratified, fine- to coarse-grained sand and granule gravel dominate. Silt content is variable, but where it is low an open-framework texture is common. Small pebbles and rip-up clasts in addition to lenticular, pebble-gravel interbeds and silty interbeds may be present.
3. Silt-dominated facies--Interbedded silt and fine- to coarse-grained sand forming well-stratified normally graded rhythmites are characteristic.

In addition to the three facies, clastic dikes also are commonly found in the Hanford formation as well as locally in other sedimentary units in the Pasco Basin (Black 1979). These clastic dikes are structures that generally cross cut bedding, although they do locally parallel bedding. The dikes consist of thin, alternating vertical to subvertical layers of silt, sand, and granules. A feature known as patterned ground can be observed where the dikes intersect the ground surface.

Holocene surficial deposits consist of silt, sand, and gravel that form a thin (4.9-m [<16 -ft]) veneer across much of the Hanford Site. These sediments were deposited by a mix of eolian and alluvial processes.

4.1.1.4 Structural Geology. The Columbia Plateau is divided into three informal structural subprovinces: Blue Mountains, Palouse, and Yakima Fold Belt (Reidel et al. 1989; Tolan and Reidel 1989). These structural subprovinces are delineated based on their structural fabric. The Hanford Site is located in the eastern Yakima Fold Belt near its junction with the Palouse subprovince.

The Yakima Fold Belt consists of a series of segmented, narrow, asymmetric, and generally east-west trending anticlines that separate broad, low-amplitude structural basins (Reidel 1984; Reidel et al. 1989). The Pasco Basin (where the Hanford Site is situated) is one of the largest structural basins within the Yakima Fold Belt. The Pasco Basin is bounded on the north by the Saddle Mountains anticline, on the west by the Hog Ranch-Naneum Ridge anticline, and on the south by the Rattlesnake Mountain anticline. The Palouse slope, a west-dipping monocline, bounds the Pasco Basin on the east. The Pasco Basin is divided into the Wahluke and Cold Creek synclines by the Gable Mountain anticline, the easternmost extension of the Umtanum Ridge anticline.

4.1.2 Local Geology

The closest well to the S-26 Crib is 299-W27-1, which is located adjacent to the crib on the south side (see Figure 2). Unfortunately, geologic detail is missing on the well log, which results in lack of specific geologic data in the crib's immediate vicinity. However, the site's general geology can be derived by examining other wells in the area and from studies of outcrops analogous to strata thought to occur in the vicinity of the crib. A northwest-southeast trending geologic cross section (Figure 13) through the area of the crib illustrates the strata present at the site and the relationships between the strata. Figure 3 shows the location of the geologic cross section.

Geologic trends in the vicinity of the S-26 Crib are similar to those in the 200 West Area. The Hanford formation, Plio-Pleistocene and early "Palouse" intervals, and the Ringold Formation comprise the unsaturated zone. Holocene-aged eolian sand less than a foot thick to several feet thick is found in the general vicinity of the crib site, but in many places has been removed by construction activities or other human activity.

Gravel, sand, and silt of the Hanford formation form the majority of the vadose zone in the southern 200 West Area and are divided into two main intervals, an upper coarse unit and a lower fine unit. Strata typical of the gravel-dominated facies form most of the upper coarse unit (Lindsey et al. 1991). The upper coarse unit is thickest to the north (about 24 m [80 ft] at wells 299-W22-38 and -27) and pinches out near well 299-W22-25 (see Figures 12 and 13). It is missing in the immediate vicinity of the S-26 Crib. Borehole data and outcrop studies elsewhere in Hanford gravels suggest minor occurrences of the sand- and silt-dominated facies may occur as lenticular interbeds within the upper coarse unit.

The lower fine unit of the Hanford formation consists of interbedded strata typical of both the sand- and silt-dominated facies. From north to south, along geologic cross section shown in Figure 13, the lower fine unit increases in thickness from approximately 18 to 61 m (60 to 200 ft). Because the upper coarse unit pinches out north of the S-26 Crib, the lower fine unit remains as the only unit in the Hanford formation in the immediate vicinity of the crib. Gravelly interbeds may be present based on experience elsewhere in the 200 West Area. The nature of the contact between the upper and lower units is not clear. It could be either sharp or gradational.

The Hanford formation is underlain in the central 200 West Area by the early "Palouse" and Plio-Pleistocene interval. Silts that typify the early "Palouse" soil (DOE 1988, Last et al. 1989) pinch out to the south and are missing in the area of the crib. The Plio-Pleistocene interval is mostly basaltic sands and gravels containing variable amounts of pedogenic CaCO_3 . The combined early "Palouse" and Plio-Pleistocene interval is approximately 3 to 8 m (10 to 25 ft) thick in the northern portion of the cross section (see Figure 13) and increases to approximately 12 m (40 ft) thick in the vicinity of the S-26 Crib. It generally dips to the south toward the axis of the Cold Creek syncline. Although the thickness of the Plio-Pleistocene interval increases southward, the amount of cementation by pedogenic CaCO_3 decreases in

Figure 13. North-Northwest to South-Southeast Geologic Cross Section Through the Southern Portion of the 200 West Area.

the same direction. In the southern portion of the cross section (see Figure 13) and in the vicinity of the S-26 Crib, pedogenic CaCO_3 cement is weak and intermittent.

Below the Plio-Pleistocene interval in the area of the S-26 Crib is the Ringold Formation. It is the thickest unit in the southern portion of the 200 West Area and consists of the upper unit, unit E, the lower mud unit, and unit A (see Figure 13). The upper Ringold unit is about 9 m (30 ft) thick near well 299-W22-38 and pinches out southward before reaching the area of the crib. It consists of strata typical of the fluvial sand and overbank-paleosol facies. The other units of the Ringold Formation are fairly uniform in thickness but dip to the south toward the axis of the Cold Creek syncline like the overlying Plio-Pleistocene interval. Ringold unit E is approximately 67 to 82 m (220 to 270 ft) thick and consists of fluvial gravel facies; however, minor interbedded occurrences of the fluvial sand and overbank-paleosol facies also may be present. The lower mud unit typically consists of the overbank-paleosol and lacustrine facies and is between 12 and 17 m (40 and 55 ft) thick in the area of the crib. Unit A displays lithologies like those found in unit E and is between 15 and 40 m (50 and 130 ft) thick.

The uppermost basalt beneath the S-26 Crib area is the Elephant Mountain Member of the Saddle Mountains Basalt (Reidel and Fecht 1981). The top of the basalt is approximately 177 m (580 ft) below ground surface and dips to the south toward the axis of the Cold Creek syncline at approximately 8 m/km (40 ft/mi). Because no boreholes penetrate the Elephant Mountain Member near the crib site, precise thicknesses of the Elephant Mountain Member and underlying Rattlesnake Ridge interbed of the Ellensburg Formation are unknown. From nearby boreholes and extrapolating to the crib site, the thicknesses of the Elephant Mountain Member and Rattlesnake Ridge interbed are approximately 25 m (82 ft) each (Reidel and Fecht 1981).

4.1.3 Regional and Hanford Site Hydrology

Delaney et al. (1991) presents a synopsis of regional and Hanford Site hydrology. Connelly et al. (1992) summarizes the hydrology of the 200 West Area. This section is summarized from Delaney et al. (1991).

4.1.3.1 Surface Water. Primary surface-water features near the Hanford Site are the Columbia and Yakima Rivers and their major tributaries: the Snake and Walla Walla Rivers. The free-flowing stretch of the Columbia River adjacent to the Hanford Site is known as the Hanford Reach. It extends from Priest Rapids Dam to the headwaters of Lake Wallula (the reservoir behind McNary Dam). Flow along the Hanford Reach is controlled by Priest Rapids Dam. Approximately one-third of the Hanford Site is drained by the Yakima River system. Cold Creek and its tributary, Dry Creek, are ephemeral streams within the Yakima River drainage system. Both streams drain areas along the western part and cross the southwestern part of the Hanford Site while flowing toward the Yakima River. West Lake, about 40,470 m² (10 acres) in size and less than 1 m (3 ft) deep, is the only natural lake within the Hanford Site (DOE 1988a). Wastewater ponds, cribs, and ditches associated with nuclear fuel reprocessing and waste disposal activities are also present on the Hanford Site (Figure 14).

Figure 14. Location of Water Disposal Sites on the Hanford Site.

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4.1.3.2 Groundwater. The Pasco Basin is characterized by a multiaquifer system. It consists of four hydrogeologic units that correspond with the upper three formations of the CRBG and the suprabasalt sediments.

Generally the basalt aquifers are confined and found within sedimentary interbeds of the Ellensburg Formation and interflow zones that occur between basalt flows. Recharge to the shallow basalt aquifers results from infiltration of precipitation and runoff along the margins of the Pasco Basin. Recharge of the deep basalt aquifers is inferred to result from interbasin groundwater movement originating northeast and northwest of the Pasco Basin in areas where the Wanapum and Grande Ronde Basalts crop out extensively (DOE 1988). Groundwater discharge from shallow basalt aquifers is probably to the overlying aquifers and the Columbia River. Discharge areas for the deeper groundwater systems are uncertain, but flow is inferred to be generally southeastward with discharge speculated to be south of the Hanford Site (DOE 1988). Erosional "windows" through dense basalt flow interiors allow direct connection between the unconfined and uppermost confined aquifers (Graham et al. 1984).

The suprabasalt sediment aquifer is in glaciofluvial deposits of the Hanford formation and alluvial/lacustrine sediments of the Ringold Formation. This aquifer lies at depths ranging from less than 3 m (1 ft) near West Lake and the Columbia and Yakima Rivers, to greater than 107 m (350 ft) near the center of the Hanford Site. The position of the water table beneath the western portion of the Hanford Site is generally within Ringold unit E. In the northern and eastern portions of the Hanford Site, the water table is generally within the Hanford formation. Hydraulic conductivities for the Hanford formation (610 to 3,050 m/day [2,000 to 10,000 ft/day]) are much greater than those of the gravel facies of the Ringold Formation (186 to 930 m/day [610 to 3,050 ft/day]). The main body of the unconfined aquifer occurs within the Ringold Formation.

The base of the uppermost aquifer system is defined as the surface of the uppermost basalt flow. However, overbank and lacustrine deposits in the Ringold Formation locally form confining layers for the underlying Ringold fluvial gravel and sand (unit A). The uppermost aquifer system is bounded laterally by anticlinal basalt ridges and is approximately 152 m (500 ft) thick near the center of the basin.

Natural recharge to the uppermost aquifer consists of rainfall and runoff from the higher bordering elevations, water infiltrating from small ephemeral streams, and river water along influent reaches of the Yakima and Columbia Rivers. The movement of moisture from precipitation through the unsaturated (vadose) zone varies. Gee (1987) and Routson and Johnson (1990) indicate it is nonexistent across much of the Hanford Site while Rockhold et al. (1990) suggest that downward water movement below the root zone is common in the 300 Area. Artificial recharge occurs from the disposal of wastewater on the Hanford Site (principally in the 200 Areas) and from large irrigation projects surrounding the Hanford Site.

4.1.4 216-S-26 Crib Area Hydrology

The hydrostratigraphic units of concern in the vicinity of the S-26 Crib are the (1) the Rattlesnake Ridge interbed, (2) Elephant Mountain Basalt, (3) Ringold Formation, (4) Plio-Pleistocene and early "Palouse" interval, and (5) Hanford formation. The Rattlesnake Ridge interbed forms the uppermost confined aquifer in the area; is approximately 25 m (82 ft) thick; and consists of the flow bottom of the Elephant Mountain Basalt, the flow top of the Pomona Basalt, and the Rattlesnake Ridge interbed. Generally groundwater flow is toward the northeast throughout much of the 200 West Area. Graham et al. (1981, 1984) report transmissivity values of 0.7 to 108 m²/day (8 to 1,165 ft²/day) for the Rattlesnake Ridge interbed.

The Rattlesnake Ridge aquifer is separated from the overlying uppermost unconfined aquifer system by the Elephant Mountain Member of the Saddle Mountains Basalt. The dense interior of this basalt has low-hydraulic conductivities (0.009 m/day [0.03 ft/day]). The surface of the Elephant Mountain Member dips south-southeast toward the axis of the Cold Creek syncline from a high just north of the 200 East Area.

The suprabasalt aquifer beneath the S-26 Crib is contained within Ringold Formation units A and E, the lower mud unit, and the lower portion of the Plio-Pleistocene unit. These strata exhibit locally confined to unconfined conditions caused by fine intervals and cemented zones. The saturated thickness of the unconfined aquifer is approximately 107 m (350 ft) beneath the crib. Hydraulic conductivities for the gravels and sands of units A and E range from 0.02 to 61 m/day (0.06 to 200 ft/day). A mean hydraulic conductivity of 1.58×10^{-5} m/day (5.19×10^{-5} ft/day) is reported for the lower mud unit (Last et al. [1989]; Connelly et al. [1992]).

In the immediate vicinity of the S-26 Crib, the water table is within the Plio-Pleistocene unit (see Figure 13). The Plio-Pleistocene unit is approximately 12 m (40 ft) thick with the top of the unit dipping to the south-southwest. The Plio-Pleistocene unit is within the unsaturated zone to the north, but the lower contact dips below the water table in the area of the crib. Pedogenic CaCO₃-cemented horizons within the interval may create locally perched conditions. However, lateral discontinuities such as pinchouts and dikes within this interval suggest perched zones, if they exist, will be of relatively local extent. No perched water was reported by Last et al. (1989) above this unit although it is encountered elsewhere in the southern 200 West Area.

The thickness of the unsaturated zone beneath the S-26 Crib is approximately 67 m (220 ft) and consists of the upper portion of the Plio-Pleistocene unit and the lower fine unit of the Hanford formation. Recent investigations at the 216-U-14 Ditch indicate significant perching of water occurs locally within the interbedded sands and silts of the lower unit. Experience gained during studies of the 216-U-14 Ditch indicate these interbedded strata probably have a greater influence on the migration of water through the vadose zone than the underlying Plio-Pleistocene unit. Hydrologic properties for the Hanford formation are summarized in Connelly et al. (1992).

Groundwater flow in the uppermost aquifer system (near the water table) is east-southeast in the vicinity of the S-26 Crib (Figure 15) (Kasza et al.

1992). The groundwater flows from a large mound or lobe on the west side of the 200 West Area. The lobe, although its apex had declined and shifted eastward in recent years, is mainly due to surface discharges to the 216-U-10 Pond system (mainly 284-WB Powerplant Ponds, 216-U-14 Ditch, and 216-Z-20 Pond).

4.2 HYDROLOGIC RESPONSES TO EFFLUENT DISPOSAL

The water table southeast (downgradient) of the large mound on the west side of 200 West Area is a relatively uniform surface that is dipping to the southeast (see Figure 15). No irregularities exist near the S-26 Crib. Furthermore, the water level in well 299-W27-1 (the well adjacent to the S-26 Crib) is consistent with the regional water table. This indicates that the amount of wastewater discharged at the S-26 Crib and the nearby 2607-W6 Septic Tank and Drain Field (see Figure 3) are insufficient to form a discernable mound.

Discharged wastewater to the S-26 Crib is decreasing with time and will cease in 1995. Therefore, the formation of a future groundwater mound at the S-26 Crib site is unlikely assuming the continued decrease in the quantities of wastewater being discharged into the crib.

Because only one well exists near the S-26 Crib and water level measurements are consistent with the regional water table, it is difficult to determine if the wastewater discharged at the crib influences the groundwater other than to say that the water is of insufficient quantity to form a mound. Consequently, it is only possible to speculate on the nature of the groundwater conditions beneath the crib. Based on experience elsewhere at the Hanford Site, the following is a very general conceptualization of water movement through the ground beneath the crib.

When wastewater from the S-26 Crib is sufficient enough to saturate the soil beneath the crib, it percolates down into the uppermost sediment unit at the crib site, a silty and sandy unit that represents the interbedded sand- and silt-dominated facies of the Hanford formation. Significant lateral spreading may occur in this fine-grained unit. Because lateral discontinuities, such as pinchouts and clastic dikes, are common in the silt-rich horizons, lateral spreading is probably limited on individual beds. However, because multiple silt-rich horizons and the cumulative thickness of this interbedded interval are present, lateral spreading may be quite pronounced through the entire interval. Lateral spreading of moisture may also occur on the underlying Plio-Pleistocene interval, which is known to have many discontinuous CaCO_3 -cemented horizons.

If any perching of the downward-migrating wastewater occurs, the amount will probably be minimal because of the discontinuous nature of the silt-rich layers in the Hanford formation and the intermittent CaCO_3 -cemented layers in the Plio-Pleistocene interval. Furthermore, if any perching occurs in the silt-rich layers of the Hanford formation, the preferential flow direction is unknown because the bedding is fairly horizontal. However, any perching that takes place on top, or within, the Plio-Pleistocene interval may cause groundwater at those perched layers to flow to the southeast because the

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Figure 15. 200 Areas Water Table Elevation, June 1992 (Kasza et al. 1992).

- 411.49 Water table elevation (feet above mean sea level)
- 400 — Groundwater table elevation contour interval = 5ft
- Ponds
- ▨ Areas where the basalt surface is generally above the water table

The 200 Areas water table elevation map has been prepared by the Geosciences Group, Environmental Division, of Westinghouse Hanford Company.

Note: To convert to metric, multiply elevation (ft) by 0.3048 to obtain elevation (m).

interval generally dips that direction. If perched groundwater does flow to the southeast, it will be flowing in a similar direction as groundwater immediately beneath the water table (southeast).

4.3 GROUNDWATER QUALITY

4.3.1 216-S-26 Crib Groundwater Quality

Groundwater analyses data from well 299-W27-1 (at the S-26 Crib) give an indication of the local groundwater quality, as well as potential local influences from the S-26 Crib. Appendix A-1 lists results of groundwater analyses data for all groundwater samples collected from well 299-W27-1 since the well and crib were installed (1984) through July 1993.

Table 12 summarizes Appendix A-1 by listing the constituents detected in the analyses. The table summarizes the highest concentration measured for the parameters listed. This approach considers the most conservative, worst-case estimate for potential groundwater contamination. The range of values for each parameter that have been measured over time can be found in Appendix A-1. More than 30 constituents have been detected since 1984, of which 12 were found in concentrations greater than those in background wells (Johnson 1993b). The constituents detected were calcium, gross beta, magnesium, nitrate, potassium, selenium, sodium, strontium (nonradiological), sulfate, total organic carbon, uranium (nonradiological), and vanadium. Five constituents were found in concentrations that exceeded regulatory limits (see Table 12 for limits and regulations). They are chloroform, gross alpha, nitrate, selenium, and tritium.

Four of the five constituents that were found in concentrations exceeding regulatory limits are found in major plumes in the southeastern portion of the 200 West Area (nitrate, chloroform, tritium, and gross alpha) (Section 4.3.2.1). These constituents are from upgradient sources and are not related to the S-26 Crib. Selenium, however, is not associated with a known plume in the 200 West Area (Ford 1993). It is also not detected in the effluent discharged to the crib (see Section 3.0). However, the detection limit used for effluent analyses, 500 parts per billion (ppb), is too high to be certain that selenium is not present in the effluent stream. Comparable groundwater sample analyses for well 299-W27-1, use a detection limit of 10 ppb, which is an order of magnitude less than the effluent detection limit. Therefore, it is unknown at this time if the effluent stream is the source of the selenium.

Several of the chemical parameter analytical results were plotted for the S-26 Crib. Plots of effluent chemistry (for the S-26 Crib), groundwater chemistry (for well 299-W27-1), and associated Hanford Site Background Average Values for the unconfined aquifer (Johnson 1993b) were created for several key parameters. These plots are shown and discussed in Appendix B. The plots show a difference in effluent chemistry versus groundwater chemistry. Figure 16 shows two groundwater quality indicator parameters, (a) pH and (b) specific conductance (conductivity). Figure 17 shows anion parameters (a) nitrate and (b) sulfate, and Figure 18 shows metal parameters (a) selenium and (b) total uranium. In most cases, the effluent chemistry was lower in

Table 12. Constituents Detected - Groundwater Monitoring Data for Well 299-W27-1. (2 sheets)

Constituent	Result ^a	Units	Background ^b	EB	Limit ^c	EL	Date ^d
Alkalinity	148,000	ppb	133,717 $\pm$ 29,399	--	--	--	8/18/88
Barium (f)	41	ppb	41 $\pm$ 20	--	1,000 (WWQS)	--	10/15/88
Calcium (f)	55,000	ppb	38,542 $\pm$ 11,023	Y	--	--	3/9/87
Cesium-137	9	pCi/L	--	--	120 (1/25 DCG)	--	4/15/85
Chloride	17,400	ppb	8,848 $\pm$ 7,723	--	250,000 (WWQS)	--	3/9/87
Chloroform	14	ppb	--	--	7 (WWQS)	Y	4/12/90
Chromium	24	ppb	<30	--	50 (WWQS)	--	1/15/88
Cobalt-60	8	pCi/L	--	--	200 (1/25 DCG)	--	10/9/84
Fluoride	400	ppb	437 $\pm$ 131	--	4,000 (WWQS)	--	12/29/92 and 4/12/93
Gross alpha	16	pCi/L	--	--	15 (WWQS)	Y	12/6/84
Gross beta	38	pCi/L	7.1 $\pm$ 2.6	Y	50 (WWQS)	--	10/9/84
Iron (f)	248	ppb	149 $\pm$ 199	--	300 (WWQS)	--	4/12/90
Magnesium (f)	15,000	ppb	11,190 $\pm$ 2,578	Y	--	--	3/9/87
Nitrate	128,000	ppb	5,170 $\pm$ 3,576	Y	10,000 (WWQS)	Y	3/9/87
Potassium (f)	6,550	ppb	4,993 $\pm$ 1,453	Y	--	--	3/9/87
Ruthenium-106	102	pCi/L	--	--	240 (1/25 DCG)	--	7/23/87
Selenium (f)	54	ppb	<5	Y	10 (WWQS)	Y	3/9/87 and 4/17/87
Silicon	14,400	ppb	18,152 $\pm$ 4,974	--	--	--	1/11/90
Sodium	39,600	ppb	15,774 $\pm$ 6,784	Y	--	--	3/9/87
Specific conductance	580	μ mhos/cm	344 $\pm$ 83	Y	--	--	4/17/87

Table 12. Constituents Detected - Groundwater Monitoring Data for Well 299-W27-1. (2 sheets)

Constituent	Result ^a	Units	Background ^b	EB	Limit ^c	EL	Date ^d
Strontium (f,nr)	264	ppb	164 ± 47	Y	--	--	10/15/87
Strontium-90	2	pCi/L	--	--	8 (WWQS)	--	4/15/85
Sulfate	63,500	ppb	30,605 ± 22,611	Y	250,000 (WWQS)	--	7/24/87
Total organic carbon	3,850	ppb	519 ± 367	Y	--	--	7/24/87
Total organic halides (as Cl)	20	ppb	<20	--	--	--	12/29/92
Tritium	637,000	pCi/L	--	--	20,000 (WWQS)	Y	10/8/85
Uranium (nr)	14	pCi/L	1.7 ± 1.2	Y	--	--	5/16/88
Uranium-234	5	pCi/L	--	--	20 (1/25 DCG)	--	12/15/88
Uranium-238	5	pCi/L	--	--	24 (1/25 DCG)	--	4/12/93
Vanadium	24	ppb	9 ± 4	Y	--	--	8/18/88
Zinc	37	ppb	95 ± 140	--	5,000 (WWQS)	--	2/3/92
pH	9	--	7.57 ± 0.29	Y	6.5 to 8.5 (WWQS)	Y	4/12/93

^aHighest recorded result from the Hanford Environmental Information System (HEIS) database, results through July 1993.

^bJohnson 1993b.

^cWWQS = Washington Water Quality Standards, Washington Administrative Code 173-200;
1/25 DCG = 1/25 Derived Concentration Guidelines, WHC-CM-7-5, Section 8.0.

^dDate sample collected.

EB = Exceed background.

EL = Exceed limit.

f = Filtered.

nr = Nonradiological.

pCi/L = Picocuries per liter.

ppb = Parts per billion.

Figure 16. Concentration Plots of 216-S-26 Crib Effluent, Well 299-W27-1 Groundwater, and Hanford Site Background Average for the Unconfined Aquifer (Johnson 1993b) for (a) pH and (b) Specific Conductance.

GW = Groundwater. EF = Effluent. BA = Background average for unconfined aquifer.

GW = Groundwater. EF = Effluent. BA = Background average for the unconfined aquifer.

Figure 17. Concentration Plots of 216-S-26 Crib Effluent, Well 299-W27-1 Groundwater, and Hanford Site Background Average for the Unconfined Aquifer (Johnson 1993b) for (a) Nitrate and (b) Sulfate.

GW = Groundwater. EF = Effluent. BA = Background average for unconfined aquifer.

GW = Groundwater. EF = Effluent. BA = Background average for unconfined aquifer.

Figure 18. Concentration Plots of 216-S-26 Crib Effluent, Well 299-W27-1 Groundwater, and Hanford Site Background Average for the Unconfined Aquifer (Johnson 1993b) for (a) Selenium and (b) Total Uranium.

—■— Selenium-GW —◆— Selenium-EF —▲— Selenium-BA
 GW = Groundwater. EF = Effluent. BA = Background average for unconfined aquifer.

Note: Effluent analytical limit of detection (all three samples) is too high to determine if selenium is present.

—■— Total Uranium-GW —◆— Total Uranium-EF —▲— Total Uranium-BA
 GW = Groundwater. EF = Effluent. BA = Background average for unconfined aquifer.

concentration than both the background unconfined aquifer and groundwater concentrations. Furthermore, the groundwater concentrations were higher than the average background concentration for the unconfined aquifer. This suggests that the effluent is not the source of many of the constituents seen in elevated concentrations in the groundwater. To determine the source(s) of the elevated concentrations seen in the groundwater, additional analytical results for several monitoring wells upgradient from the S-26 Crib were examined (Section 4.3.2.2).

4.3.2 Upgradient Groundwater Quality

4.3.2.1 200 West Area Groundwater Contaminant Plumes. Examination of contaminant plume maps (Figures 19 through 22) and comparison to regulatory limits indicate four major contaminant plumes may be present beneath the S-26 Crib (Connelly et al. 1992; Ford 1993). They are nitrate, chloroform, tritium, and gross alpha. The apparent groundwater flow direction beneath the crib is from the northwest to the southeast. The closest well immediately upgradient (299-W22-21) is approximately 503 m (1,650 ft) to the northwest. However, there is one well due north of the crib (299-W22-20) about 122 m (400 ft). The nearest well downgradient of the crib (other than 299-W27-1 located at the crib, 699-32-72) is approximately 550 m (1,800 ft) to the southeast. The concentrations of the four constituents forming plumes beneath the crib site are given below. Section 4.3.2.2 provides more detail on the probable sources.

- Nitrate is found in highly variable concentrations in several major plumes throughout most of the 200 West Area (Figure 19) indicating many possible sources. The plume beneath the S-26 Crib is smaller and separate from the major plumes to the north. The small plume at the site has a concentration approximately equal to the drinking water standard (45 parts per million [ppm]).
- The chloroform plume map (Figure 20) indicates major sources of chloroform on the west side of the 200 West Area. However, there is a small plume of chloroform in the immediate vicinity of the S-26 Crib, as it has been detected in the well at the crib (299-W27-1) and in the well (299-W22-20) immediately to the north. In these two wells, chloroform was detected in concentrations just slightly higher than the Washington Water Quality Standard (WWQS) of 7 ppm.
- A large tritium plume extends from the area to the northwest of the S-26 Crib (southwest portion of the 200 West Area), passes mainly north of the crib site, and extends southeastward, eastward, and northeastward (Figure 21). Its highest concentration is approximately 450 m (1,500 ft) northeast of the crib site where it is over 6,000,000 picocuries per liter (pCi/L). Near the crib it is much lower in concentration at approximately 4,000 pCi/L.
- Gross alpha plumes are detected at several places in the 200 West Area (Figure 22). The largest and most concentrated plume is in the southeastern portion of the 200 West Area. Another major plume is located in the southwestern portion of the 200 West Area, and a

Figure 19. Nitrate Plume Map for the 200 West Area.

Figure 20. Chloroform Plume Map for the 200 West Area.

Figure 21. Tritium Plume Map for the 200 West Area.

Figure 22. Gross Alpha Plume Map for the 200 West Area.

tongue extends to the southeast through the area of the crib. Concentrations upgradient are as high as 40 pCi/L, but near the crib the concentration is approximately 8 pCi/L.

4.3.2.2 Upgradient Groundwater Quality and Sources of Contaminants.

Groundwater chemistry data from several wells located to the north and northwest of the S-26 Crib site were examined to determine the overall quality of groundwater upgradient of the crib area. The Hanford Environmental Information System (HEIS) database was queried for analytical results from 1986 to July 1993, to give an indication of historical as well as current groundwater conditions. Appendix A-2 lists results of the groundwater analyses data for selected upgradient groundwater monitoring wells from 1986 through July 1993. Table 13 gives the potential contamination sources and accompanying wells that were examined. Figure 23 shows the well and disposal site locations.

The list of parameters used to determine groundwater conditions in upgradient wells was arrived at using data from the S-26 Crib groundwater monitoring well (299-W27-1). Constituents of interest, known contaminants present in plumes in the area, groundwater quality indicators, and other related chemical parameters used were as follows:

- Groundwater quality indicators--pH and specific conductance
- Cations--Calcium and sodium
- Anions--Nitrate, sulfate, and chloride
- Metals--Barium, selenium, strontium, vanadium, and zinc
- Radiological parameters--Total uranium, tritium, strontium-90, gross alpha, and gross beta.

Plots of groundwater chemistry and associated Hanford Site Background Average Values for the unconfined aquifer (Johnson 1993b) were created for the same key parameters as used for the plots in Section 4.3.1. These plots are shown and discussed in Appendix B. Several trends were noted when all the plots were examined together. For most parameters, Well 299-W22-20 was higher in concentration than the background average for the unconfined aquifer. Well 299-W22-12 was below the background average for most parameters. The sources of contamination nearest Well 299-W22-20 are the 216-S-1, 216-S-2, 216-S-7, 216-S-13, and 216-S-25 Crib to the northwest and the 216-S-22 Crib and 216-S-12 Trench to the north (see Figure 23). The majority of the wastes disposed of to these facilities (see Table 1) were radioactive (mainly uranium), acidic (nitric and sulfuric acid), and contained sodium, sodium dichromate, nitrate, ammonium nitrate, ferrous ammonium sulfate, and sodium sulfate (DOE-RL 1992; Jones 1993). Concentrations of nitrate, sulfate, chloride, total uranium, tritium, gross alpha and beta, and several related metals (vanadium, strontium, and potentially selenium) remain above background in the groundwater upgradient of the S-26 Crib. However, the trend appears to be a decrease in concentration over time. Figures 24 and 25 show this relationship for nitrate and total uranium. Most of the elevated concentrations are related to the past-practice disposal sites in the vicinity (see Figure 23).

Table 13. Potential Contamination Sources and Nearby Groundwater Monitoring Wells.

Potential contamination source	Nearby well
216-S-1 and 216-S-2 Cribs	299-W22-10
216-S-7 Crib	299-W22-12
216-S-13 Crib	299-W22-21
216-S-20 Crib	299-W22-20
216-S-22 Crib	299-W22-19
216-S-25 Crib	299-W23-9
216-S-12 Trench	299-W22-19 and 299-W22-20
216-S-10D Ditch	299-W26-11 and 299-W-26-12
2607-W6 and 2607-WZ Septic Tanks and Drain Fields	299-W27-1

Figure 23. Location of Nearby Facilities, Past-Practice Disposal Sites, and Selected Monitoring Wells in the Vicinity of the 216-S-26 Crib.

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Figure 24. Concentration Plots of Nitrate in (a) 216-S-26 Crib Effluent, Well 299-W27-1 Groundwater, and Hanford Site Background Average for the Unconfined Aquifer (Johnson 1993b) and (b) Upgradient Monitoring Wells Near Disposal Sites in the Vicinity of the 216-S-26 Crib.

Note: Graph illustrates groundwater data from wells upgradient of the 216-S-26 Crib location. Hanford Site background average concentration for the unconfined aquifer is shown as a dotted line.

GW = Groundwater. EF = Effluent. BA = Background average for unconfined aquifer.

Figure 25. Concentration Plots of Total Uranium in (a) 216-S-26 Crib Effluent, Well 299-W27-1 Groundwater, and Hanford Site Background Average for the Unconfined Aquifer (Johnson 1993b) and (b) Upgradient Monitoring Wells Near Disposal Sites in the Vicinity of the 216-S-26 Crib.

Well W22-12 Well W22-20 Well W22-21
Well W22-7 Well W22-10 Well W23-9

Note: Graph illustrates groundwater data from wells upgradient of the 216-S-26 Crib location. Hanford Site background average concentration for the unconfined aquifer is shown as a dotted line.

—■— Total Uranium-GW —◆— Total Uranium-EF —▲— Total Uranium-BA
GW = Groundwater. EF = Effluent. BA = Background average for unconfined aquifer.

The sulfate, selenium, and vanadium occurrences are related, but a potential upgradient source is not obvious from the historical data (Table 1). The groundwater chemistry data plots (Figures 26, 27, and 28) for upgradient wells (e.g., 299-W22-20 and 299-W27-1), indicate that these wells are located in the path of the plume of these constituents. The most likely potential upgradient sources are the 216-S-1, 216-S-2, 216-S-7, 216-S-13, and 216-S-25 Cribs.

4.4 SOIL COLUMN CHEMISTRY FACTORS

Liquid wastes discharged to the S-26 Crib have contributed chemical and radioactive wastes to the soil column. These liquid wastes included effluent from the 222-S Laboratory Complex. These liquid wastes have included low-level radiological and chemical constituents in the past, specifically strontium-90, acetone, nitrate, nitric acid, and lesser amounts of sulfuric and hydrofluoric acids (WHC 1991). In addition to these sources, there have also been three or more 4,200 L (1,100 gal) tanker truck discharges of Plutonium Finishing Plant (PFP) Complex caustic rinsate to the S-26 Crib from 1986 to 1987. These discharges had pH values of approximately 12.5, which is the high end of the Washington State Dangerous Waste regulation (WAC 173-303) range (greater than 2 and less than 12.5) for waste to be considered noncorrosive and therefore unregulated. This pH exceeds the WWQS criteria for groundwater pH values, which is given a range 6.5 to 8.5. After receiving the alkaline pH discharges, infiltration in the S-26 Crib decreased and has continued to be a problem (DOE/RL 1992). This decrease in infiltration is similar to a situation created in the 216-Z-20 Crib at the PFP Complex. After similar caustic rinsate solutions from the PFP Complex were discharged to the 216-Z-20 Crib, its infiltration capacity also decreased. This suggests that caustic rinsate forms chemical precipitates and thereby decreases the porosity of the soil column beneath the crib (Johnson 1993a). Effluent from the 222-S Laboratory Complex facilities is generally in the 6 to 7 pH range (see Table 8), which is slightly acidic to neutral. Subsequent effluent discharges in this pH range were not acidic enough to reverse this reaction and thereby unclog the near-surface sediments.

The use of detergents and decontamination chemicals in the 222-S and 222-SA laboratories and subsequent discharge of these materials in effluent to the S-26 Crib, could also effect the soil column chemistry. Early studies (Knoll 1957) showed a marked reduction in radionuclide sorption by Hanford Site soils in the presence of laundry detergents and related decontamination chemicals. For example, 0.1 weight percent solutions of various detergents reduced distribution coefficients (K_d values) significantly for long-lived radionuclides such as strontium-90, cesium-137, and plutonium (Table 14). Apparently detergents either form a complex with the radionuclides or block the sorption sites on the soil.

The potential significance of the above statement is that contaminant retention properties of the soil column beneath the S-26 Crib may have been altered. Consequently, the radionuclide inventory in the soil column may be distributed over a greater depth than expected. However, it is likely that the concentrations of detergents and chemicals in the waste solutions are relatively low because of dilution. Therefore, it is likely that they have little, if any effect on the soil column chemistry.

Figure 26. Concentration Plots of Sulfate in (a) 216-S-26 Crib Effluent, Well 299-W27-1 Groundwater, and Hanford Site Background Average for the Unconfined Aquifer (Johnson 1993b) and (b) Upgradient Monitoring Wells Near Disposal Sites in the Vicinity of the 216-S-26 Crib.

Well W22-12 Well W22-20 Well W22-21
Well W22-10 Well W23-9 Background Average¹

Note: Graph illustrates groundwater data from wells upgradient of the 216-S-26 Crib location.
¹Background Average = Hanford Site background average concentration for the unconfined aquifer and it is shown as a dotted line on the graph.

Sulfate-GW Sulfate-EF Sulfate-BA

GW = Groundwater. EF = Effluent. BA = Background average for unconfined aquifer.

Figure 27. Concentration Plots of Selenium in (a) 216-S-26 Crib Effluent, Well 299-W27-1 Groundwater, and Hanford Site Background Average for the Unconfined Aquifer (Johnson 1993b) and (b) Upgradient Monitoring Wells Near Disposal Sites in the Vicinity of the 216-S-26 Crib.

Well W22-20 Well W22-21 Background Average¹

Note: Graph illustrates groundwater data from wells upgradient of the 216-S-26 Crib location.
¹Background Average = Hanford Site background average concentration for the unconfined aquifer and it is shown as a dotted line on the graph.

Selenium-GW Selenium-EF Selenium-BA

GW = Groundwater. EF = Effluent. BA = Background average for unconfined aquifer.

Note: ¹Effluent analytical limit of detection (all three samples) is too high to determine if any selenium is present.

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Figure 28. Concentration Plots of Vanadium in (a) 216-S-26 Crib Effluent, Well 299-W27-1 Groundwater, and Hanford Site Background Average for the Unconfined Aquifer (Johnson 1993b) and (b) Upgradient Monitoring Wells Near Disposal Sites in the Vicinity of the 216-S-26 Crib.

Note: Graph illustrates groundwater data from wells upgradient of the 216-S-26 Crib location.
¹Background Average = Hanford Site background average concentration for the unconfined aquifer and it is shown as a dotted line on the graph.

GW = Groundwater. EF = Effluent. BA = Background average for unconfined aquifer.

Note: ¹Effluent vanadium concentration is less than the analytical limit of detection.

²Groundwater analytical limit of detection (starting January 1992) is too high to determine if any vanadium is present.

Table 14. K_d Values for Strontium-90, Cesium-137, and Plutonium-239 in Soils Treated with Various Detergents (adapted from Knoll 1957).

Detergent	Strontium-90					Cesium-137					Plutonium-239				
	pH of Deter. Soln.	pH at Equil. with Soil	K_d of Deter. Soln.	K_d of Water at Equil. pH	$\frac{DK_d}{WK_d}$	pH of Deter. Soln.	pH at Equil. with Soil	K_d of Deter. Soln.	K_d of Water at Equil. pH	$\frac{DK_d}{WK_d}$	pH of Deter. Soln.	pH at Equil. with Soil	K_d of Deter. Soln.	K_d of Water at Equil. pH	$\frac{DK_d}{WK_d}$
Duponal ^a	6.5	8.8	19.8	110	0.18	6.5	8.8	24	356	0.07	6.5	8.8	6	30	0.5
Lanokleen ^b	9.7	8.2	26.0	72	0.36	9.7	8.4	59	420	0.14	9.7	8.4	7	42	0.16
Calgon ^c	8.6	8.4	3.8	86	0.04	8.6	8.4	60	420	0.14	8.6	8.4	9	42	0.21
Trisodium phosphate	9.8	11.7	8.9	348	0.02	11.7	9.6	34	250	0.13	11.7	9.6	10	45	0.22
Sulfamic acid	2.3	8.4	7.6	86	0.09	2.3	8.4	31	420	0.07	2.3	8.4	>160	42	>3.8
Tide ^d	10.0	9.0	9.8	122	0.08	10.6	8.7	40	375	0.1	10.0	8.7	36	30	1.2
Kerful ^e	12.0	10.7	16.6	270	0.05	2.1	8.4	<40	420	<0.09	12.0	10.7	10	86	0.11
Oakite #32 ^f	2.1	8.4	14.1	8.6	1.65	11.7	9.9	60	200	0.3	2.1	8.4	>160	42	>3.8
Triangle 100 ^g	11.7	10.0	35.0	210	0.16	2.1	8.3	>180	430	>0.4	11.7	9.9	8	62	0.13
Bowlene ^h	2.1	8.3	9.4	78	0.12	12.0	10.9	25	65	0.38	2.1	8.3	>160	45	>3.5
Blast ⁱ	12.0	10.7	24.8	270	0.09	12.0	10.7	23	60	0.38	12.0	10.9	16	94	0.17
Turco 4306-B ^j	2.5	7.0	4.8	34	0.14	2.5	8.0	427	480	0.9	2.5	8.0	>2,500	55	>40

^aDuponal is a trademark of E. I. duPont de Nemours & Company.

