00435

1 OF 1

points. For this reason, the estimation of flow rate must be considered accurate to order of magnitude only.

WSRC-TR-92-227

**P-AREA ACID/CAUSTIC BASIN GROUNDWATER
MONITORING REPORT (U) - FIRST QUARTER 1992**

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FIRST QUARTER 1992

P-AREA ACID/CAUSTIC BASIN GROUNDWATER MONITORING REPORT (U)

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Abstract

During first quarter 1992, samples from the six PAC monitoring wells at the P-Area Acid/Caustic Basin were analyzed for herbicides, indicator parameters, major ions, pesticides, radionuclides, turbidity, volatile organic compounds, and other constituents. Monitoring results that exceeded the U.S. Environmental Protection Agency Primary Drinking Water Standards (PDWS) and the Savannah River Site (SRS) flagging criteria and turbidity standards during the quarter are discussed in this report.

No constituent exceeded the PDWS in the PAC wells at the P-Area Acid/Caustic Basin, and no wells exceeded the SRS turbidity standard during first quarter 1992. Total organic halogens exceeded the Flag 2 criterion in wells PAC 1, 2, 3, 4, and 6; iron exceeded the Flag 2 criterion in wells PAC 2, 5, and 6; and manganese exceeded the Flag 2 criterion in wells PAC 5 and 6.

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Executive Summary

The six monitoring wells at the P-Area Acid/Caustic Basin are sampled quarterly as part of the Savannah River Site (SRS) Groundwater Monitoring Program to comply with South Carolina Hazardous Waste Management Regulations. During first quarter 1992, samples from the monitoring wells were analyzed for herbicides, major ions, pesticides, pH, radio-nuclides, specific conductance, total dissolved solids, total organic carbon, total organic halogens, turbidity, volatile organic compounds, and other constituents. Monitoring results that exceeded the U.S. Environmental Protection Agency Primary Drinking Water Standards (PDWS) and the SRS flagging criteria and turbidity standards are discussed in this report.

During first quarter 1992, wells PAC 5 and 6 at the P-Area Acid/Caustic Basin did not yield four well volumes prior to sampling; thus, the samples collected from these wells may not be representative groundwater samples. No constituent exceeded the PDWS in the PAC wells, and no wells exceeded the 50 NTU turbidity standard during the quarter. Total organic halogens exceeded the Flag 2 criterion in wells PAC 1, 2, 3, 4, and 6; iron exceeded the Flag 2 criterion in wells PAC 2, 5, and 6; and manganese exceeded the Flag 2 criterion in wells PAC 5 and 6.

Water-table elevations indicate that groundwater flow direction is toward the north. Total organic halogens exceeded the Flag 2 criterion in upgradient well PAC 4 and in downgradient wells PAC 1, 2, 3, and 6; iron exceeded the Flag 2 criterion in wells PAC 2, 5, and 6; and manganese exceeded the Flag 2 criterion in wells PAC 5 and 6.

Introduction

The P-Area Acid/Caustic Basin is located east of P Area and Road F at the Savannah River Site (SRS) on a slope that leads to a tributary of Par Pond. The basin, constructed in the early 1950s, is an unlined earthen pit that received dilute sulfuric acid and sodium hydroxide solutions and other wastes from several areas within SRS. The basin provided an area for the mixing and neutralization of the dilute solutions before their discharge to nearby streams. The P-Area Acid/Caustic Basin remained in service until new neutralization facilities became operational in 1982 (Heffner and Exploration Resources, 1991).

Four groundwater monitoring wells were installed in the P-Area Acid/Caustic Basin between November 1983 and July 1984. Under the terms of a consent decree executed May 26, 1988, by the U.S. District Court (District of South Carolina, Aiken Division), the basin became subject to requirements of Subtitle C of the Resource Conservation and Recovery Act (RCRA), the South Carolina Hazardous Waste Management Regulations (SCHWMR), and associated regulations. The basin monitoring wells were reevaluated during the summer of 1988 to ensure compliance with SCHWMR. As part of this compliance effort, two additional wells were installed at the P-Area Acid/Caustic Basin during third quarter 1988.

The monitoring wells at the P-Area Acid/Caustic Basin are sampled quarterly as part of the SRS Groundwater Monitoring Program to comply with SCHWMR. The revised Groundwater Quality Assessment Plan (WSRC, 1991), submitted to the South Carolina Department of Health and Environmental Control on April 30, 1991, indicates that the monitoring well network at the P-Area Acid/Caustic Basin is sufficient to detect effects of the basin on the groundwater.

Discussion

Groundwater Monitoring Data

During first quarter 1992, samples from six monitoring wells at the P-Area Acid/Caustic Basin were analyzed for herbicides, major ions, pesticides, pH, radionuclides, specific conductance, total dissolved solids, total organic carbon, total organic halogens, turbidity, volatile organic compounds, and other constituents. This report describes monitoring results that exceeded the U.S. Environmental Protection Agency (EPA) Primary Drinking Water Standards (PDWS) (Appendix A), the SRS flagging criteria (Appendix B), and the SRS turbidity standards.

The Environmental Monitoring Section of the Environmental Protection Department at SRS recently revised the flagging criteria for identifying constituents in high concentrations in groundwater. In general, the criteria are as follows:

- Flag 2 criteria are based on the PDWS; for constituents that do not have a PDWS, Flag 2 criteria are based on the Secondary Drinking Water Standards (SDWS) or 10 times the method detection limits (MDL) as described in Appendix B. Constituent levels that equal or exceed Flag 2 criteria are described as *elevated*.
- Flag 1 criteria are based on half the PDWS; if constituents do not have a PDWS, Flag 1 criteria are based on half the SDWS or 5 times the MDL as described in Appendix B. A Flag 1 for a constituent may reflect analytical error or it may indicate the initial detection of a contaminant. Thus, constituents exceeding Flag 1 criteria are included in this report and are described as *slightly elevated*.
- Flag 0 criteria are based on constituent levels below Flag 1.

Illustrations of the monitored waste management unit at SRS (Figure 1), the individual monitoring wells (Figure 2), and the flow directions of the groundwater beneath the basin (Figure 3) are in Appendix C; monitoring results and analyses that exceeded holding times are presented in Appendix D.

Analytical Results Exceeding Standards

Results for analytes that exceeded the PDWS (see Appendix A) during first quarter 1992 are summarized in Table 1 (Appendix D). No constituent exceeded the PDWS at the P-Area Acid/Caustic Basin during first quarter 1992.

Constituents that exceeded other Flag 1 and Flag 2 criteria (see Appendix B) during first quarter 1992 are summarized in Table 2 (Appendix D). Total organic halogens exceeded the Flag 2 criterion in wells PAC 1, 2, 3, 4, and 6, with concentrations up to 78 $\mu\text{g/L}$ in well PAC 4. Iron exceeded the Flag 2 criterion in wells PAC 2, 5, and 6, with concentrations up to 3,260 $\mu\text{g/L}$ in well PAC 6. Manganese exceeded the Flag 2 criterion in wells PAC 5 and 6,

with concentrations up to 273 $\mu\text{g/L}$ in well PAC 6. All results for individual wells are presented in Table 3 (Appendix D). Table 3 also indicates those analyses that exceeded holding times.

The standard practice at SRS is to purge a minimum of four well volumes from each well and ensure that the field parameters have stabilized before sample collection. If a well that goes dry during purging recovers sufficiently for sampling within 24 hours, the procedure is considered a single sampling event. Table 3 (Appendix D) lists the amount of water purged from each well during first quarter 1992 at the P-Area Acid/Caustic Basin. Wells PAC 5 and 6 did not yield four well volumes prior to sampling.

Turbidity Results Exceeding Standards

Turbidity results, in nephelometric turbidity units (NTU), are reported for well samples exceeding the detection limit of 5 or the SRS standard of 50 NTU. During first quarter 1992, no wells exceeded the standard of 50 NTU (Table 3, Appendix D).

A detection limit of 5 NTU, established by EPA (1986) as a general standard, is considered unrealistic for monitoring wells at SRS. Gass (1989) has documented turbidity measurements ranging up to 5,000 NTU from properly designed wells screened in poorly productive formations. During the 1989 RCRA Compliance Evaluation Inspection, officials from EPA Region IV indicated that the SRS turbidity standard of 50 NTU is conservative. These officials also agreed that water-table wells in this area often correspond to nonaquifer formations, rendering development of these wells more difficult due to the low yield and high proportion of mobile fines typical of these formations (Bergren and Bennett, 1989).

Water Elevations, Flow Directions, and Flow Rates

Water-table elevations and the groundwater flow direction beneath the P-Area Acid/Caustic Basin are shown in Figure 3 (Appendix C). Water-table elevations indicate that groundwater flow direction is toward the north (using SRS grid coordinates); this flow direction is consistent with the historical flow pattern. Groundwater flow direction in this area can be accurately defined because the groundwater gradient is large and closely follows the surface topography.

The groundwater flow rate in the water table (Aquifer Zone IIB₂) beneath the P-Area Acid/Caustic Basin is estimated using the following equation:

$$\text{Flow (ft/day)} = \frac{\text{Hydraulic Conductivity (ft/day)}}{\text{Porosity (unitless)}} \times \frac{dh \text{ (ft)}}{dl \text{ (ft)}}$$

A hydraulic conductivity constant of 10 ft/day (Geraghty & Miller, Inc., 1990) is a conservative estimate (i.e., the actual hydraulic conductivity should be somewhat less than 10 ft/day). The effective porosity is estimated at 20% (Killian et al., 1987), dh is the difference in head, and dl is the length of the flow path. Flow rate estimations vary depending on the vertical gradient between wells, the size of the area under consideration, and the number of data

points. For this reason, the estimation of flow rate must be considered accurate to order of magnitude only.

Using the above equation with $dh = 10$ ft and $dl = 90$ ft (see Figure 3 in Appendix C), the flow rate estimate for groundwater in the water table beneath the P-Area Acid/Caustic Basin is 5.6 ft/day or 2,000 ft/year.

