

GROUNDWATER RESOURCES
CONSULTANTS, INC.
TUCSON, ARIZONA

ASSESSMENT OF
POND SEDIMENTS IN R2, SRE AND PERIMETER PONDS
AT THE

ROCKWELL INTERNATIONAL CORPORATION
ROCKETDYNE DIVISION
SANTA SUSANA FIELD LABORATORY
VENTURA COUNTY, CALIFORNIA

concentrations of
organics in App's
B, C & D should
be mg/kg,
not mg/l

July 26, 1990
8640M-101

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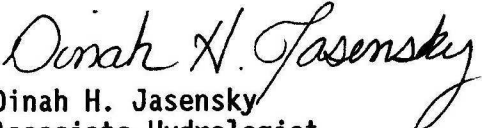
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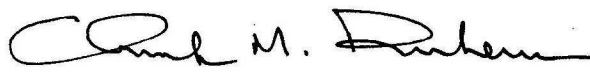
Dear Ms. Crone:

Submitted herewith is the report *Assessment of Pond Sediments in R2, SRE and Perimeter Ponds* at the Rockwell International Corporation, Rocketdyne Division, Santa Susana Field Laboratory. Please contact us if you have any questions or comments regarding this report.

Respectfully submitted,

GROUNDWATER RESOURCES CONSULTANTS, INC.


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Enclosure

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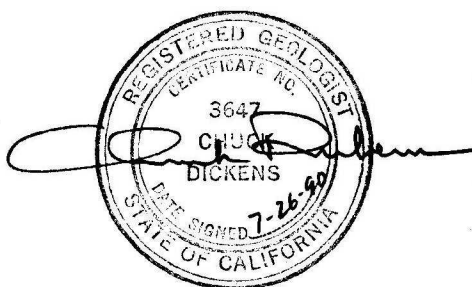
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INTRODUCTION

Pursuant to the request of the Environmental Control Group, Rocketdyne Division, Rockwell International Corporation, this report presenting the results of the investigation of the R2, Sodium Reactor Experiment (SRE) and Perimeter ponds at the Santa Susana Field Laboratory (the Facility) has been prepared. The objective of the investigation was to assess the potential presence and extent of contamination in the pond sediments.

The R2, SRE and Perimeter ponds are used for purposes of retention and reclamation of Facility surface water runoff. The R2 and Perimeter ponds also serve to retain and recycle water from site operations. Water released from the R2 and Perimeter ponds flows south through drainage ways in the Buffer Zone to two NPDES discharge points located on the southern Facility boundary (Figure 1). Surface water from the SRE pond is discharged northwest of the Area IV boundary (Figure 1).

Rocketdyne has applied to the Los Angeles Regional Water Quality Control Board (LARWQCB) for NPDES permit renewal. The renewed NPDES permit would encompass all Facility surface water discharge points, including SRE

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pond discharge. The permit is currently pending per approval by the LARWQCB.

SITE DESCRIPTION

The R2, SRE, and Perimeter ponds are located in drainage ways at the SSFL and were designed for surface water retention and reclamation. The locations of the three ponds are shown on Figure 1.

R2 POND

The R2 Pond is located in the southwest corner of Area II (Figure 1). The R2 pond is an elongate retention structure trending east-west, and is approximately 0.8 of an acre in size (Figure 2). It receives influent on both the extreme eastern and western ends. Effluent is discharged from a grating near the base of the pond on its southern side and flows down a small drainage to the NPDES discharge point south of the Facility (Figure 1).

Facilities located upgradient in the drainage basin for the R2 pond include the Engineering Chemistry Lab (ECL), STL-IV, and Delta areas (Figure 1). Materials generated at these facilities were previously discharged to surface impoundments. The surface impoundments are now closed and have been replaced by above ground storage or treatment facilities.

The materials generated at the ECL and formerly discharged into the now-closed ECL Pond included fluoride-containing compounds, nitric and sulfuric acid solutions, sodium azide, sodium hydroxide, dimethyl sulfoxide,

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freon and methylene chloride (Hargis & Associates, 1984). ECL is located approximately 1,500 feet upgradient of the R2 Pond (Figure 1).