^bLanokleen is a trademark of West Disinfecting Company.

^cCalgon is a trademark of Calgon, Inc.

^dTide is a trademark of Proctor & Gamble.

^eKerful is a trademark of Clayton Manufacturing Company.

^fOakite #32 is a trademark of Oakite Products Company.

^gTriangle 100 is a trademark of L. H. Butcher Company.

^hBowlene is a trademark of Climaline Company.

ⁱBlast is a trademark of DuBois Company.

^jTurco 4306-B is a trademark of Turco Products, Incorporated.

4.5 SUMMARY OF CONCEPTUAL MODEL

Based on the data available, a conceptual model of potential impacts of effluent discharges to the S-26 Crib is summarized below and illustrated in Figure 29.

- Wastewater discharged to the S-26 Crib moves through the crib sediments and into the Hanford formation. Lateral spreading occurs along discontinuous layers of fine-grained sediments as the water moves vertically through the soil column. The water table is within or just above the Plio-Pleistocene in this part of the 200 West Area.
- Discharges of 222-S Complex effluent containing low-level radioactive liquids and various lab chemicals contributed to the soil column inventory. Laboratory sorption studies on Hanford Site soils treated with various detergents and decontamination chemicals (Knoll 1957) have shown enhanced radionuclide mobility. The detergents and decontamination chemicals used at the 222-S Complex would have been very dilute when discharged to the crib, so their effect on the soil column would be slight.
- Discharge of trucked-in PFP Complex caustic rinsate solution very likely formed chemical precipitates in the crib soil column and decreased the porosity and infiltration capacity of the crib.
- Small amounts of long-lived radionuclides from the 222-S Laboratory Complex were released to the S-26 Crib and are assumed to be present and retained on the crib sediments and soil column immediately beneath the crib.
- Aluminum and strontium-90 discharged to the S-26 Crib would most likely have moved further down in the soil column, but would not have broken through to groundwater. Groundwater chemistry results do not show any concentration above background values for these constituents.
- A potential preferential pathway exists along the unsealed portion of the well casing (299-W27-1), from 150 ft (46 m) to the water table. Contaminants could migrate down this pathway to the aquifer.
- Nitrate, sulfate, chloride, total uranium, tritium, gross alpha and beta, and several related metals (vanadium, strontium, and potentially selenium) occur in concentrations above background in the groundwater upgradient and beneath the S-26 Crib. These constituents are present because of past-practice disposal activities in the immediate area and are moving into the S-26 Crib area from upgradient sources.

The impact assessment presented in the following section addresses these issues using a combination of contaminant migration modeling, groundwater sampling and analysis results, and existing groundwater hydraulic data from other ongoing programs.

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5.0 IMPACT ASSESSMENT

As required by the methodology document (Tyler 1991), both hydrologic and contaminant impacts are considered for each groundwater impact assessment. Accordingly, hydrologic factors relevant to the current status of the disposal facility are discussed first followed by contaminant transport analysis.

5.1 HYDROLOGIC IMPACTS

Based on current (and historical) discharges to the S-26 Crib, impact to the local groundwater flow regime is minimal. Groundwater flow is to the east-southeast in the vicinity of the S-26 Crib. There are no irregularities in the water table near the S-26 Crib. Discharged wastewater at the S-26 Crib is decreasing with time and will cease by June 1995.

Effluent discharged to the crib percolates downward through a multi-layered sequence of sediments. Perched water conditions may occur within and upon the variance fine-grained sediment layers present beneath the crib. Lateral spreading of perched water is likely limited by discontinuities or pinchouts which are common to local sediments, or by features such as clastic dikes. The presence or extent of perched water associated with the S-26 Crib is unknown. The spreading of water in the vadose zone decreases the potential for measurable mounding at the water table.

5.2 CONTAMINANT IMPACTS

5.2.1 Analytical Technique

The one-dimensional analytical method described in the *Liquid Effluent Study Final Project Report* (WHC 1990a) estimates the rate of moisture and contaminant movement through the soil column beneath the S-26 Crib. The method considered only flow in the vertical direction and did not allow for lateral spreading. Thus, calculated contaminant migration rates are considered more conservative (faster) than actual contaminant migration rates.

The method used is based on steady-state flow conditions in the unsaturated zone and assumes a unit hydraulic gradient. The basic equation for any layer of sediments is

$$t = L \times \theta / q \quad (1)$$

where:

- t = time of travel through layer, seconds
- L = thickness of layer, centimeters
- θ = moisture content of sediment, related to hydraulic conductivity
- q = Darcy velocity or moisture flux in layer, centimeter/second.

The total travel time, T , is determined as the summation of the travel times for each of the "i" layers:

$$T = \sum_{i=1}^n L_i \times \theta_i / q_i \quad (2)$$

where n is the number of sediment layers. For transport calculation purposes, the soil column beneath the crib was treated as a two-layer system of 60 m (197 ft) depth. Figure 30 illustrates the soil column used in the original analytical solution.

The relationship between hydraulic conductivity, K , and moisture content, θ , is described graphically in Figure 31. These curves were derived empirically from laboratory tests on more than 20 different Hanford Site sediment types and established five major sediment types, as noted in the figure.

The one-dimensional flow analysis embodied in equation 2 was carried out on a Symphony¹ spreadsheet. The total travel time, T , obtained with equation 2 is divided into the vadose zone thickness to provide an estimate of the rate of moisture migration from the disposal facility to the groundwater.

To obtain an estimate of the rate of contaminant migration, the retardation factor, R_f , for each of the contaminants identified was estimated from the following approximation for Hanford soils:

$$R_f = 1 + 5K_d \quad (3)$$

Conservative K_d values (i.e. at the lower end of observed ranges) were selected from the Ames and Serne (1991) tabulation for effluent described as "low salt, low organic, and neutral pH." When the rate of moisture migration is divided by the R_f for the contaminant of interest, the result is an estimate of the contaminant migration rate. These computations were also carried out using the Symphony spreadsheet method.

Recent work has been done on Hanford Site sediments to update the K_d values and "calibrate" these ranges. However, at the time of this document, the results are not yet available for use.

The effluent discharge rate, as described previously, was entered as liters per month in the spreadsheet computational method. Effluent volumes through 1987 listed in the *Waste Stream Characterization Report* (WHC 1989), were updated to include 1988 and 1989 data for the Liquid Effluent Study (WHC 1990a; the same average infiltration rate was also assumed for the time period subsequent to 1989). The total volume (liters) was divided by the

¹Symphony is a registered trademark of the Lotus Development Corporation.

Figure 30. Lithology of Well 299-W27-1 at 216-S-26 Crib (WHC 1990a).

Logged by Driller

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Figure 31. Hydraulic Conductivity Versus Moisture Content (WHC 1990a).

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corresponding operating period (months) to establish an average rate of inflow (L/month). This effluent discharge rate was divided by the crib area to obtain an estimate of the average infiltration rate.

More details and an illustrative example for application of the overall computational approach are provided in the *Liquid Effluent Study Final Project Report* (WHC 1990a).

5.2.2 Results of Initial Analytical Solution

The following discussion summarizes the results from the *Liquid Effluent Study Final Project Report* (WHC 1990a), with the exception of selenium which was added for the purpose of this report.

Based on general effluent characteristics and corresponding sorption parameters (Section 5.2.1) for the key constituents identified in Table 15 plus new data for selenium, the calculated migration rates in the vadose zone (Table 16), listed most mobile to least mobile, are as follows:

- 36 cm/day (14 in/day) for selenium
- 3.6 cm/day (1.4 in/day) for uranium
- 0.4 cm/day (0.16 in/day) for aluminum
- 0.3 cm/day (0.12 in/day) for strontium-90
- 0.1 cm/day (0.04 in/day) for manganese-54, cobalt-60, and cesium-137
- 0.04 cm/day (0.02 in/day) for americium-241.

The most significant radiological constituents based on inventory, half-life and relative hazard potential are uranium, strontium-90, cobalt-60, and cesium-137. Based on the estimated migration rates for these constituents (Table 16) and above, breakthrough of uranium would have occurred after five years. The most significant nonradiological constituent is selenium and the analytical solution predicts breakthrough of selenium in half a year. The remaining constituents listed above would still be retained on the soil column, based on the analytical solution results.

5.2.3 Actual Field Conditions and Indications

Constituents present in the groundwater adjacent to and beneath the S-26 Crib site appear to be moving in from other disposal sites in the area (see Section 4.3). The concentrations of effluent constituents are lower than most groundwater constituent concentrations for the unconfined aquifer (Hanford Site average background values, Johnson 1993b). In addition, the effluent constituents are lower in concentration than most of the groundwater values from the well adjacent to the crib (299-W27-1). Based on present effluent characteristics and groundwater data, there is no evidence of the S-26 Crib effluent adversely affecting groundwater quality, and potential future impacts are not likely under these conditions.

Table 15. Effluent Stream Sampling Data for the 216-S-26 Crib - Key Constituents (WHC 1990a).

Key constituents	Detection limit ^a	Detection/analyses	Sample concentration (90% CI) ^a	Detection limit ^a	Detection/analyses	Sample concentration (90% CI) ^a
09/85 to 04/89, During routine operation				10/89 to 03/90, During routine operation		
Aluminum	NA	2/17	330	NA	ND	ND
1976 to 1988, During routine operation ^d				10/89 to 03/90, During routine operation		
Americium-241	40	1/NA	63	NA	4/4	2
Cobalt-60	NA	1/NA	280	1	ND	ND
Cesium-137	80	18/NA	360	1	ND	ND
Manganese-54	NA	1/NA	1,900	NA	ND	ND
Strontium-90	30	17/NA	82	0.1	1/4	0.2 ^d
Uranium (isotopes) ^c	NA	4/NA	670	NA	4/4	0.267 ^{d,e}

^aUnits: Chemical = Parts per billion (ppb).

Radionuclides = Picocurie per liter (pCi/L).

^bDisposal of effluent to the 216-S-26 Crib began in 1984; thus, this data set includes some samples taken before 1984.

^cUranium-234 Group A study guideline used as the most restrictive for determination of key constituents.

^dConcentrations below Group A study guidelines (WHC 1990b, Appendix A); values given for comparison purposes.

^eConsists of 0.14 pCi/L uranium-234 and 0.13 pCi/L uranium-238.

CI = Confidence interval.

NA = Not available.

ND = Not detected.

Table 16. Analytical Solution Results for the 216-S-26 Crib from the
Liquid Effluent Study Final Project Report (WHC 1990a).^a

Disposal facility		Rate (L/month)		Area (m ²)		f (infiltration rate cm/s)		Layer number		Thickness (m)		Soil type			
216-S Crib		2.69 E+06		390		2.63 E-04		1 2		36 24 60		C D			
θ_s		K_s		θ		Moisture state		q (cm/s)		t (s)		T (d)		Estimated moisture migration (cm/d)	
0.4 0.4		5.0 E-04 1.0 E-04		0.36 0.40		Unsaturated Saturated		2.63 E-04 1.00 E-04		4.93 E+06 9.66 E+06 1.45 E+07		168		35.7	
Constituent				R_f (retardation factor)				Estimated contaminant migration (cm/day)				Contaminant transport to water table (year)			
Aluminum				100				0.4				46			
Manganese-54				250				0.1				115			
Uranium				10				3.6				5			
Cobalt-60				250				0.1				115			
Strontium-90				125				0.3				58			
Cesium-137				250				0.1				115			
Americium-241				1,000				0.04				461			
Selenium ^a				1 ^a				36 ^a				0.5 ^a			

^aSelenium was not included in the original analytical solution run for the *Liquid Effluent Study Final Project Report (WHC-EP-0367)*; it has been added to this table because current groundwater data suggest it is also a constituent of interest to this report.

5.3 EVALUATION OF MONITORING NETWORK ADEQUACY

5.3.1 Groundwater Monitoring Well Placement

The closest well upgradient (299-W22-21) is approximately 503 m (1,650 ft) to the northwest. One well is due north (299-W22-20) of the crib about 122 m (400 ft) away, but is not truly upgradient. The nearest well downgradient of the crib (other than 299-W27-1 which is located at the crib) is approximately 550 m (1,800 ft) to the southeast (699-32-72). If discharge continues beyond the cessation date, then installation of an upgradient monitoring well and possibly an additional downgradient monitoring well should be considered. This would clearly distinguish upgradient groundwater contamination from the influence of the S-26 Crib. Based on current effluent chemistry and discharge volumes to the crib, and groundwater chemical and radiological constituent concentrations, the existing groundwater monitoring well should be adequate for monitoring the crib until the June 1995 cessation date for discharge.

5.3.2 Reporting of Monitoring Data

All hydrochemical monitoring data are reported in the HEIS database, which is publicly accessible. Monitoring results for the wells in S-26 Crib area, for all historical data through July 1993 for well 299-W27-1 and data from 1896 through July 1993 for other wells, were summarized and used to evaluate the groundwater quality and chemistry in Section 4.3 in the previous section (see Appendices A-1 and A-2).

6.0 SUMMARY AND CONCLUSIONS

6.1 GROUNDWATER QUALITY IMPACTS

Effluent data, vadose zone transport predictions, and groundwater chemistry data suggest the S-26 Crib has minimal influence on groundwater contamination in the southern 200 West Area. Locally the primary groundwater contaminants are uranium, nitrate, tritium, and chloroform, which are attributed to other past-practice disposal sites in the vicinity of the S-26 Crib. The most likely sources are the 216-S-1, 216-S-2, 216-S-7, 216-S-9, 216-S-13, and 216-S-25 Crib, which are located to the northwest of the S-26 Crib. Other potential sources are the 216-S-22 Crib and 216-S-12 Trench, located to the north of the S-26 Crib.

Calculated transport times for constituents of interest (manganese-54, cobalt-60, cesium-137, americium-241, strontium-90, and aluminum) to the water table were all more than 40 years (WHC 1990a). Therefore, any of these constituents present in the crib are still retained in the soil column. Calculated transport times for uranium and selenium were less than five years. However, there is no conclusive evidence that the uranium and selenium present in the groundwater at the S-26 Crib are due to discharges to the crib. Based on comparison between the S-26 Crib effluent and upgradient groundwater contaminant levels, it is likely that the source of these constituents is upgradient of the S-26 Crib. The most likely sources are the 216-S-1, 216-S-2, 216-S-7, 216-S-13, and 216-S-25 Crib.

6.2 HYDROLOGIC IMPACTS

Discharge of water to the S-26 Crib, under current conditions (September 1993), does not substantially impact artificial recharge to the southern 200 West Area unconfined aquifer.

6.3 CONCLUSIONS

Continued short-term operation of the S-26 Crib will have little effect on groundwater contamination in the southern 200 West Area. The groundwater monitoring well currently installed at the S-26 Crib is adequate for use of the crib, under current operating conditions (September 1993), until the June 1995 cessation date. If discharges to the S-26 Crib continue beyond June 1995, it would be advisable to install additional groundwater monitoring wells for this site, to provide better up and downgradient monitoring capabilities.

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APPENDIX A-1

**GROUNDWATER DATA FOR WELL 299-W27-1
(MONITORING WELL FOR 216-S-26 CRIB)**

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Analytical results monitoring well 299-W27-1 are listed by constituent name and sampling date on pages A1-2 through A1-71. Results are reported in the Hanford Environmental Information System (HEIS) database, which was queried for results in July of 1993. The time period covered by these results starts just after the well was installed in 1984 and goes through July of 1993.

Qualifiers

Qualifiers concerning the data are indicated with a letter code in the seventh column and are defined as follows:

- B - Blank associated with analyte is elevated in concentration
- D - Sample was diluted before analysis
- E - Concentration is out of instrument calibration range
- J - Concentration is estimated
- U - Analyte concentration is below contract required quantification limit
- H - Laboratory holding time exceeded
- R - Suspect data; currently under review
- Q - Result associated with suspect quality control data
- P - Potential problem.

It should also be noted that not all of the data in the table were reviewed at the time this report was prepared. Thus, some unflagged "suspect" data may exist in the table.

Significant Figures

No more than three significant figures are justified; any additional places are database format related.

Natural Background Reference Levels

A summary of provisional background concentrations for naturally occurring constituents is provided on pages A1-72 through A1-74. Monitoring results listed on pages A1-2 through A1-71 can be compared with either the average natural background concentrations or with the provisional threshold values (columns 4 and 5, respectively, pages A1-72 through A1-74). The latter represent the upper range of naturally occurring concentrations that are considered likely to occur at the Hanford Site based on currently available data. A major sampling effort is underway to better define both soil and groundwater natural background for the Hanford Site.

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Groundwater Well Results for 299-W27-1

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Well	Constituent Name	Collect Date	Result	Error	Filtered	Qualifier	Units	CRQL	Method Name
299-W27-1	1.1.1.2-Tetrachloroethane	7/24/87	10			U	ppb	5	SW-846 8240
299-W27-1	1.1.1.2-Tetrachloroethane	10/15/87	10			U	ppb	5	SW-846 8240
299-W27-1	1.1.1.2-Tetrachloroethane	1/15/88	10			U	ppb	5	SW-846 8240
299-W27-1	1.1.1.2-Tetrachloroethane	8/18/88	10			U	ppb	5	SW-846 8240
299-W27-1	1.1.1.2-Tetrachloroethane	1/11/90	10	4		U	ppb	5	SW-846 8240
299-W27-1	1.1.1-Trichloroethane	3/09/87	10			U	ppb	5	SW-846 8240
299-W27-1	1.1.1-Trichloroethane	4/17/87	10			U	ppb	5	SW-846 8240
299-W27-1	1.1.1-Trichloroethane	7/24/87	10			U	ppb	5	SW-846 8240
299-W27-1	1.1.1-Trichloroethane	10/15/87	5			U	ppb	5	SW-846 8240
299-W27-1	1.1.1-Trichloroethane	1/15/88	5			U	ppb	5	SW-846 8240
299-W27-1	1.1.1-Trichloroethane	8/18/88	5			U	ppb	5	SW-846 8240
299-W27-1	1.1.1-Trichloroethane	12/12/88	5			U	ppb	5	SW-846 8240
299-W27-1	1.1.1-Trichloroethane	1/11/90	5	2		U	ppb	5	SW-846 8240
299-W27-1	1.1.1-Trichloroethane	4/12/90	5	2		U	ppb	5	SW-846 8240
299-W27-1	1.1.1-Trichloroethane	2/03/92	5			U	ppb	5	SW-846 8240
299-W27-1	1.1.1-Trichloroethane	3/23/92	5			U	ppb	5	SW-846 8240
299-W27-1	1.1.1-Trichloroethane	7/01/92	5			U	ppb	5	SW-846 8240
299-W27-1	1.1.1-Trichloroethane	10/27/92	5			U	ppb	5	SW-846 8240
299-W27-1	1.1.1-Trichloroethane	12/29/92	5			U	ppb	5	SW-846 8240
299-W27-1	1.1.1-Trichloroethane	4/12/93	5			U	ppb	5	SW-846 8240
299-W27-1	1.1.2.2-Tetrachloroethane	7/24/87	10			U	ppb	5	SW-846 8240
299-W27-1	1.1.2.2-Tetrachloroethane	10/15/87	10			U	ppb	5	SW-846 8240
299-W27-1	1.1.2.2-Tetrachloroethane	1/15/88	10			U	ppb	5	SW-846 8240
299-W27-1	1.1.2.2-Tetrachloroethane	8/18/88	10			U	ppb	5	SW-846 8240
299-W27-1	1.1.2.2-Tetrachloroethane	1/11/90	5	2		U	ppb	5	SW-846 8240
299-W27-1	1.1.2-Trichloroethane	3/09/87	10			U	ppb	5	SW-846 8240
299-W27-1	1.1.2-Trichloroethane	4/17/87	10			U	ppb	5	SW-846 8240
299-W27-1	1.1.2-Trichloroethane	7/24/87	10			U	ppb	5	SW-846 8240

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Well	Constituent Name	Collect Date	Result	Error	Filtered	Qualifier	Units	CRQL	Method Name
299-W27-1	1,1,2-Trichloroethane	10/15/87	5			U	ppb	5	SW-846 8240
299-W27-1	1,1,2-Trichloroethane	1/15/88	5			U	ppb	5	SW-846 8240
299-W27-1	1,1,2-Trichloroethane	8/18/88	5			U	ppb	5	SW-846 8240
299-W27-1	1,1,2-Trichloroethane	12/12/88	5			U	ppb	5	SW-846 8240
299-W27-1	1,1,2-Trichloroethane	1/11/90	5	2		U	ppb	5	SW-846 8240
299-W27-1	1,1,2-Trichloroethane	4/12/90	5	2		U	ppb	5	SW-846 8240
299-W27-1	1,1,2-Trichloroethane	2/03/92	5			U	ppb	5	SW-846 8240
299-W27-1	1,1,2-Trichloroethane	3/23/92	5			U	ppb	5	SW-846 8240
299-W27-1	1,1,2-Trichloroethane	7/01/92	5			U	ppb	5	SW-846 8240
299-W27-1	1,1,2-Trichloroethane	10/27/92	5			U	ppb	5	SW-846 8240
299-W27-1	1,1,2-Trichloroethane	12/29/92	5			U	ppb	5	SW-846 8240
299-W27-1	1,1,2-Trichloroethane	4/12/93	5			U	ppb	5	SW-846 8240
A1-3	299-W27-1	1,1-Dichloroethane	7/24/87	10		U	ppb		
	299-W27-1	1,1-Dichloroethane	10/15/87	10		U	ppb		
	299-W27-1	1,1-Dichloroethane	1/15/88	10		U	ppb		
	299-W27-1	1,1-Dichloroethane	8/18/88	10		U	ppb		
	299-W27-1	1,1-Dichloroethane	1/11/90	5	2	U	ppb		
	299-W27-1	1,1-Dichloroethane	4/12/90	5	2	U	ppb		
	299-W27-1	1,1-Dichloroethane	2/03/92	5		U	ppb	5	SW-846 8240
	299-W27-1	1,1-Dichloroethane	3/23/92	5		U	ppb	5	SW-846 8240
	299-W27-1	1,1-Dichloroethane	7/01/92	5		U	ppb	5	SW-846 8240
	299-W27-1	1,1-Dichloroethane	10/27/92	5		U	ppb	5	SW-846 8240
	299-W27-1	1,1-Dichloroethane	12/29/92	5		U	ppb	5	SW-846 8240
	299-W27-1	1,1-Dichloroethane	4/12/93	5		U	ppb	5	SW-846 8240
	299-W27-1	1,1-Dichloroethene	7/24/87	10		U	ppb	5	SW-846 8240
	299-W27-1	1,1-Dichloroethene	10/15/87	10		U	ppb	5	SW-846 8240
	299-W27-1	1,1-Dichloroethene	1/15/88	10		U	ppb	5	SW-846 8240
	299-W27-1	1,1-Dichloroethene	8/18/88	10		U	ppb	5	SW-846 8240
	299-W27-1	1,1-Dichloroethene	1/11/90	10	4	U	ppb	5	SW-846 8240
	299-W27-1	1,1-Dichloroethene	2/03/92	5		U	ppb	5	SW-846 8240

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Groundwater Well Results for 299-W27-1

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Well	Constituent Name	Collect Date	Result	Error	Filtered	Qualifier	Units	CRQL	Method Name
299-W27-1	1,1-Dimethylhydrazine	1/11/90	10	4		U	ppb		
299-W27-1	1,2,3,4-tetrachlorobenzene	7/24/87	10			U	ppb		
299-W27-1	1,2,3,4-tetrachlorobenzene	10/15/87	10			U	ppb		
299-W27-1	1,2,3,4-tetrachlorobenzene	1/15/88	10			U	ppb		
299-W27-1	1,2,3,4-tetrachlorobenzene	1/11/90	10	4		U	ppb		
299-W27-1	1,2,3,5-tetrachlorobenzene	7/24/87	10			U	ppb		SW-846 8270
299-W27-1	1,2,3,5-tetrachlorobenzene	10/15/87	10			U	ppb		SW-846 8270
299-W27-1	1,2,3,5-tetrachlorobenzene	1/15/88	10			U	ppb		SW-846 8270
299-W27-1	1,2,3,5-tetrachlorobenzene	1/11/90	10	4		U	ppb		SW-846 8270
299-W27-1	1,2,3-Trichloropropane	7/24/87	10			U	ppb		
299-W27-1	1,2,3-Trichloropropane	7/24/87	10			U	ppb	5	SW-846 8240
299-W27-1	1,2,3-Trichloropropane	10/15/87	10			U	ppb		
299-W27-1	1,2,3-Trichloropropane	10/15/87	10			U	ppb	5	SW-846 8240
299-W27-1	1,2,3-Trichloropropane	1/15/88	10			U	ppb		
299-W27-1	1,2,3-Trichloropropane	1/15/88	10			U	ppb	5	SW-846 8240
299-W27-1	1,2,3-Trichloropropane	8/18/88	10			U	ppb		
299-W27-1	1,2,3-Trichloropropane	8/18/88	10			U	ppb	5	SW-846 8240
299-W27-1	1,2,3-Trichloropropane	1/11/90	10	4		U	ppb	5	SW-846 8240
299-W27-1	1,2,3-trichlorobenzene	7/24/87	10			U	ppb		
299-W27-1	1,2,3-trichlorobenzene	10/15/87	10			U	ppb		
299-W27-1	1,2,3-trichlorobenzene	1/15/88	10			U	ppb		
299-W27-1	1,2,3-trichlorobenzene	1/11/90	10	4		U	ppb		
299-W27-1	1,2,4,5-Tetrachlorobenzene	7/24/87	10			U	ppb		
299-W27-1	1,2,4,5-Tetrachlorobenzene	10/15/87	10			U	ppb		
299-W27-1	1,2,4,5-Tetrachlorobenzene	1/15/88	10			U	ppb		
299-W27-1	1,2,4,5-Tetrachlorobenzene	1/11/90	10	4		U	ppb		
299-W27-1	1,2,4-Trichlorobenzene	7/24/87	10			U	ppb		

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Well	Constituent Name	Collect Date	Result	Error	Filtered	Qualifier	Units	CRQL	Method Name
299-W27-1	1,2,4-Trichlorobenzene	10/15/87	10			U	ppb		
299-W27-1	1,2,4-Trichlorobenzene	1/15/88	10			U	ppb		
299-W27-1	1,2,4-Trichlorobenzene	1/11/90	10	4		U	ppb		
299-W27-1	1,2-Dibromo-3-chloropropane	7/24/87	10			U	ppb	5	SW-846 8240
299-W27-1	1,2-Dibromo-3-chloropropane	10/15/87	10			U	ppb	5	SW-846 8240
299-W27-1	1,2-Dibromo-3-chloropropane	1/15/88	10			U	ppb	5	SW-846 8240
299-W27-1	1,2-Dibromo-3-chloropropane	8/18/88	10			U	ppb	5	SW-846 8240
299-W27-1	1,2-Dibromo-3-chloropropane	1/11/90	10	4		U	ppb	5	SW-846 8240
299-W27-1	1,2-Dibromoethane	7/24/87	10			U	ppb	5	SW-846 8240
299-W27-1	1,2-Dibromoethane	10/15/87	10			U	ppb	5	SW-846 8240
299-W27-1	1,2-Dibromoethane	1/15/88	10			U	ppb	5	SW-846 8240
299-W27-1	1,2-Dibromoethane	8/18/88	10			U	ppb	5	SW-846 8240
299-W27-1	1,2-Dibromoethane	1/11/90	10	4		U	ppb	5	SW-846 8240
299-W27-1	1,2-Dichlorobenzene	7/24/87	10			U	ppb		
299-W27-1	1,2-Dichlorobenzene	10/15/87	10			U	ppb		
299-W27-1	1,2-Dichlorobenzene	1/15/88	10			U	ppb		
299-W27-1	1,2-Dichlorobenzene	1/11/90	10	4		U	ppb		
299-W27-1	1,2-Dichloroethane	7/24/87	10			U	ppb	5	SW-846 8240
299-W27-1	1,2-Dichloroethane	10/15/87	10			U	ppb	5	SW-846 8240
299-W27-1	1,2-Dichloroethane	1/15/88	10			U	ppb	5	SW-846 8240
299-W27-1	1,2-Dichloroethane	8/18/88	10			U	ppb	5	SW-846 8240
299-W27-1	1,2-Dichloroethane	1/11/90	5	2		U	ppb	5	SW-846 8240
299-W27-1	1,2-Dichloroethane	4/12/90	5	2		U	ppb	5	SW-846 8240
299-W27-1	1,2-Dichloroethane	2/03/92	5			U	ppb	5	SW-846 8240
299-W27-1	1,2-Dichloroethane	3/23/92	5			U	ppb	5	SW-846 8240
299-W27-1	1,2-Dichloroethane	7/01/92	5			U	ppb	5	SW-846 8240
299-W27-1	1,2-Dichloroethane	10/27/92	5			U	ppb	5	SW-846 8240
299-W27-1	1,2-Dichloroethane	12/29/92	5			U	ppb	5	SW-846 8240

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Well	Constituent Name	Collect Date	Result	Error	Filtered	Qualifier	Units	CRQL	Method Name
299-W27-1	1,2-Dichloroethane	4/12/93	5			U	ppb	5	SW-846 8240
299-W27-1	1,2-Dichloroethene	4/12/93	5			U	ppb	5	SW-846 8240
299-W27-1	1,2-Dichloropropane	7/24/87	10			U	ppb	5	SW-846 8240
299-W27-1	1,2-Dichloropropane	10/15/87	10			U	ppb	5	SW-846 8240
299-W27-1	1,2-Dichloropropane	1/15/88	10			U	ppb	5	SW-846 8240
299-W27-1	1,2-Dichloropropane	8/18/88	10			U	ppb	5	SW-846 8240
299-W27-1	1,2-Dichloropropane	1/11/90	5	2		U	ppb	5	SW-846 8240
299-W27-1	1,2-Dimethylhydrazine	1/11/90	10	4		U	ppb		SW-846 8240
299-W27-1	1,2-Diphenylhydrazine	1/15/88	10			U	ppb		
299-W27-1	1,2-Diphenylhydrazine	1/11/90	10	4		U	ppb		
A1-6	299-W27-1	1,3,5-trichlorobenzene	7/24/87	10		U	ppb		
	299-W27-1	1,3,5-trichlorobenzene	10/15/87	10		U	ppb		
	299-W27-1	1,3,5-trichlorobenzene	1/15/88	10		U	ppb		
	299-W27-1	1,3,5-trichlorobenzene	1/11/90	10	4	U	ppb		
299-W27-1	1,3-Dichlorobenzene	7/24/87	10			U	ppb		
299-W27-1	1,3-Dichlorobenzene	10/15/87	10			U	ppb		
299-W27-1	1,3-Dichlorobenzene	1/15/88	10			U	ppb		
299-W27-1	1,3-Dichlorobenzene	1/11/90	10	4		U	ppb		
299-W27-1	1,3-Dichloropropene	7/24/87	10			U	ppb		SW-846 8240
299-W27-1	1,3-Dichloropropene	10/15/87	10			U	ppb		SW-846 8240
299-W27-1	1,3-Dichloropropene	1/15/88	10			U	ppb		SW-846 8240
299-W27-1	1,3-Dichloropropene	8/18/88	10			U	ppb		SW-846 8240
299-W27-1	1,3-Dichloropropene	1/11/90	5	2		U	ppb		SW-846 8240
299-W27-1	1,4-Dichlorobenzene	7/24/87	10			U	ppb		
299-W27-1	1,4-Dichlorobenzene	10/15/87	10			U	ppb		
299-W27-1	1,4-Dichlorobenzene	1/15/88	10			U	ppb		

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Well	Constituent Name	Collect Date	Result	Error	Filtered	Qualifier	Units	CRQL	Method Name
299-W27-1	1,4-Dichlorobenzene	1/11/90	5	2		U	ppb		
299-W27-1	1,4-Dichlorobenzene	1/11/90	10	4		U	ppb		
299-W27-1	1,4-Dichlorobenzene	4/12/90	5	2		U	ppb		
299-W27-1	1,4-Dichlorobenzene	2/03/92	5			U	ppb	5	SW-846 8240
299-W27-1	1,4-Dichlorobenzene	3/23/92	5			J	ppb	5	SW-846 8240
299-W27-1	1,4-Dichlorobenzene	7/01/92	5			U	ppb	5	SW-846 8240
299-W27-1	1,4-Dichlorobenzene	10/27/92	5			U	ppb	5	SW-846 8240
299-W27-1	1,4-Dichlorobenzene	12/29/92	5			U	ppb	5	SW-846 8240
299-W27-1	1,4-Dichlorobenzene	4/12/93	5			U	ppb	5	SW-846 8240
299-W27-1	1,4-Dioxane	7/24/87	500			U	ppb	200	SW-846 8240
299-W27-1	1,4-Dioxane	10/15/87	500			U	ppb	200	SW-846 8240
299-W27-1	1,4-Dioxane	1/15/88	500			U	ppb	200	SW-846 8240
299-W27-1	1,4-Dioxane	8/18/88	500			U	ppb	200	SW-846 8240
299-W27-1	1,4-Dioxane	1/11/90	500	175		U	ppb	200	SW-846 8240
299-W27-1	1,4-Naphtoquinone	1/15/88	10			U	ppb		
299-W27-1	1,4-Naphtoquinone	1/11/90	10	4		U	ppb		
299-W27-1	1-(o-Chlorophenyl)thiourea	1/11/90	200	60		U	ppb		
299-W27-1	1-Acetyl-2-thiourea	1/11/90	200	40		U	ppb		
299-W27-1	1-Butanol	1/11/90	10000	3500		U	ppb		
299-W27-1	1-Butanol	2/03/92	1000			U	ppb	1000	SW-846 8240
299-W27-1	1-Butanol	3/23/92	1000			U	ppb	1000	SW-846 8240
299-W27-1	1-Butanol	7/01/92	1000			U	ppb	1000	SW-846 8240
299-W27-1	1-Butanol	10/27/92	1000			U	ppb	1000	SW-846 8240
299-W27-1	1-Butanol	12/29/92	1000			U	ppb	1000	SW-846 8240
299-W27-1	1-Butanol	4/12/93	1000			U	ppb	1000	SW-846 8240
299-W27-1	1-Chloro-2,3-epoxypropane	1/15/88	10			U	ppb		

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Well	Constituent Name	Collect Date	Result	Error	Filtered	Qualifier	Units	CRQL	Method Name
299-W27-1	1-Chloro-2,3-epoxypropane	1/11/90	10	4		U	ppb		
299-W27-1	1-Naphthyl-2-thiourea	1/11/90	200	60		U	ppb		
299-W27-1	1-Naphthylamine	1/15/88	10			U	ppb		
299-W27-1	1-Naphthylamine	1/11/90	10	4		U	ppb		
299-W27-1	1-Propanol	1/11/90	10000	3500		U	ppb		
299-W27-1	2,3,4,6-Tetrachlorophenol	1/15/88	10			U	ppb		
299-W27-1	2,3,4,6-Tetrachlorophenol	1/11/90	10	4		U	ppb		
299-W27-1	2,3,7,8-TCDD	1/11/90	0	0		U	ppb	0	SW-846 8280
299-W27-1	2,4,5-T	1/11/90	2	0		U	ppb	2	SW-846 8150
299-W27-1	2,4,5-TP	1/11/90	2	0		U	ppb	2	SW-846 8150
299-W27-1	2,4,5-Trichlorophenol	1/15/88	50			U	ppb		
299-W27-1	2,4,5-Trichlorophenol	1/11/90	10	4		U	ppb		
299-W27-1	2,4,6-Trichlorophenol	1/15/88	10			U	ppb		
299-W27-1	2,4,6-Trichlorophenol	1/11/90	10	4		U	ppb		
299-W27-1	2,4-D	1/11/90	2	0		U	ppb	10	SW-846 8150
299-W27-1	2,4-Dichlorophenol	1/15/88	10			U	ppb		
299-W27-1	2,4-Dichlorophenol	1/11/90	10	4		U	ppb		
299-W27-1	2,4-Dimethylphenol	1/15/88	10			U	ppb	10	SW-846 8270
299-W27-1	2,4-Dinitrophenol	1/15/88	50			U	ppb		
299-W27-1	2,4-Dinitrophenol	1/11/90	10	4		U	ppb		

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Well	Constituent Name	Collect Date	Result	Error	Filtered	Qualifier	Units	CRQL	Method Name
299-W27-1	2,4-Dinitrotoluene	1/15/88	10			U	ppb		
299-W27-1	2,4-Dinitrotoluene	1/11/90	10	4		U	ppb		
299-W27-1	2,6-Dichlorophenol	1/15/88	10			U	ppb		
299-W27-1	2,6-Dichlorophenol	1/11/90	10	4		U	ppb		
299-W27-1	2,6-Dinitrotoluene	1/15/88	10			U	ppb		
299-W27-1	2,6-Dinitrotoluene	1/11/90	10	4		U	ppb		
299-W27-1	2-Acetylaminofluorene	1/15/88	10			U	ppb		
299-W27-1	2-Acetylaminofluorene	1/11/90	10	4		U	ppb		
A1-9	2-Chloroethyl vinyl ether	7/24/87	10			U	ppb		SW-846 8240
	2-Chloroethyl vinyl ether	10/15/87	10			U	ppb		SW-846 8240
	2-Chloroethyl vinyl ether	1/15/88	10			U	ppb		SW-846 8240
	2-Chloroethyl vinyl ether	8/18/88	10			U	ppb		SW-846 8240
	2-Chloroethyl vinyl ether	1/11/90	5	2		U	ppb		SW-846 8240
299-W27-1	2-Chloronaphthalene	1/15/88	10			U	ppb		
299-W27-1	2-Chloronaphthalene	1/11/90	10	4		U	ppb		
299-W27-1	2-Chlorophenol	1/15/88	10			U	ppb		
299-W27-1	2-Chlorophenol	1/11/90	10	4		U	ppb		
299-W27-1	2-Cyclohexyl-4,6-dinitrophenol	1/15/88	10			U	ppb		
299-W27-1	2-Cyclohexyl-4,6-dinitrophenol	1/11/90	10	4		U	ppb		
299-W27-1	2-Hexanone	1/11/90	50	18		U	ppb	50	SW-846 8240
299-W27-1	2-Methylaziridine	1/15/88	10			U	ppb		
299-W27-1	2-Methylaziridine	1/11/90	10	4		U	ppb		