Results for Upgradient vs. Downgradient Wells

Well PAC 4 is the designated upgradient well at the P-Area Acid/Caustic Basin. During first quarter 1992, no constituents exceeded the PDWS in the PAC wells. Total organic halogens exceeded the Flag 2 criterion in upgradient well PAC 4 and in downgradient wells PAC 1, 2, 3, and 6; iron exceeded the Flag 2 criterion in wells PAC 2, 5, and 6; and manganese exceeded the Flag 2 criterion in wells PAC 5 and 6.

Conclusions

During first quarter 1992, no constituent exceeded the PDWS in the PAC wells at the P-Area Acid/Caustic Basin, and no wells exceeded the 50 NTU turbidity standard. Total organic halogens exceeded the Flag 2 criterion in upgradient well PAC 4 and in downgradient wells PAC 1, 2, 3, and 6; iron exceeded the Flag 2 criterion in wells PAC 2, 5, and 6; and manganese exceeded the Flag 2 criterion in wells PAC 5 and 6. Generally, constituents found in downgradient wells but not upgradient wells at a waste management unit are considered products of the waste management unit.

Water-table elevations at the P-Area Acid/Caustic Basin indicate that groundwater flow direction is toward the north relative to SRS grid coordinates; this flow direction is consistent with the historical flow pattern. Groundwater flow direction in this area can be accurately defined because the groundwater gradient is large and follows the surface topography. The revised Groundwater Quality Assessment Plan (WSRC, 1991) for the basin indicates that the monitoring well network at the P-Area Acid/Caustic Basin is sufficient to detect effects of the basin on the groundwater.

Errata

Third Quarter 1991:

- Errors in the computer program used to mark analyses that exceed holding times caused a number of analyses to be incorrectly flagged as exceeding holding time.
- The only analyses performed by General Engineering Laboratories on samples from the PAC well series during third quarter 1991 that exceeded holding time were the following: the cyanide analyses (duplicated) for well PAC 5 and the turbidity analyses for PAC 1 and its replicate (duplicated) and PAC 5.

Fourth Quarter 1991 and 1991 Summary:

- Page D-2, Holding Time: The statement concerning holding time for pH is incorrect. The statement should read "South Carolina Department of Health and Environmental Control allows only 15 minutes to elapse between sampling and analysis for pH. Thus, laboratory pH analyses always exceed holding time."

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Appendix A – Primary Drinking Water Standards

Primary Drinking Water Standards

Analyte	Unit	Level	Status	Reference
Americium-241	pCi/L	6.34E+00	Proposed	EPA, 1991
Americium-243	pCi/L	6.37E+00	Proposed	EPA, 1991
Antimony	µg/L	5 ^a	Proposed	EPA, 1990
Antimony-125	pCi/L	3E+02	Final	EPA, 1977
Arsenic	µg/L	50	Final	CFR, 1991
Barium	µg/L	2,000	Final	CFR, 1991
Barium-140	pCi/L	9E+01	Final	EPA, 1977
Benzene	µg/L	5	Final	CFR, 1991
Benzo[a]anthracene	µg/L	0.1	Proposed	EPA, 1990
Benzo[b]fluoranthene	µg/L	0.2	Proposed	EPA, 1990
Benzo[k]fluoranthene	µg/L	0.2	Proposed	EPA, 1990
Benzo[a]pyrene	µg/L	0.2	Proposed	EPA, 1990
Beryllium	µg/L	1	Proposed	EPA, 1990
Beryllium-7	pCi/L	6E+03	Final	EPA, 1977
Bromodichloromethane	µg/L	100	Final	CFR, 1991
Bromoform	µg/L	100	Final	CFR, 1991
2-sec-Butyl-4,6-dinitrophenol (Dinoseb)	µg/L	7	Proposed	EPA, 1990
Cadmium	µg/L	5	Final	CFR, 1991
Carbon-14	pCi/L	2E+03	Final	EPA, 1977
Carbon tetrachloride	µg/L	5	Final	CFR, 1991
Cerium-141	pCi/L	3E+02	Final	EPA, 1977
Cerium-144	pCi/L	2.61E+02	Proposed	EPA, 1991
Cesium-134	pCi/L	8.13E+02 ^b	Proposed	EPA, 1991
Cesium-137	pCi/L	2E+02	Final	EPA, 1977
Chlordane	µg/L	2	Final	CFR, 1991
Chloroethene (Vinyl chloride)	µg/L	2	Final	CFR, 1991
Chloroform	µg/L	100	Final	CFR, 1991
Chromium	µg/L	100	Final	CFR, 1991
Chromium-51	pCi/L	6E+03	Final	EPA, 1977
Chrysene	µg/L	0.2	Proposed	EPA, 1990
Cobalt-57	pCi/L	1E+03	Final	EPA, 1977
Cobalt-58	pCi/L	9E+03	Final	EPA, 1977
Cobalt-60	pCi/L	1E+02	Final	EPA, 1977
Copper	µg/L	1,300	Final	CFR, 1991
Curium-242	pCi/L	1.33E+02	Proposed	EPA, 1991
Curium-243	pCi/L	8.3E+00	Proposed	EPA, 1991
Curium-244	pCi/L	9.84E+00	Proposed	EPA, 1991
Curium-246	pCi/L	6.27E+00	Proposed	EPA, 1991
Cyanide	µg/L	200	Proposed	EPA, 1990
Dibenz[a,h]anthracene	µg/L	0.3	Proposed	EPA, 1990
Dibromochloromethane	µg/L	100	Final	CFR, 1991
Dibromochloropropane	µg/L	0.2	Final	CFR, 1991
1,2-Dichlorobenzene	µg/L	600	Final	CFR, 1991
1,4-Dichlorobenzene	µg/L	75	Final	CFR, 1991
1,2-Dichloroethane	µg/L	5	Final	CFR, 1991
1,1-Dichloroethylene	µg/L	7	Final	CFR, 1991
cis-1,2-Dichloroethylene	µg/L	70	Final	CFR, 1991
trans-1,2-Dichloroethylene	µg/L	100	Final	CFR, 1991
Dichloromethane (Methylene chloride)	µg/L	5	Proposed	EPA, 1990
2,4-Dichlorophenoxyacetic acid	µg/L	70	Final	CFR, 1991
1,2-Dichloropropane	µg/L	5	Final	CFR, 1991
Endrin	µg/L	0.2	Final	CFR, 1991
Ethylbenzene	µg/L	700	Final	CFR, 1991
Europium-154	pCi/L	2E+02	Final	EPA, 1977

Analyte	Unit	Level	Status	Reference
Europium-155	pCi/L	6E+02	Final	EPA, 1977
Fluoride	µg/L	4,000	Final	CFR, 1991
Gross alpha ^c	pCi/L	1.5E+01	Final	CFR, 1991
Heptachlor	µg/L	0.4	Final	CFR, 1991
Heptachlor epoxide	µg/L	0.2	Final	CFR, 1991
Hexachlorobenzene	µg/L	1	Proposed	EPA, 1990
Hexachlorocyclopentadiene	µg/L	50	Proposed	EPA, 1990
Iodine-129	pCi/L	1E+00	Final	EPA, 1977
Iodine-131	pCi/L	3E+00	Final	EPA, 1977
Iron-55	pCi/L	2E+03	Final	EPA, 1977
Iron-59	pCi/L	2E+02	Final	EPA, 1977
Lanthanum-140	pCi/L	6E+01	Final	EPA, 1977
Lead	µg/L	15	Final	CFR, 1991
Lindane	µg/L	0.2	Final	CFR, 1991
Manganese-54	pCi/L	3E+02	Final	EPA, 1977
Mercury	µg/L	2	Final	CFR, 1991
Methoxychlor	µg/L	40	Final	CFR, 1991
Neptunium-237	pCi/L	7.06E+00	Proposed	EPA, 1991
Nickel	µg/L	100	Proposed	EPA, 1990
Nickel-59	pCi/L	3E+02	Final	EPA, 1977
Nickel-63	pCi/L	5E+01	Final	EPA, 1977
Niobium-95	pCi/L	3E+02	Final	EPA, 1977
Nitrate as nitrogen	µg/L	10,000	Final	CFR, 1991
Nitrite as nitrogen	µg/L	1,000	Final	CFR, 1991
Nonvolatile beta	pCi/L	5E+01	Proposed	EPA, 1986
PCBs ^d	µg/L	0.5	Final	CFR, 1991
Pentachlorophenol	µg/L	1	Final	CFR, 1991
Plutonium-238	pCi/L	7.02E+00	Proposed	EPA, 1991
Plutonium-239	pCi/L	6.21E+01	Proposed	EPA, 1991
Plutonium-239/240 ^e	pCi/L	6.21E+01	Proposed	EPA, 1991
Plutonium-240	pCi/L	6.22E+01	Proposed	EPA, 1991
Plutonium-241	pCi/L	6.26E+01	Proposed	EPA, 1991
Plutonium-242	pCi/L	6.54E+01	Proposed	EPA, 1991
Potassium-40	pCi/L	3E+02	Proposed	EPA, 1986
Radium-226	pCi/L	1.57E+01	Proposed	EPA, 1991
Radium-228	pCi/L	7.85E+00	Proposed	EPA, 1991
Radon-222	pCi/L	3E+02	Proposed	EPA, 1991
Ruthenium-103	pCi/L	2E+02	Final	EPA, 1977
Ruthenium-106	pCi/L	3E+01	Final	EPA, 1977
Selenium	µg/L	50	Final	CFR, 1991
Silver	µg/L	50	Final	CFR, 1991
Sodium-22	pCi/L	4.66E+02	Proposed	EPA, 1991
Strontium-89	pCi/L	2E+01 ^f	Final	EPA, 1977
Strontium-89/90 ^g	pCi/L	8E+00	Final	CFR, 1991
Strontium-90	pCi/L	8E+00	Final	CFR, 1991
Styrene	µg/L	100	Final	CFR, 1991
Sulfate	µg/L	400,000 ^a	Proposed	EPA, 1990
Technetium-99	pCi/L	9E+02	Final	EPA, 1977
Tetrachloroethylene	µg/L	5	Final	CFR, 1991
Thallium	µg/L	1	Proposed	EPA, 1990
Thorium-228	pCi/L	1.25E+02	Proposed	EPA, 1991
Thorium-230	pCi/L	7.92E+01	Proposed	EPA, 1991
Thorium-232	pCi/L	8.8E+01	Proposed	EPA, 1991
Thorium-234	pCi/L	4.01E+02	Proposed	EPA, 1991
Tin-113	pCi/L	3E+02	Final	EPA, 1977
Toluene	µg/L	1,000	Final	CFR, 1991