The STL-IV area is located about 1,000 feet northwest of the R2 Pond and is used as a small engine test facility. Materials that potentially entered the now-closed ponds at STL-IV included hydrazines, nitric acids, isopropyl alcohol, and chlorinated and fluorinated solvents (Groundwater Resources Consultants, Inc., 1987).

Delta and the Propellant Load Facility (PLF) are located east of the R2 Pond. The Delta Area was used to test-fire rocket engines. Kerosene-based fuels, hydrazines, and chlorinated and fluorinated solvents were used at Delta (Groundwater Resources Consultants, Inc., 1987). PLF is used to load fuel and oxidizer into Peacekeeper missiles. Monomethyl-hydrazine, nitrogen tetroxide, isopropyl alcohol and fluorinated solvents have been used at PLF (Groundwater Resources Consultants, Inc., 1987).

SRE POND

The SRE Pond is located in the northeast corner of Area IV (Figure 1). The SRE Pond is a small pond approximately 0.1 acre in size. It is slightly elongate to the north-south. Influent enters the pond from two channels near the southern end of the pond and effluent is discharged through a grating near the north end of the pond (Figure 3). The SRE Facility is located upgradient in the drainage basin for the SRE pond. The SRE was

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operated from 1957 to 1964. Storm water runoff has been the only source of water to the SRE pond since 1964. Materials used at SRE included enriched uranium and sodium (Rockwell, 1990).

PERIMETER POND

The Perimeter pond is located near the southern boundary of Area I (Figure 1). The Perimeter pond is approximately 0.6 of an acre in size. Influent enters the Perimeter pond at the northern end and is discharged through a grate near the southern end of the pond (Figure 4).

Facilities located upgradient in the drainage basin for the Perimeter pond include the Advanced Propulsion Test Facility (APTF), Canyon area and Bowl area (Figure 1). Activities at the APTF have included pilot plant scale engine test and development. The materials used at APTF have been liquid propellants such as hydrazines, nitrogen tetroxide (NTO), and methane gas, and solvents for degreasing operations (Groundwater Resources Consultants, Inc., 1987).

The Canyon and Bowl areas were used for the testing of large rocket engines. The engines were flushed with an organic solvent, principally trichloroethylene (TCE), as part of the testing procedure (Groundwater Resources Consultants, Inc., 1987). The closest of these areas to the Perimeter pond is Bowl area, approximately 2,000 feet to the northeast. Canyon area and APTF are 3,500 and 4,500 feet to the northeast, respectively (Figure 1).

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PREVIOUS INVESTIGATIONS - SURFACE WATER QUALITY

The chemical characterization of water in surface impoundments and ponds at the Facility has been determined by Rocketdyne personnel from 1969 through the present. Samples collected from these areas are analyzed routinely for organic and inorganic parameters.

Surface water quality data collected from the R2 and Perimeter ponds by Rocketdyne is reported monthly to the LARWQCB as part of the existing NPDES permit program. Surface water quality data collected from these ponds by Rocketdyne during the period 1969 through 1987 is summarized in the *Hydrogeologic Assessment Report* (Groundwater Resources Consultants, Inc., 1987).

The R2 and Perimeter ponds were sampled by Groundwater Resources Consultants, Inc. during the 1987 Hydrogeologic Assessment Report (HAR) investigation. One sample was collected from each pond. These samples were analyzed for determination of volatile organic compounds (VOCs) and common ion constituents. VOCs were not present in either of the surface water samples collected (Groundwater Resources Consultants, Inc., 1987).

PROCEDURES

Sediment samples were collected from each pond to assess the potential for contamination resulting from use of the ponds as retention structures for Facility surface water runoff. The ponds were drained prior to sampling. Four sediment sampling points were located at each pond. Two were located near pond inflow areas and two were located near pond outflow areas. At each point, sediment samples were collected at 0-0.5, 1-1.5, 2-2.5 and 3-3.5 foot depth intervals, or until sampler refusal. A description of sediment samples collected is presented in Table 1. Soil sample collection methods are presented in Appendix A.