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Well	Constituent Name	Collect Date	Result	Error	Filtered	Qualifier	Units	CRQL	Method Name
299-W27-1	2-Methylactonitrile	1/15/88	10			U	ppb		
299-W27-1	2-Methylactonitrile	1/11/90	10	4		U	ppb		
299-W27-1	2-Methylnaphthalene	1/11/90	10	4		U	ppb		
299-W27-1	2-Naphthylamine	1/15/88	10			U	ppb		
299-W27-1	2-Naphthylamine	1/11/90	10	4		U	ppb		
299-W27-1	2-Picoline	1/15/88	10			U	ppb		
299-W27-1	2-Picoline	1/11/90	10	4		U	ppb		
299-W27-1	2-Propyn-1-ol	1/11/90	10000	3500		U	ppb		
299-W27-1	2-methyl-2-(methylthio) propionaldehyde-	1/15/88	10			U	ppb		
299-W27-1	2-methyl-2-(methylthio) propionaldehyde-	1/11/90	10	4		U	ppb		
299-W27-1	2-sec-Butyl-4,6-dinitrophenol(DNBP)	1/15/88	10			U	ppb		
299-W27-1	2-sec-Butyl-4,6-dinitrophenol(DNBP)	1/11/90	10	4		U	ppb		
299-W27-1	3,3'-Dichlorobenzidine	1/15/88	20			U	ppb		
299-W27-1	3,3'-Dichlorobenzidine	1/11/90	10	4		U	ppb		
299-W27-1	3,3'-Dimethoxybenzidine	1/15/88	10			U	ppb		
299-W27-1	3,3'-Dimethoxybenzidine	1/11/90	10	4		U	ppb		
299-W27-1	3,3'-Dimethylbenzidine	1/15/88	10			U	ppb	10	SW-846 8270
299-W27-1	3,3'-Dimethylbenzidine	1/15/88	10			U	ppb	50	SW-846 8270
299-W27-1	3,3'-Dimethylbenzidine	1/11/90	10	4		U	ppb	10	SW-846 8270
299-W27-1	3,3'-Dimethylbenzidine	1/11/90	10	4		U	ppb	50	SW-846 8270
299-W27-1	3-Chloropropionitrile	1/11/90	10000	3500		U	ppb		

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Well	Constituent Name	Collect Date	Result	Error	Filtered	Qualifier	Units	CRQL	Method Name
299-W27-1	3-Methylcholanthrene	1/15/88	10			U	ppb		
299-W27-1	3-Methylcholanthrene	1/11/90	10	4		U	ppb		
299-W27-1	3-Nitroaniline	1/11/90	10	4		U	ppb		
299-W27-1	4,4'-DDD	1/11/90	0	0		U	ppb	0	SW-846 8080
299-W27-1	4,4'-DDE	1/11/90	0	0		U	ppb	0	SW-846 8080
299-W27-1	4,4'-DDT	1/11/90	0	0		U	ppb	0	SW-846 8080
299-W27-1	4,4'-Methylenebis(2-chloroaniline)	1/15/88	10			U	ppb		
299-W27-1	4,4'-Methylenebis(2-chloroaniline)	1/11/90	10	4		U	ppb		
299-W27-1	4,6-Dinitro-2-methylphenol	1/15/88	10			U	ppb		
299-W27-1	4,6-Dinitro-2-methylphenol	1/11/90	10	4		U	ppb		
299-W27-1	4-Aminobiphenyl	1/15/88	10			U	ppb		
299-W27-1	4-Aminobiphenyl	1/11/90	10	4		U	ppb		
299-W27-1	4-Bromophenylphenyl ether	1/15/88	10			U	ppb		
299-W27-1	4-Bromophenylphenyl ether	1/11/90	10	4		U	ppb		
299-W27-1	4-Chloro-3-methylphenol	1/15/88	10			U	ppb		
299-W27-1	4-Chloro-3-methylphenol	1/11/90	10	4		U	ppb		
299-W27-1	4-Chloroaniline	1/15/88	10			U	ppb		
299-W27-1	4-Chloroaniline	1/11/90	10	4		U	ppb		
299-W27-1	4-Methyl-2-pentanone	10/15/87	10			U	ppb	50	SW-846 8240
299-W27-1	4-Methyl-2-pentanone	1/15/88	10			U	ppb	50	SW-846 8240
299-W27-1	4-Methyl-2-pentanone	8/18/88	10			U	ppb	50	SW-846 8240

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Well	Constituent Name	Collect Date	Result	Error	Filtered	Qualifier	Units	CRQL	Method Name
299-W27-1	4-Methyl-2-pentanone	12/12/88	10			U	ppb	50	SW-846 8240
299-W27-1	4-Methyl-2-pentanone	1/11/90	10	4		U	ppb	50	SW-846 8240
299-W27-1	4-Methyl-2-pentanone	4/12/90	10	4		U	ppb	50	SW-846 8240
299-W27-1	4-Methyl-2-pentanone	2/03/92	50			U	ppb	50	SW-846 8240
299-W27-1	4-Methyl-2-pentanone	3/23/92	50			U	ppb	50	SW-846 8240
299-W27-1	4-Methyl-2-pentanone	7/01/92	50			U	ppb	50	SW-846 8240
299-W27-1	4-Methyl-2-pentanone	10/27/92	50			U	ppb	50	SW-846 8240
299-W27-1	4-Methyl-2-pentanone	12/29/92	50			U	ppb	50	SW-846 8240
299-W27-1	4-Methyl-2-pentanone	4/12/93				U	ppb	50	SW-846 8240
299-W27-1	4-Nitroaniline	1/15/88	50			U	ppb		
299-W27-1	4-Nitroaniline	1/11/90	10	4		U	ppb		
299-W27-1	4-Nitrophenol	1/15/88	50			U	ppb		
299-W27-1	4-Nitrophenol	1/11/90	10	4		U	ppb		
299-W27-1	4-Nitroquinoline-1-oxide	1/11/90	10	4		U	ppb		
299-W27-1	5-(Aminomethyl)-3-isoxazolol	1/15/88	10			U	ppb		
299-W27-1	5-(Aminomethyl)-3-isoxazolol	1/11/90	10	4		U	ppb		
299-W27-1	5-Nitro-o-toluidine	1/15/88	10			U	ppb		
299-W27-1	5-Nitro-o-toluidine	1/11/90	10	4		U	ppb		
299-W27-1	7,12-Dimethylbenz[a]anthracene	1/15/88	10			U	ppb		
299-W27-1	7,12-Dimethylbenz[a]anthracene	1/11/90	10	4		U	ppb		
299-W27-1	7H-Dibenzo[c,g]carbazole	1/15/88	10			U	ppb		
299-W27-1	7H-Dibenzo[c,g]carbazole	1/11/90	10	4		U	ppb		
299-W27-1	Acenaphthene	1/11/90	10	4		U	ppb		

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Well	Constituent Name	Collect Date	Result	Error	Filtered	Qualifier	Units	CRQL	Method Name
299-W27-1	Acenaphthylene	1/11/90	10	4		U	ppb		
299-W27-1	Acetone	1/11/90	10	4		U	ppb		
299-W27-1	Acetone	1/11/90	10	4		U	ppb	100	SW-846 8240
299-W27-1	Acetone	4/12/90	10	4		U	ppb	100	SW-846 8240
299-W27-1	Acetone	2/03/92	100			U	ppb	100	SW-846 8240
299-W27-1	Acetone	3/23/92	100			U	ppb	100	SW-846 8240
299-W27-1	Acetone	7/01/92	100			U	ppb	100	SW-846 8240
299-W27-1	Acetone	10/27/92	75			UB	ppb	100	SW-846 8240
299-W27-1	Acetone	12/29/92	37			B	ppb	100	SW-846 8240
299-W27-1	Acetone	4/12/93	100			U	ppb	100	SW-846 8240
A1-13	299-W27-1	Acetonitrile	10/15/87			U	ppb	200	SW-846 8240
	299-W27-1	Acetonitrile	1/15/88			U	ppb	200	SW-846 8240
	299-W27-1	Acetonitrile	8/18/88			U	ppb	200	SW-846 8240
	299-W27-1	Acetonitrile	1/11/90	10	4	U	ppb	200	SW-846 8240
299-W27-1	Acetophenone	1/15/88	10			U	ppb		
299-W27-1	Acetophenone	1/11/90	10	4		U	ppb		
299-W27-1	Acrolein	7/24/87	10			U	ppb	10	SW-846 8240
299-W27-1	Acrolein	10/15/87	10			U	ppb	10	SW-846 8240
299-W27-1	Acrolein	1/15/88	10			U	ppb	10	SW-846 8240
299-W27-1	Acrolein	8/18/88	10			U	ppb	10	SW-846 8240
299-W27-1	Acrolein	1/11/90	10	4		U	ppb	10	SW-846 8240
299-W27-1	Acrylamide	1/11/90	10000	3500		U	ppb		
299-W27-1	Acrylonitrile	7/24/87	10			U	ppb	5	SW-846 8240
299-W27-1	Acrylonitrile	10/15/87	10			U	ppb	5	SW-846 8240
299-W27-1	Acrylonitrile	1/15/88	10			U	ppb	5	SW-846 8240
299-W27-1	Acrylonitrile	8/18/88	10			U	ppb	5	SW-846 8240

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Well	Constituent Name	Collect Date	Result	Error	Filtered	Qualifier	Units	CRQL	Method Name
299-W27-1	Acrylonitrile	1/11/90	10	4		U	ppb	5	SW-846 8240
299-W27-1	Aldrin	1/11/90	0	0		U	ppb	0	SW-846 8080
299-W27-1	Alkalinity	3/09/87	122000				ppb		
299-W27-1	Alkalinity	4/17/87	126000				ppb		
299-W27-1	Alkalinity	7/24/87	125000				ppb		
299-W27-1	Alkalinity	10/15/87	134000				ppb		
299-W27-1	Alkalinity	1/15/88	146000				ppb		
299-W27-1	Alkalinity	8/18/88	148000				ppb		
299-W27-1	Alkalinity	12/12/88	139000				ppb		
299-W27-1	Allyl alcohol	1/11/90	10000	3500		U	ppb		
299-W27-1	Alpha, alpha-Dimethylphenethylamine	1/15/88	10			U	ppb		
299-W27-1	Alpha, alpha-Dimethylphenethylamine	1/11/90	10	4		U	ppb		
299-W27-1	Alpha-BHC	1/11/90	0	0		U	ppb	0	SW-846 8080
299-W27-1	Aluminum	3/09/87	150		Y	U	ppb	200	SW-846 6010
299-W27-1	Aluminum	4/17/87	150		Y	U	ppb	200	SW-846 6010
299-W27-1	Aluminum	7/24/87	150		Y	U	ppb	200	SW-846 6010
299-W27-1	Aluminum	10/15/87	150		Y	U	ppb	200	SW-846 6010
299-W27-1	Aluminum	1/15/88	150			U	ppb		
299-W27-1	Aluminum	1/15/88	150		Y	U	ppb	200	SW-846 6010
299-W27-1	Aluminum	8/18/88	150		Y	U	ppb	200	SW-846 6010
299-W27-1	Aluminum	12/12/88	150		Y	U	ppb	200	SW-846 6010
299-W27-1	Aluminum	1/11/90	150	20		U	ppb		
299-W27-1	Aluminum	1/11/90	150	20	Y	U	ppb	200	SW-846 6010
299-W27-1	Aluminum	4/12/90	150	20	Y	U	ppb	200	SW-846 6010
299-W27-1	Aluminum	4/12/90	150	20	Y	U	ppb	200	SW-846 6010

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Well	Constituent Name	Collect Date	Result	Error	Filtered	Qualifier	Units	CRQL	Method Name
299-W27-1	Americium-241	1/11/90	0	0		U	pCi/L		
299-W27-1	Amitrole	1/15/88	10			U	ppb		
299-W27-1	Amitrole	1/11/90	10	4		U	ppb		
299-W27-1	Ammonium ion	3/09/87	50			U	ppb	100	ASTM D-1426-D
299-W27-1	Ammonium ion	4/17/87	50			U	ppb	100	ASTM D-1426-D
299-W27-1	Ammonium ion	7/24/87	50			U	ppb	100	ASTM D-1426-D
299-W27-1	Ammonium ion	10/15/87	50			U	ppb	100	ASTM D-1426-D
299-W27-1	Ammonium ion	1/15/88	50			U	ppb	100	ASTM D-1426-D
299-W27-1	Ammonium ion	8/18/88	50			U	ppb	100	ASTM D-1426-D
299-W27-1	Ammonium ion	12/12/88	50			U	ppb	100	ASTM D-1426-D
299-W27-1	Ammonium ion	1/11/90	50	7		U	ppb	100	ASTM D-1426-D
299-W27-1	Aniline	1/15/88	10			U	ppb		
299-W27-1	Aniline	1/11/90	10	4		U	ppb		
299-W27-1	Anthracene	1/11/90	10	4		U	ppb		
299-W27-1	Antimony	1/11/90	100	14		U	ppb		
299-W27-1	Antimony, filtered	3/09/87	100		Y	U	ppb	200	SW-846 6010
299-W27-1	Antimony, filtered	4/17/87	100		Y	U	ppb	200	SW-846 6010
299-W27-1	Antimony, filtered	7/24/87	100		Y	U	ppb	200	SW-846 6010
299-W27-1	Antimony, filtered	10/15/87	100		Y	U	ppb	200	SW-846 6010
299-W27-1	Antimony, filtered	1/15/88	100		Y	U	ppb	200	SW-846 6010
299-W27-1	Antimony, filtered	8/18/88	100		Y	U	ppb	200	SW-846 6010
299-W27-1	Antimony, filtered	12/12/88	100		Y	U	ppb	200	SW-846 6010
299-W27-1	Antimony, filtered	1/11/90	100	14	Y	U	ppb	200	SW-846 6010
299-W27-1	Antimony, filtered	4/12/90	100	14	Y	U	ppb	200	SW-846 6010
299-W27-1	Antimony, filtered	4/12/90	100	14	Y	U	ppb	200	SW-846 6010
299-W27-1	Antimony, filtered	2/03/92	200		Y	U	ppb	200	SW-846 6010

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Well	Constituent Name	Collect Date	Result	Error	Filtered	Qualifier	Units	CRQL	Method Name
299-W27-1	Antimony, filtered	3/23/92	200		Y	U	ppb	200	SW-846 6010
299-W27-1	Antimony, filtered	7/01/92	200		Y	U	ppb	200	SW-846 6010
299-W27-1	Antimony, filtered	10/27/92	200		Y	U	ppb	200	SW-846 6010
299-W27-1	Antimony, filtered	12/29/92	200		Y	U	ppb	200	SW-846 6010
299-W27-1	Antimony, filtered	4/12/93	200		Y	U	ppb	200	SW-846 6010
299-W27-1	Antimony-125	3/23/92	9	15		U	pCi/L		ITAS Gamma Scan
299-W27-1	Antimony-125	10/27/92	-3	19		U	pCi/L		ITAS Gamma Scan
299-W27-1	Antimony-125	12/29/92	9	20		U	pCi/L		ITAS Gamma Scan
299-W27-1	Antimony-125	4/12/93	2	20		U	pCi/L		ITAS Gamma Scan
299-W27-1	Antimony-125	7/20/93	-4	16		U	pCi/L		ITAS Gamma Scan
299-W27-1	Aramite	1/15/88	10			U	ppb		
299-W27-1	Aramite	1/11/90	10	4		U	ppb		
299-W27-1	Aroclor-1016	1/11/90	1	0		U	ppb		
299-W27-1	Aroclor-1221	1/11/90	1	0		U	ppb		
299-W27-1	Aroclor-1232	1/11/90	1	0		U	ppb		
299-W27-1	Aroclor-1242	1/11/90	1	0		U	ppb		
299-W27-1	Aroclor-1248	1/11/90	1	0		U	ppb		
299-W27-1	Aroclor-1254	1/11/90	1	0		U	ppb		
299-W27-1	Aroclor-1260	1/11/90	1	0		U	ppb		
299-W27-1	Arsenic	1/15/88	5			U	ppb	5	SW-846 7060
299-W27-1	Arsenic	1/11/90	5	3		U	ppb	5	SW-846 7060

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Well	Constituent Name	Collect Date	Result	Error	Filtered	Qualifier	Units	CRQL	Method Name
299-W27-1	Arsenic, filtered	3/09/87	5		Y	U	ppb		
299-W27-1	Arsenic, filtered	4/17/87	5		Y	U	ppb		
299-W27-1	Arsenic, filtered	7/24/87	5		Y	U	ppb		
299-W27-1	Arsenic, filtered	10/15/87	5		Y	U	ppb		
299-W27-1	Arsenic, filtered	1/15/88	5		Y	U	ppb		
299-W27-1	Arsenic, filtered	1/11/90	5	3	Y	U	ppb		
299-W27-1	Auramine	1/15/88	10			U	ppb		
299-W27-1	Auramine	1/11/90	10	4		U	ppb		
299-W27-1	Barium	1/15/88	37				ppb		
299-W27-1	Barium	1/11/90	40	5			ppb		
299-W27-1	Barium, filtered	3/09/87	40		Y		ppb	20	SW-846 6010
299-W27-1	Barium, filtered	4/17/87	39		Y		ppb	20	SW-846 6010
299-W27-1	Barium, filtered	7/24/87	41		Y		ppb	20	SW-846 6010
299-W27-1	Barium, filtered	10/15/87	36		Y		ppt	20	SW-846 6010
299-W27-1	Barium, filtered	1/15/88	34		Y		ppb	20	SW-846 6010
299-W27-1	Barium, filtered	8/18/88	35		Y		ppb	20	SW-846 6010
299-W27-1	Barium, filtered	12/12/88	32		Y		ppb	20	SW-846 6010
299-W27-1	Barium, filtered	1/11/90	40	5	Y		ppb	20	SW-846 6010
299-W27-1	Barium, filtered	4/12/90	29	4	Y		ppb	20	SW-846 6010
299-W27-1	Barium, filtered	4/12/90	27	4	Y		ppb	20	SW-846 6010
299-W27-1	Barium, filtered	2/03/92	20		Y	U	ppb	20	SW-846 6010
299-W27-1	Barium, filtered	3/23/92	20	3	Y		ppb	20	SW-846 6010
299-W27-1	Barium, filtered	7/01/92	22	3	Y		ppb	20	SW-846 6010
299-W27-1	Barium, filtered	10/27/92	20	3	Y		ppb	20	SW-846 6010
299-W27-1	Barium, filtered	12/29/92	20	3	Y		ppb	20	SW-846 6010
299-W27-1	Barium, filtered	4/12/93	20	0	Y		ppb	20	SW-846 6010
299-W27-1	Benz[c]acridine	1/15/88	10			U	ppb		
299-W27-1	Benz[c]acridine	1/11/90	10	4		U	ppb		

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Well	Constituent Name	Collect Date	Result	Error	Filtered	Qualifier	Units	CRQL	Method Name
299-W27-1	Benzene	7/24/87	10			U	ppb	5	SW-846 8240
299-W27-1	Benzene	10/15/87	5			U	ppb	5	SW-846 8240
299-W27-1	Benzene	1/15/88	5			U	ppb	5	SW-846 8240
299-W27-1	Benzene	8/18/88	5			U	ppb	5	SW-846 8240
299-W27-1	Benzene	1/11/90	5	2		U	ppb	5	SW-846 8240
299-W27-1	Benzene	4/12/90	5	2		U	ppb	5	SW-846 8240
299-W27-1	Benzene	2/03/92	5			U	ppb	5	SW-846 8240
299-W27-1	Benzene	3/23/92	5			U	ppb	5	SW-846 8240
299-W27-1	Benzene	7/01/92	5			U	ppb	5	SW-846 8240
299-W27-1	Benzene	10/27/92	5			U	ppb	5	SW-846 8240
299-W27-1	Benzene	12/29/92	5			U	ppb	5	SW-846 8240
299-W27-1	Benzene	4/12/93	5			U	ppb	5	SW-846 8240
299-W27-1	Benzene, dichloromethyl-	1/15/88	10			U	ppb		
299-W27-1	Benzene, dichloromethyl-	1/11/90	10	4		U	ppb		
299-W27-1	Benzenethiol	1/15/88	10			U	ppb		
299-W27-1	Benzenethiol	1/11/90	10	4		U	ppb		
299-W27-1	Benzidine	1/15/88	10			U	ppb		
299-W27-1	Benzidine	1/11/90	10	4		U	ppb		
299-W27-1	Benzo(a)anthracene	1/15/88	10			U	ppb		
299-W27-1	Benzo(a)anthracene	1/11/90	10	4		U	ppb		
299-W27-1	Benzo(a)pyrene	1/15/88	10			U	ppb		
299-W27-1	Benzo(a)pyrene	1/11/90	10	4		U	ppb		
299-W27-1	Benzo(b)fluoranthene	1/15/88	10			U	ppb		
299-W27-1	Benzo(b)fluoranthene	1/11/90	10	4		U	ppb		

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Well	Constituent Name	Collect Date	Result	Error	Filtered	Qualifier	Units	CRQL	Method Name
299-W27-1	Benzo(ghi)perylene	1/11/90	10	4		U	ppb		
299-W27-1	Benzo(j)fluoranthene	1/15/88	10			U	ppb		
299-W27-1	Benzo(j)fluoranthene	1/11/90	10	4		U	ppb		
299-W27-1	Benzo(k)fluoranthene	1/11/90	10	4		U	ppb		
299-W27-1	Benzyl alcohol	1/11/90	10	4		U	ppb		
299-W27-1	Benzyl chloride	1/15/88	10			U	ppb		
299-W27-1	Benzyl chloride	1/11/90	10	4		U	ppb		
299-W27-1	Beryllium	1/11/90	5	1		U	ppb		
299-W27-1	Beryllium, filtered	3/09/87	5		Y	U	ppb	3	SW-846 6010
299-W27-1	Beryllium, filtered	4/17/87	5		Y	U	ppb	3	SW-846 6010
299-W27-1	Beryllium, filtered	7/24/87	5		Y	U	ppb	3	SW-846 6010
299-W27-1	Beryllium, filtered	10/15/87	5		Y	U	ppb	3	SW-846 6010
299-W27-1	Beryllium, filtered	1/15/88	5		Y	U	ppb	3	SW-846 6010
299-W27-1	Beryllium, filtered	8/18/88	5		Y	U	ppb	3	SW-846 6010
299-W27-1	Beryllium, filtered	12/12/88	5		Y	U	ppb	3	SW-846 6010
299-W27-1	Beryllium, filtered	1/11/90	5	1	Y	U	ppb	3	SW-846 6010
299-W27-1	Beryllium, filtered	4/12/90	5	1	Y	U	ppb	3	SW-846 6010
299-W27-1	Beryllium, filtered	4/12/90	5	1	Y	U	ppb	3	SW-846 6010
299-W27-1	Beryllium, filtered	2/03/92	3		Y	U	ppb	3	SW-846 6010
299-W27-1	Beryllium, filtered	3/23/92	3		Y	U	ppb	3	SW-846 6010
299-W27-1	Beryllium, filtered	7/01/92	3		Y	U	ppb	3	SW-846 6010
299-W27-1	Beryllium, filtered	10/27/92	3		Y	U	ppb	3	SW-846 6010
299-W27-1	Beryllium, filtered	12/29/92	3		Y	U	ppb	3	SW-846 6010
299-W27-1	Beryllium, filtered	4/12/93	3		Y	U	ppb	3	SW-846 6010
299-W27-1	Beta-BHC	1/11/90	0	0		U	ppb	0	SW-846 8080

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Well	Constituent Name	Collect Date	Result	Error	Filtered	Qualifier	Units	CRQL	Method Name
299-W27-1	Bis(2-Chloroethoxy)methane	1/15/88	10			U	ppb		
299-W27-1	Bis(2-Chloroethoxy)methane	1/11/90	10	4		U	ppb		
299-W27-1	Bis(2-chloro-1-methylethyl)ether	1/11/90	10	4		U	ppb		
299-W27-1	Bis(2-chloroethyl) ether	1/15/88	10			U	ppb		
299-W27-1	Bis(2-chloroethyl) ether	1/11/90	10	4		U	ppb		
299-W27-1	Bis(2-chloroisopropyl) ether	1/15/88	10			U	ppb		
299-W27-1	Bis(2-chloroisopropyl) ether	1/11/90	10	4		U	ppb		
299-W27-1	Bis(2-ethylhexyl) phthalate	1/15/88	10			U	ppb		
299-W27-1	Bis(2-ethylhexyl) phthalate	1/11/90	10	4		U	ppb		
299-W27-1	Bis(chloromethyl) ether	7/24/87	10			U	ppb		SW-846 8240
299-W27-1	Bis(chloromethyl) ether	10/15/87	10			U	ppb		SW-846 8240
299-W27-1	Bis(chloromethyl) ether	1/15/88	10			U	ppb		SW-846 8240
299-W27-1	Bis(chloromethyl) ether	8/18/88	10			U	ppb		SW-846 8240
299-W27-1	Bis(chloromethyl) ether	1/11/90	5	2		U	ppb		SW-846 8240
299-W27-1	Bismuth	7/24/87	5			U	??		
299-W27-1	Boron	1/11/90	30	6			ppb		
299-W27-1	Boron, filtered	1/11/90	32	6	Y		ppb		SW-846 6010
299-W27-1	Boron, filtered	4/12/90	37	6	Y		ppb		SW-846 6010
299-W27-1	Boron, filtered	4/12/90	34	6	Y		ppb		SW-846 6010
299-W27-1	Bromide	1/11/90	1000	111		U	ppb		EPA 300.0
299-W27-1	Bromide	4/12/90	1000	111		U	ppb		EPA 300.0
299-W27-1	Bromide	4/12/90	1000	111		U	ppb		EPA 300.0
299-W27-1	Bromide	2/03/92	500			U	ppb	500	ASTM D-4327-88

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Well	Constituent Name	Collect Date	Result	Error	Filtered	Qualifier	Units	CRQL	Method Name
299-W27-1	Bromide	3/23/92	500			U	ppb	500	ASTM D-4327-88
299-W27-1	Bromide	7/01/92	500			U	ppb	500	ASTM D-4327-88
299-W27-1	Bromide	10/27/92	500			U	ppb	500	ASTM D-4327-88
299-W27-1	Bromide	12/29/92	500			U	ppb	500	ASTM D-4327-88
299-W27-1	Bromide	4/12/93	500			U	ppb	500	ASTM D-4327-88
299-W27-1	Bromoacetone	7/24/87	10			U	ppb		SW-846 8240
299-W27-1	Bromoacetone	10/15/87	10			U	ppb		SW-846 8240
299-W27-1	Bromoacetone	1/15/88	10			U	ppb		SW-846 8240
299-W27-1	Bromoacetone	8/18/88	10			U	ppb		SW-846 8240
299-W27-1	Bromoacetone	1/11/90	5	2		U	ppb		SW-846 8240
299-W27-1	Bromodichloromethane	1/11/90	5	2		U	ppb	5	SW-846 8240
299-W27-1	Bromoform	7/24/87	10			U	ppb	5	SW-846 8240
299-W27-1	Bromoform	10/15/87	10			U	ppb	5	SW-846 8240
299-W27-1	Bromoform	1/15/88	10			U	ppb	5	SW-846 8240
299-W27-1	Bromoform	8/18/88	10			U	ppb	5	SW-846 8240
299-W27-1	Bromoform	1/11/90	5	2		U	ppb	5	SW-846 8240
299-W27-1	Butylbenzylphthalate	1/15/88	10			U	ppb		
299-W27-1	Butylbenzylphthalate	1/11/90	10	4		U	ppb		
299-W27-1	Cadmium	1/15/88	2			U	ppb		
299-W27-1	Cadmium	1/11/90	2	1		U	ppb		
299-W27-1	Cadmium, filtered	3/09/87	2		Y	U	ppb	10	SW-846 6010
299-W27-1	Cadmium, filtered	4/17/87	2		Y	U	ppb	10	SW-846 6010
299-W27-1	Cadmium, filtered	7/24/87	2		Y	U	ppb	10	SW-846 6010
299-W27-1	Cadmium, filtered	10/15/87	2		Y	U	ppb	10	SW-846 6010
299-W27-1	Cadmium, filtered	1/15/88	2		Y		ppb	10	SW-846 6010
299-W27-1	Cadmium, filtered	8/18/88	2		Y	U	ppb	10	SW-846 6010

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Well	Constituent Name	Collect Date	Result	Error	Filtered	Qualifier	Units	CRQL	Method Name
299-W27-1	Cadmium, filtered	12/12/88	2		Y	U	ppb	10	SW-846 6010
299-W27-1	Cadmium, filtered	1/11/90	2	1	Y	U	ppb	10	SW-846 6010
299-W27-1	Cadmium, filtered	4/12/90	2	1	Y	U	ppb	10	SW-846 6010
299-W27-1	Cadmium, filtered	4/12/90	2	1	Y	U	ppb	10	SW-846 6010
299-W27-1	Cadmium, filtered	2/03/92	10		Y	U	ppb	10	SW-846 6010
299-W27-1	Cadmium, filtered	3/23/92	10		Y	U	ppb	10	SW-846 6010
299-W27-1	Cadmium, filtered	7/01/92	10		Y	U	ppb	10	SW-846 6010
299-W27-1	Cadmium, filtered	10/27/92	10		Y	U	ppb	10	SW-846 6010
299-W27-1	Cadmium, filtered	12/29/92	10		Y	U	ppb	10	SW-846 6010
299-W27-1	Cadmium, filtered	4/12/93	10		Y	U	ppb	10	SW-846 6010
299-W27-1	Calcium	1/15/88	52600				ppb		
299-W27-1	Calcium	1/11/90	49800	6390			ppb		
299-W27-1	Calcium, filtered	3/09/87	55500		Y		ppb	100	SW-846 6010
299-W27-1	Calcium, filtered	4/17/87	54600		Y		ppb	100	SW-846 6010
299-W27-1	Calcium, filtered	7/24/87	49600		Y		ppb	100	SW-846 6010
299-W27-1	Calcium, filtered	10/15/87	49000		Y		ppb	100	SW-846 6010
299-W27-1	Calcium, filtered	1/15/88	52300		Y		ppb	100	SW-846 6010
299-W27-1	Calcium, filtered	8/18/88	46400		Y		ppb	100	SW-846 6010
299-W27-1	Calcium, filtered	12/12/88	46000		Y		ppb	100	SW-846 6010
299-W27-1	Calcium, filtered	1/11/90	50600	6490	Y		ppb	100	SW-846 6010
299-W27-1	Calcium, filtered	4/12/90	39200	5030	Y		ppb	100	SW-846 6010
299-W27-1	Calcium, filtered	4/12/90	37100	4760	Y		ppb	100	SW-846 6010
299-W27-1	Calcium, filtered	2/03/92	32000		Y		ppb	100	SW-846 6010
299-W27-1	Calcium, filtered	3/23/92	30000		Y		ppb	100	SW-846 6010
299-W27-1	Calcium, filtered	7/01/92	33000		Y		ppb	100	SW-846 6010
299-W27-1	Calcium, filtered	10/27/92	32000		Y		ppb	100	SW-846 6010
299-W27-1	Calcium, filtered	12/29/92	32000		Y		ppb	100	SW-846 6010
299-W27-1	Calcium, filtered	4/12/93	29000	8790	Y		ppb	100	SW-846 6010
299-W27-1	Carbon disulfide	7/24/87	10			U	ppb	5	SW-846 8240

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Well	Constituent Name	Collect Date	Result	Error	Filtered	Qualifier	Units	CRQL	Method Name
299-W27-1	Carbon disulfide	10/15/87	10			U	ppb	5	SW-846 8240
299-W27-1	Carbon disulfide	1/15/88	10			U	ppb	5	SW-846 8240
299-W27-1	Carbon disulfide	8/18/88	10			U	ppb	5	SW-846 8240
299-W27-1	Carbon disulfide	1/11/90	10	4		U	ppb	5	SW-846 8240
299-W27-1	Carbon tetrachloride	3/09/87	10			U	ppb	5	SW-846 8240
299-W27-1	Carbon tetrachloride	4/17/87	10			U	ppb	5	SW-846 8240
299-W27-1	Carbon tetrachloride	7/24/87	10			U	ppb	5	SW-846 8240
299-W27-1	Carbon tetrachloride	10/15/87	5			U	ppb	5	SW-846 8240
299-W27-1	Carbon tetrachloride	1/15/88	5			U	ppb	5	SW-846 8240
299-W27-1	Carbon tetrachloride	8/18/88	5			U	ppb	5	SW-846 8240
299-W27-1	Carbon tetrachloride	12/12/88	5			U	ppb	5	SW-846 8240
299-W27-1	Carbon tetrachloride	1/11/90	5	2		U	ppb	5	SW-846 8240
299-W27-1	Carbon tetrachloride	4/12/90	5	2		U	ppb	5	SW-846 8240
299-W27-1	Carbon tetrachloride	2/03/92	5			U	ppb	5	SW-846 8240
299-W27-1	Carbon tetrachloride	3/23/92	5			U	ppb	5	SW-846 8240
299-W27-1	Carbon tetrachloride	7/01/92	5			U	ppb	5	SW-846 8240
299-W27-1	Carbon tetrachloride	10/27/92	5			U	ppb	5	SW-846 8240
299-W27-1	Carbon tetrachloride	12/29/92	5			U	ppb	5	SW-846 8240
299-W27-1	Carbon tetrachloride	4/12/93	5			U	ppb	5	SW-846 8240
299-W27-1	Carbonphenothion	1/11/90	2	1		U	ppb		SW-846 8140
299-W27-1	Cesium-137	10/09/84	8				pCi/L		
299-W27-1	Cesium-137	11/05/84	-11				pCi/L		
299-W27-1	Cesium-137	12/06/84	5				pCi/L		
299-W27-1	Cesium-137	1/08/85	4				pCi/L		
299-W27-1	Cesium-137	4/15/85	9				pCi/L		
299-W27-1	Cesium-137	7/11/85	3	3		U	pCi/L		
299-W27-1	Cesium-137	10/08/85	4	7		U	pCi/L		
299-W27-1	Cesium-137	1/07/86	1	1		U	pCi/L		
299-W27-1	Cesium-137	4/07/86	-18	10		U	pCi/L		

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Well	Constituent Name	Collect Date	Result	Error	Filtered	Qualifier	Units	CRQL	Method Name
A1-24	299-W27-1	Cesium-137	7/02/86	3	5	U	pCi/L		
	299-W27-1	Cesium-137	11/25/86	-3	7	U	pCi/L		
	299-W27-1	Cesium-137	1/20/87	1	6	U	pCi/L		
	299-W27-1	Cesium-137	4/17/87	6	4		pCi/L		
	299-W27-1	Cesium-137	7/23/87	6	4		pCi/L		
	299-W27-1	Cesium-137	10/12/87	5	6	U	pCi/L		
	299-W27-1	Cesium-137	1/15/88	-3	8	U	pCi/L		
	299-W27-1	Cesium-137	5/16/88	-3	8	U	pCi/L		
	299-W27-1	Cesium-137	8/18/88	2	8	U	pCi/L		
	299-W27-1	Cesium-137	12/15/88	-3	8	U	pCi/L		
	299-W27-1	Cesium-137	2/01/89	0	5	U	pCi/L		
	299-W27-1	Cesium-137	1/11/90	-2	4	U	pCi/L		
	299-W27-1	Cesium-137	3/23/92	6	7	U	pCi/L	20	ITAS Gamma Scan
	299-W27-1	Cesium-137	10/27/92	-3	7	U	pCi/L	20	ITAS Gamma Scan
	299-W27-1	Cesium-137	12/29/92	1	7	U	pCi/L	20	ITAS Gamma Scan
	299-W27-1	Cesium-137	4/12/93	1	7	U	pCi/L	20	ITAS Gamma Scan
	299-W27-1	Cesium-137	7/20/93	4	6	U	pCi/L	20	ITAS Gamma Scan
299-W27-1	Chlordane	1/11/90	1	0	U	ppb		0	SW-846 8080
299-W27-1	Chloride	3/09/87	17400				ppb		EPA 300.0
299-W27-1	Chloride	4/17/87	2890				ppb		EPA 300.0
299-W27-1	Chloride	7/24/87	12800				ppb		EPA 300.0
299-W27-1	Chloride	10/15/87	11000				ppb		EPA 300.0
299-W27-1	Chloride	1/15/88	8130				ppb		EPA 300.0
299-W27-1	Chloride	8/18/88	5360				ppb		EPA 300.0
299-W27-1	Chloride	12/12/88	8200				ppb		EPA 300.0
299-W27-1	Chloride	1/11/90	9700	1040			ppb		EPA 300.0
299-W27-1	Chloride	4/12/90	5900	600			ppb		EPA 300.0
299-W27-1	Chloride	4/12/90	5900	600			ppb		EPA 300.0
299-W27-1	Chloride	2/03/92	5300	1780			ppb	200	ASTM D-4327-88
299-W27-1	Chloride	3/23/92	5200	1750			ppb	200	ASTM D-4327-88

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299-W27-1	Chloride	7/01/92	5000	1680			ppb	200	ASTM D-4327-88
299-W27-1	Chloride	10/27/92	5000	1680			ppb	200	ASTM D-4327-88
299-W27-1	Chloride	12/29/92	5100	1720			ppb	200	ASTM D-4327-88
299-W27-1	Chloride	4/12/93	4500	745			ppb	200	ASTM D-4327-88
299-W27-1	Chlornaphazine	1/15/88	10			U	ppb		
299-W27-1	Chlornaphazine	1/11/90	10	4		U	ppb		
299-W27-1	Chloroalkyl ethers	1/15/88	10			U	ppb		
299-W27-1	Chloroalkyl ethers	1/11/90	10	4		U	ppb		
299-W27-1	Chlorobenzene	7/24/87	10			U	ppb	5	SW-846 8240
299-W27-1	Chlorobenzene	10/15/87	10			U	ppb	5	SW-846 8240
299-W27-1	Chlorobenzene	1/15/88	10			U	ppb	5	SW-846 8240
299-W27-1	Chlorobenzene	8/18/88	10			U	ppb	5	SW-846 8240
299-W27-1	Chlorobenzene	1/11/90	5	2		U	ppb	5	SW-846 8240
299-W27-1	Chlorobenzene	1/11/90	10	4		U	ppb		
299-W27-1	Chlorobenzene	2/03/92	5			U	ppb	5	SW-846 8240
299-W27-1	Chlorobenzilate	1/11/90	300	75		U	ppb		SW-846 8080
299-W27-1	Chloroethane	1/11/90	10	4		U	ppb	10	SW-846 8240
299-W27-1	Chloroform	3/09/87	10			U	ppb	5	SW-846 8240
299-W27-1	Chloroform	4/17/87	10			U	ppb	5	SW-846 8240
299-W27-1	Chloroform	7/24/87	10			U	ppb	5	SW-846 8240
299-W27-1	Chloroform	10/15/87	2			U	ppb	5	SW-846 8240
299-W27-1	Chloroform	1/15/88	5			U	ppb	5	SW-846 8240
299-W27-1	Chloroform	8/18/88	6				ppb	5	SW-846 8240
299-W27-1	Chloroform	12/12/88	6				ppb	5	SW-846 8240
299-W27-1	Chloroform	1/11/90	6	2			ppb	5	SW-846 8240
299-W27-1	Chloroform	4/12/90	14	3			ppb	5	SW-846 8240