<u>Analyte</u>	<u>Unit</u>	<u>Level</u>	<u>Status</u>	<u>Reference</u>
Total radium	pCi/L	5E + 00	Final	CFR, 1991
Toxaphene	µg/L	3	Final	CFR, 1991
2,4,5-TP (Silvex)	µg/L	50	Final	CFR, 1991
1,2,4-Trichlorobenzene	µg/L	9	Proposed	EPA, 1990
1,1,1-Trichloroethane	µg/L	200	Final	CFR, 1991
1,1,2-Trichloroethane	µg/L	5	Proposed	EPA, 1990
Trichloroethylene	µg/L	5	Final	CFR, 1991
Total trihalomethanes	µg/L	100	Final	CFR, 1991
Tritium	pCi/mL	2E + 01	Final	CFR, 1991
Uranium	µg/L	20	Proposed	EPA, 1991
Uranium alpha activity	pCi/L	3E + 01	Proposed	EPA, 1991
Uranium-233/234 ^a	pCi/L	1.38E + 01	Proposed	EPA, 1991
Uranium-234	pCi/L	1.39E + 01	Proposed	EPA, 1991
Uranium-235	pCi/L	1.45E + 01	Proposed	EPA, 1991
Uranium-238	pCi/L	1.46E + 01	Proposed	EPA, 1991
Xylenes	µg/L	10,000	Final	CFR, 1991
Zinc-65	pCi/L	3E + 02	Final	EPA, 1977
Zirconium-95	pCi/L	2E + 02	Final	EPA, 1977
Zirconium/Niobium-95 ^a	pCi/L	2E + 02	Final	EPA, 1977

Note: Drinking water standards set by EPA (1977) correspond to the level at which each radionuclide contributes 4 mrem/yr of dose to an individual consuming 2 L of contaminated liquid a day. See EPA (1977) for details.

- ^a This value is the lower of two proposed levels.
- ^b EPD/EMS uses the proposed standard because it is a lower value; the final PDWS in 1977 may have been in error.
- ^c The standard given is for gross alpha including radium-226 but excluding radon and uranium.
- ^d Analyses were conducted in 1992 for the following: PCB 1016, PCB 1221, PCB 1232, PCB 1242, PCB 1248, PCB 1254, and PCB 1260.
- ^e For double radionuclide analyses where each separate radionuclide has its own standard, the more stringent standard is used.
- ^f This value is the lower of two levels given for strontium-89.

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Appendix B – Flagging Criteria

Flagging Criteria

Beginning in 1991, the Environmental Monitoring Section of the Environmental Protection Department (EPD/EMS) modified its guidelines for flagging constituents in the Groundwater Monitoring Program. These flagging criteria are as follows:

- Flag 2 criteria for constituents equal the U.S. Environmental Protection Agency (EPA) Primary Drinking Water Standard, the EPA proposed Primary Drinking Water Standard, or the EPA Secondary Drinking Water Standard. If a constituent does not have a drinking water standard, the Flag 2 criterion equals 10 times the method detection limit (MDL) calculated as the 90th percentile detection limit obtained recently by one of the primary analytical laboratories.
- Flag 1 criteria for constituents equal one-half of the EPA Primary Drinking Water Standard, one-half the EPA proposed Primary Drinking Water Standard, or one-half the EPA Secondary Drinking Water Standard. If a constituent does not have an EPA drinking water standard, the Flag 1 criterion equals 5 times the MDL calculated as the 90th percentile detection limit obtained recently by one of the primary analytical laboratories.
- Analytical results for constituents below Flag 1 are classified as Flag 0.

The following parameters are not assigned flagging criteria: alkalinity, calcium, carbonate, color, corrosivity, magnesium, odor, potassium, Eh, silica, sodium, total dissolved solids, total phosphorus, total phosphates (as P), and turbidity. In addition, common laboratory contaminants and cleaners including phthalates, methylene chloride, ketones, and toluene are not assigned flagging criteria.

Analyte	Unit	Flag 1	Flag 2	Source
Acenaphthene	µg/L	50	100	EPA Method 8270
Acenaphthylene	µg/L	50	100	EPA Method 8270
Acetone	µg/L	50	100	EPA Method 8240
Acetonitrile (Methyl cyanide)	µg/L	500	1,000	EPA Method 8240
Acetophenone	µg/L	50	100	EPA Method 8270
2-Acetylaminofluorene	µg/L	50	100	EPA Method 8270
Acrolein	µg/L	100	200	EPA Method 8240
Acrylonitrile	µg/L	100	200	EPA Method 8240
Aldrin	µg/L	2.5	5	EPA Method 8080
Alkalinity (as CaCO ₃)		No flag	No flag	Set by EPD/EMS
Allyl chloride	µg/L	250	500	EPA Method 8240
Aluminum	µg/L	100	200	EPA Method 6010
Americium-241	pCi/L	3.17E+00	6.34E+00	Proposed DWS (EPA, 1991)
Americium-243	pCi/L	3.19E+00	6.37E+00	Proposed DWS (EPA, 1991)
4-Aminobiphenyl	µg/L	50	100	EPA Method 8270
Ammonia	µg/L	500	1,000	APHA Method 417B
Ammonia nitrogen	µg/L	50	100	EPA Method 350.1
Aniline	µg/L	50	100	EPA Method 8270
Anthracene	µg/L	50	100	EPA Method 8270
Antimony	µg/L	2.5	5	Proposed DWS (EPA, 1990)
Antimony-125	pCi/L	1.5E+02	3E+02	Final DWS (EPA, 1977)
Aramite	µg/L	50	100	EPA Method 8270

Analyte	Unit	Flag 1	Flag 2	Source
Arsenic	µg/L	25	50	Final DWS (CFR, 1991)
Azobenzene	µg/L	50	100	EPA Method 625
Barium	µg/L	1,000	2,000	Final DWS (CFR, 1991)
Barium-140	pCi/L	4.5E+01	9E+01	Final DWS (EPA, 1977)
Benzene	µg/L	2.5	5	Final DWS (CFR, 1991)
alpha-Benzene hexachloride	µg/L	2.5	5	EPA Method 8080
beta-Benzene hexachloride	µg/L	2.5	5	EPA Method 8080
delta-Benzene hexachloride	µg/L	2.5	5	EPA Method 8080
Benzidine	µg/L	250	500	EPA Method 8270
Benzo[a]anthracene	µg/L	0.05	0.1	Proposed DWS (EPA, 1990)
Benzo[b]fluoranthene	µg/L	0.1	0.2	Proposed DWS (EPA, 1990)
Benzo[k]fluoranthene	µg/L	0.1	0.2	Proposed DWS (EPA, 1990)
Benzo[g,h,i]perylene	µg/L	50	100	EPA Method 8270
Benzo[a]pyrene	µg/L	0.1	0.2	Proposed DWS (EPA, 1990)
Benzoic acid	µg/L	250	500	EPA Method 8270
1,4-Benzoquinone	µg/L	50	100	EPA Method 8270
Benzyl alcohol	µg/L	100	200	EPA Method 8270
Beryllium	µg/L	0.5	1	Proposed DWS (EPA, 1990)
Beryllium-7	pCi/L	3E+03	6E+03	Final DWS (EPA, 1977)
Bis(2-chloroethoxy) methane	µg/L	50	100	EPA Method 8270
Bis(2-chloroethyl) ether	µg/L	50	100	EPA Method 8270
Bis(2-chloroisopropyl) ether	µg/L	50	100	EPA Method 8270
Bis(chloromethyl)ether	µg/L	50	100	EPA Method 8270
Bis(2-ethylhexyl) phthalate		No flag	No flag	Set by EPD/EMS
Bromide	µg/L	5,000	10,000	EPA Method 300.0
Bromodichloromethane	µg/L	50	100	Final DWS (CFR, 1991)
Bromoform	µg/L	50	100	Final DWS (CFR, 1991)
Bromomethane (Methyl bromide)	µg/L	5	10	EPA Method 8240
4-Bromophenyl phenyl ether	µg/L	50	100	EPA Method 8270
2-sec-Butyl-4,6-dinitrophenol	µg/L	3.5	7	Proposed DWS (EPA, 1990)
Butylbenzyl phthalate		No flag	No flag	Set by EPD/EMS
Cadmium	µg/L	2.5	5	Final DWS (CFR, 1991)
Calcium		No flag	No flag	Set by EPD/EMS
Carbon disulfide	µg/L	5	10	EPA Method 8240
Carbon tetrachloride	µg/L	2.5	5	Final DWS (CFR, 1991)
Carbon 12-labeled 2,3,7,8-TCDD	µg/L	0.00225	0.0045	EPA Method 8280
Carbon 12-labeled 2,3,7,8-TCDF	µg/L	0.002	0.004	EPA Method 8280
Carbon-14	pCi/L	1E+03	2E+03	Final DWS (EPA, 1977)
Carbonate		No flag	No flag	Set by EPD/EMS
Cerium-141	pCi/L	1.5E+02	3E+02	Final DWS (EPA, 1977)
Cerium-144	pCi/L	1.31E+02	2.61E+02	Proposed DWS (EPA, 1991)
Cesium-134	pCi/L	4.07E+01	8.13E+01	Proposed DWS (EPA, 1991)
Cesium-137	pCi/L	1E+02	2E+02	Final DWS (EPA, 1977)
Chlordane	µg/L	1	2	Final DWS (CFR, 1991)
Chloride	µg/L	125,000	250,000	Secondary DWS (EPA, 1991a)
4-Chloroaniline	µg/L	50	100	EPA Method 8270
Chlorobenzene	µg/L	5	10	EPA Method 8240
Chlorobenzilate	µg/L	50	100	EPA Method 8270
Chloroethane	µg/L	5	10	EPA Method 8240
Chloroethene (Vinyl chloride)	µg/L	1	2	Final DWS (CFR, 1991)
Chloroethyl vinyl ether	µg/L	5	10	EPA Method 8240
2-Chloroethyl vinyl ether	µg/L	5	10	EPA Method 8240
Chloroform	µg/L	50	100	Final DWS (CFR, 1991)
para-Chloro-meta-cresol	µg/L	50	100	EPA Method 8270
Chloromethane (Methyl chloride)	µg/L	5	10	EPA Method 8240
2-Chloronaphthalene	µg/L	50	100	EPA Method 8240