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Well	Constituent Name	Collect Date	Result	Error	Filtered	Qualifier	Units	CRQL	Method Name
299-W27-1	Chloroform	2/03/92	12				ppb	5	SW-846 8240
299-W27-1	Chloroform	3/23/92	13				ppb	5	SW-846 8240
299-W27-1	Chloroform	7/01/92	10				ppb	5	SW-846 8240
299-W27-1	Chloroform	10/27/92	13				ppb	5	SW-846 8240
299-W27-1	Chloroform	12/29/92	11				ppb	5	SW-846 8240
299-W27-1	Chloroform	4/12/93	11				ppb	5	SW-846 8240
299-W27-1	Chloromethyl methyl ether	7/24/87	10			U	ppb		SW-846 8240
299-W27-1	Chloromethyl methyl ether	10/15/87	10			U	ppb		SW-846 8240
299-W27-1	Chloromethyl methyl ether	1/15/88	10			U	ppb		SW-846 8240
299-W27-1	Chloromethyl methyl ether	8/18/88	10			U	ppb		SW-846 8240
299-W27-1	Chloromethyl methyl ether	1/11/90	10	4		U	ppb		SW-846 8240
299-W27-1	Chromium	1/15/88	21				ppb		
299-W27-1	Chromium	1/11/90	13	5			ppb		
299-W27-1	Chromium, filtered	3/09/87	11		Y		ppb	20	SW-846 6010
299-W27-1	Chromium, filtered	4/17/87	13		Y		ppb	20	SW-846 6010
299-W27-1	Chromium, filtered	7/24/87	13		Y		ppb	20	SW-846 6010
299-W27-1	Chromium, filtered	10/15/87	18		Y		ppb	20	SW-846 6010
299-W27-1	Chromium, filtered	1/15/88	24		Y		ppb	20	SW-846 6010
299-W27-1	Chromium, filtered	8/18/88	13		Y		ppb	20	SW-846 6010
299-W27-1	Chromium, filtered	12/12/88	16		Y		ppb	20	SW-846 6010
299-W27-1	Chromium, filtered	1/11/90	12	5	Y		ppb	20	SW-846 6010
299-W27-1	Chromium, filtered	4/12/90	10	5	Y	U	ppb	20	SW-846 6010
299-W27-1	Chromium, filtered	4/12/90	11	5	Y		ppb	20	SW-846 6010
299-W27-1	Chromium, filtered	2/03/92	20		Y	U	ppb	20	SW-846 6010
299-W27-1	Chromium, filtered	3/23/92	20		Y	U	ppb	20	SW-846 6010
299-W27-1	Chromium, filtered	7/01/92	20		Y	U	ppb	20	SW-846 6010
299-W27-1	Chromium, filtered	10/27/92	20		Y	U	ppb	20	SW-846 6010
299-W27-1	Chromium, filtered	12/29/92	20		Y	U	ppb	20	SW-846 6010
299-W27-1	Chromium, filtered	4/12/93	20		Y	U	ppb	20	SW-846 6010

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299-W27-1	Chrysene	1/15/88	10			U	ppb		
299-W27-1	Chrysene	1/11/90	10	4		U	ppb		
299-W27-1	Citrus red No. 2	1/11/90	1000	135		U	ppb		
299-W27-1	Cobalt	1/11/90	20	3		U	ppb		
299-W27-1	Cobalt, filtered	1/11/90	20	3	Y	U	ppb	20	SW-846 6010
299-W27-1	Cobalt, filtered	4/12/90	20	3	Y	U	ppb	20	SW-846 6010
299-W27-1	Cobalt, filtered	4/12/90	20	3	Y	U	ppb	20	SW-846 6010
299-W27-1	Cobalt, filtered	2/03/92	20		Y	U	ppb	20	SW-846 6010
299-W27-1	Cobalt, filtered	3/23/92	20		Y	U	ppb	20	SW-846 6010
299-W27-1	Cobalt, filtered	7/01/92	20		Y	U	ppb	20	SW-846 6010
299-W27-1	Cobalt, filtered	10/27/92	20		Y	U	ppb	20	SW-846 6010
299-W27-1	Cobalt, filtered	12/29/92	20		Y	U	ppb	20	SW-846 6010
299-W27-1	Cobalt, filtered	4/12/93	20		Y	U	ppb	20	SW-846 6010
299-W27-1	Cobalt-60	10/09/84	8				pCi/L		
299-W27-1	Cobalt-60	11/05/84	6				pCi/L		
299-W27-1	Cobalt-60	12/06/84	-5				pCi/L		
299-W27-1	Cobalt-60	1/08/85	-3				pCi/L		
299-W27-1	Cobalt-60	4/15/85	5				pCi/L		
299-W27-1	Cobalt-60	7/11/85	-9	8		U	pCi/L		
299-W27-1	Cobalt-60	10/08/85	3	4		U	pCi/L		
299-W27-1	Cobalt-60	1/07/86	2	3		U	pCi/L		
299-W27-1	Cobalt-60	4/07/86	0				pCi/L		
299-W27-1	Cobalt-60	7/02/86	-4	6		U	pCi/L		
299-W27-1	Cobalt-60	11/25/86	4	5		U	pCi/L		
299-W27-1	Cobalt-60	1/20/87	3	4		U	pCi/L		
299-W27-1	Cobalt-60	4/17/87	1	8		U	pCi/L		
299-W27-1	Cobalt-60	7/23/87	-3	7		U	pCi/L		

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Well	Constituent Name	Collect Date	Result	Error	Filtered	Qualifier	Units	CRQL	Method Name
299-W27-1	Cobalt-60	10/12/87	12	8			pCi/L		
299-W27-1	Cobalt-60	1/15/88	1	7		U	pCi/L		
299-W27-1	Cobalt-60	5/16/88	-4	7		U	pCi/L		
299-W27-1	Cobalt-60	8/18/88	0	4		U	pCi/L		
299-W27-1	Cobalt-60	12/15/88	2	6		U	pCi/L		
299-W27-1	Cobalt-60	2/01/89	0				pCi/L		
299-W27-1	Cobalt-60	1/11/90	-7	5		U	pCi/L		
299-W27-1	Cobalt-60	3/23/92	-1	7		U	pCi/L		ITAS Gamma Scan
299-W27-1	Cobalt-60	10/27/92	-0	7		U	pCi/L		ITAS Gamma Scan
299-W27-1	Cobalt-60	12/29/92	-2	9		U	pCi/L		ITAS Gamma Scan
299-W27-1	Cobalt-60	4/12/93	-6	5		U	pCi/L		ITAS Gamma Scan
299-W27-1	Cobalt-60	7/20/93	2	5		U	pCi/L		ITAS Gamma Scan
A1-28	299-W27-1	Copper	1/15/88	10		U	ppb		
	299-W27-1	Copper	1/11/90	10	3	U	ppb		
299-W27-1	Copper, filtered	3/09/87	10		Y	U	ppb	20	SW-846 6010
299-W27-1	Copper, filtered	4/17/87	10		Y	U	ppb	20	SW-846 6010
299-W27-1	Copper, filtered	7/24/87	10		Y	U	ppb	20	SW-846 6010
299-W27-1	Copper, filtered	10/15/87	10		Y	U	ppb	20	SW-846 6010
299-W27-1	Copper, filtered	1/15/88	10		Y	U	ppb	20	SW-846 6010
299-W27-1	Copper, filtered	8/18/88	10		Y	U	ppb	20	SW-846 6010
299-W27-1	Copper, filtered	12/12/88	10		Y	U	ppb	20	SW-846 6010
299-W27-1	Copper, filtered	1/11/90	10	3	Y	U	ppb	20	SW-846 6010
299-W27-1	Copper, filtered	4/12/90	10	3	Y	U	ppb	20	SW-846 6010
299-W27-1	Copper, filtered	4/12/90	10	3	Y	U	ppb	20	SW-846 6010
299-W27-1	Copper, filtered	2/03/92	20		Y	U	ppb	20	SW-846 6010
299-W27-1	Copper, filtered	3/23/92	20		Y	U	ppb	20	SW-846 6010
299-W27-1	Copper, filtered	7/01/92	20		Y	U	ppb	20	SW-846 6010
299-W27-1	Copper, filtered	10/27/92	20		Y	U	ppb	20	SW-846 6010
299-W27-1	Copper, filtered	12/29/92	20		Y	U	ppb	20	SW-846 6010
299-W27-1	Copper, filtered	4/12/93	20		Y	U	ppb	20	SW-846 6010

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Well	Constituent Name	Collect Date	Result	Error	Filtered	Qualifier	Units	CROL	Method Name
299-W27-1	Cresols (methylphenols)	1/15/88	10			U	ppb		
299-W27-1	Cresols (methylphenols)	1/11/90	10	4		U	ppb		
299-W27-1	Crotonaldehyde	7/24/87	10			U	ppb		SW-846 8240
299-W27-1	Crotonaldehyde	10/15/87	10			U	ppb		SW-846 8240
299-W27-1	Crotonaldehyde	1/15/88	10			U	ppb		SW-846 8240
299-W27-1	Crotonaldehyde	8/18/88	10			U	ppb		SW-846 8240
299-W27-1	Crotonaldehyde	1/11/90	10	4		U	ppb		SW-846 8240
299-W27-1	Cyanide	7/24/87	10			U	ppb	20	SW-846 9010
299-W27-1	Cyanide	10/15/87	10			U	ppb	20	SW-846 9010
299-W27-1	Cyanide	1/15/88	10			U	ppb	20	SW-846 9010
299-W27-1	Cyanide	8/18/88	10			U	ppb	20	SW-846 9010
299-W27-1	Cyanide	12/12/88	10			U	ppb	20	SW-846 9010
299-W27-1	Cyanide	1/11/90	10	3		U	ppb	20	SW-846 9010
299-W27-1	Delta-BHC	1/11/90	0	0		U	ppb	0	SW-846 8080
299-W27-1	Di-n-butylphthalate	1/15/88	10			U	ppb		
299-W27-1	Di-n-butylphthalate	1/11/90	10	4		U	ppb		
299-W27-1	Di-n-octylphthalate	1/15/88	10			U	ppb		
299-W27-1	Di-n-octylphthalate	1/11/90	10	4		U	ppb		
299-W27-1	Diallate	1/11/90	10	4		U	ppb	10	SW-846 8270
299-W27-1	Dibenz(a,j)acridine	1/15/88	10			U	ppb		
299-W27-1	Dibenz(a,j)acridine	1/11/90	10	4		U	ppb		
299-W27-1	Dibenz[a,h]acridine	1/15/88	10			U	ppb		
299-W27-1	Dibenz[a,h]acridine	1/11/90	10	4		U	ppb		
299-W27-1	Dibenz[a,h]anthracene	1/15/88	10			U	ppb		

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Well	Constituent Name	Collect Date	Result	Error	Filtered	Qualifier	Units	CRQL	Method Name
299-W27-1	Dibenz[a,h]anthracene	1/11/90	10	4		U	ppb		
299-W27-1	Dibenzo(a,e)pyrene	1/15/88	10			U	ppb		
299-W27-1	Dibenzo(a,e)pyrene	1/11/90	10	4		U	ppb		
299-W27-1	Dibenzo[a,h]pyrene	1/15/88	10			U	ppb		
299-W27-1	Dibenzo[a,h]pyrene	1/11/90	10	4		U	ppb		
299-W27-1	Dibenzo[a,i]pyrene	1/15/88	10			U	ppb		
299-W27-1	Dibenzo[a,i]pyrene	1/11/90	10	4		U	ppb		
299-W27-1	Dibenzofuran	1/11/90	10	4		U	ppb		
299-W27-1	Dibromochloromethane	1/11/90	5	2		U	ppb	5	SW-846 8240
299-W27-1	Dibromomethane	7/24/87	10			U	ppb	5	SW-846 8240
299-W27-1	Dibromomethane	10/15/87	10			U	ppb	5	SW-846 8240
299-W27-1	Dibromomethane	1/15/88	10			U	ppb	5	SW-846 8240
299-W27-1	Dibromomethane	8/18/88	10			U	ppb	5	SW-846 8240
299-W27-1	Dibromomethane	1/11/90	10	4		U	ppb	5	SW-846 8240
299-W27-1	Diethyl Phosphate	1/11/90	10000	3500		U	ppb		
299-W27-1	Dichlorodifluoromethane	7/24/87	10			U	ppb	5	SW-846 8240
299-W27-1	Dichlorodifluoromethane	10/15/87	10			U	ppb	5	SW-846 8240
299-W27-1	Dichlorodifluoromethane	1/15/88	10			U	ppb	5	SW-846 8240
299-W27-1	Dichlorodifluoromethane	8/18/88	10			U	ppb	5	SW-846 8240
299-W27-1	Dichlorodifluoromethane	1/11/90	10	4		U	ppb	5	SW-846 8240
299-W27-1	Dieldrin	1/11/90	0	0		U	ppb	0	SW-846 8080
299-W27-1	Diethyl phthalate	1/15/88	10			U	ppb		

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Well	Constituent Name	Collect Date	Result	Error	Filtered	Qualifier	Units	CRQL	Method Name
299-W27-1	Diethyl phthalate	1/11/90	10	4		U	ppb		
299-W27-1	Diethylarsine	7/24/87	10			U	ppb		
299-W27-1	Diethylarsine	10/15/87	10			U	ppb		
299-W27-1	Diethylarsine	1/15/88	10			U	ppb		
299-W27-1	Diethylarsine	8/18/88	10			U	ppb		
299-W27-1	Diethylstilbesterol	1/11/90	200	40		U	ppb		
299-W27-1	Dihydrosafrole	1/15/88	10			U	ppb		
299-W27-1	Dihydrosafrole	1/11/90	10	4		U	ppb		
299-W27-1	Dimethoate	1/11/90	2	1		U	ppb		SW-846 8140
299-W27-1	Dimethyl phthalate	1/15/88	10			U	ppb		
299-W27-1	Dimethyl phthalate	1/11/90	10	4		U	ppb		
299-W27-1	Dinoseb	1/11/90	10	4		U	ppb		
299-W27-1	Diphenylamine	1/15/88	10			U	ppb		
299-W27-1	Diphenylamine	1/11/90	10	4		U	ppb		
299-W27-1	Disulfoton	1/11/90	2	1		U	ppb	2	SW-846 8140
299-W27-1	Endosulfan I	1/11/90	0	0		U	ppb	0	SW-846 8080
299-W27-1	Endosulfan II	1/11/90	0	0		U	ppb	0	SW-846 8080
299-W27-1	Endosulfan sulfate	1/11/90	1	0		U	ppb	1	SW-846 8080
299-W27-1	Endrin	1/11/90	0	0		U	ppb	0	SW-846 8080
299-W27-1	Ethanol	1/11/90	10000	3500		U	ppb		

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Well	Constituent Name	Collect Date	Result	Error	Filtered	Qualifier	Units	CRQL	Method Name
299-W27-1	Ethyl carbamate (Urethane)	1/11/90	10000	3500		U	ppb		
299-W27-1	Ethyl cyanide	1/11/90	10000	3500		U	ppb		
299-W27-1	Ethyl methacrylate	7/24/87	10			U	ppb		
299-W27-1	Ethyl methacrylate	10/15/87	10			U	ppb		
299-W27-1	Ethyl methacrylate	1/15/88	10			U	ppb		
299-W27-1	Ethyl methacrylate	8/18/88	10			U	ppb		
299-W27-1	Ethyl methacrylate	1/11/90	10	4		U	ppb		
299-W27-1	Ethyl methanesulfonate	1/15/88	10			U	ppb		
299-W27-1	Ethyl methanesulfonate	1/11/90	10	4		U	ppb		
299-W27-1	Ethylbenzene	1/11/90	5	2		U	ppb	5	SW-846 8240
299-W27-1	Ethylene Glycol	1/11/90	10000	3500		U	ppb		
299-W27-1	Ethylene oxide	10/15/87	3000			U	ppb		SW-846 8240
299-W27-1	Ethylene oxide	1/15/88	3000			U	ppb		SW-846 8240
299-W27-1	Ethylene oxide	8/18/88	3000			U	ppb		SW-846 8240
299-W27-1	Ethylene oxide	1/11/90	10	4		U	ppb		SW-846 8240
299-W27-1	Ethyleneimine	1/15/88	10			U	ppb		
299-W27-1	Ethyleneimine	1/11/90	10	4		U	ppb		
299-W27-1	Ethylenethiourea	1/11/90	200	40		U	ppb		
299-W27-1	Fluoranthene	1/15/88	10			U	ppb		
299-W27-1	Fluoranthene	1/11/90	10	4		U	ppb		
299-W27-1	Fluorene	1/11/90	10	4		U	ppb		

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Well	Constituent Name	Collect Date	Result	Error	Filtered	Qualifier	Units	CRQL	Method Name
299-W27-1	Fluoride	2/03/92	300	63			ppb	100	ASTM D-4327-88
299-W27-1	Fluoride	3/23/92	300	63			ppb	100	ASTM D-4327-88
299-W27-1	Fluoride	7/01/92	300	63			ppb	100	ASTM D-4327-88
299-W27-1	Fluoride	10/27/92	300	63			ppb	100	ASTM D-4327-88
299-W27-1	Fluoride	12/29/92	400	84			ppb	100	ASTM D-4327-88
299-W27-1	Fluoride	4/12/93	400	26			ppb	100	ASTM D-4327-88
299-W27-1	Fluorine	3/09/87	500			U	ppb		EPA 300.0
299-W27-1	Fluorine	4/17/87	500			U	ppb		EPA 300.0
299-W27-1	Fluorine	7/24/87	208				ppb		
299-W27-1	Fluorine	7/24/87	500			U	ppb		EPA 300.0
299-W27-1	Fluorine	10/15/87	225				ppb		
299-W27-1	Fluorine	10/15/87	506				ppb		EPA 300.0
299-W27-1	Fluorine	1/15/88	500			U	ppb		EPA 300.0
299-W27-1	Fluorine	8/18/88	267				ppb		
299-W27-1	Fluorine	8/18/88	500			U	ppb		EPA 300.0
299-W27-1	Fluorine	12/12/88	500			U	ppb		EPA 300.0
299-W27-1	Fluorine	1/11/90	500	56		U	ppb		EPA 300.0
299-W27-1	Fluorine	4/12/90	500	56		U	ppb		EPA 300.0
299-W27-1	Fluorine	4/12/90	500	56		U	ppb		EPA 300.0
299-W27-1	Formaldehyde	7/24/87	500			U	ppb		SW-846 8240
299-W27-1	Formaldehyde	10/15/87	500			U	ppb		SW-846 8240
299-W27-1	Formaldehyde	1/15/88	500			U	ppb		SW-846 8240
299-W27-1	Formaldehyde	8/18/88	500			U	ppb		SW-846 8240
299-W27-1	Formaldehyde	1/11/90	500	175		U	ppb		SW-846 8240
299-W27-1	Gross alpha	10/09/84	4				pCi/L		
299-W27-1	Gross alpha	11/05/84	6				pCi/L		
299-W27-1	Gross alpha	12/06/84	16				pCi/L		
299-W27-1	Gross alpha	1/08/85	8				pCi/L		
299-W27-1	Gross alpha	2/07/85	8				pCi/L		

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Well	Constituent Name	Collect Date	Result	Error	Filtered	Qualifier	Units	CRQL	Method Name
299-W27-1	Gross alpha	3/11/85	5				pCi/L		
299-W27-1	Gross alpha	4/04/85	8				pCi/L		
299-W27-1	Gross alpha	5/09/85	9				pCi/L		
299-W27-1	Gross alpha	6/04/85	8				pCi/L		
299-W27-1	Gross alpha	7/11/85	5	1			pCi/L		
299-W27-1	Gross alpha	8/12/85	6	1			pCi/L		
299-W27-1	Gross alpha	9/04/85	6	1			pCi/L		
299-W27-1	Gross alpha	10/08/85	8	2			pCi/L		
299-W27-1	Gross alpha	11/07/85	9	2			pCi/L		
299-W27-1	Gross alpha	12/14/85	7	2			pCi/L		
299-W27-1	Gross alpha	1/07/86	8	2			pCi/L		
299-W27-1	Gross alpha	2/07/86	8	2			pCi/L		
299-W27-1	Gross alpha	3/10/86	9	2			pCi/L		
299-W27-1	Gross alpha	4/07/86	7	2			pCi/L		
299-W27-1	Gross alpha	5/07/86	8	2			pCi/L		
299-W27-1	Gross alpha	6/05/86	9	2			pCi/L		
299-W27-1	Gross alpha	7/02/86	7	2			pCi/L		
299-W27-1	Gross alpha	8/05/86	7	2			pCi/L		
299-W27-1	Gross alpha	9/17/86	6	1			pCi/L		
299-W27-1	Gross alpha	11/06/86	14	3			pCi/L		
299-W27-1	Gross alpha	11/25/86	13	3			pCi/L		
299-W27-1	Gross alpha	12/10/86	6	1			pCi/L		
299-W27-1	Gross alpha	1/20/87	7	2			pCi/L		
299-W27-1	Gross alpha	2/11/87	10	2			pCi/L		
299-W27-1	Gross alpha	3/07/87	7	2			pCi/L		
299-W27-1	Gross alpha	3/09/87	6	2			pCi/L		
299-W27-1	Gross alpha	4/17/87	4	2			pCi/L		
299-W27-1	Gross alpha	4/17/87	6	1			pCi/L		
299-W27-1	Gross alpha	5/15/87	7	2			pCi/L		
299-W27-1	Gross alpha	6/09/87	6	2			pCi/L		
299-W27-1	Gross alpha	7/23/87	6	2			pCi/L		
299-W27-1	Gross alpha	7/24/87	5	2			pCi/L		

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Well	Constituent Name	Collect Date	Result	Error	Filtered	Qualifier	Units	CRQL	Method Name
299-W27-1	Gross alpha	8/18/87	7	2			pCi/L		
299-W27-1	Gross alpha	9/16/87	5	1			pCi/L		
299-W27-1	Gross alpha	10/12/87	9	2			pCi/L		
299-W27-1	Gross alpha	10/15/87	4	2			pCi/L		
299-W27-1	Gross alpha	11/17/87	8	2			pCi/L		
299-W27-1	Gross alpha	12/08/87	9	2			pCi/L		
299-W27-1	Gross alpha	1/15/88	11	2			pCi/L		
299-W27-1	Gross alpha	5/16/88	13	3			pCi/L		
299-W27-1	Gross alpha	8/18/88	5	1			pCi/L		
299-W27-1	Gross alpha	12/15/88	9	2			pCi/L		
299-W27-1	Gross alpha	2/01/89	6	3			pCi/L		
299-W27-1	Gross alpha	1/11/90	4	2			pCi/L		
299-W27-1	Gross alpha	4/12/90	7	3			pCi/L		
299-W27-1	Gross alpha	4/12/90	6	3			pCi/L		
299-W27-1	Gross alpha	2/03/92	6	3			pCi/L	4	SW-846 9310. Alpha
299-W27-1	Gross alpha	3/23/92	4	2			pCi/L	4	SW-846 9310. Alpha
299-W27-1	Gross alpha	7/01/92	2	1		U	pCi/L	4	SW-846 9310. Alpha
299-W27-1	Gross alpha	10/27/92	4	2			pCi/L	4	SW-846 9310. Alpha
299-W27-1	Gross alpha	12/29/92	10	3			pCi/L	4	SW-846 9310. Alpha
299-W27-1	Gross alpha	4/12/93	5	2			pCi/L	4	SW-846 9310. Alpha
299-W27-1	Gross alpha	7/20/93	4	2			pCi/L	4	SW-846 9310. Alpha
299-W27-1	Gross beta	10/09/84	38				pCi/L		
299-W27-1	Gross beta	11/05/84	23				pCi/L		
299-W27-1	Gross beta	12/06/84	28				pCi/L		
299-W27-1	Gross beta	1/08/85	26				pCi/L		
299-W27-1	Gross beta	2/07/85	34				pCi/L		
299-W27-1	Gross beta	3/11/85	18				pCi/L		
299-W27-1	Gross beta	4/04/85	26				pCi/L		
299-W27-1	Gross beta	5/09/85	24				pCi/L		
299-W27-1	Gross beta	6/04/85	19				pCi/L		
299-W27-1	Gross beta	7/11/85	22	4			pCi/L		

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Well	Constituent Name	Collect Date	Result	Error	Filtered	Qualifier	Units	CRQL	Method Name
299-W27-1	Gross beta	8/12/85	16	3			pCi/L		
299-W27-1	Gross beta	9/04/85	25	4			pCi/L		
299-W27-1	Gross beta	10/08/85	15	3			pCi/L		
299-W27-1	Gross beta	11/07/85	23	4			pCi/L		
299-W27-1	Gross beta	12/14/85	19	4			pCi/L		
299-W27-1	Gross beta	1/07/86	14	3			pCi/L		
299-W27-1	Gross beta	2/07/86	17	3			pCi/L		
299-W27-1	Gross beta	3/10/86	17	3			pCi/L		
299-W27-1	Gross beta	4/07/86	9	3			pCi/L		
299-W27-1	Gross beta	5/07/86	9	3			pCi/L		
299-W27-1	Gross beta	6/05/86	7	2			pCi/L		
299-W27-1	Gross beta	7/02/86	9	3			pCi/L		
299-W27-1	Gross beta	8/05/86	8	2			pCi/L		
299-W27-1	Gross beta	9/17/86	9	3			pCi/L		
299-W27-1	Gross beta	11/06/86	10	3			pCi/L		
299-W27-1	Gross beta	11/25/86	11	3			pCi/L		
299-W27-1	Gross beta	12/10/86	10	3			pCi/L		
299-W27-1	Gross beta	1/20/87	10	3			pCi/L		
299-W27-1	Gross beta	2/11/87	7	2			pCi/L		
299-W27-1	Gross beta	3/07/87	7	2			pCi/L		
299-W27-1	Gross beta	3/09/87	12	4			pCi/L		
299-W27-1	Gross beta	4/17/87	11	4			pCi/L		
299-W27-1	Gross beta	4/17/87	7	2			pCi/L		
299-W27-1	Gross beta	5/15/87	6	2			pCi/L		
299-W27-1	Gross beta	6/09/87	8	2			pCi/L		
299-W27-1	Gross beta	7/23/87	9	2			pCi/L		
299-W27-1	Gross beta	7/24/87	35	9			pCi/L		
299-W27-1	Gross beta	8/18/87	6	2			pCi/L		
299-W27-1	Gross beta	9/16/87	8	2			pCi/L		
299-W27-1	Gross beta	10/12/87	6	2			pCi/L		
299-W27-1	Gross beta	10/15/87	8	5			pCi/L		
299-W27-1	Gross beta	11/17/87	8	2			pCi/L		

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Well	Constituent Name	Collect Date	Result	Error	Filtered	Qualifier	Units	CRQL	Method Name
299-W27-1	Gross beta	12/08/87	9	2			pCi/L		
299-W27-1	Gross beta	1/15/88	9	3			pCi/L		
299-W27-1	Gross beta	5/16/88	8	2			pCi/L		
299-W27-1	Gross beta	8/18/88	10	3			pCi/L		
299-W27-1	Gross beta	12/15/88	9	3			pCi/L		
299-W27-1	Gross beta	2/01/89	5	3			pCi/L		
299-W27-1	Gross beta	1/11/90	6	3			pCi/L		
299-W27-1	Gross beta	4/12/90	6	3			pCi/L		
299-W27-1	Gross beta	4/12/90	7	3			pCi/L		
299-W27-1	Gross beta	2/03/92	9	3			pCi/L	8	SW-846 9310, Beta
299-W27-1	Gross beta	3/23/92	2	2	U		pCi/L	8	SW-846 9310, Beta
299-W27-1	Gross beta	7/01/92	9	3			pCi/L	8	SW-846 9310, Beta
299-W27-1	Gross beta	10/27/92	5	2	U		pCi/L	8	SW-846 9310, Beta
299-W27-1	Gross beta	12/29/92	11	3			pCi/L	8	SW-846 9310, Beta
299-W27-1	Gross beta	4/12/93	8	3	U		pCi/L	8	SW-846 9310, Beta
299-W27-1	Gross beta	7/20/93	9	3			pCi/L	8	SW-846 9310, Beta
299-W27-1	Heptachlor	1/11/90	0	0	U		ppb	0	SW-846 8080
299-W27-1	Heptachlor epoxide	1/11/90	0	0	U		ppb	1	SW-846 8080
299-W27-1	Hexachlorobenzene	7/24/87	10		U		ppb		
299-W27-1	Hexachlorobenzene	10/15/87	10		U		ppb		
299-W27-1	Hexachlorobenzene	1/15/88	10		U		ppb		
299-W27-1	Hexachlorobenzene	1/11/90	10	4	U		ppb		
299-W27-1	Hexachlorobutadiene	1/15/88	10		U		ppb		
299-W27-1	Hexachlorobutadiene	1/11/90	10	4	U		ppb		
299-W27-1	Hexachlorocyclopentadiene	1/15/88	10		U		ppb		
299-W27-1	Hexachlorocyclopentadiene	1/11/90	10	4	U		ppb		

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Well	Constituent Name	Collect Date	Result	Error	Filtered	Qualifier	Units	CRQL	Method Name
299-W27-1	Hexachloroethane	1/15/88	10			U	ppb		
299-W27-1	Hexachloroethane	1/11/90	10	4		U	ppb		
299-W27-1	Hexachlorophene	7/24/87	10			U	ppb		
299-W27-1	Hexachlorophene	10/15/87	10			U	ppb		
299-W27-1	Hexachlorophene	1/15/88	10			U	ppb		
299-W27-1	Hexachlorophene	1/11/90	10	4		U	ppb		
299-W27-1	Hexachloropropene	1/15/88	10			U	ppb		
299-W27-1	Hexachloropropene	1/11/90	10	4		U	ppb		
299-W27-1	Hydrazine	1/11/90	30	5		U	ppb	30	ASTM D-1385
299-W27-1	Hydrogen sulfide	7/24/87	10			U	ppb		
299-W27-1	Hydrogen sulfide	10/15/87	10			U	ppb		
299-W27-1	Hydrogen sulfide	1/15/88	10			U	ppb		
299-W27-1	Hydrogen sulfide	8/18/88	10			U	ppb		
299-W27-1	Indeno(1.2.3-cd)pyrene	1/15/88	10			U	ppb		
299-W27-1	Indeno(1.2.3-cd)pyrene	1/11/90	10	4		U	ppb		
299-W27-1	Iodine-129	4/12/90	0	0			pCi/L		
299-W27-1	Iodine-129	4/12/90	-0	0		U	pCi/L		
299-W27-1	Iron	1/15/88	106				ppb		
299-W27-1	Iron	1/11/90	177	21			ppb		
299-W27-1	Iron, filtered	3/09/87	59		Y		ppb	20	SW-846 6010
299-W27-1	Iron, filtered	4/17/87	50		Y	U	ppb	20	SW-846 6010
299-W27-1	Iron, filtered	7/24/87	50		Y	U	ppb	20	SW-846 6010
299-W27-1	Iron, filtered	10/15/87	30		Y	U	ppb	20	SW-846 6010
299-W27-1	Iron, filtered	1/15/88	30		Y	U	ppb	20	SW-846 6010
299-W27-1	Iron, filtered	8/18/88	30		Y	U	ppb	20	SW-846 6010

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Well	Constituent Name	Collect Date	Result	Error	Filtered	Qualifier	Units	CRQL	Method Name
299-W27-1	Iron, filtered	12/12/88	30		Y	U	ppb	20	SW-846 6010
299-W27-1	Iron, filtered	1/11/90	30	10	Y	U	ppb	20	SW-846 6010
299-W27-1	Iron, filtered	4/12/90	30	10	Y	U	ppb	20	SW-846 6010
299-W27-1	Iron, filtered	4/12/90	248	28	Y		ppb	20	SW-846 6010
299-W27-1	Iron, filtered	2/03/92	130	112	Y		ppb	20	SW-846 6010
299-W27-1	Iron, filtered	3/23/92	24	21	Y		ppb	20	SW-846 6010
299-W27-1	Iron, filtered	7/01/92	20		Y	U	ppb	20	SW-846 6010
299-W27-1	Iron, filtered	10/27/92	20	17	Y		ppb	20	SW-846 6010
299-W27-1	Iron, filtered	12/29/92	20	17	Y		ppb	20	SW-846 6010
299-W27-1	Iron, filtered	4/12/93	20		Y	U	ppb	20	SW-846 6010
299-W27-1	Isobutyl alcohol	1/11/90	10000	3500		U	ppb		
299-W27-1	Isodrin	1/11/90	10	4		U	ppb	10	SW-846 8270
299-W27-1	Isophorone	1/11/90	10	4		U	ppb		
299-W27-1	Isosafrole	1/15/88	10			U	ppb		
299-W27-1	Isosafrole	1/11/90	10	4		U	ppb		
299-W27-1	Kepone	1/11/90	1	0		U	ppb		SW-846 8080
299-W27-1	Kerosene	7/24/87	10000			U	ppb		
299-W27-1	Kerosene	10/15/87	10000			U	ppb		
299-W27-1	Kerosene	1/15/88	10000			U	ppb		
299-W27-1	Kerosene	1/11/90	10000	3500		U	ppb		
299-W27-1	Lead	1/15/88	5			U	ppb		
299-W27-1	Lead	1/11/90	5	3		U	ppb		
299-W27-1	Lead, filtered	3/09/87	5		Y	U	ppb	5	SW-846 7421
299-W27-1	Lead, filtered	4/17/87	5		Y	U	ppb	5	SW-846 7421
299-W27-1	Lead, filtered	7/24/87	5		Y	U	ppb	5	SW-846 7421

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Well	Constituent Name	Collect Date	Result	Error	Filtered	Qualifier	Units	CRQL	Method Name
299-W27-1	Lead, filtered	10/15/87	5		Y	U	ppb	5	SW-846 7421
299-W27-1	Lead, filtered	1/15/88	5		Y	U	ppb	5	SW-846 7421
299-W27-1	Lead, filtered	12/12/88	5		Y	U	ppb	5	SW-846 7421
299-W27-1	Lead, filtered	1/11/90	5	3	Y	U	ppb	5	SW-846 7421
299-W27-1	Lithium	1/11/90	10	2		U	ppb		
299-W27-1	Lithium	1/11/90	10	2	Y	U	ppb		SW-846 6010
299-W27-1	Lithium	4/12/90	10	2	Y	U	ppb		SW-846 6010
299-W27-1	Lithium	4/12/90	10	2	Y	U	ppb		SW-846 6010
299-W27-1	Magnesium	1/15/88	13400				ppb		
299-W27-1	Magnesium	1/11/90	13100	2130			ppb		
299-W27-1	Magnesium, filtered	3/09/87	15000		Y		ppb	100	SW-846 6010
299-W27-1	Magnesium, filtered	4/17/87	14400		Y		ppb	100	SW-846 6010
299-W27-1	Magnesium, filtered	7/24/87	13700		Y		ppb	100	SW-846 6010
299-W27-1	Magnesium, filtered	10/15/87	13700		Y		ppb	100	SW-846 6010
299-W27-1	Magnesium, filtered	1/15/88	13200		Y		ppb	100	SW-846 6010
299-W27-1	Magnesium, filtered	8/18/88	12400		Y		ppb	100	SW-846 6010
299-W27-1	Magnesium, filtered	12/12/88	12800		Y		ppb	100	SW-846 6010
299-W27-1	Magnesium, filtered	1/11/90	13400	2180	Y		ppb	100	SW-846 6010
299-W27-1	Magnesium, filtered	4/12/90	10100	1650	Y		ppb	100	SW-846 6010
299-W27-1	Magnesium, filtered	4/12/90	9390	1530	Y		ppb	100	SW-846 6010
299-W27-1	Magnesium, filtered	2/03/92	8100		Y		ppb	100	SW-846 6010
299-W27-1	Magnesium, filtered	3/23/92	7500		Y		ppb	100	SW-846 6010
299-W27-1	Magnesium, filtered	7/01/92	8000		Y		ppb	100	SW-846 6010
299-W27-1	Magnesium, filtered	10/27/92	8300		Y		ppb	100	SW-846 6010
299-W27-1	Magnesium, filtered	12/29/92	8300		Y		ppb	100	SW-846 6010
299-W27-1	Magnesium, filtered	4/12/93	7500	3940	Y		ppb	100	SW-846 6010
299-W27-1	Maleic hydrazide	1/15/88	500			U	ppb		
299-W27-1	Maleic hydrazide	1/11/90	500	175		U	ppb		

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Well	Constituent Name	Collect Date	Result	Error	Filtered	Qualifier	Units	CRQL	Method Name
299-W27-1	Malononitrile	1/15/88	10			U	ppb		
299-W27-1	Malononitrile	1/11/90	10	4		U	ppb		
299-W27-1	Manganese	1/15/88	5			U	ppb		
299-W27-1	Manganese	1/11/90	5	2		U	ppb		
299-W27-1	Manganese, filtered	3/09/87	5		Y	U	ppb	10	SW-846 6010
299-W27-1	Manganese, filtered	4/17/87	5		Y	U	ppb	10	SW-846 6010
299-W27-1	Manganese, filtered	7/24/87	5		Y	U	ppb	10	SW-846 6010
299-W27-1	Manganese, filtered	10/15/87	5		Y	U	ppb	10	SW-846 6010
299-W27-1	Manganese, filtered	1/15/88	5		Y	U	ppb	10	SW-846 6010
299-W27-1	Manganese, filtered	8/18/88	5		Y	U	ppb	10	SW-846 6010
299-W27-1	Manganese, filtered	12/12/88	5		Y	U	ppb	10	SW-846 6010
299-W27-1	Manganese, filtered	1/11/90	5	2	Y	U	ppb	10	SW-846 6010
299-W27-1	Manganese, filtered	4/12/90	5	2	Y	U	ppb	10	SW-846 6010
299-W27-1	Manganese, filtered	4/12/90	6	2	Y		ppb	10	SW-846 6010
299-W27-1	Manganese, filtered	2/03/92	10		Y	U	ppb	10	SW-846 6010
299-W27-1	Manganese, filtered	3/23/92	10		Y	U	ppb	10	SW-846 6010
299-W27-1	Manganese, filtered	7/01/92	10		Y	U	ppb	10	SW-846 6010
299-W27-1	Manganese, filtered	10/27/92	10		Y	U	ppb	10	SW-846 6010
299-W27-1	Manganese, filtered	12/29/92	10		Y	U	ppb	10	SW-846 6010
299-W27-1	Manganese, filtered	4/12/93	10		Y	U	ppb	10	SW-846 6010
299-W27-1	Manganese-54	1/11/90	3	5		U	pCi/L		
299-W27-1	Melphalan	1/15/88	10			U	ppb		
299-W27-1	Melphalan	1/11/90	10	4		U	ppb		
299-W27-1	Mercury, filtered	3/09/87	0		Y	U	ppb	0	SW-846 7470
299-W27-1	Mercury, filtered	4/17/87	0		Y	U	ppb	0	SW-846 7470
299-W27-1	Mercury, filtered	7/24/87	0		Y	U	ppb	0	SW-846 7470
299-W27-1	Mercury, filtered	10/15/87	0		Y	U	ppb	0	SW-846 7470
299-W27-1	Mercury, filtered	1/15/88	0		Y	U	ppb	0	SW-846 7470

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Well	Constituent Name	Collect Date	Result	Error	Filtered	Qualifier	Units	CRQL	Method Name
299-W27-1	Mercury, filtered	1/11/90	0	0	Y	U	ppb	0	SW-846 7470
299-W27-1	Methacrylonitrile	7/24/87	10			U	ppb	5	SW-846 8240
299-W27-1	Methacrylonitrile	10/15/87	10			U	ppb	5	SW-846 8240
299-W27-1	Methacrylonitrile	1/15/88	10			U	ppb	5	SW-846 8240
299-W27-1	Methacrylonitrile	8/18/88	10			U	ppb	5	SW-846 8240
299-W27-1	Methacrylonitrile	1/11/90	10	4		U	ppb	5	SW-846 8240
299-W27-1	Methanethiol	7/24/87	10			U	ppb		SW-846 8240
299-W27-1	Methanethiol	10/15/87	10			U	ppb		SW-846 8240
299-W27-1	Methanethiol	1/15/88	10			U	ppb		SW-846 8240
299-W27-1	Methanethiol	8/18/88	10			U	ppb		SW-846 8240
299-W27-1	Methanethiol	1/11/90	10	4		U	ppb		SW-846 8240
299-W27-1	Methapyrilene	1/15/88	10			U	ppb	10	SW-846 8270
299-W27-1	Methapyrilene	1/11/90	10	4		U	ppb	10	SW-846 8270
299-W27-1	Metholonyl	1/15/88	10			U	ppb		
299-W27-1	Metholonyl	1/11/90	10	4		U	ppb		
299-W27-1	Methoxychlor	1/11/90	3	1		U	ppb	2	SW-846 8080
299-W27-1	Methyl Iodide	7/24/87	10			U	ppb	5	SW-846 8240
299-W27-1	Methyl Iodide	10/15/87	10			U	ppb	5	SW-846 8240
299-W27-1	Methyl Iodide	1/15/88	10			U	ppb	5	SW-846 8240
299-W27-1	Methyl Iodide	8/18/88	10			U	ppb	5	SW-846 8240
299-W27-1	Methyl Iodide	1/11/90	10	4		U	ppb	5	SW-846 8240
299-W27-1	Methyl bromide	7/24/87	10			U	ppb	10	SW-846 8240
299-W27-1	Methyl bromide	10/15/87	10			U	ppb	10	SW-846 8240
299-W27-1	Methyl bromide	1/15/88	10			U	ppb	10	SW-846 8240
299-W27-1	Methyl bromide	8/18/88	10			U	ppb	10	SW-846 8240

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Well	Constituent Name	Collect Date	Result	Error	Filtered	Qualifier	Units	CRQL	Method Name
299-W27-1	Methyl bromide	1/11/90	10	4		U	ppb	10	SW-846 8240
299-W27-1	Methyl chloride	7/24/87	10			U	ppb	10	SW-846 8240
299-W27-1	Methyl chloride	10/15/87	10			U	ppb	10	SW-846 8240
299-W27-1	Methyl chloride	1/15/88	10			U	ppb	10	SW-846 8240
299-W27-1	Methyl chloride	8/18/88	10			U	ppb	10	SW-846 8240
299-W27-1	Methyl chloride	1/11/90	10	4		U	ppb	10	SW-846 8240
299-W27-1	Methyl ethyl ketone	3/09/87	10			U	ppb	100	SW-846 8240
299-W27-1	Methyl ethyl ketone	4/17/87	10			U	ppb	100	SW-846 8240
299-W27-1	Methyl ethyl ketone	7/24/87	10			U	ppb	100	SW-846 8240
299-W27-1	Methyl ethyl ketone	10/15/87	10			U	ppb	100	SW-846 8240
299-W27-1	Methyl ethyl ketone	1/15/88	10			U	ppb	100	SW-846 8240
299-W27-1	Methyl ethyl ketone	8/18/88	10			U	ppb	100	SW-846 8240
299-W27-1	Methyl ethyl ketone	12/12/88	10			U	ppb	100	SW-846 8240
299-W27-1	Methyl ethyl ketone	1/11/90	10	4		U	ppb	100	SW-846 8240
299-W27-1	Methyl ethyl ketone	4/12/90	10	4		U	ppb	100	SW-846 8240
299-W27-1	Methyl ethyl ketone	2/03/92	100			U	ppb	100	SW-846 8240
299-W27-1	Methyl ethyl ketone	3/23/92	100			U	ppb	100	SW-846 8240
299-W27-1	Methyl ethyl ketone	7/01/92	100			U	ppb	100	SW-846 8240
299-W27-1	Methyl ethyl ketone	10/27/92	100			U	ppb	100	SW-846 8240
299-W27-1	Methyl ethyl ketone	12/29/92	100			U	ppb	100	SW-846 8240
299-W27-1	Methyl ethyl ketone	4/12/93	100			U	ppb	100	SW-846 8240
299-W27-1	Methyl methacrylate	7/24/87	10			U	ppb		
299-W27-1	Methyl methacrylate	10/15/87	10			U	ppb		
299-W27-1	Methyl methacrylate	1/15/88	10			U	ppb		
299-W27-1	Methyl methacrylate	8/18/88	10			U	ppb		
299-W27-1	Methyl methacrylate	1/11/90	10	4		U	ppb		
299-W27-1	Methyl methanesulfonate	1/15/88	10			U	ppb		
299-W27-1	Methyl methanesulfonate	1/11/90	10	4		U	ppb		

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Well	Constituent Name	Collect Date	Result	Error	Filtered	Qualifier	Units	CRQL	Method Name
299-W27-1	Methyl parathion	1/11/90	2	1		U	ppb	1	SW-846 8140
299-W27-1	Methylene chloride	3/09/87	10			U	ppb	5	SW-846 8240
299-W27-1	Methylene chloride	4/17/87	10			U	ppb	5	SW-846 8240
299-W27-1	Methylene chloride	7/24/87	10			U	ppb	5	SW-846 8240
299-W27-1	Methylene chloride	10/15/87	10			U	ppb	5	SW-846 8240
299-W27-1	Methylene chloride	1/15/88	10			U	ppb	5	SW-846 8240
299-W27-1	Methylene chloride	8/18/88	10			U	ppb	5	SW-846 8240
299-W27-1	Methylene chloride	12/12/88	10			U	ppb	5	SW-846 8240
299-W27-1	Methylene chloride	1/11/90	5	2		U	ppb	5	SW-846 8240
299-W27-1	Methylene chloride	4/12/90	5	2		U	ppb	5	SW-846 8240
299-W27-1	Methylene chloride	2/03/92	5			U	ppb	5	SW-846 8240
299-W27-1	Methylene chloride	3/23/92	5			U	ppb	5	SW-846 8240
299-W27-1	Methylene chloride	7/01/92	5			U	ppb	5	SW-846 8240
299-W27-1	Methylene chloride	10/27/92	1			UJ	ppb	5	SW-846 8240
299-W27-1	Methylene chloride	12/29/92	5			U	ppb	5	SW-846 8240
299-W27-1	Methylene chloride	4/12/93	2			BU	ppb	5	SW-846 8240
299-W27-1	Methylthiouracil	1/15/88	10			U	ppb		
299-W27-1	Methylthiouracil	1/11/90	10	4		U	ppb		
299-W27-1	Molybdenum	1/11/90	40	5		U	ppb		
299-W27-1	Molybdenum	1/11/90	40	5	Y	U	ppb		SW-846 6010
299-W27-1	Molybdenum	4/12/90	40	5	Y	U	ppb		SW-846 6010
299-W27-1	Molybdenum	4/12/90	40	5	Y	U	ppb		SW-846 6010
299-W27-1	Monobutyl Phosphate	1/11/90	10000	3500		U	ppb		
299-W27-1	N,N-Diethylhydrazine	7/24/87	10			U	ppb		SW-846 8240
299-W27-1	N,N-Diethylhydrazine	10/15/87	10			U	ppb		SW-846 8240
299-W27-1	N,N-Diethylhydrazine	1/15/88	10			U	ppb		SW-846 8240

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Well	Constituent Name	Collect Date	Result	Error	Filtered	Qualifier	Units	CRQL	Method Name
299-W27-1	N,N-Diethylhydrazine	8/18/88	10			U	ppb		SW-846 8240
299-W27-1	N,N-Diethylhydrazine	1/11/90	10	4		U	ppb		SW-846 8240
299-W27-1	N-Nitroso-N-methylurethane	1/15/88	10			U	ppb		
299-W27-1	N-Nitroso-N-methylurethane	1/11/90	10	4		U	ppb		
299-W27-1	N-Nitroso-di-n-dipropylamine	1/15/88	10			U	ppb		
299-W27-1	N-Nitroso-di-n-dipropylamine	1/11/90	10	4		U	ppb		
299-W27-1	N-Nitrosodi-n-butylamine	1/15/88	10			U	ppb		
299-W27-1	N-Nitrosodi-n-butylamine	1/11/90	10	4		U	ppb		
299-W27-1	N-Nitrosodiethanolamine	1/15/88	10			U	ppb		
299-W27-1	N-Nitrosodiethanolamine	1/11/90	10	4		U	ppb		
299-W27-1	N-Nitrosodiethylamine	1/15/88	10			U	ppb		
299-W27-1	N-Nitrosodiethylamine	1/11/90	10	4		U	ppb		
299-W27-1	N-Nitrosodimethylamine	1/15/88	10			U	ppb		
299-W27-1	N-Nitrosodimethylamine	1/11/90	10	4		U	ppb		
299-W27-1	N-Nitrosodiphenylamine	1/11/90	10	4		U	ppb		
299-W27-1	N-Nitrosomethylethylamine	1/15/88	10			U	ppb		
299-W27-1	N-Nitrosomethylethylamine	1/11/90	10	4		U	ppb		
299-W27-1	N-Nitrosomethylvinylamine	1/15/88	10			U	ppb		
299-W27-1	N-Nitrosomethylvinylamine	1/11/90	10	4		U	ppb		
299-W27-1	N-Nitrosomorpholine	1/15/88	10			U	ppb		
299-W27-1	N-Nitrosomorpholine	1/11/90	10	4		U	ppb		
299-W27-1	N-Nitrosornicotine	1/15/88	10			U	ppb		
299-W27-1	N-Nitrosornicotine	1/11/90	10	4		U	ppb		

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Well	Constituent Name	Collect Date	Result	Error	Filtered	Qualifier	Units	CRQL	Method Name
299-W27-1	N-Nitrosopiperidine	1/15/88	10			U	ppb		
299-W27-1	N-Nitrosopiperidine	1/11/90	10	4		U	ppb		
299-W27-1	N-Phenylthiourea	1/11/90	500	150		U	ppb		
299-W27-1	N-Propylamine	1/11/90	10000	3500		U	ppb		
299-W27-1	Naphthalene	7/24/87	10			U	ppb		
299-W27-1	Naphthalene	10/15/87	10			U	ppb		
299-W27-1	Naphthalene	1/15/88	10			U	ppb		
299-W27-1	Naphthalene	1/11/90	10	4		U	ppb		
299-W27-1	Nickel	1/15/88	10			U	ppb		
299-W27-1	Nickel	1/11/90	10	3		U	ppb		
299-W27-1	Nickel, filtered	3/09/87	10	Y	Y	U	ppb	30	SW-846 6010
299-W27-1	Nickel, filtered	4/17/87	10	Y	Y	U	ppb	30	SW-846 6010
299-W27-1	Nickel, filtered	7/24/87	10	Y	Y	U	ppb	30	SW-846 6010
299-W27-1	Nickel, filtered	10/15/87	10	Y	Y	U	ppb	30	SW-846 6010
299-W27-1	Nickel, filtered	1/15/88	10	Y	Y	U	ppb	30	SW-846 6010
299-W27-1	Nickel, filtered	8/18/88	10	Y	Y	U	ppb	30	SW-846 6010
299-W27-1	Nickel, filtered	12/12/88	10	Y	Y	U	ppb	30	SW-846 6010
299-W27-1	Nickel, filtered	1/11/90	10	3	Y	U	ppb	30	SW-846 6010
299-W27-1	Nickel, filtered	4/12/90	10	3	Y	U	ppb	30	SW-846 6010
299-W27-1	Nickel, filtered	4/12/90	10	3	Y	U	ppb	30	SW-846 6010
299-W27-1	Nickel, filtered	2/03/92	30	Y	Y	U	ppb	30	SW-846 6010
299-W27-1	Nickel, filtered	3/23/92	30	Y	Y	U	ppb	30	SW-846 6010
299-W27-1	Nickel, filtered	7/01/92	30	Y	Y	U	ppb	30	SW-846 6010
299-W27-1	Nickel, filtered	10/27/92	30	Y	Y	U	ppb	30	SW-846 6010
299-W27-1	Nickel, filtered	12/29/92	30	Y	Y	U	ppb	30	SW-846 6010
299-W27-1	Nickel, filtered	4/12/93	30	Y	Y	U	ppb	30	SW-846 6010
299-W27-1	Nicotinic acid	1/15/88	100			U	ppb		

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Well	Constituent Name	Collect Date	Result	Error	Filtered	Qualifier	Units	CRQL	Method Name
299-W27-1	Nicotinic acid	1/11/90	100	35		U	ppb		
299-W27-1	Nitrate	7/18/84	4				ppm		
299-W27-1	Nitrate	8/06/84	5				ppm		
299-W27-1	Nitrate	10/09/84	17				ppm		
299-W27-1	Nitrate	11/05/84	23				ppm		
299-W27-1	Nitrate	12/06/84	23				ppm		
299-W27-1	Nitrate	1/08/85	23				ppm		
299-W27-1	Nitrate	4/15/85	27				ppm		
299-W27-1	Nitrate	7/11/85	26	5			ppm		
299-W27-1	Nitrate	12/20/85	96	18			ppm		
299-W27-1	Nitrate	1/07/86	118	22			ppm		
299-W27-1	Nitrate	4/07/86	116	22			ppm		
299-W27-1	Nitrate	7/02/86	93	17			ppm		
299-W27-1	Nitrate	11/25/86	87200				ppb		EPA 300.0
299-W27-1	Nitrate	1/20/87	113000				ppb		EPA 300.0
299-W27-1	Nitrate	3/09/87	128000				ppb		EPA 300.0
299-W27-1	Nitrate	4/17/87	118000				ppb		EPA 300.0
299-W27-1	Nitrate	4/17/87	118000				ppb		EPA 300.0
299-W27-1	Nitrate	7/24/87	108000				ppb		EPA 300.0
299-W27-1	Nitrate	7/24/87	110000				ppb		EPA 300.0
299-W27-1	Nitrate	10/12/87	78200				ppb		EPA 300.0
299-W27-1	Nitrate	10/15/87	82600				ppb		EPA 300.0
299-W27-1	Nitrate	1/15/88	60000				ppb		EPA 300.0
299-W27-1	Nitrate	1/15/88	61100				ppb		EPA 300.0
299-W27-1	Nitrate	5/16/88	49300				ppb		EPA 300.0
299-W27-1	Nitrate	8/18/88	29000				ppb		EPA 300.0
299-W27-1	Nitrate	8/18/88	28200				ppb		EPA 300.0
299-W27-1	Nitrate	12/12/88	63500				ppb		EPA 300.0
299-W27-1	Nitrate	12/15/88	34400				ppb		EPA 300.0
299-W27-1	Nitrate	2/01/89	96900	9700			ppb		EPA 300.0
299-W27-1	Nitrate	1/11/90	70500	7100			ppb		EPA 300.0

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Well	Constituent Name	Collect Date	Result	Error	Filtered	Qualifier	Units	CRQL	Method Name
299-W27-1	Nitrate	4/12/90	31400	3230			ppb		EPA 300.0
299-W27-1	Nitrate	4/12/90	31100	3200			ppb		EPA 300.0
299-W27-1	Nitrate	2/03/92	18000	10100			ppb	200	ASTM D-4327-88
299-W27-1	Nitrate	3/23/92	17000	9570			ppb	200	ASTM D-4327-88
299-W27-1	Nitrate	7/01/92	13000	7320			ppb	200	ASTM D-4327-88
299-W27-1	Nitrate	10/27/92	14000	7880			ppb	200	ASTM D-4327-88
299-W27-1	Nitrate	12/29/92	12000	6750			ppb	200	ASTM D-4327-88
299-W27-1	Nitrate	4/12/93	10000	867			ppb	200	ASTM D-4327-88
299-W27-1	Nitrite	1/11/90	1000	118		U	ppb		
299-W27-1	Nitrite	4/12/90	1000	118		U	ppb		
299-W27-1	Nitrite	4/12/90	1000	118		U	ppb		
299-W27-1	Nitrite	2/03/92	200			U	ppb	200	ASTM D-4327-88
299-W27-1	Nitrite	3/23/92	200			U	ppb	200	ASTM D-4327-88
299-W27-1	Nitrite	7/01/92	200			U	ppb	200	ASTM D-4327-88
299-W27-1	Nitrite	10/27/92	200			U	ppb	200	ASTM D-4327-88
299-W27-1	Nitrite	12/29/92	200			U	ppb	200	ASTM D-4327-88
299-W27-1	Nitrite	4/12/93	200			U	ppb	200	ASTM D-4327-88
299-W27-1	Nitrobenzene	1/15/88	10			U	ppb		
299-W27-1	Nitrobenzene	1/11/90	10	4		U	ppb		
299-W27-1	Nitrosopyrrolidine	1/15/88	10			U	ppb		
299-W27-1	Nitrosopyrrolidine	1/11/90	10	4		U	ppb		
299-W27-1	O,O,O-Triethyl phosphorothioate	1/15/88	10			U	ppb		
299-W27-1	O,O,O-Triethyl phosphorothioate	1/11/90	10	4		U	ppb		
299-W27-1	O,O-diethylO-2-pyrazinylphosphor	1/11/90	10	4		U	ppb	10	SW-846 8270
299-W27-1	Osmium, filtered	3/09/87	300		Y	U	??		
299-W27-1	Osmium, filtered	4/17/87	300		Y	U	??		

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Well	Constituent Name	Collect Date	Result	Error	Filtered	Qualifier	Units	CRQL	Method Name
299-W27-1	Osmium, filtered	7/24/87	300		Y	U	??		
299-W27-1	PCDDs	1/11/90	0	0		U	ppb	0	SW-846 8280
299-W27-1	PCDFs	1/11/90	0	0		U	ppb	0	SW-846 8280
299-W27-1	Paraldehyde	1/11/90	10000	3500		U	ppb		
299-W27-1	Parathion	1/11/90	2	1		U	ppb		SW-846 8140
299-W27-1	Pentachlorobenzene	7/24/87	10			U	ppb		
299-W27-1	Pentachlorobenzene	10/15/87	10			U	ppb		
299-W27-1	Pentachlorobenzene	1/15/88	10			U	ppb		
299-W27-1	Pentachlorobenzene	1/11/90	10	4		U	ppb		
299-W27-1	Pentachloroethane	7/24/87	10			U	ppb	5	SW-846 8240
299-W27-1	Pentachloroethane	10/15/87	10			U	ppb	5	SW-846 8240
299-W27-1	Pentachloroethane	1/15/88	10			U	ppb	5	SW-846 8240
299-W27-1	Pentachloroethane	8/18/88	10			U	ppb	5	SW-846 8240
299-W27-1	Pentachloroethane	1/11/90	10	4		U	ppb	5	SW-846 8240
299-W27-1	Pentachloronitrobenzene (PCNB)	1/15/88	10			U	ppb		
299-W27-1	Pentachloronitrobenzene (PCNB)	1/11/90	10	4		U	ppb		
299-W27-1	Pentachlorophenol	1/15/88	50			U	ppb		
299-W27-1	Pentachlorophenol	1/11/90	50	18		U	ppb		
299-W27-1	Perchlorate	1/11/90	500	52		U	ppb		EPA 300.0
299-W27-1	Phenacetin	1/15/88	10			U	ppb		
299-W27-1	Phenacetin	1/11/90	10	4		U	ppb		
299-W27-1	Phenanthrene	1/11/90	10	4		U	ppb		

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Well	Constituent Name	Collect Date	Result	Error	Filtered	Qualifier	Units	CRQL	Method Name
299-W27-1	Phenol	7/24/87	10			U	ppb		
299-W27-1	Phenol	10/15/87	10			U	ppb		
299-W27-1	Phenol	1/15/88	10			U	ppb		
299-W27-1	Phenol	1/11/90	10	4		U	ppb		
299-W27-1	Phenylenediamine	1/15/88	10			U	ppb		
299-W27-1	Phenylenediamine	1/11/90	10	4		U	ppb		
299-W27-1	Phorate	1/11/90	2	1		U	ppb	2	SW-846 8140
299-W27-1	Phosphate	3/09/87	1000			U	ppb		EPA 300.0
299-W27-1	Phosphate	4/17/87	1000			U	ppb		EPA 300.0
299-W27-1	Phosphate	7/24/87	1000			U	ppb		EPA 300.0
299-W27-1	Phosphate	10/15/87	1000			U	ppb		EPA 300.0
299-W27-1	Phosphate	1/15/88	1000			U	ppb		EPA 300.0
299-W27-1	Phosphate	8/18/88	1000			U	ppb		EPA 300.0
299-W27-1	Phosphate	12/12/88	1000			U	ppb		EPA 300.0
299-W27-1	Phosphate	1/11/90	1000	141		U	ppb		EPA 300.0
299-W27-1	Phosphate	4/12/90	1000	141		U	ppb		EPA 300.0
299-W27-1	Phosphate	4/12/90	1000	141		U	ppb		EPA 300.0
299-W27-1	Phosphate	2/03/92	400			U	ppb	400	ASTM D-4327-88
299-W27-1	Phosphate	2/03/92	400			U	ppb	500	ASTM D-4327-88
299-W27-1	Phosphate	3/23/92	400			U	ppb	400	ASTM D-4327-88
299-W27-1	Phosphate	3/23/92	400			U	ppb	500	ASTM D-4327-88
299-W27-1	Phosphate	7/01/92	400			U	ppb	400	ASTM D-4327-88
299-W27-1	Phosphate	7/01/92	400			U	ppb	500	ASTM D-4327-88
299-W27-1	Phosphate	10/27/92	400			U	ppb	400	ASTM D-4327-88
299-W27-1	Phosphate	10/27/92	400			U	ppb	500	ASTM D-4327-88
299-W27-1	Phosphate	12/29/92	400			U	ppb	400	ASTM D-4327-88
299-W27-1	Phosphate	12/29/92	400			U	ppb	500	ASTM D-4327-88
299-W27-1	Phosphate	4/12/93	400			U	ppb	400	ASTM D-4327-88

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299-W27-1	Phosphate	4/12/93	400			U	ppb	500	ASTM D-4327-88
299-W27-1	Phthalic acid esters	1/15/88	10			U	ppb		
299-W27-1	Phthalic acid esters	1/11/90	10	4		U	ppb		
299-W27-1	Plutonium-238	10/09/84	0				pCi/L		
299-W27-1	Plutonium-238	11/05/84	-0				pCi/L		
299-W27-1	Plutonium-238	12/06/84	-0				pCi/L		
299-W27-1	Plutonium-238	1/15/88	-0	0		U	pCi/L		
299-W27-1	Plutonium-238	5/16/88	0	0		U	pCi/L		
299-W27-1	Plutonium-238	8/18/88	-0	0		U	pCi/L		
299-W27-1	Plutonium-238	12/15/88	-0	0		U	pCi/L		
299-W27-1	Plutonium-238	2/01/89	-0	0		U	pCi/L		
299-W27-1	Plutonium-238	1/14/92	0	0		U	pCi/L	0	ITAS Isotopic Pu
299-W27-1	Plutonium-239/40	10/09/84	0				pCi/L		
299-W27-1	Plutonium-239/40	11/05/84	0				pCi/L		
299-W27-1	Plutonium-239/40	12/06/84	-0				pCi/L		
299-W27-1	Plutonium-239/40	1/15/88	-0	0		U	pCi/L		
299-W27-1	Plutonium-239/40	5/16/88	-0	0		U	pCi/L		
299-W27-1	Plutonium-239/40	8/18/88	-0	0		U	pCi/L		
299-W27-1	Plutonium-239/40	12/15/88	-0	0		U	pCi/L		
299-W27-1	Plutonium-239/40	2/01/89	0	0		U	pCi/L		
299-W27-1	Plutonium-239/40	1/14/92	-0	0		U	pCi/L	0	ITAS Isotopic Pu
299-W27-1	Potassium	1/15/88	6460				ppb		
299-W27-1	Potassium	1/11/90	6010	689			ppb		
299-W27-1	Potassium, filtered	3/09/87	6550		Y		ppb	300	SW-846 6010
299-W27-1	Potassium, filtered	3/09/87	6550		Y		ppb	1000	SW-846 6010
299-W27-1	Potassium, filtered	4/17/87	6360		Y		ppb	300	SW-846 6010
299-W27-1	Potassium, filtered	4/17/87	6360		Y		ppb	1000	SW-846 6010
299-W27-1	Potassium, filtered	7/24/87	5170		Y		ppb	300	SW-846 6010

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Well	Constituent Name	Collect Date	Result	Error	Filtered	Qualifier	Units	CRQL	Method Name
A1-52	Potassium, filtered	7/24/87	5170		Y		ppb	1000	SW-846 6010
	Potassium, filtered	10/15/87	6240		Y		ppb	300	SW-846 6010
	Potassium, filtered	10/15/87	6240		Y		ppb	1000	SW-846 6010
	Potassium, filtered	1/15/88	5820		Y		ppb	300	SW-846 6010
	Potassium, filtered	1/15/88	5820		Y		ppb	1000	SW-846 6010
	Potassium, filtered	8/18/88	6170		Y		ppb	300	SW-846 6010
	Potassium, filtered	8/18/88	6170		Y		ppb	1000	SW-846 6010
	Potassium, filtered	12/12/88	6300		Y		ppb	300	SW-846 6010
	Potassium, filtered	12/12/88	6300		Y		ppb	1000	SW-846 6010
	Potassium, filtered	1/11/90	6140	703	Y		ppb	300	SW-846 6010
	Potassium, filtered	1/11/90	6140	703	Y		ppb	1000	SW-846 6010
	Potassium, filtered	4/12/90	5360	615	Y		ppb	300	SW-846 6010
	Potassium, filtered	4/12/90	5360	615	Y		ppb	1000	SW-846 6010
	Potassium, filtered	4/12/90	5170	593	Y		ppb	300	SW-846 6010
	Potassium, filtered	4/12/90	5170	593	Y		ppb	1000	SW-846 6010
	Potassium, filtered	2/03/92	4500		Y		ppb	300	SW-846 6010
	Potassium, filtered	2/03/92	4500		Y		ppb	1000	SW-846 6010
	Potassium, filtered	3/23/92	5300		Y		ppb	300	SW-846 6010
	Potassium, filtered	3/23/92	5300		Y		ppb	1000	SW-846 6010
	Potassium, filtered	7/01/92	4700		Y		ppb	300	SW-846 6010
	Potassium, filtered	7/01/92	4700		Y		ppb	1000	SW-846 6010
	Potassium, filtered	10/27/92	5000		Y		ppb	300	SW-846 6010
	Potassium, filtered	10/27/92	5000		Y		ppb	1000	SW-846 6010
	Potassium, filtered	12/29/92	5200		Y		ppb	300	SW-846 6010
	Potassium, filtered	12/29/92	5200		Y		ppb	1000	SW-846 6010
	Potassium, filtered	4/12/93	5400	5170	Y		ppb	300	SW-846 6010
	Potassium, filtered	4/12/93	5400	5170	Y		ppb	1000	SW-846 6010
	Potassium, filtered	4/12/93	5400	5170	Y		ppb	1000	SW-846 6010
	Potassium, filtered	4/12/93	5400	5170	Y		ppb	1000	SW-846 6010
	Potassium, filtered	4/12/93	5400	5170	Y		ppb	1000	SW-846 6010
	Potassium, filtered	4/12/93	5400	5170	Y		ppb	1000	SW-846 6010
	Potassium, filtered	4/12/93	5400	5170	Y		ppb	1000	SW-846 6010
	Potassium, filtered	4/12/93	5400	5170	Y		ppb	1000	SW-846 6010
	Potassium, filtered	4/12/93	5400	5170	Y		ppb	1000	SW-846 6010
	Potassium, filtered	4/12/93	5400	5170	Y		ppb	1000	SW-846 6010
	Potassium, filtered	4/12/93	5400	5170	Y		ppb	1000	SW-846 6010
	Potassium, filtered	4/12/93	5400	5170	Y		ppb	1000	SW-846 6010
	Potassium, filtered	4/12/93	5400	5170	Y		ppb	1000	SW-846 6010
	Potassium, filtered	4/12/93	5400	5170	Y		ppb	1000	SW-846 6010
	Potassium, filtered	4/12/93	5400	5170	Y		ppb	1000	SW-846 6010
299-W27-1	Pronamide	1/15/88	10			U	ppb		
299-W27-1	Pronamide	1/11/90	10	4		U	ppb		
299-W27-1	Propionitrile	1/11/90	5	2		U	ppb		SW-846 8240

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Well	Constituent Name	Collect Date	Result	Error	Filtered	Qualifier	Units	CRQL	Method Name
299-W27-1	Pyrene	1/11/90	10	4		U	ppb		
299-W27-1	Pyridine	7/24/87	500			U	ppb	5	SW-846 8240
299-W27-1	Pyridine	10/15/87	500			U	ppb	5	SW-846 8240
299-W27-1	Pyridine	1/15/88	500			U	ppb	5	SW-846 8240
299-W27-1	Pyridine	8/18/88	500			U	ppb	5	SW-846 8240
299-W27-1	Pyridine	1/11/90	500	175		U	ppb	5	SW-846 8240
299-W27-1	Radium	3/09/87	-0	0		U	pCi/L		
299-W27-1	Radium	4/17/87	0	0			pCi/L		
299-W27-1	Radium	1/15/88	0	0		U	pCi/L		
299-W27-1	Radium	1/11/90	0	0		U	pCi/L		
299-W27-1	Reserpine	1/15/88	10			U	ppb		
299-W27-1	Reserpine	1/11/90	10	4		U	ppb		
299-W27-1	Resorcinol	1/15/88	10			U	ppb		
299-W27-1	Resorcinol	1/11/90	10	4		U	ppb		
299-W27-1	Ruthenium-106	10/09/84	-9				pCi/L		
299-W27-1	Ruthenium-106	11/05/84	58				pCi/L		
299-W27-1	Ruthenium-106	12/06/84	-12				pCi/L		
299-W27-1	Ruthenium-106	1/08/85	14				pCi/L		
299-W27-1	Ruthenium-106	4/15/85	69				pCi/L		
299-W27-1	Ruthenium-106	7/11/85	14	40		U	pCi/L		
299-W27-1	Ruthenium-106	10/08/85	47	34			pCi/L		
299-W27-1	Ruthenium-106	1/07/86	-53	61		U	pCi/L		
299-W27-1	Ruthenium-106	4/07/86	-20	56		U	pCi/L		
299-W27-1	Ruthenium-106	7/02/86	11	54		U	pCi/L		
299-W27-1	Ruthenium-106	11/25/86	-44	81		U	pCi/L		
299-W27-1	Ruthenium-106	1/20/87	-11	48		U	pCi/L		

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Well	Constituent Name	Collect Date	Result	Error	Filtered	Qualifier	Units	CRQL	Method Name
299-W27-1	Ruthenium-106	4/17/87	15	40		U	pCi/L		
299-W27-1	Ruthenium-106	7/23/87	102	51			pCi/L		
299-W27-1	Ruthenium-106	10/12/87	22	71		U	pCi/L		
299-W27-1	Ruthenium-106	1/15/88	19	59		U	pCi/L		
299-W27-1	Ruthenium-106	5/16/88	-6	39		U	pCi/L		
299-W27-1	Ruthenium-106	8/18/88	13	63		U	pCi/L		
299-W27-1	Ruthenium-106	12/15/88	-18	46		U	pCi/L		
299-W27-1	Ruthenium-106	2/01/89	8	70		U	pCi/L		
299-W27-1	Ruthenium-106	1/11/90	41	40			pCi/L		
299-W27-1	Ruthenium-106	3/23/92	-50	57		U	pCi/L		ITAS Gamma Scan
299-W27-1	Ruthenium-106	10/27/92	-1	47		U	pCi/L		ITAS Gamma Scan
299-W27-1	Ruthenium-106	12/29/92	-24	55		U	pCi/L		ITAS Gamma Scan
299-W27-1	Ruthenium-106	4/12/93	-12	64		U	pCi/L		ITAS Gamma Scan
299-W27-1	Ruthenium-106	7/20/93	-6	40		U	pCi/L		ITAS Gamma Scan
299-W27-1	Safrol	1/15/88	10			U	ppb		
299-W27-1	Safrol	1/11/90	10	4		U	ppb		
299-W27-1	Selenium	1/15/88	21				ppb		
299-W27-1	Selenium	1/11/90	35	7			ppb		
299-W27-1	Selenium	3/23/92	10			U	ppb	10	SW-846 7740
299-W27-1	Selenium	10/27/92	10			U	ppb	10	SW-846 7740
299-W27-1	Selenium	4/12/93	10			U	ppb	10	SW-846 7740
299-W27-1	Selenium	7/20/93	3	2		L	ppb	10	SW-846 7740
299-W27-1	Selenium, filtered	3/09/87	54		Y		ppb	10	SW-846 7740
299-W27-1	Selenium, filtered	4/17/87	54		Y		ppb	10	SW-846 7740
299-W27-1	Selenium, filtered	7/24/87	50		Y		ppb	10	SW-846 7740
299-W27-1	Selenium, filtered	10/15/87	46		Y		ppb	10	SW-846 7740
299-W27-1	Selenium, filtered	1/15/88	24		Y		ppb	10	SW-846 7740
299-W27-1	Selenium, filtered	1/11/90	33	7	Y		ppb	10	SW-846 7740
299-W27-1	Selenium, filtered	3/23/92	10		Y	U	ppb	10	SW-846 7740
299-W27-1	Selenium, filtered	10/27/92	10		Y	U	ppb	10	SW-846 7740

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Well	Constituent Name	Collect Date	Result	Error	Filtered	Qualifier	Units	CRQL	Method Name
299-W27-1	Selenium, filtered	12/29/92	10		Y	U	ppb	10	SW-846 7740
299-W27-1	Selenium, filtered	4/12/93	10		Y	U	ppb	10	SW-846 7740
299-W27-1	Selenium, filtered	7/20/93	5	3	Y	L	ppb	10	SW-846 7740
299-W27-1	Silicon	1/11/90	14300	2340			ppb		
299-W27-1	Silicon	1/11/90	14400	2360	Y		ppb		SW-846 6010
299-W27-1	Silicon	4/12/90	13800	2270	Y		ppb		SW-846 6010
299-W27-1	Silicon	4/12/90	14000	2300	Y		ppb		SW-846 6010
299-W27-1	Silver	1/15/88	10			U	ppb		
299-W27-1	Silver	1/11/90	10	2		U	ppb		
299-W27-1	Silver, filtered	3/09/87	10		Y	U	ppb	20	SW-846 6010
299-W27-1	Silver, filtered	4/17/87	10		Y	U	ppb	20	SW-846 6010
299-W27-1	Silver, filtered	7/24/87	10		Y	U	ppb	20	SW-846 6010
299-W27-1	Silver, filtered	10/15/87	10		Y	U	ppb	20	SW-846 6010
299-W27-1	Silver, filtered	1/15/88	10		Y	U	ppb	20	SW-846 6010
299-W27-1	Silver, filtered	8/18/88	10		Y	U	ppb	20	SW-846 6010
299-W27-1	Silver, filtered	12/12/88	10		Y	U	ppb	20	SW-846 6010
299-W27-1	Silver, filtered	1/11/90	10	2	Y	U	ppb	20	SW-846 6010
299-W27-1	Silver, filtered	4/12/90	10	2	Y	U	ppb	20	SW-846 6010
299-W27-1	Silver, filtered	4/12/90	10	2	Y	U	ppb	20	SW-846 6010
299-W27-1	Silver, filtered	2/03/91	20		Y	U	ppb	20	SW-846 6010
299-W27-1	Silver, filtered	3/23/92	20		Y	U	ppb	20	SW-846 6010
299-W27-1	Silver, filtered	7/01/92	20		Y	U	ppb	20	SW-846 6010
299-W27-1	Silver, filtered	10/27/92	20		Y	U	ppb	20	SW-846 6010
299-W27-1	Silver, filtered	12/29/92	20		Y	U	ppb	20	SW-846 6010
299-W27-1	Silver, filtered	4/12/93	20		Y	U	ppb	20	SW-846 6010
299-W27-1	Sodium	1/15/88	38000				ppb		
299-W27-1	Sodium	1/11/90	34800	3890			ppb		
299-W27-1	Sodium, filtered	3/09/87	39600		Y		ppb	300	SW-846 6010
299-W27-1	Sodium, filtered	4/17/87	38200		Y		ppb	300	SW-846 6010

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Well	Constituent Name	Collect Date	Result	Error	Filtered	Qualifier	Units	CRQL	Method Name
299-W27-1	Sodium, filtered	7/24/87	31700		Y		ppb	300	SW-846 6010
299-W27-1	Sodium, filtered	10/15/87	34800		Y		ppb	300	SW-846 6010
299-W27-1	Sodium, filtered	1/15/88	33800		Y		ppb	300	SW-846 6010
299-W27-1	Sodium, filtered	8/18/88	35600		Y		ppb	300	SW-846 6010
299-W27-1	Sodium, filtered	12/12/88	35500		Y		ppb	300	SW-846 6010
299-W27-1	Sodium, filtered	1/11/90	35100	3930	Y		ppb	300	SW-846 6010
299-W27-1	Sodium, filtered	4/12/90	31700	3540	Y		ppb	300	SW-846 6010
299-W27-1	Sodium, filtered	4/12/90	30500	3410	Y		ppb	300	SW-846 6010
299-W27-1	Sodium, filtered	2/03/92	26000		Y		ppb	300	SW-846 6010
299-W27-1	Sodium, filtered	3/23/92	26000		Y		ppb	300	SW-846 6010
299-W27-1	Sodium, filtered	7/01/92	27000		Y		ppb	300	SW-846 6010
299-W27-1	Sodium, filtered	10/27/92	28000		Y		ppb	300	SW-846 6010
299-W27-1	Sodium, filtered	12/29/92	29000		Y		ppb	300	SW-846 6010
299-W27-1	Sodium, filtered	4/12/93	27000	8420	Y		ppb	300	SW-846 6010
299-W27-1	Specific conductance	3/09/87	506				umhos		
299-W27-1	Specific conductance	4/17/87	580				umhos		
299-W27-1	Specific conductance	7/24/87	512				umhos		
299-W27-1	Specific conductance	10/15/87	492				umhos		
299-W27-1	Specific conductance	1/15/88	479				umhos		
299-W27-1	Specific conductance	8/18/88	488				umhos		
299-W27-1	Specific conductance	12/12/88	415				umhos		
299-W27-1	Specific conductance	1/11/90	501				umhos		
299-W27-1	Specific conductance	1/11/90	544	56			umhos		ASTM D-1125-A
299-W27-1	Specific conductance	4/12/90	395				umhos		
299-W27-1	Specific conductance	4/12/90	442	45			umhos		ASTM D-1125-A
299-W27-1	Specific conductance	1/14/92	382				umhos	1	Probe, Conductivity
299-W27-1	Specific conductance	2/03/92	327				umhos	1	Probe, Conductivity
299-W27-1	Specific conductance	2/03/92	370				umhos		ASTM D-1125-A
299-W27-1	Specific conductance	3/23/92	310				umhos	1	Probe, Conductivity
299-W27-1	Specific conductance	3/23/92	360				umhos		ASTM D-1125-A
299-W27-1	Specific conductance	7/01/92	358				umhos	1	Probe, Conductivity

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Well	Constituent Name	Collect Date	Result	Error	Filtered	Qualifier	Units	CRQL	Method Name
299-W27-1	Specific conductance	7/01/92	360				umhos		ASTM D-1125-A
299-W27-1	Specific conductance	10/27/92	350				umhos		ASTM D-1125-A
299-W27-1	Specific conductance	10/27/92	350				umhos	1	Probe, Conductivity
299-W27-1	Specific conductance	12/29/92	340				umhos		ASTM D-1125-A
299-W27-1	Specific conductance	12/29/92	341				umhos	1	Probe, Conductivity
299-W27-1	Specific conductance	4/12/93	330				umhos		ASTM D-1125-A
299-W27-1	Specific conductance	4/12/93	337				umhos	1	Probe, Conductivity
299-W27-1	Specific conductance	7/20/93	316				umhos	1	Probe, Conductivity
299-W27-1	Specific conductance	7/20/93	330				umhos		ASTM D-1125-A
299-W27-1	Strontium	1/11/90	264	32			ppb		
299-W27-1	Strontium, filtered	3/09/87	300		Y	U	ppb		SW-846 6010
299-W27-1	Strontium, filtered	4/17/87	300		Y	U	ppb		SW-846 6010
299-W27-1	Strontium, filtered	7/24/87	300		Y	U	ppb		SW-846 6010
299-W27-1	Strontium, filtered	10/15/87	264		Y		ppb		SW-846 6010
299-W27-1	Strontium, filtered	1/15/88	252		Y		ppb		SW-846 6010
299-W27-1	Strontium, filtered	8/18/88	244		Y		ppb		SW-846 6010
299-W27-1	Strontium, filtered	12/12/88	237		Y		ppb		SW-846 6010
299-W27-1	Strontium, filtered	1/11/90	263	32	Y		ppb		SW-846 6010
299-W27-1	Strontium, filtered	4/12/90	202	25	Y		ppb		SW-846 6010
299-W27-1	Strontium, filtered	4/12/90	188	23	Y		ppb		SW-846 6010
299-W27-1	Strontium-90	8/06/84	0				pCi/L		
299-W27-1	Strontium-90	10/09/84	-3				pCi/L		
299-W27-1	Strontium-90	11/05/84	0				pCi/L		
299-W27-1	Strontium-90	12/06/84	0				pCi/L		
299-W27-1	Strontium-90	1/08/85	-0				pCi/L		
299-W27-1	Strontium-90	4/15/85	2				pCi/L		
299-W27-1	Strontium-90	7/11/85	0	1		U	pCi/L		
299-W27-1	Strontium-90	10/08/85	1	1		U	pCi/L		
299-W27-1	Strontium-90	1/07/86	-0	1		U	pCi/L		
299-W27-1	Strontium-90	4/07/86	1	1			pCi/L		