<u>Analyte</u>	<u>Unit</u>	<u>Flag 1</u>	<u>Flag 2</u>	<u>Source</u>
2-Chlorophenol	µg/L	50	100	EPA Method 8270
4-Chlorophenyl phenyl ether	µg/L	50	100	EPA Method 8270
Chloroprene	µg/L	1,000	2,000	EPA Method 8240
Chromium	µg/L	50	100	Final DWS (CFR, 1991)
Chromium-51	pCi/L	3E+03	6E+03	Final DWS (EPA, 1977)
Chrysene	µg/L	0.1	0.2	Proposed DWS (EPA, 1990)
Cobalt	µg/L	20	40	EPA Method 6010
Cobalt-57	pCi/L	5E+02	1E+03	Final DWS (EPA, 1977)
Cobalt-58	pCi/L	4.5E+03	9E+03	Final DWS (EPA, 1977)
Cobalt-60	pCi/L	5E+01	1E+02	Final DWS (EPA, 1977)
Color		No flag	No flag	Set by EPD/EMS
Copper	µg/L	650	1,300	Final DWS (CFR, 1991)
Corrosivity		No flag	No flag	Set by EPD/EMS
m-Cresol (3-Methylphenol)	µg/L	50	100	EPA Method 8270
o-Cresol (2-Methylphenol)	µg/L	50	100	EPA Method 8270
p-Cresol (4-Methylphenol)	µg/L	50	100	EPA Method 8270
Curium-242	pCi/L	6.65E+01	1.33E+02	Proposed DWS (EPA, 1991)
Curium-243	pCi/L	4.15E+00	8.3E+00	Proposed DWS (EPA, 1991)
Curium-244	pCi/L	4.92E+00	9.84E+00	Proposed DWS (EPA, 1991)
Curium-246	pCi/L	3.14E+00	6.27E+00	Proposed DWS (EPA, 1991)
Cyanide	µg/L	100	200	Proposed DWS (EPA, 1990)
p,p'-DDD	µg/L	2.5	5	EPA Method 8080
p,p'-DDE	µg/L	2.5	5	EPA Method 8080
p,p'-DDT	µg/L	2.5	5	EPA Method 8080
Di-n-butyl phthalate		No flag	No flag	Set by EPD/EMS
Di-n-octyl phthalate		No flag	No flag	Set by EPD/EMS
Diallate	µg/L	50	100	EPA Method 8270
Dibenz[a,h]anthracene	µg/L	0.15	0.3	Proposed DWS (EPA, 1990)
Dibenzofuran	µg/L	50	100	EPA Method 8270
Dibromochloromethane	µg/L	50	100	Final DWS (CFR, 1991)
Dibromochloropropane	µg/L	0.1	0.2	Final DWS (CFR, 1991)
1,2-Dibromoethane	µg/L	100	200	EPA Method 8240
Dibromomethane				
(Methylene bromide)	µg/L	5	10	EPA Method 8240
1,2-Dichlorobenzene	µg/L	300	600	Final DWS (CFR, 1991)
1,3-Dichlorobenzene	µg/L	50	100	EPA Method 8270
1,4-Dichlorobenzene	µg/L	37.5	75	Final DWS (CFR, 1991)
3,3'-Dichlorobenzidine	µg/L	50	100	EPA Method 8270
trans-1,4-Dichloro-2-butene	µg/L	150	300	EPA Method 8240
Dichlorodifluoromethane	µg/L	5	10	EPA Method 8240
1,1-Dichloroethane	µg/L	5	10	EPA Method 8240
1,2-Dichloroethane	µg/L	2.5	5	Final DWS (CFR, 1991)
cis-1,2-Dichloroethene	µg/L	35	70	Final DWS (CFR, 1991)
1,1-Dichloroethylene	µg/L	3.5	7	Final DWS (CFR, 1991)
1,2-Dichloroethylene	µg/L	25	50	EPA Method 8240
trans-1,2-Dichloroethylene	µg/L	50	100	Final DWS (CFR, 1991)
Dichloromethane				
(Methylene chloride)		No flag	No flag	Set by EPD/EMS
2,4-Dichlorophenol	µg/L	50	100	EPA Method 8270
2,6-Dichlorophenol	µg/L	50	100	EPA Method 8270
2,4-Dichlorophenoxyacetic acid	µg/L	35	70	Final DWS (CFR, 1991)
1,2-Dichloropropane	µg/L	2.5	5	Final DWS (CFR, 1991)
cis-1,3-Dichloropropene	µg/L	5	10	EPA Method 8240
trans-1,3-Dichloropropene	µg/L	5	10	EPA Method 8240
Dieldrin	µg/L	2.5	5	EPA Method 8080
Diethyl phthalate		No flag	No flag	Set by EPD/EMS

Analyte	Unit	Flag 1	Flag 2	Source
Dimethoate	µg/L	50	100	EPA Method 8270
p-Dimethylaminoazobenzene	µg/L	50	100	EPA Method 8270
p-(Dimethylamino)ethylbenzene	µg/L	50	100	EPA Method 8270
7,12-Dimethylbenz[a]anthracene	µg/L	50	100	EPA Method 8270
3,3'-Dimethylbenzidine	µg/L	50	100	EPA Method 8270
a,a-Dimethylphenethylamine	µg/L	50	100	EPA Method 8270
2,4-Dimethyl phenol	µg/L	50	100	EPA Method 8270
Dimethyl phthalate		No flag	No flag	Set by EPD/EMS
1,3-Dinitrobenzene	µg/L	50	100	EPA Method 8270
4,6-Dinitro-ortho-cresol	µg/L	250	500	EPA Method 8270
2,4-Dinitrophenol	µg/L	250	500	EPA Method 8270
2,4-Dinitrotoluene	µg/L	50	100	EPA Method 8270
2,6-Dinitrotoluene	µg/L	50	100	EPA Method 8270
1,4-Dioxane	µg/L	50	100	EPA Method 8270
Diphenylamine	µg/L	50	100	EPA Method 8270
1,2-Diphenylhydrazine	µg/L	50	100	EPA Method 8270
Dissolved organic carbon	µg/L	5,000	10,000	EPA Method 9060
Disulfoton	µg/L	50	100	EPA Method 8270
Eh		No flag	No flag	Set by EPD/EMS
alpha-Endosulfan	µg/L	50	100	EPA Method 8270
beta-Endosulfan	µg/L	50	100	EPA Method 8270
Endosulfan I	µg/L	2.5	5	EPA Method 8080
Endosulfan II	µg/L	2.5	5	EPA Method 8080
Endosulfan sulfate	µg/L	2.5	5	EPA Method 8080
Endrin	µg/L	0.1	0.2	Final DWS (CFR, 1991)
Endrin aldehyde	µg/L	2.5	5	EPA Method 8080
Endrin ketone		No flag	No flag	Set by EPD/EMS
Ethyl methacrylate	µg/L	50	100	EPA Method 8270
Ethyl methanesulfonate	µg/L	50	100	EPA Method 8270
Ethylbenzene	µg/L	350	700	Final DWS (CFR, 1991)
Europium-154	pCi/L	1E+02	2E+02	Final DWS (EPA, 1977)
Europium-155	pCi/L	3E+02	6E+02	Final DWS (EPA, 1977)
Famphur	µg/L	50	100	EPA Method 8270
Fluoranthene	µg/L	50	100	EPA Method 8270
Fluorene	µg/L	50	100	EPA Method 8270
Fluoride	µg/L	2,000	4,000	Final DWS (CFR, 1991)
Gross alpha	pCi/L	7.5E+00	1.5E+01	Final DWS (CFR, 1991)
Heptachlor	µg/L	0.2	0.4	Final DWS (CFR, 1991)
Heptachlor epoxide	µg/L	0.1	0.2	Final DWS (CFR, 1991)
Heptachlorodibenzo-p-dioxin isomers	µg/L	0.00325	0.0065	EPA Method 8280
1,2,3,4,6,7,8-Heptachlorodibenzo-p-dioxin	µg/L	0.00325	0.0065	EPA Method 8280
Heptachlorodibenzo-p-furan isomers	µg/L	0.00225	0.0045	EPA Method 8280
1,2,3,4,6,7,8-Heptachlorodibenzo-p-furan	µg/L	0.00225	0.0045	EPA Method 8280
Hexachlorobenzene	µg/L	0.5	1	Proposed DWS (EPA, 1990)
Hexachlorobutadiene	µg/L	50	100	EPA Method 8270
Hexachlorocyclopentadiene	µg/L	25	50	Proposed DWS (EPA, 1990)
Hexachlorodibenzo-p-dioxin isomers	µg/L	0.00225	0.0045	EPA Method 8280
1,2,3,4,7,8-Hexachlorodibenzo-p-dioxin	µg/L	0.00225	0.0045	EPA Method 8280
Hexachlorodibenzo-p-furan isomers	µg/L	0.002	0.004	EPA Method 8280
1,2,3,4,7,8-Hexachlorodibenzo-p-furan	µg/L	0.002	0.004	EPA Method 8280

Analyte	Unit	Flag 1	Flag 2	Source
Hexachloroethane	µg/L	50	100	EPA Method 8270
Hexachlorophene	µg/L	250	500	EPA Method 8270
Hexachloropropene	µg/L	50	100	EPA Method 8270
2-Hexanone	µg/L	100	200	EPA Method 8240
Indeno[1,2,3-c,d]pyrene	µg/L	50	100	EPA Method 8270
Iodine	µg/L	500	1,000	EPA Method 415
Iodine-129	pCi/L	5E-01	1E+00	Final DWS (EPA, 1977)
Iodine-131	pCi/L	1.5E+00	3E+00	Final DWS (EPA, 1977)
Iodomethane (Methyl iodide)	µg/L	75	150	EPA Method 8240
Iron	µg/L	150	300	Secondary DWS (EPA, 1991a)
Iron-55	pCi/L	1E+03	2E+03	Final DWS (EPA, 1977)
Iron-59	pCi/L	1E+02	2E+02	Final DWS (EPA, 1977)
Isobutyl alcohol	µg/L	500	1,000	EPA Method 8240
Isodrin	µg/L	50	100	EPA Method 8270
Isophorone	µg/L	50	100	EPA Method 8270
Isosafrole	µg/L	50	100	EPA Method 8270
Kepone	µg/L	50	100	EPA Method 8270
Lanthanum-140	pCi/L	3E+01	6E+01	Final DWS (EPA, 1977)
Lead	µg/L	7.5	15	Final DWS (CFR, 1991)
Lindane	µg/L	0.1	0.2	Final DWS (CFR, 1991)
Lithium	µg/L	25	50	EPA Method 6010
Magnesium		No flag	No flag	Set by EPD/EMS
Manganese	µg/L	25	50	Secondary DWS (EPA, 1991a)
Manganese-54	pCi/L	1.5E+02	3E+02	Final DWS (EPA, 1977)
Mercury	µg/L	1	2	Final DWS (CFR, 1991)
Methacrylonitrile	µg/L	250	500	EPA Method 8240
Methapyrilene	µg/L	50	100	EPA Method 8270
Methoxychlor	µg/L	20	40	Final DWS (CFR, 1991)
3-Methylcholanthrene	µg/L	50	100	EPA Method 8270
2-Methyl-4,6-dinitrophenol	µg/L	250	500	EPA Method 8270
Methyl ethyl ketone		No flag	No flag	Set by EPD/EMS
Methyl isobutyl ketone		No flag	No flag	Set by EPD/EMS
Methyl methacrylate	µg/L	50	100	EPA Method 8270
Methyl methanesulfonate	µg/L	50	100	EPA Method 8270
2-Methylnaphthalene	µg/L	50	100	EPA Method 8270
Molybdenum	µg/L	250	500	EPA Method 6010
Naphthalene	µg/L	50	100	EPA Method 8270
1,4-Naphthoquinone	µg/L	50	100	EPA Method 8270
1-Naphthylamine	µg/L	50	100	EPA Method 8270
2-Naphthylamine	µg/L	50	100	EPA Method 8270
Neptunium-237	pCi/L	3.53E+00	7.06E+00	Proposed DWS (EPA, 1991)
Nickel	µg/L	50	100	Proposed DWS (EPA, 1990)
Nickel-59	pCi/L	1.5E+02	3E+02	Final DWS (EPA, 1977)
Nickel-63	pCi/L	2.5E+01	5E+01	Final DWS (EPA, 1977)
Niobium-95	pCi/L	1.5E+02	3E+02	Final DWS (EPA, 1977)
Nitrate as nitrogen	µg/L	5,000	10,000	Final DWS (CFR, 1991)
Nitrite as nitrogen	µg/L	500	1,000	Final DWS (CFR, 1991)
2-Nitroaniline	µg/L	50	100	EPA Method 8270
3-Nitroaniline	µg/L	50	100	EPA Method 8270
4-Nitroaniline	µg/L	50	100	EPA Method 8270
Nitrobenzene	µg/L	50	100	EPA Method 8270
Nitrogen by Kjeldahl method	µg/L	500	1,000	EPA Method 351.2
2-Nitrophenol	µg/L	50	100	EPA Method 8270
4-Nitrophenol	µg/L	50	100	EPA Method 8270
4-Nitroquinoline-1-oxide	µg/L	50	100	EPA Method 8270
N-Nitrosodi-n-butylamine	µg/L	50	100	EPA Method 8270

Analyte	Unit	Flag 1	Flag 2	Source
N-Nitrosodiethylamine	µg/L	50	100	EPA Method 8270
N-Nitrosodimethylamine	µg/L	50	100	EPA Method 8270
N-Nitrosodiphenylamine	µg/L	50	100	EPA Method 8270
N-Nitrosodi-propylamine	µg/L	50	100	EPA Method 8270
N-Nitrosomethylethylamine	µg/L	50	100	EPA Method 8270
N-Nitrosomorpholine	µg/L	50	100	EPA Method 8270
N-Nitrosopiperidine	µg/L	50	100	EPA Method 8270
N-Nitrosopyrrolidine	µg/L	50	100	EPA Method 8270
5-Nitro-o-toluidine	µg/L	50	100	EPA Method 8270
Nonvolatile beta	pCi/L	2.5E+01	5E+01	Proposed DWS (EPA, 1986)
Octachlorodibenzo-p-dioxin isomers	µg/L	0.005	0.01	EPA Method 8280
Octachlorodibenzo-p-furan isomers	µg/L	0.005	0.01	EPA Method 8280
Odor		No flag	No flag	Set by EPD/EMS
Oil & Grease	µg/L	5,000	10,000	EPA Method 413.1
Parathion	µg/L	2.5	5	EPA Method 8080
Parathion methyl	µg/L	2.5	5	EPA Method 8080
PCB 1016	µg/L	0.25	0.5	Final DWS (CFR, 1991)
PCB 1221	µg/L	0.25	0.5	Final DWS (CFR, 1991)
PCB 1232	µg/L	0.25	0.5	Final DWS (CFR, 1991)
PCB 1242	µg/L	0.25	0.5	Final DWS (CFR, 1991)
PCB 1248	µg/L	0.25	0.5	Final DWS (CFR, 1991)
PCB 1254	µg/L	0.25	0.5	Final DWS (CFR, 1991)
PCB 1260	µg/L	0.25	0.5	Final DWS (CFR, 1991)
PCB 1262	µg/L	0.25	0.5	Final DWS (CFR, 1991)
Pentachlorobenzene	µg/L	50	100	EPA Method 8270
Pentachlorodibenzo-p-dioxin isomers	µg/L	0.00275	0.0055	EPA Method 8280
1,2,3,7,8-Pentachlorodibenzo-p-dioxin	µg/L	0.00275	0.0055	EPA Method 8280
Pentachlorodibenzo-p-furan isomers	µg/L	0.00275	0.0055	EPA Method 8280
1,2,3,7,8-Pentachlorodibenzo-p-furan	µg/L	0.00275	0.0055	EPA Method 8280
Pentachloroethane	µg/L	50	100	EPA Method 8270
Pentachloronitrobenzene	µg/L	50	100	EPA Method 8270
Pentachlorophenol	µg/L	0.5	1	Final DWS (CFR, 1991)
pH	pH	8	10	Set by EPD/EMS
pH	pH	4	3	Set by EPD/EMS
Phenacetin	µg/L	50	100	EPA Method 8270
Phenanthrene	µg/L	50	100	EPA Method 8270
Phenol	µg/L	50	100	EPA Method 8270
Phenols	µg/L	25	50	EPA Method 420.2
p-Phenylenediamine	µg/L	50	100	EPA Method 8270
Phorate	µg/L	2.5	5	EPA Method 8080
2-Picoline	µg/L	50	100	EPA Method 8270
Plutonium-238	pCi/L	3.51E+00	7.02E+00	Proposed DWS (EPA, 1991)
Plutonium-239	pCi/L	3.11E+01	6.21E+01	Proposed DWS (EPA, 1991)
Plutonium-239/240 ^a	pCi/L	3.11E+01	6.21E+01	Proposed DWS (EPA, 1991)
Plutonium-240	pCi/L	3.11E+01	6.22E+01	Proposed DWS (EPA, 1991)
Plutonium-241	pCi/L	3.13E+01	6.26E+01	Proposed DWS (EPA, 1991)
Plutonium-242	pCi/L	3.27E+01	6.54E+01	Proposed DWS (EPA, 1991)
Potassium		No flag	No flag	Set by EPD/EMS
Potassium-40	pCi/L	1.5E+02	3E+02	Proposed DWS (EPA, 1986)
Pronamid	µg/L	50	100	EPA Method 8270
Propionitrile	µg/L	1,000	2,000	EPA Method 8240
Pyrene	µg/L	50	100	EPA Method 8270
Pyridine	µg/L	50	100	EPA Method 8270