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Well	Constituent Name	Collect Date	Result	Error	Filtered	Qualifier	Units	CRQL	Method Name
299-W27-1	Strontium-90	7/02/86	0	1		U	pCi/L		
299-W27-1	Strontium-90	11/25/86	0	1		U	pCi/L		
299-W27-1	Strontium-90	1/20/87	1	1		U	pCi/L		
299-W27-1	Strontium-90	4/17/87	0	1		U	pCi/L		
299-W27-1	Strontium-90	7/23/87	0	1		U	pCi/L		
299-W27-1	Strontium-90	10/12/87	-0	1		U	pCi/L		
299-W27-1	Strontium-90	1/15/88	1	1			pCi/L		
299-W27-1	Strontium-90	5/16/88	-0	1		U	pCi/L		
299-W27-1	Strontium-90	8/18/88	-0	1		U	pCi/L		
299-W27-1	Strontium-90	12/15/88	-0	1		U	pCi/L		
299-W27-1	Strontium-90	2/01/89	-1	1		U	pCi/L		
299-W27-1	Strontium-90	1/11/90	0	1		U	pCi/L		
299-W27-1	Strontium-90	3/23/92	-0	1		U	pCi/L	5	ITAS Sr-90
299-W27-1	Strontium-90	10/27/92	-0	0		U	pCi/L	5	ITAS Sr-90
299-W27-1	Strontium-90	12/29/92	-0	0		U	pCi/L	5	ITAS Sr-90
299-W27-1	Strontium-90	4/12/93	-1	0		U	pCi/L	5	ITAS Sr-90
299-W27-1	Strontium-90	7/20/93	-0	0		U	pCi/L	5	ITAS Sr-90
299-W27-1	Strychnine	1/15/88	50			U	ppb		
299-W27-1	Strychnine	1/11/90	50	18		U	ppb		
299-W27-1	Styrene	1/11/90	5	2		U	ppb	5	SW-846 8240
299-W27-1	Sulfate	3/09/87	61600				ppb		EPA 300.0
299-W27-1	Sulfate	4/17/87	10900				ppb		EPA 300.0
299-W27-1	Sulfate	7/24/87	63500				ppb		EPA 300.0
299-W27-1	Sulfate	10/15/87	62500				ppb		EPA 300.0
299-W27-1	Sulfate	1/15/88	53100				ppb		EPA 300.0
299-W27-1	Sulfate	8/18/88	39300				ppb		EPA 300.0
299-W27-1	Sulfate	12/12/88	43600				ppb		EPA 300.0
299-W27-1	Sulfate	1/11/90	58700	5910			ppb		EPA 300.0
299-W27-1	Sulfate	4/12/90	36600	3710			ppb		EPA 300.0

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Well	Constituent Name	Collect Date	Result	Error	Filtered	Qualifier	Units	CRQL	Method Name
299-W27-1	Sulfate	4/12/90	36100	3660			ppb		EPA 300.0
299-W27-1	Sulfate	2/03/92	30000	28900			ppb	500	ASTM D-4327-88
299-W27-1	Sulfate	3/23/92	28000	27000			ppb	500	ASTM D-4327-88
299-W27-1	Sulfate	7/01/92	27000	26000			ppb	500	ASTM D-4327-88
299-W27-1	Sulfate	10/27/92	26000	25100			ppb	500	ASTM D-4327-88
299-W27-1	Sulfate	12/29/92	25000	24100			ppb	500	ASTM D-4327-88
299-W27-1	Sulfate	4/12/93	24000	1170			ppb	500	ASTM D-4327-88
299-W27-1	Sulfide	1/11/90	1000	208		U	ppb	10000	SW-846 9030
299-W27-1	Technetium-99	1/11/90	3	6		U	pCi/L		
299-W27-1	Temperature, field	3/09/87	19				DegC	0	Probe, temperature
299-W27-1	Temperature, field	4/17/87	20				DegC	0	Probe, temperature
299-W27-1	Temperature, field	7/24/87	16				DegC	0	Probe, temperature
299-W27-1	Temperature, field	10/15/87	19				DegC	0	Probe, temperature
299-W27-1	Temperature, field	1/15/88	21				DegC	0	Probe, temperature
299-W27-1	Temperature, field	8/1/88	20				DegC	0	Probe, temperature
299-W27-1	Temperature, field	12/12/88	19				DegC	0	Probe, temperature
299-W27-1	Temperature, field	1/11/89	20				DegC	0	Probe, temperature
299-W27-1	Temperature, field	4/12/89	19				DegC	0	Probe, temperature
299-W27-1	Temperature, field	1/14/92	19				DegC	0	Probe, temperature
299-W27-1	Temperature, field	2/03/92	20				DegC	0	Probe, temperature
299-W27-1	Temperature, field	3/23/92	19				DegC	0	Probe, temperature
299-W27-1	Temperature, field	7/01/92	20				DegC	0	Probe, temperature
299-W27-1	Temperature, field	10/27/92	19				DegC	0	Probe, temperature
299-W27-1	Temperature, field	12/29/92	19				DegC	0	Probe, temperature
299-W27-1	Temperature, field	4/12/93	20				DegC	0	Probe, temperature
299-W27-1	Temperature, field	7/20/93	20				DegC	0	Probe, temperature
299-W27-1	Tetrachloroethene	3/09/87	10			U	ppb	5	SW-846 8240
299-W27-1	Tetrachloroethene	4/17/87	10			U	ppb	5	SW-846 8240
299-W27-1	Tetrachloroethene	7/24/87	10			U	ppb	5	SW-846 8240

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Well	Constituent Name	Collect Date	Result	Error	Filtered	Qualifier	Units	CRQL	Method Name
299-W27-1	Tetrachloroethene	10/15/87	5			U	ppb	5	SW-846 8240
299-W27-1	Tetrachloroethene	1/15/88	5			U	ppb	5	SW-846 8240
299-W27-1	Tetrachloroethene	8/18/88	5			U	ppb	5	SW-846 8240
299-W27-1	Tetrachloroethene	12/12/88	5			U	ppb	5	SW-846 8240
299-W27-1	Tetrachloroethene	1/11/90	5	2		U	ppb	5	SW-846 8240
299-W27-1	Tetrachloroethene	4/12/90	5	2		U	ppb	5	SW-846 8240
299-W27-1	Tetrachloroethene	2/03/92	5			U	ppb	5	SW-846 8240
299-W27-1	Tetrachloroethene	3/23/92	5			U	ppb	5	SW-846 8240
299-W27-1	Tetrachloroethene	7/01/92	5			U	ppb	5	SW-846 8240
299-W27-1	Tetrachloroethene	10/27/92	5			U	ppb	5	SW-846 8240
299-W27-1	Tetrachloroethene	12/29/92	5			U	ppb	5	SW-846 8240
299-W27-1	Tetrachloroethene	4/12/93	5			U	ppb	5	SW-846 8240
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299-W27-1	Tetrahydrofuran	1/11/90	10	4		U	ppb	10	SW-846 8240
299-W27-1	Tetrahydrofuran	4/12/90	10	4		U	ppb	10	SW-846 8240
299-W27-1	Tetrahydrofuran	2/03/92	10			U	ppb	10	SW-846 8240
299-W27-1	Tetrahydrofuran	3/23/92	10			U	ppb	10	SW-846 8240
299-W27-1	Tetrahydrofuran	7/01/92	10			U	ppb	10	SW-846 8240
299-W27-1	Tetrahydrofuran	10/27/92	10			U	ppb	10	SW-846 8240
299-W27-1	Tetrahydrofuran	12/29/92	10			U	ppb	10	SW-846 8240
299-W27-1	Tetrahydrofuran	4/12/93				U	ppb	10	SW-846 8240
299-W27-1	Thallium	1/11/90	5	3		U	ppb		
299-W27-1	Thallium, filtered	1/11/90	5	3	Y	U	ppb	5	SW-846 7841
299-W27-1	Thiofanox	1/15/88	10			U	ppb		
299-W27-1	Thiofanox	1/11/90	10	4		U	ppb		
299-W27-1	Thiourea	1/11/90	200	40		U	ppb		

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Well	Constituent Name	Collect Date	Result	Error	Filtered	Qualifier	Units	CRQL	Method Name
299-W27-1	Thiuram	1/15/88	10			U	ppb		
299-W27-1	Thiuram	1/11/90	10	4		U	ppb		
299-W27-1	Tin	1/11/90	30	6		U	ppb		
299-W27-1	Tin, filtered	1/11/90	30	6	Y	U	ppb	100	SW-846 6010
299-W27-1	Tin, filtered	4/12/90	30	6	Y	U	ppb	100	SW-846 6010
299-W27-1	Tin, filtered	4/12/90	30	6	Y	U	ppb	100	SW-846 6010
299-W27-1	Tin, filtered	2/03/92	100		Y	U	ppb	100	SW-846 6010
299-W27-1	Tin, filtered	3/23/92	100		Y	U	ppb	100	SW-846 6010
299-W27-1	Tin, filtered	7/01/92	100		Y	U	ppb	100	SW-846 6010
299-W27-1	Tin, filtered	10/27/92	100		Y	U	ppb	100	SW-846 6010
299-W27-1	Tin, filtered	12/29/92	100		Y	U	ppb	100	SW-846 6010
299-W27-1	Tin, filtered	4/12/93	100		Y	U	ppb	100	SW-846 6010
299-W27-1	Titanium	1/11/90	60	17		U	ppb		
299-W27-1	Titanium	1/11/90	60	17	Y	U	ppb		SW-846 6010
299-W27-1	Titanium	4/12/90	60	17	Y	U	ppb		SW-846 6010
299-W27-1	Titanium	4/12/90	60	17	Y	U	ppb		SW-846 6010
299-W27-1	Toluene	7/24/87	10			U	ppb	5	SW-846 8240
299-W27-1	Toluene	10/15/87	5			U	ppb	5	SW-846 8240
299-W27-1	Toluene	1/15/88	5			U	ppb	5	SW-846 8240
299-W27-1	Toluene	8/18/88	5			U	ppb	5	SW-846 8240
299-W27-1	Toluene	1/11/90	5	2		U	ppb	5	SW-846 8240
299-W27-1	Toluene	4/12/90	5	2		U	ppb	5	SW-846 8240
299-W27-1	Toluene	2/03/92	5			U	ppb	5	SW-846 8240
299-W27-1	Toluene	3/23/92	5			U	ppb	5	SW-846 8240
299-W27-1	Toluene	7/01/92	5			U	ppb	5	SW-846 8240
299-W27-1	Toluene	10/27/92	5			U	ppb	5	SW-846 8240
299-W27-1	Toluene	12/29/92	5			U	ppb	5	SW-846 8240
299-W27-1	Toluene	4/12/93	5			U	ppb	5	SW-846 8240

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Well	Constituent Name	Collect Date	Result	Error	Filtered	Qualifier	Units	CRQL	Method Name
299-W27-1	Toluenediamine	1/15/88	10			U	ppb		
299-W27-1	Toluenediamine	1/11/90	10	4		U	ppb		
299-W27-1	Total Carbon	7/24/87	29100				ppb	2000	ASTM D-2579-A
299-W27-1	Total Carbon	10/15/87	31600				ppb	2000	ASTM D-2579-A
299-W27-1	Total Carbon	1/15/88	32900				ppb	2000	ASTM D-2579-A
299-W27-1	Total Carbon	8/18/88	33400				ppb	2000	ASTM D-2579-A
299-W27-1	Total Carbon	12/12/88	32600				ppb	2000	ASTM D-2579-A
299-W27-1	Total Carbon	1/11/90	32200	3460			ppb	2000	ASTM D-2579-A
299-W27-1	Total Organic Carbon	3/09/87	229			U	ppb		
299-W27-1	Total Organic Carbon	4/17/87	349			U	ppb		
299-W27-1	Total Organic Carbon	7/24/87	3850				ppb		
299-W27-1	Total Organic Carbon	10/15/87	449			U	ppb		
299-W27-1	Total Organic Carbon	1/15/88	352			U	ppb		
299-W27-1	Total Organic Carbon	8/18/88	717			U	ppb		
299-W27-1	Total Organic Carbon	12/12/88	300			U	ppb		
299-W27-1	Total Organic Carbon	1/11/90	400	56		U	ppb		
299-W27-1	Total Organic Carbon	2/03/92	1000			U	ppb	1000	SW-846 9060
299-W27-1	Total Organic Carbon	3/23/92	1000			U	ppb	1000	SW-846 9060
299-W27-1	Total Organic Carbon	7/01/92	1000			U	ppb	1000	SW-846 9060
299-W27-1	Total Organic Carbon	10/27/92	1000			U	ppb	1000	SW-846 9060
299-W27-1	Total Organic Carbon	12/29/92	1000			U	ppb	1000	SW-846 9060
299-W27-1	Total Organic Carbon	4/12/93	1000			U	ppb	1000	SW-846 9060
299-W27-1	Total Organic Carbon	7/20/93	300			L	ppb	1000	SW-846 9060
299-W27-1	Total Organic Halogen	3/09/87	20			U	ppb	10	SW-846 9020
299-W27-1	Total Organic Halogen	4/17/87	20			U	ppb	10	SW-846 9020
299-W27-1	Total Organic Halogen	7/24/87	6			U	ppb	10	SW-846 9020
299-W27-1	Total Organic Halogen	10/15/87	11			U	ppb	10	SW-846 9020
299-W27-1	Total Organic Halogen	1/15/88	13			U	ppb	10	SW-846 9020
299-W27-1	Total Organic Halogen	1/11/90	10	4			ppb	10	SW-846 9020

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Well	Constituent Name	Collect Date	Result	Error	Filtered	Qualifier	Units	CRQL	Method Name
299-W27-1	Total Organic Halogen	4/12/90	12	4			ppb	10	SW-846 9020
299-W27-1	Total Organic Halogen	2/03/92	10			U	ppb	10	SW-846 9020
299-W27-1	Total Organic Halogen	3/23/92	10				ppb	10	SW-846 9020
299-W27-1	Total Organic Halogen	3/23/92	20				ppb	10	SW-846 9020
299-W27-1	Total Organic Halogen	7/01/92	10			U	ppb	10	SW-846 9020
299-W27-1	Total Organic Halogen	7/01/92	20				ppb	10	SW-846 9020
299-W27-1	Total Organic Halogen	10/27/92	10			U	ppb	10	SW-846 9020
299-W27-1	Total Organic Halogen	12/29/92	20				ppb	10	SW-846 9020
299-W27-1	Total Organic Halogen	4/12/93	10			U	ppb	10	SW-846 9020
299-W27-1	Total Organic Halogen	7/20/93	8			U	ppb	10	SW-846 9020
299-W27-1	Toxaphene	1/11/90	1	0		U	ppb		
299-W27-1	Tributylphosphoric Acid	10/15/87	10			U	ppb		
299-W27-1	Tributylphosphoric Acid	1/15/88	10			U	ppb		
299-W27-1	Tributylphosphoric Acid	1/11/90	10	4		U	ppb		
299-W27-1	Trichloroethene	3/09/87	10			U	ppb	5	SW-846 8240
299-W27-1	Trichloroethene	4/17/87	10			U	ppb	5	SW-846 8240
299-W27-1	Trichloroethene	7/24/87	10			U	ppb	5	SW-846 8240
299-W27-1	Trichloroethene	10/15/87	5			U	ppb	5	SW-846 8240
299-W27-1	Trichloroethene	1/15/88	5			U	ppb	5	SW-846 8240
299-W27-1	Trichloroethene	8/18/88	5			U	ppb	5	SW-846 8240
299-W27-1	Trichloroethene	12/12/88	5			U	ppb	5	SW-846 8240
299-W27-1	Trichloroethene	1/11/90	5	2		U	ppb	5	SW-846 8240
299-W27-1	Trichloroethene	4/12/90	5	2		U	ppb	5	SW-846 8240
299-W27-1	Trichloroethene	2/03/92	5			U	ppb	5	SW-846 8240
299-W27-1	Trichloroethene	3/23/92	5			U	ppb	5	SW-846 8240
299-W27-1	Trichloroethene	7/01/92	5			U	ppb	5	SW-846 8240
299-W27-1	Trichloroethene	10/27/92	5			U	ppb	5	SW-846 8240
299-W27-1	Trichloroethene	12/29/92	5			U	ppb	5	SW-846 8240
299-W27-1	Trichloroethene	4/12/93	5			U	ppb	5	SW-846 8240

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Well	Constituent Name	Collect Date	Result	Error	Filtered	Qualifier	Units	CRQL	Method Name
299-W27-1	Trichloromethanethiol	7/24/87	10			U	ppb		SW-846 8240
299-W27-1	Trichloromethanethiol	10/15/87	10			U	ppb		SW-846 8240
299-W27-1	Trichloromethanethiol	1/15/88	10			U	ppb		SW-846 8240
299-W27-1	Trichloromethanethiol	8/18/88	10			U	ppb		SW-846 8240
299-W27-1	Trichloromethanethiol	1/11/90	10	4		U	ppb		SW-846 8240
299-W27-1	Trichloromonofluoromethane	7/24/87	10			U	ppb	5	SW-846 8240
299-W27-1	Trichloromonofluoromethane	10/15/87	10			U	ppb	5	SW-846 8240
299-W27-1	Trichloromonofluoromethane	1/15/88	10			U	ppb	5	SW-846 8240
299-W27-1	Trichloromonofluoromethane	8/18/88	10			U	ppb	5	SW-846 8240
299-W27-1	Trichloromonofluoromethane	1/11/90	10	4		U	ppb	5	SW-846 8240
A1-64	299-W27-1	Tris(2,3-dibromopropyl) phosphate	1/15/88	10		U	ppb		
	299-W27-1	Tris(2,3-dibromopropyl) phosphate	1/11/90	10	4	U	ppb		
299-W27-1	Tritium	7/18/84	145000				pCi/L		
299-W27-1	Tritium	8/06/84	11700				pCi/L		
299-W27-1	Tritium	10/09/84	117000				pCi/L		
299-W27-1	Tritium	11/05/84	196000				pCi/L		
299-W27-1	Tritium	12/06/84	166000				pCi/L		
299-W27-1	Tritium	1/08/85	122000				pCi/L		
299-W27-1	Tritium	4/15/85	102000				pCi/L		
299-W27-1	Tritium	7/11/85	98000	6110			pCi/L		
299-W27-1	Tritium	10/08/85	637000	29400			pCi/L		
299-W27-1	Tritium	1/07/86	26700	3360			pCi/L		
299-W27-1	Tritium	4/07/86	11500	2210			pCi/L		
299-W27-1	Tritium	7/02/86	7360	2020			pCi/L		
299-W27-1	Tritium	11/25/86	19100	2970			pCi/L		
299-W27-1	Tritium	1/20/87	14500	2270			pCi/L		
299-W27-1	Tritium	4/17/87	7510	1930			pCi/L		
299-W27-1	Tritium	7/23/87	987	1580		U	pCi/L		

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Groundwater Well Results for 299-W27-1

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Well	Constituent Name	Collect Date	Result	Error	Filtered	Qualifier	Units	CRQL	Method Name
A1-65	299-W27-1	Tritium	10/12/87	108	319	U	pCi/L		
	299-W27-1	Tritium	1/15/88	2290	514		pCi/L		
	299-W27-1	Tritium	5/16/88	5760	688		pCi/L		
	299-W27-1	Tritium	8/18/88	342	265		pCi/L		
	299-W27-1	Tritium	12/15/88	267	316	U	pCi/L		
	299-W27-1	Tritium	2/01/89	5050	622		pCi/L		
	299-W27-1	Tritium	1/11/90	3510	433		pCi/L		
	299-W27-1	Tritium	4/12/90	1540	413		pCi/L		
	299-W27-1	Tritium	4/12/90	4400	595		pCi/L		
	299-W27-1	Tritium	2/03/92	2120	357		pCi/L	500	ITAS H-3
	299-W27-1	Tritium	3/23/92	1710	380		pCi/L	500	ITAS H-3
	299-W27-1	Tritium	7/01/92	3460	431		pCi/L	500	ITAS H-3
	299-W27-1	Tritium	10/27/92	3820	472		pCi/L	500	ITAS H-3
	299-W27-1	Tritium	12/29/92	4330	506		pCi/L	500	ITAS H-3
	299-W27-1	Tritium	4/12/93	3330	423		pCi/L	500	ITAS H-3
	299-W27-1	Tritium	7/20/93	4280	491		pCi/L	500	ITAS H-3
	299-W27-1	Turbidity	1/11/90	1	0		NTU		
	299-W27-1	Uranium	1/08/85	8			pCi/L		
	299-W27-1	Uranium	4/15/85	8			pCi/L		
	299-W27-1	Uranium	7/11/85	6	3		pCi/L		
	299-W27-1	Uranium	10/08/85	6	1		pCi/L		
	299-W27-1	Uranium	1/07/86	9	2		pCi/L		
	299-W27-1	Uranium	4/07/86	8	3		pCi/L		
	299-W27-1	Uranium	7/02/86	5	2		pCi/L		
	299-W27-1	Uranium	11/25/86	5	1		pCi/L		
	299-W27-1	Uranium	1/20/87	6	2		pCi/L		
	299-W27-1	Uranium	4/17/87	9	2		pCi/L		
	299-W27-1	Uranium	7/23/87	6	2		pCi/L		
	299-W27-1	Uranium	10/12/87	9	2		pCi/L		
	299-W27-1	Uranium	1/15/88	11	3		pCi/L		

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Well	Constituent Name	Collect Date	Result	Error	Filtered	Qualifier	Units	CRQL	Method Name
299-W27-1	Uranium	5/16/88	14	4			pCi/L		
299-W27-1	Uranium	8/18/88	13	4			pCi/L		
299-W27-1	Uranium	12/15/88	9	2			pCi/L		
299-W27-1	Uranium	2/01/89	11	3			pCi/L		
299-W27-1	Uranium	1/11/90	6	2			pCi/L		
299-W27-1	Uranium	2/03/92	7	1			ppb	1	ITAS Gross U
299-W27-1	Uranium	3/23/92	7	2			ppb	1	ITAS Gross U
299-W27-1	Uranium	7/01/92	6	2			ppb	1	ITAS Gross U
299-W27-1	Uranium	10/27/92	6	2			ppb	1	ITAS Gross U
299-W27-1	Uranium	12/29/92	8	2			ppb	1	ITAS Gross U
299-W27-1	Uranium	7/20/93	5	1			ppb	1	ITAS Gross U
A1-66	299-W27-1	Uranium-234	1/15/88	5	1		pCi/L		
	299-W27-1	Uranium-234	5/16/88	5	1		pCi/L		
	299-W27-1	Uranium-234	8/18/88	4	0		pCi/L		
	299-W27-1	Uranium-234	12/15/88	5	0		pCi/L		
	299-W27-1	Uranium-234	2/01/89	4	0		pCi/L		
299-W27-1	Uranium-235	1/15/88	0	0			pCi/L		
299-W27-1	Uranium-235	5/16/88	0	0			pCi/L		
299-W27-1	Uranium-235	8/18/88	0	0			pCi/L		
299-W27-1	Uranium-235	12/15/88	0	0			pCi/L		
299-W27-1	Uranium-235	2/01/89	0	0			pCi/L		
299-W27-1	Uranium-238	1/15/88	4	0			pCi/L		
299-W27-1	Uranium-238	5/16/88	5	0			pCi/L		
299-W27-1	Uranium-238	8/18/88	4	0			pCi/L		
299-W27-1	Uranium-238	12/15/88	4	0			pCi/L		
299-W27-1	Uranium-238	2/01/89	3	0			pCi/L		
299-W27-1	Uranium-238	4/12/93	5	1			ppb	1	ITAS Gross U
299-W27-1	Vanadium	1/15/88	16				ppb		

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Well	Constituent Name	Collect Date	Result	Error	Filtered	Qualifier	Units	CRQL	Method Name
A1-67	299-W27-1 Vanadium	1/11/90	19	4			ppb		
	299-W27-1 Vanadium, filtered	3/09/87	15		Y		ppb	30	SW-846 6010
	299-W27-1 Vanadium, filtered	4/17/87	15		Y		ppb	30	SW-846 6010
	299-W27-1 Vanadium, filtered	7/24/87	13		Y		ppb	30	SW-846 6010
	299-W27-1 Vanadium, filtered	10/15/87	18		Y		ppb	30	SW-846 6010
	299-W27-1 Vanadium, filtered	1/15/88	18		Y		ppb	30	SW-846 6010
	299-W27-1 Vanadium, filtered	8/18/88	24		Y		ppb	30	SW-846 6010
	299-W27-1 Vanadium, filtered	12/12/88	19		Y		ppb	30	SW-846 6010
	299-W27-1 Vanadium, filtered	1/11/90	18	4	Y		ppb	30	SW-846 6010
	299-W27-1 Vanadium, filtered	4/12/90	16	4	Y		ppb	30	SW-846 6010
	299-W27-1 Vanadium, filtered	4/12/90	20	4	Y		ppb	30	SW-846 6010
	299-W27-1 Vanadium, filtered	2/03/92	30		Y	U	ppb	30	SW-846 6010
	299-W27-1 Vanadium, filtered	3/23/92	30		Y	U	ppb	30	SW-846 6010
	299-W27-1 Vanadium, filtered	7/01/92	30		Y	U	ppb	30	SW-846 6010
	299-W27-1 Vanadium, filtered	10/27/92	30		Y	U	ppb	30	SW-846 6010
	299-W27-1 Vanadium, filtered	12/29/92	30		Y	U	ppb	30	SW-846 6010
	299-W27-1 Vanadium, filtered	4/12/93	30		Y	U	ppb	30	SW-846 6010
299-W27-1	Vinyl acetate	1/11/90	5	2		U	ppb	5	SW-846 8240
299-W27-1	Vinyl chloride	7/24/87	10			U	ppb	10	SW-846 8240
299-W27-1	Vinyl chloride	10/15/87	10			U	ppb	10	SW-846 8240
299-W27-1	Vinyl chloride	1/15/88	10			U	ppb	10	SW-846 8240
299-W27-1	Vinyl chloride	8/18/88	10			U	ppb	10	SW-846 8240
299-W27-1	Vinyl chloride	1/11/90	10	4		U	ppb	10	SW-846 8240
299-W27-1	Vinyl chloride	4/12/90	10	4		U	ppb	10	SW-846 8240
299-W27-1	Vinyl chloride	2/03/92	10			U	ppb	10	SW-846 8240
299-W27-1	Vinyl chloride	3/23/92	10			U	ppb	10	SW-846 8240
299-W27-1	Vinyl chloride	7/01/92	10			U	ppb	10	SW-846 8240
299-W27-1	Vinyl chloride	10/27/92	10			U	ppb	10	SW-846 8240
299-W27-1	Vinyl chloride	12/29/92	10			U	ppb	10	SW-846 8240
299-W27-1	Vinyl chloride	4/12/93	10			U	ppb	10	SW-846 8240

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Well	Constituent Name	Collect Date	Result	Error	Filtered	Qualifier	Units	CRQL	Method Name
299-W27-1	Warfarin	1/15/88	10			U	ppb		
299-W27-1	Warfarin	1/11/90	10	4		U	ppb		
299-W27-1	Xylenes	3/09/87	10			U	ppb		SW-846 8240
299-W27-1	Xylenes	4/17/87	10			U	ppb		SW-846 8240
299-W27-1	Xylenes	7/24/87	10			U	ppb		SW-846 8240
299-W27-1	Xylenes	10/15/87	5			U	ppb		SW-846 8240
299-W27-1	Xylenes	1/15/88	5			U	ppb		SW-846 8240
299-W27-1	Xylenes	8/18/88	5			U	ppb		SW-846 8240
299-W27-1	Xylenes	12/12/88	5			U	ppb		SW-846 8240
299-W27-1	Xylenes	1/11/90	5	2		U	ppb		SW-846 8240
299-W27-1	Xylenes	4/12/90	5	2		U	ppb		SW-846 8240
299-W27-1	Xylenes (total)	3/09/87	10			U	ppb	5	SW-846 8240
299-W27-1	Xylenes (total)	4/17/87	10			U	ppb	5	SW-846 8240
299-W27-1	Xylenes (total)	7/24/87	10			U	ppb	5	SW-846 8240
299-W27-1	Xylenes (total)	10/15/87	5			U	ppb	5	SW-846 8240
299-W27-1	Xylenes (total)	1/15/88	5			U	ppb	5	SW-846 8240
299-W27-1	Xylenes (total)	8/18/88	5			U	ppb	5	SW-846 8240
299-W27-1	Xylenes (total)	12/12/88	5			U	ppb	5	SW-846 8240
299-W27-1	Xylenes (total)	1/11/90	5	2		U	ppb	5	SW-846 8240
299-W27-1	Xylenes (total)	4/12/90	5	2		U	ppb	5	SW-846 8240
299-W27-1	Xylenes (total)	2/03/92	5			U	ppb	5	SW-846 8240
299-W27-1	Xylenes (total)	3/23/92	5			U	ppb	5	SW-846 8240
299-W27-1	Xylenes (total)	7/01/92	5			U	ppb	5	SW-846 8240
299-W27-1	Xylenes (total)	10/27/92	5			U	ppb	5	SW-846 8240
299-W27-1	Xylenes (total)	12/29/92	5			U	ppb	5	SW-846 8240
299-W27-1	Xylenes (total)	4/12/93	5			U	ppb	5	SW-846 8240
299-W27-1	Zinc	1/15/88	5			U	ppb		
299-W27-1	Zinc	1/11/90	31	6			ppb		
299-W27-1	Zinc, filtered	3/09/87	7		Y		ppb	10	SW-846 6010

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Well	Constituent Name	Collect Date	Result	Error	Filtered	Qualifier	Units	CRQL	Method Name
A1-69	299-W27-1	Zinc, filtered	4/17/87	6	Y		ppb	10	SW-846 6010
	299-W27-1	Zinc, filtered	7/24/87	5	Y	U	ppb	10	SW-846 6010
	299-W27-1	Zinc, filtered	10/15/87	5	Y	U	ppb	10	SW-846 6010
	299-W27-1	Zinc, filtered	1/15/88	5	Y	U	ppb	10	SW-846 6010
	299-W27-1	Zinc, filtered	8/18/88	5	Y	U	ppb	10	SW-846 6010
	299-W27-1	Zinc, filtered	12/12/88	8	Y		ppb	10	SW-846 6010
	299-W27-1	Zinc, filtered	1/11/90	27	6 Y		ppb	10	SW-846 6010
	299-W27-1	Zinc, filtered	4/12/90	30	6 Y		ppb	10	SW-846 6010
	299-W27-1	Zinc, filtered	4/12/90	30	6 Y		ppb	10	SW-846 6010
	299-W27-1	Zinc, filtered	2/03/92	37	5 Y		ppb	10	SW-846 6010
	299-W27-1	Zinc, filtered	3/23/92	10	Y	U	ppb	10	SW-846 6010
	299-W27-1	Zinc, filtered	7/01/92	10	Y	U	ppb	10	SW-846 6010
	299-W27-1	Zinc, filtered	10/27/92	10	Y	U	ppb	10	SW-846 6010
	299-W27-1	Zinc, filtered	12/29/92	10	Y	U	ppb	10	SW-846 6010
	299-W27-1	Zinc, filtered	4/12/93	10	Y	U	ppb	10	SW-846 6010
	299-W27-1	Zirconium	1/11/90	50	7	U	ppb		
	299-W27-1	Zirconium	1/11/90	50	7 Y	U	ppb		SW-846 6010
	299-W27-1	Zirconium	4/12/90	50	7 Y	U	ppb		SW-846 6010
	299-W27-1	Zirconium	4/12/90	50	7 Y	U	ppb		SW-846 6010
299-W27-1	allylchloride	1/11/90	100	35		U	ppb	100	SW-846 8240
299-W27-1	gamma-BHC (Lindane)	1/11/90	0	0		U	ppb	0	SW-846 8080
299-W27-1	m-dinitrobenzene	1/15/88	10			U	ppb	10	SW-846 8270
299-W27-1	m-dinitrobenzene	1/11/90	10	4		U	ppb	10	SW-846 8270
299-W27-1	o-Nitroaniline	1/11/90	10	4		U	ppb		
299-W27-1	o-Toluidine hydrochloride	1/15/88	10			U	ppb		
299-W27-1	o-Toluidine hydrochloride	1/11/90	10	4		U	ppb		

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Well	Constituent Name	Collect Date	Result	Error	Filtered	Qualifier	Units	CRQL	Method Name
299-W27-1	p-Benzoquinone	1/15/88	10			U	ppb		
299-W27-1	p-Benzoquinone	1/11/90	10	4		U	ppb		
299-W27-1	p-Dimethylaminoazobenzene	1/15/88	10			U	ppb		
299-W27-1	p-Dimethylaminoazobenzene	1/11/90	10	4		U	ppb		
299-W27-1	pH	3/09/87	8						
299-W27-1	pH	3/09/87	8						
299-W27-1	pH	4/17/87	8						
299-W27-1	pH	4/17/87	8						
299-W27-1	pH	7/24/87	7						
299-W27-1	pH	7/24/87	8						
299-W27-1	pH	10/15/87	7						
299-W27-1	pH	10/15/87	8						
299-W27-1	pH	1/15/88	8						
299-W27-1	pH	1/15/88	8						
299-W27-1	pH	8/18/88	8						
299-W27-1	pH	8/18/88	8						
299-W27-1	pH	12/12/88	8						
299-W27-1	pH	12/12/88	8						
299-W27-1	pH	1/11/90	8	0					
299-W27-1	pH	1/11/90	8						
299-W27-1	pH	4/12/90	8	0					
299-W27-1	pH	4/12/90	8						
299-W27-1	pH	1/14/92	8						
299-W27-1	pH	2/03/92	8				pH	0	Probe. pH ASTM D-1293
299-W27-1	pH	2/03/92	9					0	Probe. pH
299-W27-1	pH	3/23/92	8				pH		ASTM D-1293
299-W27-1	pH	3/23/92	8					0	Probe. pH
299-W27-1	pH	7/01/92	8					0	Probe. pH
299-W27-1	pH	7/01/92	8				pH		ASTM D-1293

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Well	Constituent Name	Collect Date	Result	Error	Filtered	Qualifier	Units	CRQL	Method Name
299-W27-1	pH	10/27/92	8					0	Probe, pH
299-W27-1	pH	10/27/92	8				pH		ASTM D-1293
299-W27-1	pH	12/29/92	8					0	Probe, pH
299-W27-1	pH	12/29/92	8				pH		ASTM D-1293
299-W27-1	pH	4/12/93	9				pH		ASTM D-1293
299-W27-1	pH	4/12/93	9					0	Probe, pH
299-W27-1	pH	7/20/93	8					0	Probe, pH
299-W27-1	pH	7/20/93	8				pH		ASTM D-1293
299-W27-1	sym-Trinitrobenzene	1/15/88	10			U	ppb		
299-W27-1	sym-Trinitrobenzene	1/11/90	10	4		U	ppb		
299-W27-1	trans-1,2-Dichloroethylene	7/24/87	10			U	ppb	5	SW-846 8240
299-W27-1	trans-1,2-Dichloroethylene	10/15/87	10			U	ppb	5	SW-846 8240
299-W27-1	trans-1,2-Dichloroethylene	1/15/88	10			U	ppb	5	SW-846 8240
299-W27-1	trans-1,2-Dichloroethylene	8/18/88	10			U	ppb	5	SW-846 8240
299-W27-1	trans-1,2-Dichloroethylene	1/11/90	5	2		U	ppb	5	SW-846 8240
299-W27-1	trans-1,2-Dichloroethylene	4/12/90	5	2		U	ppb	5	SW-846 8240
299-W27-1	trans-1,2-Dichloroethylene	2/03/92	5			U	ppb	5	SW-846 8240
299-W27-1	trans-1,2-Dichloroethylene	3/23/92	5			U	ppb	5	SW-846 8240
299-W27-1	trans-1,2-Dichloroethylene	7/01/92	5			U	ppb	5	SW-846 8240
299-W27-1	trans-1,2-Dichloroethylene	10/27/92	5			U	ppb	5	SW-846 8240
299-W27-1	trans-1,2-Dichloroethylene	12/29/92	5			U	ppb	5	SW-846 8240
299-W27-1	trans-1,4-dichloro-2-butene	7/24/87	10			U	ppb	5	SW-846 8240
299-W27-1	trans-1,4-dichloro-2-butene	10/15/87	10			U	ppb	5	SW-846 8240
299-W27-1	trans-1,4-dichloro-2-butene	1/15/88	10			U	ppb	5	SW-846 8240
299-W27-1	trans-1,4-dichloro-2-butene	8/18/88	10			U	ppb	5	SW-846 8240
299-W27-1	trans-1,4-dichloro-2-butene	1/11/90	10	4		U	ppb	5	SW-846 8240

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Summary of Provisional Hanford Site Groundwater Background Values^a
(Johnson, 1993b). (3 sheets)

Constituent (concentration)	PNL Results ^b	USGS Results ^b (sample size)	WHC Unconfined ^b (sample size)	WHC Provisional Threshold Values
Aluminum (ppb)	<2	110 ± 139 (12)	<200 (50)	<200
Ammonium (ppb)	<50	NA	<50 (18)	<120
Arsenic (ppb)	3.9±2.4	6.7 ± 3.7 (7)	<5 (14)	10
Barium (ppb)	42±20	53 ± 14 (11)	41±20 (53)	68.5
Beryllium (ppb)	<0.3	NA	<5 (16)	<5
Bismuth (ppb)	<0.02	NA	<5 (4)	<5
Boron (ppb)	<50	<50 (14)	<100 (35)	<100
Cadmium (ppb)	<0.2	<10 (1)	<10 (16)	<10
Calcium (ppb)	40,400 ± 10,300	40,857 ± 8,282 (14)	38,542 ± 11,023 (53)	63,600
Chloride-low (ppb)	NA	5,825 ± 1,355 (8)	5,032 ± 1,774 (53)	8,690
Chloride-high (ppb)	NA	20,667 ± 2,503 (6)	23,296 ± 2,463 (14)	28,500
Chloride-all (ppb)	10,300 ± 6,500	12,186 ± 7,842 (14)	8,848 ± 7,723 (67)	NC
Chromium (ppb)	4±2	<50 (11)	<30 (8)	<30
Copper (ppb)	<1	<10 (10)	<30 (50)	<30
Fluoride (ppb)	370 ± 100	550 ± 330 (14)	437 ± 131 ^c (47)	1,340 775 ^c
Iron-low (ppb)	NA	22 ± 16 ^c	<50 (34)	86
Iron-mid (ppb)	NA	NA	115 ± 52 (7)	291
Iron-high (ppb)	NA	NA	494 ± 118 (12)	818
Iron-all (ppb)	NA	NA	149 ± 199 (53)	NC
Lead (ppb)	<0.5	<30 ^c (6)	<5 (15)	<5
Magnesium (ppb)	11,800 ± 3,400	10,814 ± 1,813 (14)	11,190 ± 2,578 (14)	16,840
Manganese-low (ppb)	NA	26 ± 27 (8)	<20 (33)	24.5
Manganese-high (ppb)	NA	150 ± 87 (3)	118 ± 17 (20)	163.5

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Summary of Provisional Hanford Site Groundwater Background Values^a
(Johnson, 1993b). (3 sheets)

Constituent (concentration)	PNL Results ^b	USGS Results ^b (sample size)	WHC Unconfined ^b (sample size)	WHC Provisional Threshold Values
Manganese-all (ppb)	---	60 ± 73 (11)	50 ± 55 (53)	NC
Mercury (ppb)	---	NA	<0.1 (14)	<0.1
Nickel (ppb)	<4	<50 (14)	<30 (23)	<30
Nitrate (ppb)	NA	3,224 ± 3,380 (13)	5,170 ± 3,576 (78)	12,400
Phosphate (ppb)	<1000	140 ± 62 (3)	<1,000	<1,000
Potassium (ppb)	4,950 ± 1,240	5,900 ± 1,253 (14)	4,993 ± 1,453 (53)	7.975
Selenium (ppb)	<2	NA	<5 (14)	<5
Silver (ppb)	<10	NA	<10	<10
Silicon (ppb)	NA	16,786 ± 3,683 (14)	18,152 ± 4,974 (35)	26,500
Sodium (ppb)	18,260 ± 10,150	20,286 ± 7,907 (14)	15,774 ± 6,784 (53)	33,500
Strontium (ppb)	236 ± 102	159 ± 78 (14)	164 ± 47 (43)	264.1
Sulfate (ppb)	34,300 ± 16,900	41,286 ± 27,880 (14)	30,605 ± 22,611 (67)	90,500
Uranium (pCi/L)	1.7 ± 0.8	NA	1.7 ± 1.2 (10)	3.43
Vanadium (ppb)	17 ± 9	NA	9 ± 4 (18)	15
Zinc-low (ppb)	NA	14 ± 20 (11)	<50 (36)	<50
Zinc-high (ppb)	NA	373 ± 284 (3)	247 ± 165 (17)	673
Zinc-all (ppb)	6 ± 2	91 ± 190 (14)	95 ± 140 (53)	NC
Field alkalinity (ppb)	NA	134,100 ± 20,469 (10)	137,758 ± 33,656 (31)	215,000
Lab alkalinity (ppb)	123,000 ± 21,000	130,000 ± 8,165 (4)	133,717 ± 29,399 (52)	210,000
Field pH	NA	NA	7.57 ± 0.29 (57)	[6.90, 8.24]
Lab pH	7.64 ± 0.16	NA	7.75 ± 0.21 (52)	[7.25, 8.25]
Total organic carbon (ppb)	586 ± 347	NA	519 ± 367 ^c (62)	2,610 1,610 ^c

Summary of Provisional Hanford Site Groundwater Background Values^a
(Johnson, 1993b). (3 sheets)

Constituent (concentration)	PNL Results ^b	USGS Results ^b (sample size)	WHC Unconfined ^b (sample size)	WHC Provisional Threshold Values
Field conductivity (μ mhos/cm)	NA	NA	344 $\pm$ 83 (22)	539
Lab conductivity (μ mhos/cm)	380 $\pm$ 82	NA	332 $\pm$ 93 (36)	530
Total organic halogen, lower detection limit (ppb)	NA	NA	<20 ^c (14)	60.8 37.6 ^c
Total carbon (ppb)	NA	NA	31,772 $\pm$ 7,022 (48)	50,100
Gross alpha (pCi/L)	2.5 $\pm$ 1.4	NA	2.5 $\pm$ 1.5 ^c (36)	63 5.79 ^c
Gross beta (pCi/L)	19 $\pm$ 12	NA	7.1 $\pm$ 2.6 ^c (44)	35.5 12.62 ^c
Radium (pCi/L)	<0.2	NA	ND (10)	0.23

Note: Johnson, V. G., 1993, Westinghouse Hanford Company Operational Groundwater Status Report, WHC-EP-0595, Westinghouse Hanford Company, Richland, Washington.