Analyte	Unit	Flag 1	Flag 2	Source
Radium-226	pCi/L	7.85E+00	1.57E+01	Proposed DWS (EPA, 1991)
Radium-228	pCi/L	3.93E+00	7.85E+00	Proposed DWS (EPA, 1991)
Radon-222	pCi/L	1.5E+02	3E+02	Proposed DWS (EPA, 1991)
Ruthenium-103	pCi/L	1E+02	2E+02	Final DWS (EPA, 1977)
Ruthenium-106	pCi/L	1.5E+01	3E+01	Final DWS (EPA, 1977)
Safrole	µg/L	50	100	EPA Method 8270
Selenium	µg/L	25	50	Final DWS (CFR, 1991)
Silica		No flag	No flag	Set by EPD/EMS
Silver	µg/L	25	50	Final DWS (CFR, 1991)
Sodium		No flag	No flag	Set by EPD/EMS
Sodium-22	pCi/L	2.33E+02	4.66E+02	Proposed DWS (EPA, 1991)
Specific conductance	µS/cm	250	500	Set by EPD/EMS
Strontium-89	pCi/L	1E+01	2E+01	Final DWS (EPA, 1977)
Strontium-89/90 ^a	pCi/L	4E+00	8E+00	Final DWS (CFR, 1991)
Strontium-90	pCi/L	4E+00	8E+00	Final DWS (CFR, 1991)
Styrene	µg/L	50	100	Final DWS (CFR, 1991)
Sulfate	µg/L	200,000	400,000	Proposed DWS (EPA, 1990)
Sulfide	µg/L	5,000	10,000	EPA Method 9030
Sulfotep	µg/L	50	100	EPA Method 8270
Surfactants		No flag	No flag	Set by EPD/EMS
Technetium-99	pCi/L	4.5E+02	9E+02	Final DWS (EPA, 1977)
1,2,4,5-Tetrachlorobenzene	µg/L	50	100	EPA Method 8270
Tetrachlorodibenzo-p-dioxin isomers	µg/L	0.00225	0.0045	EPA Method 8280
Tetrachlorodibenzo-p-furan isomers	µg/L	0.002	0.004	EPA Method 8280
1,1,1,2-Tetrachloroethane	µg/L	5	10	EPA Method 8240
1,1,2,2-Tetrachloroethane	µg/L	5	10	EPA Method 8240
Tetrachloroethylene	µg/L	2.5	5	Final DWS (CFR, 1991)
2,3,4,6-Tetrachlorophenol	µg/L	50	100	EPA Method 8270
Tetraethyl dithiopyrophosphate	µg/L	50	100	EPA Method 8270
Thallium	µg/L	0.5	1	Proposed DWS (EPA, 1990)
Thionazin	µg/L	50	100	EPA Method 8270
Thorium-228	pCi/L	6.25E+01	1.25E+02	Proposed DWS (EPA, 1991)
Thorium-230	pCi/L	3.96E+01	7.92E+01	Proposed DWS (EPA, 1991)
Thorium-232	pCi/L	4.4E+01	8.8E+01	Proposed DWS (EPA, 1991)
Thorium-234	pCi/L	2E+02	4.01E+02	Proposed DWS (EPA, 1991)
Tin	µg/L	10	20	EPA Method 282.2
Tin-113	pCi/L	150	300	Final DWS (EPA, 1977)
Toluene	µg/L	500	1,000	Final DWS (CFR, 1991)
o-Toluidine	µg/L	50	100	EPA Method 8270
Total carbon	µg/L	5,000	10,000	EPA Method 9060
Total dissolved solids		No flag	No flag	Set by EPD/EMS
Total hydrocarbons	µg/L	5,000	10,000	EPA Method 418.1
Total inorganic carbon	µg/L	5,000	10,000	EPA Method 9060
Total organic carbon	µg/L	5,000	10,000	EPA Method 9060
Total organic halogens	µg/L	25	50	EPA Method 9020
Total organic nitrogen	µg/L	500	1,000	EPA Method 420
Total petroleum hydrocarbons	µg/L	5,000	10,000	EPA Method 418.1
Total phosphates (as P)		No flag	No flag	Set by EPD/EMS
Total phosphorus		No flag	No flag	Set by EPD/EMS
Total radium	pCi/L	2.5	5	Final DWS (CFR, 1991)
Total silica	µg/L	500	1,000	EPA Method 6010
Toxaphene	µg/L	1.5	3	Final DWS (CFR, 1991)
2,4,5-TP (Silvex)	µg/L	25	50	Final DWS (CFR, 1991)
Tributyl phosphate	µg/L	50	100	EPA Method 8270

Analyte	Unit	Flag 1	Flag 2	Source
1,2,4-Trichlorobenzene	µg/L	4.5	9	Proposed DWS (EPA, 1990)
1,1,1-Trichloroethane	µg/L	100	200	Final DWS (CFR, 1991)
1,1,2-Trichloroethane	µg/L	2.5	5	Proposed DWS (EPA, 1990)
Trichloroethylene	µg/L	2.5	5	Final DWS (CFR, 1991)
Trichlorofluoromethane	µg/L	5	10	EPA Method 8240
2,4,5-Trichlorophenol	µg/L	50	100	EPA Method 8270
2,4,6-Trichlorophenol	µg/L	50	100	EPA Method 8270
2,4,5-Trichlorophenoxyacetic acid	µg/L	2.5	5	EPA Method 8150
1,2,3-Trichloropropane	µg/L	5	10	EPA Method 8240
O,O,O-Triethyl phosphorothioate	µg/L	50	100	EPA Method 8270
1,3,5-Trinitrobenzene	µg/L	50	100	EPA Method 8270
Tritium	pCi/mL	1E+01	2E+01	Final DWS (CFR, 1991)
Turbidity		No flag	No flag	Set by EPD/EMS
Uranium	µg/L	10	20	Proposed DWS (EPA, 1991)
Uranium alpha activity	pCi/L	1.5E+01	3E+01	Proposed DWS (EPA, 1991)
Uranium-233/234 ^a	pCi/L	6.9E-01	1.38E+01	Proposed DWS (EPA, 1991)
Uranium-234	pCi/L	6.95E+00	1.39E+01	Proposed DWS (EPA, 1991)
Uranium-235	pCi/L	7.25E+00	1.45E+01	Proposed DWS (EPA, 1991)
Uranium-238	pCi/L	7.3E+00	1.46E+01	Proposed DWS (EPA, 1991)
Vanadium	µg/L	50	100	EPA Method 6010
Vinyl acetate	µg/L	5	10	EPA Method 8240
Xylenes	µg/L	5,000	10,000	Final DWS (CFR, 1991)
Zinc	µg/L	2,500	5,000	Secondary DWS (EPA, 1991a)
Zinc-65	pCi/L	1.5E+02	3E+02	Final DWS (EPA, 1977)
Zirconium-95	pCi/L	1E+02	2E+02	Final DWS (EPA, 1977)
Zirconium/Niobium-95 ^a	pCi/L	1E+02	2E+02	Final DWS (EPA, 1977)

^a For double radionuclide analyses where each separate radionuclide has its own standard, the more stringent standard is used.

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Appendix C – Figures

Figure 1. Location of the P-Area Acid/Caustic Basin at the Savannah River Site

Figure 2. Location of Groundwater Monitoring Wells at the P-Area Acid/Caustic Basin

Figure 3. Water-Elevation Contour Map of the Water Table at the P-Area Acid/Caustic Basin

Appendix D – Groundwater Monitoring Results Tables

Key to Reading the Tables

The following abbreviations may appear in the tabular data:

B = analyte detected in associated blank as well as in sample
D = drinking water standard
E = exponential notation (e.g., $1.1\text{E}-09 = 1.1 \times 10^{-9} = 0.0000000011$)
EM = EPD/EMS Laboratory
GE = General Engineering Laboratories
H = holding time
1,2,3,4,6,7,8-HPCDD = 1,2,3,4,6,7,8-heptachlorodibenzo-p-dioxin
1,2,3,4,6,7,8-HPCDF = 1,2,3,4,6,7,8-heptachlorodibenzo-p-furan
1,2,3,4,7,8-HXCDD = 1,2,3,4,7,8-hexachlorodibenzo-p-dioxin
1,2,3,4,7,8-HXCDF = 1,2,3,4,7,8-heptachlorodibenzo-p-furan
J = estimated value
Lindane = gamma-benzene hexachloride
MA = M-Area Laboratory
msl = mean sea level
MSL = million structures/liter
NTU = turbidity unit
pH = pH unit
pCi/L = picocuries per liter
pCi/mL = picocuries per milliliter
PVC = polyvinyl chloride
TCDD = tetrachlorodibenzo-p-dioxin
TCDF = tetrachlorodibenzo-p-furan
TOC = top of casing
Sp. = specific
 $\mu\text{g/L}$ = micrograms per liter
 $\mu\text{S/cm}$ = microsiemens per centimeter

Holding Times

Standard analytical methods include a limit, called holding time, on the maximum elapsed time between sample collection and extraction or analysis by the laboratory. In the data tables, a large dot (•) in the H (holding time) column indicates that holding time was exceeded. Analyses performed beyond holding time may not yield valid results.

South Carolina Department of Health and Environmental Control (SCDHEC) allows only 15 minutes to elapse between sampling and analysis for pH. Thus, laboratory pH analyses always exceed holding time.

Laboratory-initiated procedures for reducing the number of other analyses performed out of holding time include subcontracting analyses when difficulties with equipment, personnel, or work load would prevent timely analyses. Beginning fourth quarter 1991, SRS reduced the compensation to laboratories for analyses performed out of holding time.

Table 1. Constituents Exceeding the Primary Drinking Water Standards

<u>Well</u>	<u>Constituent</u>	<u>Unit</u>	<u>1Q92</u>
N ^a	None	N	N

^a N = not applicable

Table 2. Constituents Exceeding Half the Primary Drinking Water Standards or Other Flag 1 or Flag 2 Criteria

<u>Well</u>	<u>Constituent</u>	<u>Unit</u>	<u>1Q92</u>	<u>Flag</u>
PAC 1	Total organic halogens	µg/L	70	2
PAC 2	Iron	µg/L	2,560	2
	Manganese	µg/L	46	1
	Total organic halogens	µg/L	69	2
PAC 3	Manganese	µg/L	36	1
	Specific conductance	µS/cm	261	1
	Total organic halogens	µg/L	70	2
PAC 4	Total organic halogens	µg/L	78	2
PAC 5	Iron	µg/L	386	2
	Manganese	µg/L	214	2
	Specific conductance	µS/cm	366 ^a	1
	Specific conductance	µS/cm	368 ^a	1
	Total organic halogens	µg/L	34	1
PAC 6	Iron	µg/L	3,260	2
	Manganese	µg/L	273	2
	Total organic halogens	µg/L	53	2

^a Duplicate samples of specific conductance

Table 3. Groundwater Monitoring Results for Individual Wells**WELL PAC 1**

<u>SRS Coord.</u>	<u>Lat/Longitude</u>	<u>Screen Zone Elevation</u>	<u>Top of Casing</u>	<u>Casing</u>	<u>Formation</u>
N43543.3 E66753.4	33.230963 °N 81.575658 °W	283.9-253.9 ft msl	295.9 ft msl	4" PVC	Water table

FIELD MEASUREMENTS

Sample date: 02/28/92
 Depth to water: 11.30 ft (3.44 m) below TOC
 Water elevation: 284.60 ft (86.75 m) msl
 Sp. conductance: 31 μ S/cm
 Water evacuated before sampling: 81 gal

Time: 14:10
 pH: 5.2
 Alkalinity: 2 mg/L
 Water temperature: 17.1°C

LABORATORY ANALYSES

<u>H</u>	<u>D</u>	<u>Analyte</u>	<u>Result</u>	<u>Unit</u>	<u>Flag</u>	<u>Lab</u>
•		pH	5.5	pH	0	WA
		Specific conductance	26	μ S/cm	0	WA
		Turbidity	30	NTU	0	WA
		Arsenic	< 2.0	μ g/L	0	WA
		Barium	24	μ g/L	0	WA
		Cadmium	< 0.35	μ g/L	0	WA
		Calcium	766	μ g/L	0	WA
		Chloride	3,520	μ g/L	0	WA
		Chromium	< 1.1	μ g/L	0	WA
		2,4-Dichlorophenoxyacetic acid	< 1.1	μ g/L	0	WA
		Endrin	< 0.11	μ g/L	0	WA
		Fluoride	< 100	μ g/L	0	WA
		Iron	60	μ g/L	0	WA
		Lead	2.8	μ g/L	0	WA
		Lindane	< 0.055	μ g/L	0	WA
		Magnesium	318	μ g/L	0	WA
		Manganese	5.5	μ g/L	0	WA
		Mercury	< 0.20	μ g/L	0	WA
		Methoxychlor	< 0.55	μ g/L	0	WA
		Nitrate as nitrogen	507	μ g/L	0	WA
		Phenols	< 5.0	μ g/L	0	WA
		Potassium	688	μ g/L	0	WA
		Selenium	< 2.0	μ g/L	0	WA
		Silicon	2,150	μ g/L	0	WA
		Silver	< 0.70	μ g/L	0	WA
		Sodium	3,790	μ g/L	0	WA
		Sulfate	2,330	μ g/L	0	WA
		Total dissolved solids	53,000	μ g/L	0	WA
		Total organic carbon	1,310	μ g/L	0	WA
		Total organic carbon	1,310	μ g/L	0	WA
		Total organic halogens	70	μ g/L	2	WA
		Total phosphates (as P)	49	μ g/L	0	WA
		Toxaphene	< 1.1	μ g/L	0	WA
		2,4,5-TP (Silvex)	< 0.55	μ g/L	0	WA
		Gross alpha	2.7E+00 $\pm$ 1.1E+00	pCi/L	0	TM
		Nonvolatile beta	3.1E+00 $\pm$ 1.6E+00	pCi/L	0	TM
		Radium-226	< 1.0E+00	pCi/L	0	TM
		Radium-228	< 1.1E+01	pCi/L	0	TM
		Tritium	3.4E-01 $\pm$ 1.7E-01	pCi/mL	0	TM

• = exceeded holding time. ■ = exceeded primary drinking water standard.

WELL PAC 2

<u>SRS Coord.</u>	<u>Lat/Longitude</u>	<u>Screen Zone Elevation</u>	<u>Top of Casing</u>	<u>Casing</u>	<u>Formation</u>
N43527.7 E66980.9	33.231299 °N 81.575029 °W	277.9-247.9 ft msl	284.8 ft msl	4" PVC	Water table

FIELD MEASUREMENTS

Sample date: 02/28/92	Time: 13:10
Depth to water: 12.96 ft (3.95 m) below TOC	pH: 6.1
Water elevation: 271.84 ft (82.86 m) msl	Alkalinity: 14 mg/L
Sp. conductance: 70 µS/cm	Water temperature: 17.5°C
Water evacuated before sampling: 63 gal	

LABORATORY ANALYSES

<u>H</u>	<u>D</u>	<u>Analyte</u>	<u>Result</u>	<u>Unit</u>	<u>Flag</u>	<u>Lab</u>
•		pH	6.2	pH	0	WA
		Specific conductance	59	µS/cm	0	WA
		Turbidity	7.3	NTU	0	WA
		Arsenic	< 2.0	µg/L	0	WA
		Barium	20	µg/L	0	WA
		Cadmium	< 0.35	µg/L	0	WA
		Calcium	3,210	µg/L	0	WA
		Chloride	4,720	µg/L	0	WA
		Chromium	< 1.1	µg/L	0	WA
		2,4-Dichlorophenoxyacetic acid	< 1.1	µg/L	0	WA
		Endrin	< 0.11	µg/L	0	WA
		Fluoride	< 100	µg/L	0	WA
		Iron	2,560	µg/L	2	WA
		Lead	< 2.0	µg/L	0	WA
		Lindane	< 0.055	µg/L	0	WA
		Magnesium	595	µg/L	0	WA
		Manganese	46	µg/L	1	WA
		Mercury	< 0.20	µg/L	0	WA
		Methoxychlor	< 0.55	µg/L	0	WA
		Nitrate as nitrogen	43	µg/L	0	WA
		Phenols	< 5.0	µg/L	0	WA
		Potassium	645	µg/L	0	WA
		Selenium	< 2.0	µg/L	0	WA
		Silicon	3,420	µg/L	0	WA
		Silver	< 0.70	µg/L	0	WA
		Sodium	6,170	µg/L	0	WA
		Sulfate	8,360	µg/L	0	WA
		Total dissolved solids	53,000	µg/L	0	WA
		Total organic carbon	2,340	µg/L	0	WA
		Total organic halogens	69	µg/L	2	WA
		Total phosphates (as P)	20	µg/L	0	WA
		Toxaphene	< 1.1	µg/L	0	WA
		2,4,5-TP (Silvex)	< 0.55	µg/L	0	WA
		Gross alpha	< 6.7E-01 ± 6.4E-01	pCi/L	0	TM
		Nonvolatile beta	2.6E+00 ± 1.6E+00	pCi/L	0	TM
		Radium-226	1.0E+00 ± 4.0E-01	pCi/L	0	TM
		Radium-228	< 1.0E+01	nCi/L	0	TM
		Tritium	< 1.4E-01 ± 1.8E-01	pCi/mL	0	TM

• = exceeded holding time. ■ = exceeded primary drinking water standard.

WELL PAC 3

<u>SRS Coord.</u>	<u>Lat/Longitude</u>	<u>Screen Zone Elevation</u>	<u>Top of Casing</u>	<u>Casing</u>	<u>Formation</u>
N43585.6 E66861.4	33.231232 °N 81.575456 °W	282.9-252.9 ft msl	289.9 ft msl	4" PVC	Water table

FIELD MEASUREMENTS

Sample date: 02/28/92	Time: 12:35
Depth to water: 17.92 ft (5.46 m) below TOC	pH: 6.4
Water elevation: 271.98 ft (82.90 m) msl	Alkalinity: 28 mg/L
Sp. conductance: 312 µS/cm	Water temperature: 18.3°C
Water evacuated before sampling: 50 gal	

LABORATORY ANALYSES

<u>H</u>	<u>D</u>	<u>Analyte</u>	<u>Result</u>	<u>Unit</u>	<u>Flag</u>	<u>Lab</u>
•		pH	6.3	pH	0	WA
		Specific conductance	261	µS/cm	1	WA
		Turbidity	20	NTU	0	WA
		Arsenic	< 2.0	µg/L	0	WA
		Barium	79	µg/L	0	WA
		Cadmium	< 0.35	µg/L	0	WA
		Calcium	14,200	µg/L	0	WA
		Chloride	6,500	µg/L	0	WA
		Chromium	< 1.1	µg/L	0	WA
		2,4-Dichlorophenoxyacetic acid	< 1.1	µg/L	0	WA
		Endrin	< 0.11	µg/L	0	WA
		Fluoride	< 100	µg/L	0	WA
		Iron	149	µg/L	0	WA
		Lead	< 2.0	µg/L	0	WA
		Lindane	< 0.055	µg/L	0	WA
		Magnesium	3,840	µg/L	0	WA
		Manganese	36	µg/L	1	NA
		Mercury	< 0.20	µg/L	0	WA
		Methoxychlor	< 0.55	µg/L	0	WA
		Nitrate as nitrogen	97	µg/L	0	WA
		Phenols	< 5.0	µg/L	0	WA
		Phenols	< 5.0	µg/L	0	WA
		Potassium	1,000	µg/L	0	WA
		Selenium	< 2.0	µg/L	0	WA
		Silicon	5,550	µg/L	0	WA
		Silver	< 0.70	µg/L	0	WA
		Sodium	39,500	µg/L	0	WA
		Sulfate	96,800	µg/L	0	WA
		Total dissolved solids	214,000	µg/L	0	WA
		Total organic carbon	3,530	µg/L	0	WA
		Total organic halogens	70	µg/L	2	WA
		Total phosphates (as P)	29	µg/L	0	WA
		Toxaphene	< 1.1	µg/L	0	WA
		2,4,5-TP (Silvex)	< 0.54	µg/L	0	WA
		Gross alpha	1.7E+00 ± 1.4E+00	pCi/L	0	TM
		Nonvolatile beta	3.5E+00 ± 1.6E+00	pCi/L	0	TM
		Radium-226	2.0E-01 ± 2.0E-01	pCi/L	0	TM
		Radium-228	< 1.3E+01	pCi/L	0	TM
		Tritium	3.2E+00 ± 3.8E-01	pCi/mL	0	TM

• = exceeded holding time. ■ = exceeded primary drinking water standard.