^a Source: From Tables 5-9 and 5-11 (DOE-RL, 1992, Hanford Site Groundwater Background, DOE/RL-92-23, U.S. Department of Energy, Richland Operations Office, Richland, Washington).

^b Results shown are mean $\pm$ one standard deviation.

^c Potential outlier observation(s) were removed.

NA = not available.

NC = not calculated.

ND = not detected.

PNL = Pacific Northwest Laboratory.

ppb = parts per billion.

USGS = United States Geological Survey.

WHC = Westinghouse Hanford Company.

APPENDIX A-2

**GROUNDWATER DATA FOR SELECTED
UPGRADIENT WELLS (NEAR THE
216-S-26 CRIB LOCATION)**

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Analytical results for upgradient monitoring wells near the 216-S-26 Crib location are listed by well number, constituent name, and sampling date on pages A2-2 through A2-30. Results are reported in the Hanford Environmental Information System (HEIS) database, which was queried for results in July of 1993. The time period covered by these results goes from January of 1986 through July of 1993.

Qualifiers

Qualifiers concerning the data are indicated with a letter code in the seventh column and are defined as follows:

- B - Blank associated with analyte is elevated in concentration
- D - Sample was diluted before analysis
- E - Concentration is out of instrument calibration range
- J - Concentration is estimated
- U - Analyte concentration is below contract required quantification limit
- H - Laboratory holding time exceeded
- R - Suspect data; currently under review
- Q - Result associated with suspect quality control data
- P - Potential problem.

It should also be noted that not all of the data in the table were reviewed at the time this report was prepared. Thus, some unflagged "suspect" data may exist in the table.

Significant Figures

No more than three significant figures are justified; any additional places are database format related.

Natural Background Reference Levels

A summary of provisional background concentrations for naturally occurring constituents is provided on pages A2-31 through A2-33. Monitoring results listed on pages A2-2 through A2-30 can be compared with either the average natural background concentrations or with the provisional threshold values (columns 4 and 5, respectively, pages A2-31 through A2-33). The latter represent the upper range of naturally occurring concentrations that are considered likely to occur at the Hanford Site based on currently available data. A major sampling effort is underway to better define both soil and groundwater natural background for the Hanford Site.

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Groundwater Well Results for the 216-S-26 Crib

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Well	Constituent Name	Collect Date	Result	Error	Filtered	Qualifier	Units	CRQL	Method Name
299-W22-10	Chloride	4/02/90	13200	1390			ppb		EPA 300.0
299-W22-10	Chloride	6/04/92	7900	2660			ppb	200	ASTM D-4327-88
299-W22-10	Gross alpha	6/27/86	2			U	pCi/L		
299-W22-10	Gross alpha	11/06/86	1			U	pCi/L		
299-W22-10	Gross alpha	1/28/87	-0	0		U	pCi/L		
299-W22-10	Gross alpha	1/28/87	0	0		U	pCi/L		
299-W22-10	Gross alpha	6/29/87	-0	0		U	pCi/L		
299-W22-10	Gross alpha	9/23/87	0	0		U	pCi/L		
299-W22-10	Gross alpha	11/01/87	0	0		U	pCi/L		
299-W22-10	Gross alpha	2/28/88	-0	0		U	pCi/L		
299-W22-10	Gross alpha	5/17/88	0	0			pCi/L		
299-W22-10	Gross alpha	7/27/88	0	0		U	pCi/L		
299-W22-10	Gross alpha	11/28/88	0	0		U	pCi/L		
299-W22-10	Gross alpha	2/15/89	8	3			pCi/L		
299-W22-10	Gross alpha	4/02/90	0	1		U	pCi/L		
299-W22-10	Gross beta	1/28/87	120	13			pCi/L		
299-W22-10	Gross beta	6/29/87	86	10			pCi/L		
299-W22-10	Gross beta	9/23/87	82	10			pCi/L		
299-W22-10	Gross beta	11/01/87	66	8			pCi/L		
299-W22-10	Gross beta	2/28/88	42	6			pCi/L		
299-W22-10	Gross beta	5/17/88	55	7			pCi/L		
299-W22-10	Gross beta	7/27/88	65	8			pCi/L		
299-W22-10	Gross beta	11/28/88	33	5			pCi/L		
299-W22-10	Gross beta	2/15/89	60	7			pCi/L		
299-W22-10	Gross beta	4/02/90	35	5			pCi/L		

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Groundwater Well Results for the 216-S-26 Crib

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Well	Constituent Name	Collect Date	Result	Error	Filtered	Qualifier	Units	CRQL	Method Name
299-W22-10	Nitrate	4/02/90	500	84		U	ppb		EPA 300.0
299-W22-10	Nitrate	6/04/92	5100	2870			ppb	200	ASTM D-4327-88
299-W22-10	Specific conductance	4/02/90	177	18			umhos		ASTM D-1125-A
299-W22-10	Specific conductance	4/02/90	194				umhos		
299-W22-10	Specific conductance	6/04/92	385				umhos	1	Probe, Conductivity
A2-3	Strontium-90	6/27/86	36				pCi/L		
299-W22-10	Strontium-90	1/28/87	62	16			pCi/L		
299-W22-10	Strontium-90	1/28/87	94	24			pCi/L		
299-W22-10	Strontium-90	6/29/87	41	11			pCi/L		
299-W22-10	Strontium-90	9/23/87	28	7			pCi/L		
299-W22-10	Strontium-90	11/01/87	33	9			pCi/L		
299-W22-10	Strontium-90	2/28/88	26	7			pCi/L		
299-W22-10	Strontium-90	5/17/88	20	5			pCi/L		
299-W22-10	Strontium-90	7/27/88	25	5			pCi/L		
299-W22-10	Strontium-90	11/28/88	17	4			pCi/L		
299-W22-10	Strontium-90	2/15/89	30	6			pCi/L		
299-W22-10	Strontium-90	4/02/90	13	3			pCi/L		
299-W22-10	Sulfate	4/02/90	500	67		U	ppb		EPA 300.0
299-W22-10	Sulfate	6/04/92	15000	14500			ppb	500	ASTM D-4327-88
299-W22-10	Tritium	1/28/87	483000	24400			pCi/L		

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Groundwater Well Results for the 216-S-26 Crib

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Well	Constituent Name	Collect Date	Result	Error	Filtered	Qualifier	Units	CRQL	Method Name
299-W22-10	Tritium	9/23/87	130000	6730			pCi/L		
299-W22-10	Tritium	2/28/88	121000	9070			pCi/L		
299-W22-10	Tritium	7/27/88	93700	7090			pCi/L		
299-W22-10	Tritium	4/02/90	96400	7180			pCi/L		
299-W22-10	Tritium	6/04/92	1280	298			pCi/L	500	ITAS H-3
299-W22-10	Uranium	1/28/87	0	0			pCi/L		
299-W22-10	Uranium	9/23/87	1	0			pCi/L		
299-W22-10	Uranium	2/28/88	0	0		U	pCi/L		
299-W22-10	Uranium	7/27/88	0	0		U	pCi/L		
299-W22-10	pH	4/02/90	8	0					
299-W22-10	pH	4/02/90	8						
299-W22-10	pH	6/04/92	8					0	Probe, pH
299-W22-12	Barium	12/14/90	0				ppb	20	SW-846 6010
299-W22-12	Barium, filtered	8/24/88	34		Y		ppb	20	SW-846 6010
299-W22-12	Barium, filtered	12/14/88	31		Y		ppb	20	SW-846 6010
299-W22-12	Calcium	12/14/90	23				ppb	100	SW-846 6010

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Groundwater Well Results for the 216-S-26 Crib

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Well	Constituent Name	Collect Date	Result	Error	Filtered	Qualifier	Units	CRQL	Method Name
299-W22-12	Calcium, filtered	8/24/88	25100		Y		ppb	100	SW-846 6010
299-W22-12	Calcium, filtered	12/14/88	28000		Y		ppb	100	SW-846 6010
299-W22-12	Chloride	3/16/87	7360				ppb		EPA 300.0
299-W22-12	Chloride	5/28/87	6160				ppb		EPA 300.0
299-W22-12	Chloride	8/18/87	6250				ppb		EPA 300.0
299-W22-12	Chloride	8/24/88	6180				ppb		EPA 300.0
299-W22-12	Chloride	12/14/88	5900				ppb		EPA 300.0
299-W22-12	Chloride	5/17/90	5600	570			ppb		EPA 300.0
299-W22-12	Chloride	6/19/92	3800	1280			ppb	200	ASTM D-4327-88
299-W22-12	Gross alpha	3/16/87	2	1			pCi/L		
299-W22-12	Gross alpha	5/28/87	2	1			pCi/L		
299-W22-12	Gross alpha	8/18/87	2	1			pCi/L		
299-W22-12	Gross alpha	5/17/90	2	1			pCi/L		
299-W22-12	Gross alpha	5/17/90	2	1			pCi/L		
299-W22-12	Gross beta	3/04/86	10	3			pCi/L		
299-W22-12	Gross beta	6/30/86	7	2			pCi/L		
299-W22-12	Gross beta	1/19/87					pCi/L		
299-W22-12	Gross beta	3/16/87	8	4			pCi/L		
299-W22-12	Gross beta	5/28/87	7	3			pCi/L		
299-W22-12	Gross beta	5/28/87	7	2			pCi/L		
299-W22-12	Gross beta	8/18/87	7	2			pCi/L		
299-W22-12	Gross beta	8/18/87	7	4			pCi/L		
299-W22-12	Gross beta	11/01/87	6	2			pCi/L		
299-W22-12	Gross beta	2/22/88	7	2			pCi/L		

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Well	Constituent Name	Collect Date	Result	Error	Filtered	Qualifier	Units	CRQL	Method Name
299-W22-12	Gross beta	9/27/88	5	2			pCi/L		
299-W22-12	Gross beta	5/17/90	10	3			pCi/L		
299-W22-12	Gross beta	5/17/90	10	3			pCi/L		
299-W22-12	Nitrate	3/04/86	3	1			ppm		
299-W22-12	Nitrate	6/30/86	5	1			ppm		
299-W22-12	Nitrate	1/19/87					ppb		EPA 300.0
299-W22-12	Nitrate	3/16/87	3920				ppb		EPA 300.0
299-W22-12	Nitrate	5/28/87	3320				ppb		EPA 300.0
299-W22-12	Nitrate	5/28/87	3560				ppb		EPA 300.0
299-W22-12	Nitrate	8/18/87	3040				ppb		EPA 300.0
299-W22-12	Nitrate	8/18/87	3060				ppb		EPA 300.0
299-W22-12	Nitrate	11/01/87	2810				ppb		EPA 300.0
299-W22-12	Nitrate	2/22/88	2770				ppb		EPA 300.0
299-W22-12	Nitrate	8/24/88	2280				ppb		EPA 300.0
299-W22-12	Nitrate	9/27/88	2500			U	ppb		EPA 300.0
299-W22-12	Nitrate	12/14/88	2400				ppb		EPA 300.0
299-W22-12	Nitrate	5/17/90	1300	148			ppb		EPA 300.0
299-W22-12	Nitrate	5/17/90	1400	157			ppb		EPA 300.0
299-W22-12	Nitrate	6/19/92	2000	1130			ppb	200	ASTM D-4327-88
299-W22-12	Sodium	12/14/90	18				ppb	300	SW-846 6010
299-W22-12	Sodium, filtered	8/24/88	19900		Y		ppb	300	SW-846 6010
299-W22-12	Sodium, filtered	12/14/88	18500		Y		ppb	300	SW-846 6010

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Groundwater Well Results for the 216-S-26 Crib

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Well	Constituent Name	Collect Date	Result	Error	Filtered	Qualifier	Units	CRQL	Method Name
299-W22-12	Specific conductance	3/16/87	244				umhos		
299-W22-12	Specific conductance	5/28/87	283				umhos		
299-W22-12	Specific conductance	8/18/87	258				umhos		
299-W22-12	Specific conductance	8/24/88	228				umhos		
299-W22-12	Specific conductance	12/14/88	1208				umhos		
299-W22-12	Specific conductance	5/16/90	312				umhos		
299-W22-12	Specific conductance	5/17/90	298	31			umhos		ASTM D-1125-A
299-W22-12	Specific conductance	12/14/90	277				umhos		
299-W22-12	Specific conductance	6/19/92	231				umhos		1 Probe, Conductivity
A2-7 299-W22-12	Strontium, filtered	8/24/88	136		Y		ppb		SW-846 6010
299-W22-12	Strontium, filtered	12/14/88	126		Y		ppb		SW-846 6010
299-W22-12	Strontium-90	3/04/86	-0	1		U	pCi/L		
299-W22-12	Strontium-90	6/30/86	-0	1		U	pCi/L		
299-W22-12	Strontium-90	1/19/87					pCi/L		
299-W22-12	Strontium-90	8/18/87	0	1		U	pCi/L		
299-W22-12	Strontium-90	2/22/88	0	1		U	pCi/L		
299-W22-12	Strontium-90	9/27/88	-0	1		U	pCi/L		
299-W22-12	Strontium-90	12/14/90	0	1		U	pCi/L	5	ITAS Sr-90
299-W22-12	Sulfate	3/16/87	20600				ppb		EPA 300.0
299-W22-12	Sulfate	5/28/87	19900				ppb		EPA 300.0
299-W22-12	Sulfate	8/18/87	18900				ppb		EPA 300.0
299-W22-12	Sulfate	8/24/88	21600				ppb		EPA 300.0
299-W22-12	Sulfate	12/14/88	18500				ppb		EPA 300.0
299-W22-12	Sulfate	5/17/90	18000	1800			ppb		EPA 300.0

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Groundwater Well Results for the 216-S-26 Crib

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Well	Constituent Name	Collect Date	Result	Error	Filtered	Qualifier	Units	CRQL	Method Name
299-W22-12	Sulfate	5/17/90	18300	1830			ppb		EPA 300.0
299-W22-12	Sulfate	6/19/92	15000	14500			ppb	500	ASTM D-4327-88
299-W22-12	Tritium	3/04/86	76100	5430			pCi/L		
299-W22-12	Tritium	6/30/86	519	1700		U	pCi/L		
299-W22-12	Tritium	1/19/87					pCi/L		
299-W22-12	Tritium	5/28/87	17800	2200			pCi/L		
299-W22-12	Tritium	8/18/87	33600	1900			pCi/L		
299-W22-12	Tritium	11/01/87	26900	1580			pCi/L		
299-W22-12	Tritium	2/22/88	25200	2130			pCi/L		
299-W22-12	Tritium	9/27/88	20100	1750			pCi/L		
299-W22-12	Tritium	12/14/90	14000	1167			pCi/L	500	ITAS H-3
299-W22-12	Tritium	6/19/92	97100	7239			pCi/L	500	ITAS H-3
299-W22-12	Uranium	8/18/87	1	0			pCi/L		
299-W22-12	Uranium	2/22/88	1	0			pCi/L		
299-W22-12	Uranium	9/27/88	1	0			pCi/L		
299-W22-12	Uranium	12/14/90	1	0			ppb	1	ITAS Gross U
299-W22-12	Vanadium, filtered	8/24/88	25		Y		ppb	30	SW-846 6010
299-W22-12	Vanadium, filtered	12/14/88	19		Y		ppb	30	SW-846 6010
299-W22-12	Zinc	12/14/90				U	ppb	10	SW-846 6010
299-W22-12	Zinc, filtered	8/24/88	5		Y	U	ppb	10	SW-846 6010

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Groundwater Well Results for the 216-S-26 Crib

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Well	Constituent Name	Collect Date	Result	Error	Filtered	Qualifier	Units	CRQL	Method Name
299-W22-12	Zinc, filtered	12/14/88	45		Y		ppb	10	SW-846 6010
299-W22-12	pH	3/16/87	8						
299-W22-12	pH	3/16/87	8						
299-W22-12	pH	5/28/87	8						
299-W22-12	pH	5/28/87	8						
299-W22-12	pH	8/18/87	6						
299-W22-12	pH	8/18/87	8						
299-W22-12	pH	8/24/88	8						
299-W22-12	pH	8/24/88	8						
299-W22-12	pH	12/14/88	8						
299-W22-12	pH	5/17/90	8	0					
299-W22-12	pH	5/17/90	8						
299-W22-12	pH	12/14/90	8						
299-W22-12	pH	6/19/92	8					0	Probe, pH
299-W22-20	Barium	3/02/88	103				ppb		
299-W22-20	Barium	10/03/91	48	7			ppb	20	SW-846 6010
299-W22-20	Barium	1/07/92	130	18			ppb	20	SW-846 6010
299-W22-20	Barium, filtered	3/02/88	55		Y		ppb	20	SW-846 6010
299-W22-20	Barium, filtered	8/24/88	55		Y		ppb	20	SW-846 6010
299-W22-20	Barium, filtered	12/14/88	43		Y		ppb	20	SW-846 6010
299-W22-20	Barium, filtered	2/21/90	49	6	Y		ppb	20	SW-846 6010
299-W22-20	Barium, filtered	1/07/92	52	7	Y		ppb	20	SW-846 6010

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Well	Constituent Name	Collect Date	Result	Error	Filtered	Qualifier	Units	CRQL	Method Name
299-W22-20	Calcium	3/02/88	88200				ppb		
299-W22-20	Calcium	10/03/91	83000				ppb	100	SW-846 6010
299-W22-20	Calcium	1/07/92	92000				ppb	100	SW-846 6010
299-W22-20	Calcium, filtered	3/02/88	89200		Y		ppb	100	SW-846 6010
299-W22-20	Calcium, filtered	8/24/88	89400		Y		ppb	100	SW-846 6010
299-W22-20	Calcium, filtered	12/14/88	97600		Y		ppb	100	SW-846 6010
299-W22-20	Calcium, filtered	2/21/90	76300	9790	Y		ppb	100	SW-846 6010
299-W22-20	Calcium, filtered	1/07/92	88000		Y		ppb	100	SW-846 6010
299-W22-20	Chloride	5/28/87	29700				ppb		EPA 300.0
299-W22-20	Chloride	8/18/87	30500				ppb		EPA 300.0
299-W22-20	Chloride	12/09/87	44900				ppb		EPA 300.0
299-W22-20	Chloride	3/02/88	33200				ppb		EPA 300.0
299-W22-20	Chloride	8/24/88	26700				ppb		EPA 300.0
299-W22-20	Chloride	12/14/88	25900				ppb		EPA 300.0
299-W22-20	Chloride	2/21/90	25800	2650			ppb		EPA 300.0
299-W22-20	Chloride	1/18/91	22				ppm		PNL Anions
299-W22-20	Chloride	4/01/91	21				ppm		PNL Anions
299-W22-20	Chloride	6/18/91	24				ppm		PNL Anions
299-W22-20	Chloride	9/04/91	25				ppm		PNL Anions
299-W22-20	Chloride	12/04/91	25000	8420			ppb	200	ASTM D-4327-88
299-W22-20	Chloride	1/07/92	30000	10100			ppb	200	ASTM D-4327-88
299-W22-20	Chloride	5/12/92	24000	8080			ppb	200	ASTM D-4327-88
299-W22-20	Chloride	8/19/92	26000	8750			ppb	200	ASTM D-4327-88

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Well	Constituent Name	Collect Date	Result	Error	Filtered	Qualifier	Units	CRQL	Method Name
299-W22-20	Gross alpha	5/28/87	16	5			pCi/L		
299-W22-20	Gross alpha	8/18/87	11	5			pCi/L		
299-W22-20	Gross alpha	12/09/87	16	6			pCi/L		
299-W22-20	Gross alpha	2/21/90	12	4			pCi/L		
299-W22-20	Gross alpha	8/06/90	4	2		U	pCi/L	4	SW-846 9310, Alpha
299-W22-20	Gross alpha	10/16/90	6	2			pCi/L	4	SW-846 9310, Alpha
299-W22-20	Gross alpha	1/18/91	22	9			pCi/L	4	SW-846 9310, Alpha
299-W22-20	Gross alpha	4/01/91	5	2			pCi/L	4	SW-846 9310, Alpha
299-W22-20	Gross alpha	6/18/91	8	5			pCi/L	4	SW-846 9310, Alpha
299-W22-20	Gross alpha	9/04/91	3	2			pCi/L	4	SW-846 9310, Alpha
299-W22-20	Gross alpha	10/03/91	4	2			pCi/L	4	SW-846 9310, Alpha
299-W22-20	Gross alpha	12/04/91	11	5			pCi/L	4	SW-846 9310, Alpha
299-W22-20	Gross alpha	5/12/92	49	27			pCi/L	4	SW-846 9310, Alpha
299-W22-20	Gross alpha	8/19/92	7	3			pCi/L	4	SW-846 9310, Alpha
299-W22-20	Gross alpha	11/17/92	8	6			pCi/L	4	SW-846 9310, Alpha
299-W22-20	Gross beta	3/04/86	53	7			pCi/L		
299-W22-20	Gross beta	4/29/86	43	6			pCi/L		
299-W22-20	Gross beta	7/31/86	40	6			pCi/L		
299-W22-20	Gross beta	10/30/86	44	7			pCi/L		
299-W22-20	Gross beta	1/26/87	41	6			pCi/L		
299-W22-20	Gross beta	5/28/87	43	6			pCi/L		
299-W22-20	Gross beta	5/28/87	44	8			pCi/L		
299-W22-20	Gross beta	8/18/87	36	10			pCi/L		
299-W22-20	Gross beta	8/18/87	37	6			pCi/L		
299-W22-20	Gross beta	12/09/87	33	5			pCi/L		
299-W22-20	Gross beta	12/09/87	43	12			pCi/L		
299-W22-20	Gross beta	2/22/88	31	5			pCi/L		
299-W22-20	Gross beta	9/28/88	32	5			pCi/L		

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Well	Constituent Name	Collect Date	Result	Error	Filtered	Qualifier	Units	CRQL	Method Name
299-W22-20	Gross beta	2/21/90	20	4			pCi/L		
299-W22-20	Gross beta	8/06/90	21	4			pCi/L	8	SW-846 9310, Beta
299-W22-20	Gross beta	10/16/90	35	5			pCi/L	8	SW-846 9310, Beta
299-W22-20	Gross beta	1/18/91	51	7			pCi/L	8	SW-846 9310, Beta
299-W22-20	Gross beta	4/01/91	30	5			pCi/L	8	SW-846 9310, Beta
299-W22-20	Gross beta	6/18/91	-6	3		U	pCi/L	8	SW-846 9310, Beta
299-W22-20	Gross beta	9/04/91	37	6			pCi/L	8	SW-846 9310, Beta
299-W22-20	Gross beta	10/03/91	36	5			pCi/L	8	SW-846 9310, Beta
299-W22-20	Gross beta	12/04/91	26	4			pCi/L	8	SW-846 9310, Beta
299-W22-20	Gross beta	5/12/92	66	14			pCi/L	8	SW-846 9310, Beta
299-W22-20	Gross beta	8/19/92	34	5			pCi/L	8	SW-846 9310, Beta
299-W22-20	Gross beta	11/17/92	38	6			pCi/L	8	SW-846 9310, Beta
299-W22-20	Nitrate	5/28/87	123000				ppb		EPA 300.0
299-W22-20	Nitrate	8/18/87	131000				ppb		EPA 300.0
299-W22-20	Nitrate	12/09/87	131000				ppb		EPA 300.0
299-W22-20	Nitrate	2/22/88	122000				ppb		EPA 300.0
299-W22-20	Nitrate	3/02/88	124000				ppb		EPA 300.0
299-W22-20	Nitrate	8/24/88	199000				ppb		EPA 300.0
299-W22-20	Nitrate	9/28/88	132000				ppb		EPA 300.0
299-W22-20	Nitrate	12/14/88	140000				ppb		EPA 300.0
299-W22-20	Nitrate	2/21/90	142000	14300			ppb		EPA 300.0
299-W22-20	Nitrate	1/18/91	122				ppm		PNL Anions
299-W22-20	Nitrate	4/01/91	132				ppm		PNL Anions
299-W22-20	Nitrate	6/18/91	136				ppm		PNL Anions
299-W22-20	Nitrate	9/04/91	136				ppm		PNL Anions
299-W22-20	Nitrate	10/03/91	145000				ppb	200	EPA Method 300.0
299-W22-20	Nitrate	12/04/91	28000	15800			ppb	200	ASTM D-4327-88
299-W22-20	Nitrate	1/07/92	110000	61900			ppb	200	ASTM D-4327-88

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Well	Constituent Name	Collect Date	Result	Error	Filtered	Qualifier	Units	CRQL	Method Name
299-W22-20	Nitrate	5/12/92	100000	56300			ppb	200	ASTM D-4327-88
299-W22-20	Nitrate	8/19/92	120000	67500			ppb	200	ASTM D-4327-88
299-W22-20	Selenium	3/02/88	14				ppb		
299-W22-20	Selenium	1/07/92	10			U	ppb	10	SW-846 7740
299-W22-20	Selenium, filtered	3/02/88	8		Y		ppb	10	SW-846 7740
299-W22-20	Selenium, filtered	1/07/92	10		Y	U	ppb	10	SW-846 7740
299-W22-20	Sodium	3/02/88	54600				ppb		
299-W22-20	Sodium	10/03/91	52000				ppb	300	SW-846 6010
299-W22-20	Sodium	1/07/92	56000				ppb	300	SW-846 6010
299-W22-20	Sodium, filtered	3/02/88	53500		Y		ppb	300	SW-846 6010
299-W22-20	Sodium, filtered	8/24/88	55600		Y		ppb	300	SW-846 6010
299-W22-20	Sodium, filtered	12/14/88	48900		Y		ppb	300	SW-846 6010
299-W22-20	Sodium, filtered	2/21/90	53400	5980	Y		ppb	300	SW-846 6010
299-W22-20	Sodium, filtered	1/07/92	55000		Y		ppb	300	SW-846 6010
299-W22-20	Specific conductance	5/28/87	825				umhos		
299-W22-20	Specific conductance	8/18/87	783				umhos		
299-W22-20	Specific conductance	12/09/87	658				umhos		
299-W22-20	Specific conductance	3/02/88	820				umhos		
299-W22-20	Specific conductance	8/24/88	679				umhos		
299-W22-20	Specific conductance	12/14/88	1815				umhos		

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Well	Constituent Name	Collect Date	Result	Error	Filtered	Qualifier	Units	CRQL	Method Name
A2-14	299-W22-20	Specific conductance	2/21/90	659			umhos		
	299-W22-20	Specific conductance	2/21/90	841	86		umhos		ASTM D-1125-A
	299-W22-20	Specific conductance	8/06/90	917			umhos		
	299-W22-20	Specific conductance	10/16/90	872			umhos		
	299-W22-20	Specific conductance	1/18/91	820			umhos		
	299-W22-20	Specific conductance	4/01/91	871			umhos		
	299-W22-20	Specific conductance	6/18/91	970			umhos	1	Probe, Conductivity
	299-W22-20	Specific conductance	9/04/91	875			umhos	1	Probe, Conductivity
	299-W22-20	Specific conductance	10/03/91	900			umhos	1	Probe, Conductivity
	299-W22-20	Specific conductance	12/04/91	808			umhos	1	Probe, Conductivity
	299-W22-20	Specific conductance	1/07/92	893			umhos	1	Probe, Conductivity
	299-W22-20	Specific conductance	5/12/92	871			umhos	1	Probe, Conductivity
	299-W22-20	Specific conductance	8/19/92	876			umhos	1	Probe, Conductivity
	299-W22-20	Specific conductance	11/17/92	790			umhos	1	Probe, Conductivity
299-W22-20	Strontium	3/02/88	402				ppb		
299-W22-20	Strontium, filtered	3/02/88	399		Y		ppb		SW-846 6010
299-W22-20	Strontium, filtered	8/24/88	420		Y		ppb		SW-846 6010
299-W22-20	Strontium, filtered	12/14/88	390		Y		ppb		SW-846 6010
299-W22-20	Strontium, filtered	2/21/90	394	48	Y		ppb		SW-846 6010
299-W22-20	Strontium-90	3/04/86	0	1		U	pCi/L		
299-W22-20	Strontium-90	4/29/86	1	1		U	pCi/L		
299-W22-20	Strontium-90	7/31/86	0	1		U	pCi/L		
299-W22-20	Strontium-90	10/30/86	0	1		U	pCi/L		
299-W22-20	Strontium-90	1/26/87	1	1			pCi/L		

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Well	Constituent Name	Collect Date	Result	Error	Filtered	Qualifier	Units	CRQL	Method Name
299-W22-20	Strontium-90	8/18/87	-0	1		U	pCi/L		
299-W22-20	Strontium-90	2/22/88	-0	1		U	pCi/L		
299-W22-20	Strontium-90	9/28/88	-1	1		U	pCi/L		
299-W22-20	Strontium-90	2/21/90	-0	1		U	pCi/L		
299-W22-20	Strontium-90	2/21/90	-0	1		U	pCi/L		
299-W22-20	Sulfate	5/28/87	149000				ppb		EPA 300.0
299-W22-20	Sulfate	8/18/87	170000				ppb		EPA 300.0
299-W22-20	Sulfate	12/09/87	170000				ppb		EPA 300.0
299-W22-20	Sulfate	3/02/88	147000				ppb		EPA 300.0
299-W22-20	Sulfate	8/24/88	143000				ppb		EPA 300.0
299-W22-20	Sulfate	12/14/88	139000				ppb		EPA 300.0
299-W22-20	Sulfate	2/21/90	151000	15100			ppb		EPA 300.0
299-W22-20	Sulfate	1/18/91	157				ppm		PNL Anions
299-W22-20	Sulfate	4/01/91	156				ppm		PNL Anions
299-W22-20	Sulfate	6/18/91	161				ppm		PNL Anions
299-W22-20	Sulfate	9/04/91	155				ppm		PNL Anions
299-W22-20	Sulfate	12/04/91	150000	145000			ppb	500	ASTM D-4327-88
299-W22-20	Sulfate	1/07/92	140000	135000			ppb	500	ASTM D-4327-88
299-W22-20	Sulfate	5/12/92	130000	125000			ppb	500	ASTM D-4327-88
299-W22-20	Sulfate	8/19/92	150000	145000			ppb	500	ASTM D-4327-88
299-W22-20	Tritium	3/04/86	724000	37800			pCi/L		
299-W22-20	Tritium	4/29/86	747000	38900			pCi/L		
299-W22-20	Tritium	7/31/86	605000	32300			pCi/L		
299-W22-20	Tritium	10/30/86	362000	20100			pCi/L		
299-W22-20	Tritium	1/26/87	268000	14800			pCi/L		
299-W22-20	Tritium	5/28/87	262000	14300			pCi/L		

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Well	Constituent Name	Collect Date	Result	Error	Filtered	Qualifier	Units	CRQL	Method Name
A2-16	299-W22-20	Tritium	8/18/87	258000	13100		pCi/L		
	299-W22-20	Tritium	12/09/87	233000	17200		pCi/L		
	299-W22-20	Tritium	2/22/88	200000	14900		pCi/L		
	299-W22-20	Tritium	9/28/88	193000	14300		pCi/L		
	299-W22-20	Tritium	2/21/90	216000	16000		pCi/L		
	299-W22-20	Tritium	8/06/90	246000	18120		pCi/L	500	ITAS H-3
	299-W22-20	Tritium	10/16/90	275000	20200		pCi/L	500	ITAS H-3
	299-W22-20	Tritium	1/18/91	247000	18170		pCi/L	500	ITAS H-3
	299-W22-20	Tritium	4/01/91	310000	22710		pCi/L	500	ITAS H-3
	299-W22-20	Tritium	6/18/91	286000	20980		pCi/L	500	ITAS H-3
	299-W22-20	Tritium	9/04/91	295000	21650		pCi/L	500	ITAS H-3
	299-W22-20	Tritium	10/03/91	277000	20300		pCi/L	500	ITAS H-3
	299-W22-20	Tritium	12/04/91	265000	19520		pCi/L	500	ITAS H-3
	299-W22-20	Tritium	5/12/92	187000	13780		pCi/L	500	ITAS H-3
	299-W22-20	Tritium	8/19/92	286000	21020		pCi/L	500	ITAS H-3
	299-W22-20	Tritium	11/17/92	225000	16520		pCi/L	500	ITAS H-3
A2-16	299-W22-20	Uranium	1/26/87	5	1		pCi/L		
	299-W22-20	Uranium	8/18/87	4	1		pCi/L		
	299-W22-20	Uranium	2/22/88	7	2		pCi/L		
	299-W22-20	Uranium	9/28/88	6	2		pCi/L		
	299-W22-20	Uranium	2/21/90	7	2		pCi/L		
	299-W22-20	Uranium	2/21/90	7	2		pCi/L		
	299-W22-20	Uranium	8/06/90	12	4		ppb	1	ITAS Gross U
	299-W22-20	Uranium	6/18/91	10	3		ppb	1	ITAS Gross U
	299-W22-20	Uranium	9/04/91	12	4		ppb	1	ITAS Gross U
	299-W22-20	Uranium	10/03/91	6	2		ppb	1	ITAS Gross U
	299-W22-20	Uranium	5/12/92	12	3		ppb	1	ITAS Gross U
	299-W22-20	Uranium	8/19/92	8	1		ppb	1	ITAS Gross U

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Well	Constituent Name	Collect Date	Result	Error	Filtered	Qualifier	Units	CRQL	Method Name
299-W22-20	Uranium	11/17/92	8	2			ppb	1	ITAS Gross U
299-W22-20	Vanadium	3/02/88	21				ppb		
299-W22-20	Vanadium	10/03/91	30			U	ppb	30	SW-846 6010
299-W22-20	Vanadium	1/07/92	39	5			ppb	30	SW-846 6010
299-W22-20	Vanadium, filtered	3/02/88	8		Y		ppb	30	SW-846 6010
299-W22-20	Vanadium, filtered	8/24/88	19		Y		ppb	30	SW-846 6010
299-W22-20	Vanadium, filtered	12/14/88	12		Y		ppb	30	SW-846 6010
299-W22-20	Vanadium, filtered	2/21/90	16	4	Y		ppb	30	SW-846 6010
299-W22-20	Vanadium, filtered	1/07/92	30		Y	U	ppb	30	SW-846 6010
299-W22-20	Zinc	3/02/88	11				ppb		
299-W22-20	Zinc	10/03/91	10			U	ppb	10	SW-846 6010
299-W22-20	Zinc	1/07/92	54	7			ppb	10	SW-846 6010
299-W22-20	Zinc, filtered	3/02/88	5		Y	U	ppb	10	SW-846 6010
299-W22-20	Zinc, filtered	8/24/88	8		Y		ppb	10	SW-846 6010
299-W22-20	Zinc, filtered	12/14/88	31		Y		ppb	10	SW-846 6010
299-W22-20	Zinc, filtered	2/21/90	5	3	Y	U	ppb	10	SW-846 6010
299-W22-20	Zinc, filtered	1/07/92	13	2	Y		ppb	10	SW-846 6010
299-W22-20	pH	5/28/87	7						
299-W22-20	pH	5/28/87	8						
299-W22-20	pH	8/18/87	5						

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Well	Constituent Name	Collect Date	Result	Error	Filtered	Qualifier	Units	CRQL	Method Name
299-W22-20	pH	8/18/87	8						
299-W22-20	pH	12/09/87	7						
299-W22-20	pH	12/09/87	8						
299-W22-20	pH	3/02/88	7						
299-W22-20	pH	3/02/88	7						
299-W22-20	pH	8/24/88	7						
299-W22-20	pH	8/24/88	8						
299-W22-20	pH	12/14/88	8						
299-W22-20	pH	12/14/88	8						
299-W22-20	pH	2/21/90	8	0					
299-W22-20	pH	2/21/90	8						
299-W22-20	pH	8/06/90	8						
299-W22-20	pH	10/16/90	8						
299-W22-20	pH	1/18/91	7						
299-W22-20	pH	4/01/91	7						
299-W22-20	pH	6/18/91	9						0 Probe, pH
299-W22-20	pH	9/04/91	7						0 Probe, pH
299-W22-20	pH	10/03/91	7						0 Probe, pH
299-W22-20	pH	12/04/91	7						0 Probe, pH
299-W22-20	pH	1/07/92	7						0 Probe, pH
299-W22-20	pH	5/12/92	8						0 Probe, pH
299-W22-20	pH	8/19/92	8						0 Probe, pH
299-W22-20	pH	11/17/92	8						0 Probe, pH
299-W22-21	Barium	1/09/92	44	6			ppb	20	SW-846 6010

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Well	Constituent Name	Collect Date	Result	Error	Filtered	Qualifier	Units	CRQL	Method Name
299-W22-21	Barium, filtered	1/09/92	27	4	Y		ppb	20	SW-846 6010
299-W22-21	Calcium	1/09/92	32000				ppb	100	SW-846 6010
299-W22-21	Calcium, filtered	1/09/92	30000		Y		ppb	100	SW-846 6010
299-W22-21	Chloride	1/09/92	5600	1880			ppb	200	ASTM D-4327-88
A2-19 299-W22-21	Gross alpha	3/04/86	16	3			pCi/L		
299-W22-21	Gross alpha	5/22/86	28	5			pCi/L		
299-W22-21	Gross alpha	7/30/86	23	5			pCi/L		
299-W22-21	Gross alpha	10/30/86	23	4			pCi/L		
299-W22-21	Gross alpha	1/26/87	16	3			pCi/L		
299-W22-21	Gross alpha	5/17/87	15	3			pCi/L		
299-W22-21	Gross alpha	9/17/87	19	4			pCi/L		
299-W22-21	Gross alpha	12/01/87	16	3			pCi/L		
299-W22-21	Gross alpha	2/22/88	14	3			pCi/L		
299-W22-21	Gross alpha	9/28/88	12	3			pCi/L		
299-W22-21	Gross alpha	1/09/92	21	6			pCi/L	4	SW-846 9310, Alpha
299-W22-21	Gross beta	3/04/86	221	23			pCi/L		
299-W22-21	Gross beta	5/22/86	181	19			pCi/L		
299-W22-21	Gross beta	7/30/86	213	23			pCi/L		
299-W22-21	Gross beta	10/30/86	233	24			pCi/L		
299-W22-21	Gross beta	1/26/87	224	24			pCi/L		

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Well	Constituent Name	Collect Date	Result	Error	Filtered	Qualifier	Units	CRQL	Method Name
299-W22-21	Gross beta	5/17/87	180	19			pCi/L		
299-W22-21	Gross beta	9/17/87	198	21			pCi/L		
299-W22-21	Gross beta	12/01/87	185	20			pCi/L		
299-W22-21	Gross beta	2/22/88	170	18			pCi/L		
299-W22-21	Gross beta	9/28/88	164	18			pCi/L		
299-W22-21	Gross beta	1/09/92	131	13			pCi/L	8	SW-846 9310, Beta
299-W22-21	Nitrate	3/04/86	13	2			ppm		
299-W22-21	Nitrate	5/22/86	13	2			ppm		
299-W22-21	Nitrate	7/30/86	14	3			ppm		
299-W22-21	Nitrate	10/30/86	13700				ppb		EPA 300.0
299-W22-21	Nitrate	1/26/87	14200				ppb		EPA 300.0
299-W22-21	Nitrate	5/17/87	14000				ppb		EPA 300.0
299-W22-21	Nitrate	9/17/87	13000				ppb		EPA 300.0
299-W22-21	Nitrate	12/01/87	11200				ppb		EPA 300.0
299-W22-21	Nitrate	2/22/88	35300				ppb		EPA 300.0
299-W22-21	Nitrate	9/28/88	12700				ppb		EPA 300.0
299-W22-21	Nitrate	1/09/92	4000	2250			ppb	200	ASTM D-4327-88
299-W22-21	Selenium	1/09/92	10			U	ppb	10	SW-846 7740
299-W22-21	Selenium, filtered	1/09/92	10		Y	U	ppb	10	SW-846 7740
299-W22-21	Sodium	1/09/92	28000				ppb	300	SW-846 6010

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Well	Constituent Name	Collect Date	Result	Error	Filtered	Qualifier	Units	CRQL	Method Name
299-W22-21	Sodium, filtered	1/09/92	27000		Y		ppb	300	SW-846 6010
299-W22-21	Specific conductance	1/09/92	360				umhos	1	Probe, Conductivity
299-W22-21	Strontium-90	3/04/86	0	1		U	pCi/L		
299-W22-21	Strontium-90	5/22/86	0	1		U	pCi/L		
299-W22-21	Strontium-90	10/30/86	0	1		U	pCi/L		
299-W22-21	Strontium-90	1/26/87	1	1			pCi/L		
299-W22-21	Strontium-90	9/17/87	1	1		U	pCi/L		
299-W22-21	Strontium-90	2/22/88	-0	1		U	pCi/L		
299-W22-21	Strontium-90	9/28/88	-0	1		U	pCi/L		
299-W22-21	Sulfate	1/09/92	21000	20300			ppb	500	ASTM D-4327-88
299-W22-21	Tritium	1/09/92	76000	5729			pCi/L	500	ITAS H-3
299-W22-21	Uranium	1/26/87	15	6			pCi/L		
299-W22-21	Uranium	5/17/87	20	6			pCi/L		
299-W22-21	Uranium	9/17/87	20	6			pCi/L		
299-W22-21	Uranium	12/01/87	23	7			pCi/L		
299-W22-21	Uranium	1/09/92	30	8			ppb	1	ITAS Gross U
299-W22-21	Vanadium	1/09/92	38	5			ppb	30	SW-846 6010

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Well	Constituent Name	Collect Date	Result	Error	Filtered	Qualifier	Units	CRQL	Method Name
299-W22-21	Vanadium, filtered	1/09/92	30		Y	U	ppb	30	SW-846 6010
299-W22-21	Zinc	1/09/92	13	2			ppb	10	SW-846 6010
299-W22-21	Zinc, filtered	1/09/92	10		Y	U	ppb	10	SW-846 6010
299-W22-21	pH	1/09/92	8					0	Probe, pH
299-W22-7	Nitrate	3/26/86	6				ppm		
299-W22-7	Nitrate	11/06/86	1350				ppb		EPA 300.0
299-W22-7	Nitrate	1/26/87	1620				ppb		EPA 300.0
299-W22-7	Nitrate	9/17/87	2500			U	ppb		EPA 300.0
299-W22-7	Nitrate	2/22/88	2500			U	ppb		EPA 300.0
299-W22-7	Nitrate	9/27/88	2500			U	ppb		EPA 300.0
299-W22-7	Strontium-90	1/26/87	0	1		U	pCi/L		
299-W22-7	Strontium-90	9/17/87	-1	6		U	pCi/L		
299-W22-7	Strontium-90	2/22/88	-0	1		U	pCi/L		
299-W22-7	Strontium-90	9/27/88	1	1			pCi/L		
299-W22-7	Tritium	3/26/86	370000				pCi/L		
299-W22-7	Tritium	11/06/86	341000				pCi/L		

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Well	Constituent Name	Collect Date	Result	Error	Filtered	Qualifier	Units	CRCL	Method Name
299-W22-7	Tritium	1/26/87	412000	20800			pCi/L		
299-W22-7	Tritium	9/17/87	344000	17400			pCi/L		
299-W22-7	Tritium	2/22/88	364000	26800			pCi/L		
299-W22-7	Tritium	9/27/88	335000	24700			pCi/L		
299-W22-7	Uranium	1/26/87	1	0			pCi/L		
299-W22-7	Uranium	9/17/87	1	0			pCi/L		
299-W22-7	Uranium	2/22/88	1	0			pCi/L		
299-W22-7	Uranium	9/27/88	1	1			pCi/L		
299-W23-9	Chloride	4/06/90	2700	277			ppb		EPA 300.0
299-W23-9	Chloride	11/25/91	3300	1110			ppb	200	ASTM D-4327-88
299-W23-9	Chloride	4/27/92	4800	1620			ppb	200	ASTM D-4327-88
299-W23-9	Gross alpha	1/07/86	9	2			pCi/L		
299-W23-9	Gross alpha	2/07/86	10	2			pCi/L		
299-W23-9	Gross alpha	3/10/86	14	3			pCi/L		
299-W23-9	Gross alpha	4/08/86	22	4			pCi/L		
299-W23-9	Gross alpha	5/07/86	31	6			pCi/L		
299-W23-9	Gross alpha	6/05/86	22	4			pCi/L		
299-W23-9	Gross alpha	7/08/86	19	4			pCi/L		
299-W23-9	Gross alpha	9/03/86	31	6			pCi/L		
299-W23-9	Gross alpha	11/06/86	38	8			pCi/L		
299-W23-9	Gross alpha	11/25/86	59	11			pCi/L		
299-W23-9	Gross alpha	12/10/86	59	11			pCi/L		

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Well	Constituent Name	Collect Date	Result	Error	Filtered	Qualifier	Units	CRQL	Method Name
299-W23-9	Gross alpha	1/06/87	33	7			pCi/L		
299-W23-9	Gross alpha	2/11/87	48	9			pCi/L		
299-W23-9	Gross alpha	3/13/87	39	7			pCi/L		
299-W23-9	Gross alpha	4/19/87	24	5			pCi/L		
299-W23-9	Gross alpha	5/10/87	33	6			pCi/L		
299-W23-9	Gross alpha	6/09/87	27	5			pCi/L		
299-W23-9	Gross alpha	7/24/87	27	5			pCi/L		
299-W23-9	Gross alpha	8/19/87	14	3			pCi/L		
299-W23-9	Gross alpha	9/16/87	24	5			pCi/L		
299-W23-9	Gross alpha	10/13/87	19	4			pCi/L		
299-W23-9	Gross alpha	11/17/87	17	4			pCi/L		
299-W23-9	Gross alpha	12/11/87	22	4			pCi/L		
299-W23-9	Gross alpha	1/19/88	26	5			pCi/L		
299-W23-9	Gross alpha	2/17/88	19	4			pCi/L		
299-W23-9	Gross alpha	3/18/88	23	5			pCi/L		
299-W23-9	Gross alpha	4/11/88	19	4			pCi/L		
299-W23-9	Gross alpha	5/09/88	19	4			pCi/L		
299-W23-9	Gross alpha	6/15/88	20	4			pCi/L		
299-W23-9	Gross alpha	7/13/88	20	4			pCi/L		
299-W23-9	Gross alpha	8/12/88	18	4			pCi/L		
299-W23-9	Gross alpha	9/08/88	19	4			pCi/L		
299-W23-9	Gross alpha	10/18/88	21	4			pCi/L		
299-W23-9	Gross alpha	11/03/88	18	4			pCi/L		
299-W23-9	Gross alpha	1/05/89	57	10			pCi/L		
299-W23-9	Gross alpha	1/11/89	26	6			pCi/L		
299-W23-9	Gross alpha	2/23/89	27	7			pCi/L		
299-W23-9	Gross alpha	3/10/89	28	6			pCi/L		
299-W23-9	Gross alpha	10/06/89	49	10			pCi/L		
299-W23-9	Gross alpha	4/06/90	19	5			pCi/L		

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Well	Constituent Name	Collect Date	Result	Error	Filtered	Qualifier	Units	CROL	Method Name
A2-25	299-W23-9	Gross beta	1/07/86	5	2		pCi/L		
	299-W23-9	Gross beta	2/07/86	7	2		pCi/L		
	299-W23-9	Gross beta	3/10/86	6	2		pCi/L		
	299-W23-9	Gross beta	4/08/86	6	2		pCi/L		
	299-W23-9	Gross beta	5/07/86	11	3		pCi/L		
	299-W23-9	Gross beta	6/05/86	9	3		pCi/L		
	299-W23-9	Gross beta	7/08/86	16	3		pCi/L		
	299-W23-9	Gross beta	9/03/86	11	3		pCi/L		
	299-W23-9	Gross beta	11/06/86	11	3		pCi/L		
	299-W23-9	Gross beta	11/25/86	12	3		pCi/L		
	299-W23-9	Gross beta	12/10/86	12	3		pCi/L		
	299-W23-9	Gross beta	1/06/87	22	4		pCi/L		
	299-W23-9	Gross beta	2/11/87	16	3		pCi/L		
	299-W23-9	Gross beta	3/13/87	13	3		pCi/L		
	299-W23-9	Gross beta	4/19/87	12	3		pCi/L		
	299-W23-9	Gross beta	5/10/87	11	3		pCi/L		
	299-W23-9	Gross beta	6/09/87	15	3		pCi/L		
	299-W23-9	Gross beta	7/24/87	13	3		pCi/L		
	299-W23-9	Gross beta	8/19/87	10	3		pCi/L		
	299-W23-9	Gross beta	9/16/87	12	3		pCi/L		
	299-W23-9	Gross beta	10/13/87	9	2		pCi/L		
	299-W23-9	Gross beta	11/17/87	9	2		pCi/L		
	299-W23-9	Gross beta	12/11/87	10	3		pCi/L		
	299-W23-9	Gross beta	1/19/88	17	3		pCi/L		
	299-W23-9	Gross beta	2/17/88	13	3		pCi/L		
	299-W23-9	Gross beta	3/18/88	14	3		pCi/L		
	299-W23-9	Gross beta	4/11/88	10	3		pCi/L		
	299-W23-9	Gross beta	5/09/88	15	3		pCi/L		
	299-W23-9	Gross beta	6/15/88	15	3		pCi/L		
	299-W23-9	Gross beta	7/13/88	11	3		pCi/L		

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Well	Constituent Name	Collect Date	Result	Error	Filtered	Qualifier	Units	CRQL	Method Name
299-W23-9	Gross beta	8/12/88	13	3			pCi/L		
299-W23-9	Gross beta	9/08/88	11	3			pCi/L		
299-W23-9	Gross beta	10/18/88	13	3			pCi/L		
299-W23-9	Gross beta	11/03/88	12	3			pCi/L		
299-W23-9	Gross beta	1/05/89	51	7			pCi/L		
299-W23-9	Gross beta	1/11/89	20	4			pCi/L		
299-W23-9	Gross beta	2/23/89	23	4			pCi/L		
299-W23-9	Gross beta	3/10/89	25	4			pCi/L		
299-W23-9	Gross beta	10/06/89	31	5			pCi/L		
299-W23-9	Gross beta	4/06/90	14	3			pCi/L		
299-W23-9	Nitrate	7/24/87	409000				ppb		EPA 300.0
299-W23-9	Nitrate	8/19/87	285000				ppb		EPA 300.0
299-W23-9	Nitrate	9/16/87	262000				ppb		EPA 300.0
299-W23-9	Nitrate	10/13/87	142000				ppb		EPA 300.0
299-W23-9	Nitrate	11/17/87	82800				ppb		EPA 300.0
299-W23-9	Nitrate	12/11/87	77100				ppb		EPA 300.0
299-W23-9	Nitrate	1/19/88	98200				ppb		EPA 300.0
299-W23-9	Nitrate	2/17/88	99400				ppb		EPA 300.0
299-W23-9	Nitrate	3/18/88	105000				ppb		EPA 300.0
299-W23-9	Nitrate	4/11/88	100000				ppb		EPA 300.0
299-W23-9	Nitrate	5/09/88	101000				ppb		EPA 300.0
299-W23-9	Nitrate	6/15/88	102000				ppb		EPA 300.0
299-W23-9	Nitrate	7/13/88	99800				ppb		EPA 300.0
299-W23-9	Nitrate	8/12/88	95500				ppb		EPA 300.0
299-W23-9	Nitrate	9/08/88	92600				ppb		EPA 300.0
299-W23-9	Nitrate	10/18/88	78100				ppb		EPA 300.0
299-W23-9	Nitrate	11/03/88	24600				ppb		EPA 300.0
299-W23-9	Nitrate	1/05/89	54000	5400			ppb		EPA 300.0

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Well	Constituent Name	Collect Date	Result	Error	Filtered	Qualifier	Units	CRQL	Method Name
299-W23-9	Nitrate	1/11/89	59400	5940			ppb		EPA 300.0
299-W23-9	Nitrate	2/23/89	42300	4230			ppb		EPA 300.0
299-W23-9	Nitrate	10/06/89	223000	22300			ppb		EPA 300.0
299-W23-9	Nitrate	4/06/90	4300	437			ppb		EPA 300.0
299-W23-9	Nitrate	11/25/91	7500	4220			ppb	200	ASTM D-4327-88
299-W23-9	Nitrate	4/27/92	31000	17400			ppb	200	ASTM D-4327-88
299-W23-9	Specific conductance	4/06/90	149				umhos		
299-W23-9	Specific conductance	4/06/90	212	22			umhos		ASTM D-1125-A
299-W23-9	Specific conductance	11/25/91	206				umhos	1	Probe, Conductivity
299-W23-9	Specific conductance	4/27/92	301				umhos	1	Probe, Conductivity
299-W23-9	Strontium-90	1/07/86	0	1		U	pCi/L		
299-W23-9	Strontium-90	2/07/86	0	0		U	pCi/L		
299-W23-9	Strontium-90	3/10/86	-0	1		U	pCi/L		
299-W23-9	Strontium-90	4/08/86	1	1		U	pCi/L		
299-W23-9	Strontium-90	5/07/86	0	1		U	pCi/L		
299-W23-9	Strontium-90	6/05/86	0	1		U	pCi/L		
299-W23-9	Strontium-90	7/08/86	0	1		U	pCi/L		
299-W23-9	Strontium-90	9/03/86	1	1		U	pCi/L		
299-W23-9	Strontium-90	11/06/86	1	1		U	pCi/L		
299-W23-9	Strontium-90	11/25/86	-0	1		U	pCi/L		
299-W23-9	Strontium-90	12/10/86	1	1		U	pCi/L		
299-W23-9	Strontium-90	1/06/87	0	1		U	pCi/L		
299-W23-9	Strontium-90	4/19/87	0	1		U	pCi/L		
299-W23-9	Strontium-90	7/24/87	0	1		U	pCi/L		
299-W23-9	Strontium-90	10/13/87	-0	1		U	pCi/L		
299-W23-9	Strontium-90	1/19/88	-0	1		U	pCi/L		

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Well	Constituent Name	Collect Date	Result	Error	Filtered	Qualifier	Units	CRQL	Method Name
299-W23-9	Strontium-90	4/11/88	-0	1		U	pCi/L		
299-W23-9	Strontium-90	7/13/88	0	1		U	pCi/L		
299-W23-9	Strontium-90	10/18/88	-0	1		U	pCi/L		
299-W23-9	Strontium-90	1/11/89	0	1		U	pCi/L		
299-W23-9	Strontium-90	10/06/89	0	1		U	pCi/L		
299-W23-9	Sulfate	4/06/90	13400	1340			ppb		EPA 300.0
299-W23-9	Sulfate	11/25/91	13000	12500			ppb	500	ASTM D-4327-88
299-W23-9	Sulfate	4/27/92	15000	14500			ppb	500	ASTM D-4327-88
299-W23-9	Tritium	1/07/86	151000	9020			pCi/L		
299-W23-9	Tritium	2/07/86	209000	12000			pCi/L		
299-W23-9	Tritium	3/10/86	241000	14000			pCi/L		
299-W23-9	Tritium	4/08/86	422000	22600			pCi/L		
299-W23-9	Tritium	5/07/86	785000	40800			pCi/L		
299-W23-9	Tritium	6/05/86	977000	50400			pCi/L		
299-W23-9	Tritium	7/08/86	1120000	57500			pCi/L		
299-W23-9	Tritium	9/03/86	1380000	70900			pCi/L		
299-W23-9	Tritium	11/06/86	1510000	77500			pCi/L		
299-W23-9	Tritium	11/25/86	1420000	73200			pCi/L		
299-W23-9	Tritium	12/10/86	1320000	66600			pCi/L		
299-W23-9	Tritium	1/06/87	1370000	69700			pCi/L		
299-W23-9	Tritium	2/11/87	1370000	69700			pCi/L		
299-W23-9	Tritium	3/13/87	1470000	73600			pCi/L		
299-W23-9	Tritium	4/19/87	1450000	73700			pCi/L		
299-W23-9	Tritium	5/10/87	1530000	77600			pCi/L		
299-W23-9	Tritium	6/09/87	1550000	78700			pCi/L		
299-W23-9	Tritium	7/24/87	1490000	75600			pCi/L		

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Well	Constituent Name	Collect Date	Result	Error	Filtered	Qualifier	Units	CRQL	Method Name
A2-29	299-W23-9	Tritium	8/19/87	1340000	67200		pCi/L		
	299-W23-9	Tritium	9/16/87	1450000	72700		pCi/L		
	299-W23-9	Tritium	10/13/87	947000	47600		pCi/L		
	299-W23-9	Tritium	11/17/87	776000	39000		pCi/L		
	299-W23-9	Tritium	12/11/87	783000	57300		pCi/L		
	299-W23-9	Tritium	1/19/88	1280000	93700		pCi/L		
	299-W23-9	Tritium	2/17/88	1430000	104000		pCi/L		
	299-W23-9	Tritium	3/18/88	1360000	99600		pCi/L		
	299-W23-9	Tritium	4/11/88	1320000	96600		pCi/L		
	299-W23-9	Tritium	5/09/88	1410000	103000		pCi/L		
	299-W23-9	Tritium	6/15/88	1470000	107000		pCi/L		
	299-W23-9	Tritium	7/13/88	1430000	105000		pCi/L		
	299-W23-9	Tritium	8/12/88	1360000	99600		pCi/L		
	299-W23-9	Tritium	9/08/88	1340000	97900		pCi/L		
	299-W23-9	Tritium	10/18/88	1440000	105000		pCi/L		
	299-W23-9	Tritium	11/03/88	1360000	99700		pCi/L		
	299-W23-9	Tritium	1/05/89	1190000	87000		pCi/L		
	299-W23-9	Tritium	1/11/89	1140000	83000		pCi/L		
	299-W23-9	Tritium	2/23/89	1150000	84000		pCi/L		
	299-W23-9	Tritium	3/10/89	1050000	76500		pCi/L		
	299-W23-9	Tritium	10/06/89	1520000	111000		pCi/L		
	299-W23-9	Tritium	4/06/90	215000	15900		pCi/L		
	299-W23-9	Tritium	4/27/92	576000	42060		pCi/L	500	ITAS H-3
A2-29	299-W23-9	Uranium	1/06/87	45	12		pCi/L		
	299-W23-9	Uranium	2/11/87	47	13		pCi/L		
	299-W23-9	Uranium	3/13/87	73	19		pCi/L		
	299-W23-9	Uranium	4/19/87	30	9		pCi/L		
	299-W23-9	Uranium	5/10/87	55	15		pCi/L		

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Groundwater Well Results for the 216-S-26 Crib

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Well	Constituent Name	Collect Date	Result	Error	Filtered	Qualifier	Units	CRQL	Method Name
299-W23-9	Uranium	7/24/87	34	10			pCi/L		
299-W23-9	Uranium	8/19/87	27	8			pCi/L		
299-W23-9	Uranium	9/16/87	39	11			pCi/L		
299-W23-9	Uranium	10/13/87	32	10			pCi/L		
299-W23-9	Uranium	11/17/87	29	9			pCi/L		
299-W23-9	Uranium	12/11/87	28	9			pCi/L		
299-W23-9	Uranium	1/19/88	27	8			pCi/L		
299-W23-9	Uranium	2/17/88	29	9			pCi/L		
299-W23-9	Uranium	3/18/88	28	9			pCi/L		
299-W23-9	Uranium	4/11/88	28	9			pCi/L		
299-W23-9	Uranium	5/09/88	28	9			pCi/L		
299-W23-9	Uranium	6/15/88	28	9			pCi/L		
299-W23-9	Uranium	7/13/88	25	8			pCi/L		
299-W23-9	Uranium	8/12/88	26	8			pCi/L		
299-W23-9	Uranium	9/08/88	26	8			pCi/L		
299-W23-9	Uranium	10/18/88	20	7			pCi/L		
299-W23-9	Uranium	11/03/88	25	8			pCi/L		
299-W23-9	Uranium	1/05/89	61	17			pCi/L		
299-W23-9	Uranium	1/11/89	52	15			pCi/L		
299-W23-9	Uranium	2/23/89	73	21			pCi/L		
299-W23-9	Uranium	3/10/89	45	12			pCi/L		
299-W23-9	Uranium	10/06/89	65	17			pCi/L		
299-W23-9	Uranium	4/06/90	18	5			pCi/L		
299-W23-9	pH	4/06/90	8	0					
299-W23-9	pH	4/06/90	9						
299-W23-9	pH	11/25/91	9						0 Probe, pH
299-W23-9	pH	4/27/92	9						0 Probe, pH

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Summary of Provisional Hanford Site Groundwater Background Values^a
(Johnson, 1993b). (3 sheets)

Constituent (concentration)	PNL Results ^b	USGS Results ^b (sample size)	WHC Unconfined ^b (sample size)	WHC Provisional Threshold Values
Aluminum (ppb)	<2	110 ± 139 (12)	<200 (50)	<200
Ammonium (ppb)	<50	NA	<50 (18)	<120
Arsenic (ppb)	3.9±2.4	6.7 ± 3.7 (7)	<5 (14)	10
Barium (ppb)	42±20	53 ± 14 (11)	41±20 (53)	68.5
Beryllium (ppb)	<0.3	NA	<5 (16)	<5
Bismuth (ppb)	<0.02	NA	<5 (4)	<5
Boron (ppb)	<50	<50 (14)	<100 (35)	<100
Cadmium (ppb)	<0.2	<10 (1)	<10 (16)	<10
Calcium (ppb)	40,400 ± 10,300	40,857 ± 8,282 (14)	38,542 ± 11,023 (53)	63,600
Chloride-low (ppb)	NA	5,825 ± 1,355 (8)	5,032 ± 1,774 (53)	8,690
Chloride-high (ppb)	NA	20,667 ± 2,503 (6)	23,296 ± 2,463 (14)	28,500
Chloride-all (ppb)	10,300 ± 6,500	12,186 ± 7,842 (14)	8,848 ± 7,723 (67)	NC
Chromium (ppb)	4±2	<50 (11)	<30 (8)	<30
Copper (ppb)	<1	<10 (10)	<30 (50)	<30
Fluoride (ppb)	370 ± 100	550 ± 330 (14)	437 ± 131 ^c (47)	1,340 775 ^c
Iron-low (ppb)	NA	22 ± 16 ^c	<50 (34)	86
Iron-mid (ppb)	NA	NA	115 ± 52 (7)	291
Iron-high (ppb)	NA	NA	494 ± 118 (12)	818
Iron-all (ppb)	NA	NA	149 ± 199 (53)	NC
Lead (ppb)	<0.5	<30 ^c (6)	<5 (15)	<5
Magnesium (ppb)	11,800 ± 3,400	10,814 ± 1,813 (14)	11,190 ± 2,578 (14)	16,840
Manganese-low (ppb)	NA	26 ± 27 (8)	<20 (33)	24.5
Manganese-high (ppb)	NA	150 ± 87 (3)	118 ± 17 (20)	163.5

Summary of Provisional Hanford Site Groundwater Background Values^a
(Johnson, 1993b). (3 sheets)

Constituent (concentration)	PNL Results ^b	USGS Results ^b (sample size)	WHC Unconfined ^b (sample size)	WHC Provisional Threshold Values
Manganese-all (ppb)	---	60 ± 73 (11)	50 ± 55 (53)	NC
Mercury (ppb)	---	NA	<0.1 (14)	<0.1
Nickel (ppb)	<4	<50 (14)	<30 (23)	<30
Nitrate (ppb)	NA	3,224 ± 3,380 (13)	5,170 ± 3,576 (78)	12,400
Phosphate (ppb)	<1000	140 ± 62 (3)	<1,000	<1,000
Potassium (ppb)	4,950 ± 1,240	5,900 ± 1,253 (14)	4,993 ± 1,453 (53)	7,975
Selenium (ppb)	<2	NA	<5 (14)	<5
Silver (ppb)	<10	NA	<10	<10
Silicon (ppb)	NA	16,786 ± 3,683 (14)	18,152 ± 4,974 (35)	26,500
Sodium (ppb)	18,260 ± 10,150	20,286 ± 7,907 (14)	15,774 ± 6,784 (53)	33,500
Strontium (ppb)	236 ± 102	159 ± 78 (14)	164 ± 47 (43)	264.1
Sulfate (ppb)	34,300 ± 16,900	41,286 ± 27,880 (14)	30,605 ± 22,611 (67)	90,500
Uranium (pCi/L)	1.7 ± 0.8	NA	1.7 ± 1.2 (10)	3.43
Vanadium (ppb)	17 ± 9	NA	9 ± 4 (18)	15
Zinc-low (ppb)	NA	14 ± 20 (11)	<50 (36)	<50
Zinc-high (ppb)	NA	373 ± 284 (3)	247 ± 165 (17)	673
Zinc-all (ppb)	6 ± 2	91 ± 190 (14)	95 ± 140 (53)	NC
Field alkalinity (ppb)	NA	134,100 ± 20,469 (10)	137,758 ± 33,656 (31)	215,000
Lab alkalinity (ppb)	123,000 ± 21,000	130,000 ± 8,165 (4)	133,717 ± 29,399 (52)	210,000
Field pH	NA	NA	7.57 ± 0.29 (57)	[6.90, 8.24]
Lab pH	7.64 ± 0.16	NA	7.75 ± 0.21 (52)	[7.25, 8.25]
Total organic carbon (ppb)	586 ± 347	NA	519 ± 367 ^c (62)	2,610 1,610 ^c

Summary of Provisional Hanford Site Groundwater Background Values^a
(Johnson, 1993b). (3 sheets)

Constituent (concentration)	PNL Results ^b	USGS Results ^b (sample size)	WHC Unconfined ^b (sample size)	WHC Provisional Threshold Values
Field conductivity (μ mhos/cm)	NA	NA	344 $\pm$ 83 (22)	539
Lab conductivity (μ mhos/cm)	380 $\pm$ 82	NA	332 $\pm$ 93 (36)	530
Total organic halogen, lower detection limit (ppb)	NA	NA	<20 ^c (14)	60.8 37.6 ^c
Total carbon (ppb)	NA	NA	31,772 $\pm$ 7,022 (48)	50,100
Gross alpha (pCi/L)	2.5 $\pm$ 1.4	NA	2.5 $\pm$ 1.5 ^c (36)	63 5.79 ^c
Gross beta (pCi/L)	19 $\pm$ 12	NA	7.1 $\pm$ 2.6 ^c (44)	35.5 12.62 ^c
Radium (pCi/L)	<0.2	NA	ND (10)	0.23

Note: Johnson, V. G., 1993, Westinghouse Hanford Company Operational Groundwater Status Report, WHC-EP-0595, Westinghouse Hanford Company, Richland, Washington.

^a Source: From Tables 5-9 and 5-11 (DOE-RL, 1992, Hanford Site Groundwater Background, DOE/RL-92-23, U.S. Department of Energy, Richland Operations Office, Richland, Washington).

^b Results shown are mean $\pm$ one standard deviation.

^c Potential outlier observation(s) were removed.

NA = not available.

NC = not calculated.

ND = not detected.

PNL = Pacific Northwest Laboratory.

ppb = parts per billion.

USGS = United States Geological Survey.

WHC = Westinghouse Hanford Company.

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APPENDIX B
CHEMISTRY PLOTS

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Chemistry data correlation plots of the available effluent and groundwater monitoring data were created and are shown in this appendix. Some of these plots were also used in the text of the document. The plots are of two basic types:

1. Plots showing 216-S-26 (S-26) effluent data, well 299-W27-1 groundwater data, and the Hanford Site background average concentration data (Johnson 1993b)
2. Plots showing groundwater data for wells near upgradient past-practice disposal sites and contaminant sources in the vicinity of the S-26 Crib and for comparison, Hanford Site background average concentration data.

The plots were created to illustrate differences between the different sites sampled. The Hanford Site background average concentration was plotted to show how the concentration of a given constituent in effluent and/or groundwater compared to the background unconfined aquifer concentration. Concentrations which are lower than the average value are most likely the result of disposal of Hanford Site "system water" (i.e. treated Columbia River water), with little or no contamination. Concentrations which are higher than the average value are most likely the result of disposal of wastewater from Hanford Site processes and operations (i.e. process facility effluent), which is often elevated in concentration and contaminated. The parameters which are elevated can be used to determine the source of the "contamination" if enough is known about the composition of the wastewater that was originally discharged to a given facility.

For the first set of plots, the effluent consistently plotted below the Hanford Site background average for the unconfined aquifer. Groundwater data from well 299-W27-1 consistently had higher concentrations than the Hanford Site background values. Effluent discharged to the S-26 Crib and groundwater beneath the crib differ greatly in concentration; the elevated concentrations seen in the groundwater are not a result of discharge to the crib.

The second set of plots which show upgradient groundwater concentrations also exhibit trends. Some wells are elevated in concentration and are also higher than the Hanford Site background average concentration for the unconfined aquifer. Although these wells have elevated concentrations, the values have decreased somewhat from the highest values recorded in the late 1980's. Well 299-22-20 consistently exhibited concentrations which followed this trend. It is the one well which is most likely downgradient of several of the potential sources of contamination from past-practice operations. Two other wells, 299-W23-9 which is downgradient of the 216-S-25 (S-25) Crib and 299-W22-21 which is downgradient of the 216-S-13 (S-13) Crib, also exhibited this trend to a lesser degree. Wells 299-W22-12 which is downgradient of the 216-S-7 (S-7) Crib, 299-W22-7 which is downgradient of the 216-S-9 (S-9) Crib, and 299-W22-10 which is downgradient of the 216-S-1 (S-1) and 216-S-2 (S-2) Crib, showed concentrations which were slightly elevated or just below the Hanford Site background average concentrations. All the wells showed elevated concentrations of gross alpha and beta, but to varying degrees.

It is difficult to rule out any of the upgradient sources based on these data. The elevated concentrations found at well 299-W23-9 are definitely related to the S-25 Crib disposal operations. The source of the elevated

concentrations at well 299-W-22-20 is more difficult to determine. Given its downgradient location from several disposal facilities and the length of time since some of these facilities last received discharges of wastewater, it is not surprising that the wells near the facilities do not show elevated concentrations and 299-W-22-20 which is further downgradient does show elevated concentrations. The contaminated groundwater has moved downgradient from the wells in the immediate vicinity of S-1, S-2, S-7, and S-13 Cribs, and is now affecting well 299-W22-20 and 299-W27-1 (at the S-26 Crib site).

Therefore, all of the cribs mentioned above are the likely sources of the elevated concentrations and contaminants seen in wells upgradient of and at the S-26 Crib. Disposal of effluents to the S-26 Crib is mainly diluting the groundwater beneath the site with less concentrated "river water".

The plots are shown together in pairs (one of each type) for each parameter plotted, with the exception of potassium and magnesium, which only have a plot of type 1. The plots are grouped as follows:

- Groundwater quality indicators - pH, specific conductance (conductivity)
- Cations - Magnesium, potassium, sodium, calcium, and barium
- Metals - Strontium, selenium, vanadium, and zinc
- Anions - Chloride, nitrate, and sulfate
- Radionuclides - Total uranium, strontium-90, tritium, gross alpha and gross beta.

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—■— pH-GW —◆— pH-EF —▲— pH-BA

GW = Groundwater. EF = Effluent. BA = Background average for unconfined aquifer.

Note: Graph illustrates groundwater data from wells upgradient of the 216-S-26 Crib location.
 Background Average = Hanford Site background average concentration for the unconfined aquifer and it is shown as a dotted line on the graph.

■ Specific Conductance-GW ◆ Specific Conductance-EF
 ▲ Specific Conductance-BA

GW = Groundwater. EF = Effluent. BA = Background average for the unconfined aquifer.

Well W22-12

Well W22-20

Well W22-21

Well W22-10

Well W23-9

Background Average¹

Note: Graph illustrates groundwater data from wells upgradient of the 216-S-26 Crib location.

¹Background Average = Hanford Site background average concentration for the unconfined aquifer and it is shown as a dotted line on the graph.

—■— Magnesium-GW —◆— Magnesium-EF —▲— Magnesium-BA
 GW = Groundwater. EF = Effluent. BA = Background average for unconfined aquifer.

—■— Sodium-GW —◆— Sodium-EF —▲— Sodium-BA

GW = Groundwater. EF = Effluent. BA = Background average for unconfined aquifer.

Note: Graph illustrates groundwater data from wells upgradient of the 216-S-26 Crib location.
¹Background Average = Hanford Site background average concentration for the unconfined aquifer and it is shown as a dotted line on the graph.

Note: Graph illustrates groundwater data from wells upgradient of the 216-S-26 Crib location.
¹Background Average = Hanford Site background average concentration for the unconfined aquifer and it is shown as a dotted line on the graph.

Note: Graph illustrates groundwater data from wells upgradient of the 216-S-26 Crib location.
¹Background Average = Hanford Site background average concentration for the unconfined aquifer and it is shown as a dotted line on the graph.

Strontium-GW
 Strontium-EF
 Strontium-BA
 GW = Groundwater. EF = Effluent. BA = Background average for unconfined aquifer.

Note: Graph illustrates groundwater data from wells upgradient of the 216-S-26 Crib location.

¹Background Average = Hanford Site background average concentration for the unconfined aquifer and it is shown as a dotted line on the graph.

—■— Selenium-GW —◆— Selenium-EF —▲— Selenium-BA

GW = Groundwater. EF = Effluent. BA = Background average for unconfined aquifer.

Note: ¹Effluent analytical limit of detection (all three samples) is too high to determine if any selenium is present.

Note: Graph illustrates groundwater data from wells upgradient of the 216-S-26 Crib location.

¹Background Average = Hanford Site background average concentration for the unconfined aquifer and it is shown as a dotted line on the graph.

—■— Vanadium-GW —◆— Vanadium-EF —▲— Vanadium-BA

GW = Groundwater. EF = Effluent. BA = Background average for unconfined aquifer.

Note: ¹Effluent vanadium concentration is less than the analytical limit of detection.

²Groundwater analytical limit of detection (starting January 1992) is too high to determine if any vanadium is present.

Note: Graph illustrates groundwater data from wells upgradient of the 216-S-26 Crib location.
¹Background Average = Hanford Site background average concentration for the unconfined aquifer and it is shown as a dotted line on the graph.

Note: Graph illustrates groundwater data from wells upgradient of the 216-S-26 Crib location.

¹Background Average = Hanford Site background average concentration for the unconfined aquifer and it is shown as a dotted line on the graph.

—■— Chloride-GW —◆— Chloride-EF —▲— Chloride-BA

GW = Groundwater. EF = Effluent. BA = Background average for unconfined aquifer.

Note: Graph illustrates groundwater data from wells upgradient of the 216-S-26 Crib location.
¹Background Average = Hanford Site background average concentration for the unconfined aquifer and it is shown as a dotted line on the graph.

—■ Nitrate-GW —◆ Nitrate-EF —▲ Nitrate-BA
 GW = Groundwater. EF = Effluent. BA = Background average for unconfined aquifer.

Note: Graph illustrates groundwater data from wells upgradient of the 216-S-26 Crib location.
Hanford Site background average concentration for the unconfined aquifer is shown as a dotted line.

—■ Sulfate-GW —◆ Sulfate-EF —▲ Sulfate-BA
 GW = Groundwater. EF = Effluent. BA = Background average for unconfined aquifer.

■ Well W22-12 ◆ Well W22-20 ▲ Well W22-21
 □ Well W22-10 ◇ Well W23-9 ▲ Background Average¹

Note: Graph illustrates groundwater data from wells upgradient of the 216-S-26 Crib location.
¹Background Average = Hanford Site background average concentration for the unconfined aquifer and it is shown as a dotted line on the graph.

■ Total Uranium-GW ◆ Total Uranium-EF ▲ Total Uranium-BA
 GW = Groundwater. EF = Effluent. BA = Background average for unconfined aquifer.

—■— Strontium-90 - GW —◆— Strontium-90 - EF

GW = Groundwater. EF = Effluent.

Note: Graph illustrates groundwater data from wells upgradient of the 216-S-26 Crib location.

—■— Gross Alpha-GW —◆— Gross Alpha-EF —▲— Gross Alpha-BA
 GW = Groundwater. EF = Effluent. BA = Background average for unconfined aquifer.

Note: Graph illustrates groundwater data from wells upgradient of the 216-S-26 Crib location.
¹Background Average = Hanford Site background average concentration for the unconfined aquifer and it is shown as a dotted line on the graph.

Note: Graph illustrates groundwater data from wells upgradient of the 216-S-26 Crib location.

¹Background Average = Hanford Site background average concentration for the unconfined aquifer and it is shown as a dotted line on the graph.

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