WELL PAC 4

SRS Coord	Lat/Longitude	Screen Zone Elevation	Top of Casing	Casing	Formation
N43495.4 E66863.2	33.231036 °N 81.575276 °W	280.6-250.6 ft msl	291.6 ft msl	4" PVC	Water table

FIELD MEASUREMENTS

Sample date: 02/28/92	Time: 13:45
Depth to water: 7.23 ft (2.20 m) below TOC	pH: 5.3
Water elevation: 284.37 ft (86.68 m) msl	Alkalinity: 4 mg/L
Sp. conductance: 123 µS/cm	Water temperature: 17.0°C
Water evacuated before sampling: 87 gal	

LABORATORY ANALYSES

H	D	Analyte	Result	Unit	Flag	Lab
•		pH	5.6	pH	0	WA
		Specific conductance	99	µS/cm	0	WA
		Turbidity	21	NTU	0	WA
		Arsenic	< 2.0	µg/L	0	WA
		Barium	14	µg/L	0	WA
		Cadmium	< 0.35	µg/L	0	WA
		Calcium	171	µg/L	0	WA
		Chloride	4,020	µg/L	0	WA
		Chromium	< 1.1	µg/L	0	WA
		2,4-Dichlorophenoxyacetic acid	< 1.1	µg/L	0	WA
		Endrin	< 0.10	µg/L	0	WA
		Fluoride	< 100	µg/L	0	WA
		Iron	11	µg/L	0	WA
		Lead	< 2.0	µg/L	0	WA
		Lindane	< 0.052	µg/L	0	WA
		Magnesium	198	µg/L	0	WA
		Manganese	1.3	µg/L	0	WA
		Mercury	< 0.20	µg/L	0	WA
		Methoxychlor	< 0.52	µg/L	0	WA
		Nitrate as nitrogen	1,180	µg/L	0	WA
		Phenols	< 5.0	µg/L	0	WA
		Potassium	576	µg/L	0	WA
		Selenium	< 2.0	µg/L	0	WA
		Silicon	2,420	µg/L	0	WA
		Silver	< 0.70	µg/L	0	WA
		Sodium	20,100	µg/L	0	WA
		Sulfate	30,600	µg/L	0	WA
		Total dissolved solids	93,000	µg/L	0	WA
		Total dissolved solids	90,000	µg/L	0	WA
		Total organic carbon	646	µg/L	0	WA
		Total organic carbon	646	µg/L	0	WA
		Total organic halogens	78	µg/L	2	WA
		Total phosphates (as P)	29	µg/L	0	WA
		Toxaphene	< 1.0	µg/L	0	WA
		2,4,5-TP (Silvex)	< 0.54	µg/L	0	WA
		Gross alpha	1.8E+00 ± 1.1E+00	pCi/L	0	TM
		Nonvolatile beta	2.9E+00 ± 1.6E+00	pCi/L	0	TM
		Radium-226	5.0E-01 ± 3.0E-01	pCi/L	0	TM
		Radium-228	< 1.3E+01	pCi/L	0	TM
		Tritium	6.8E+00 ± 2.3E-01	pCi/mL	0	TM

• = exceeded holding time. ■ = exceeded primary drinking water standard.

WELL PAC 5

<u>SRS Coord.</u>	<u>Lat/Longitude</u>	<u>Screen Zone Elevation</u>	<u>Top of Casing</u>	<u>Casing</u>	<u>Formation</u>
N43561.7 E66907.1	33.231254 °N 81.575289 °W	275.1-255.1 ft msl	289.3 ft msl	4" PVC	Water table

FIELD MEASUREMENTS

Sample date: 03/02/92	Time: 15:50
Depth to water: 13.33 ft (4.06 m) below TOC	pH: 7.1
Water elevation: 275.97 ft (84.12 m) msl	Alkalinity: 96 mg/L
Sp. conductance: 448 µS/cm	Water temperature: 15.8°C
Water evacuated before sampling: 12 gal	
The well went dry during purging.	

LABORATORY ANALYSES

<u>H</u>	<u>D</u>	<u>Analyte</u>	<u>Result</u>	<u>Unit</u>	<u>Flag</u>	<u>Lab</u>
•		pH	7.1	pH	0	WA
•		pH	7.0	pH	0	WA
		Specific conductance	366	µS/cm	1	WA
		Specific conductance	368	µS/cm	1	WA
		Turbidity	5.5	NTU	0	WA
		Turbidity	5.6	NTU	0	WA
		Arsenic	< 2.0	µg/L	0	WA
		Barium	50	µg/L	0	WA
		Cadmium	< 0.35	µg/L	0	WA
		Calcium	33,300	µg/L	0	WA
		Chloride	4,620	µg/L	0	WA
		Chromium	2.0	µg/L	0	WA
		2,4-Dichlorophenoxyacetic acid	< 1.1	µg/L	0	WA
		Endrin	< 0.12	µg/L	0	WA
		Fluoride	< 100	µg/L	0	WA
		Iron	386	µg/L	2	WA
		Lead	< 2.0	µg/L	0	WA
		Lindane	< 0.058	µg/L	0	WA
		Magnesium	8,250	µg/L	0	WA
		Manganese	214	µg/L	2	WA
		Mercury	< 0.20	µg/L	0	WA
		Methoxychlor	< 0.58	µg/L	0	WA
		Nitrate as nitrogen	233	µg/L	0	WA
		Nitrate as nitrogen	225	µg/L	0	WA
		Phenols	< 5.0	µg/L	0	WA
		Phenols	< 5.0	µg/L	0	WA
		Potassium	1,540	µg/L	0	WA
		Selenium	< 2.0	µg/L	0	WA
		Silicon	6,510	µg/L	0	WA
		Silver	1.5	µg/L	0	WA
		Sodium	43,700	µg/L	0	WA
		Sulfate	100,000	µg/L	0	WA
		Sulfate	99,000	µg/L	0	WA

• = exceeded holding time. ■ = exceeded primary drinking water standard.

WELL PAC 5 collected on 03/02/92, laboratory analyses (cont.)

<u>H</u>	<u>D</u>	<u>Analyte</u>	<u>Result</u>	<u>Unit</u>	<u>Flag</u>	<u>Lab</u>
		Total dissolved solids	264,000	µg/L	0	WA
		Total organic carbon	2,140	µg/L	0	WA
		Total organic halogens	34	µg/L	1	WA
		Total phosphates (as P)	20	µg/L	0	WA
		Total phosphates (as P)	< 20	µg/L	0	WA
		Toxaphene	< 1.2	µg/L	0	WA
		2,4,5-TP (Silvex)	< 0.56	µg/L	0	WA
		Gross alpha	2.7E+00 ± 1.7E+00	pCi/L	0	TM
		Nonvolatile beta	6.2E+00 ± 1.6E+00	pCi/L	0	TM
		Radium-226	8.0E-01 ± 4.0E-01	pCi/L	0	TM
		Radium-228	< 2.3E+01	pCi/L	0	TM
		Tritium	3.7E+00 ± 2.1E-01	pCi/mL	0	TM

WELL PAC 6

<u>SRS Coord.</u>	<u>Lat/Longitude</u>	<u>Screen Zone Elevation</u>	<u>Top of Casing</u>	<u>Casing</u>	<u>Formation</u>
N43580.1	33.231274 °N	275.2-255.2 ft msl	289.4 ft msl	4" PVC	Water table
E66894.7	81.575358 °W				

FIELD MEASUREMENTS

Sample date: 03/02/92
 Depth to water: 13.87 ft (4.23 m) below TOC
 Water elevation: 275.53 ft (83.98 m) msl
 Sp. conductance: 324 µS/cm
 Water evacuated before sampling: 12 gal
 The well went dry during purging.

Time: 15:35
 pH: 6.4
 Alkalinity: 65 mg/L
 Water temperature: 14.5°C

LABORATORY ANALYSES

<u>H</u>	<u>D</u>	<u>Analyte</u>	<u>Result</u>	<u>Unit</u>	<u>Flag</u>	<u>Lab</u>
•		pH	6.8	pH	0	WA
		Specific conductance	< 1.0	µS/cm	0	WA
		Turbidity	16	NTU	0	WA
		Arsenic	< 2.0	µg/L	0	WA
		Barium	36	µg/L	0	WA
		Cadmium	< 0.35	µg/L	0	WA
		Calcium	16,100	µg/L	0	WA
		Chloride	4,700	µg/L	0	WA
		Chromium	< 1.1	µg/L	0	WA
		2,4-Dichlorophenoxyacetic acid	< 1.1	µg/L	0	WA
		Endrin	< 0.11	µg/L	0	WA
		Fluoride	< 100	µg/L	0	WA
		Iron	3,260	µg/L	2	WA
		Lead	< 2.0	µg/L	0	WA
		Lindane	< 0.055	µg/L	0	WA
		Magnesium	5,120	µg/L	0	WA
		Manganese	273	µg/L	2	WA
		Mercury	< 0.20	µg/L	0	WA
		Methoxychlor	< 0.55	µg/L	0	WA
		Nitrate as nitrogen	61	µg/L	0	WA
		Phenols	< 5.0	µg/L	0	WA
		Potassium	947	µg/L	0	WA

• = exceeded holding time. ■ = exceeded primary drinking water standard.

WELL PAC 6 collected on 03/02/92, laboratory analyses (cont.)

<u>H</u>	<u>D</u>	<u>Analyte</u>	<u>Result</u>	<u>Unit</u>	<u>Flag</u>	<u>Lab</u>
		Selenium	< 2.0	µg/L	0	WA
		Silicon	8,500	µg/L	0	WA
		Silver	< 0.70	µg/L	0	WA
		Sodium	35,700	µg/L	0	WA
		Sulfate	66,000	µg/L	0	WA
		Total dissolved solids	195,000	µg/L	0	WA
		Total organic carbon	1,540	µg/L	0	WA
		Total organic halogens	53	µg/L	2	WA
		Total phosphates (as P)	< 20	µg/L	0	WA
		Toxaphene	< 1.1	µg/L	0	WA
		2,4,5-TP (Silvex)	< 0.55	µg/L	0	WA
		Gross alpha	1.5E+00 ± 1.4E+00	pCi/L	0	TM
		Nonvolatile beta	4.0E+00 ± 1.6E+00	pCi/L	0	TM
		Radium-226	5.0E-01 ± 3.0E-01	pCi/L	0	TM
		Radium-228	< 2.4E+01	pCi/L	0	TM
		Tritium	3.6E+00 ± 3.1E-01	pCi/mL	0	TM

● = exceeded holding time. ■ = exceeded primary drinking water standard.

P-Area Acid Caustic Basin

D-10

First Quarter 1992

END

**DATE
FILMED**

21/7/93