All sediment samples were analyzed for VOCs by EPA method 8240, for base/neutral and acid (B/NA) organic compounds by EPA method 8270, and for metals. A portion of all samples were digested and analyzed for metals according to methods described in "Test Methods for Evaluating Solid Waste, Physical/Chemical Methods" (SW 846, 1986). The results of these analyses were then compared to Soluble Threshold Limit Concentration (STLC) and Total Threshold Limit Concentration (TTLC) values (CCR 22). STLC and TTLC values are presented in Table 2. If the results of the analyses exceeded the STLC values for any metal, the reserved portion of that sample was extracted by the Waste Extraction Test (WET) method and then analyzed for the metal in question (CCR 22).

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Additionally, all samples were tested for gross alpha and gross beta radioactivity by EPA method 900.0, and for gamma emitting radionuclides by EPA method 901.1. One sample from the 0-0.5 foot interval at each pond was analyzed for petroleum hydrocarbons by EPA method 418.1 and total fuel hydrocarbons by modified EPA method 8015.

SUMMARY OF ANALYTICAL RESULTS

The results of analyses for VOCs, B/NA organics, hydrocarbons, metals, and radioactivity in R2, SRE and Perimeter pond sediment samples are presented in Appendices B through G, respectively. A summary of the organic compounds detected in sediment samples collected from each pond is presented in Table 3.

R2 POND

Eight sediment samples were collected from four locations (PS-1 through PS-4) at the R2 pond. Samples collected from the R2 pond were composed of clayey silt (Table 1). Samples designated PS-1 and PS-4 were collected near areas of pond inflow. Samples designated PS-2 and PS-3 were collected near the point of pond outflow (Figure 2).

All samples collected from the R2 pond were analyzed for VOCs, B/NAs, metals, gross alpha and gross beta radioactivity and gamma radiation. A sample collected from PS-1 near the pond influent at the depth interval 0 to 0.5 feet was also analyzed for petroleum hydrocarbons and total fuel hydrocarbons.

Organic Compounds

Organic compounds detected in R2 pond sediments included hydrocarbons, base/neutral organic compounds and VOCs (Table 3). Hydrocarbons were detected in each sample collected from R2 pond influent locations. Petroleum hydrocarbons, as determined by EPA method 418.1, were reported at a concentration of 230 mg/kg in the sample collected from PS-1 at 0-0.5 feet. Fuel hydrocarbons as determined by modified EPA method 8015 were reported as less than the laboratory detection limit of 5 mg/kg in the same sample (Appendix E).

Hydrocarbons were also detected as semi-quantified compounds by EPA method 8270 in all samples collected from influent locations. The concentration of total extractable hydrocarbons in the C8 through C28 range varied from 30 mg/kg at PS-1, 0-0.5 feet, to a total of 120 mg/kg at PS-4, 1-1.5 feet. Individual aliphatic hydrocarbons were also found in each of the four samples as semi-quantified compounds ranging in concentration from 0.5 mg/kg to 10 mg/kg (Table 3, Appendix E).

Total extractable hydrocarbons ranging from C9 through C28 were determined as semi-quantified compounds by method 8270 in each R2 pond effluent area sample. Concentrations ranged from 50 mg/kg in the 0-0.5 foot sample collected at PS-2 to 80 mg/kg in the 1-1.5 foot sample collected from PS-2 (Table 3). Individual aliphatic hydrocarbons determined as semi-quantified compounds by both methods 8240 and 8270 were detected in all

effluent samples in concentrations of less than 5 mg/kg (Table 3, Appendix E).

TCE was detected at the PS-3 location in the 0-0.5 foot sample at a concentration of 0.08 mg/kg (Table 3). No other VOCs were detected in R2 pond sediments (Appendix B).

Several polynuclear aromatic (PNA) compounds ranging in concentration from 0.19 mg/kg to 0.32 mg/kg were detected as base/neutral compounds by method 8270 in sediments collected from 0-0.5 feet and 1-1.5 feet at inflow sample location PS-1. An unidentified PNA was reported at a concentration of 2 mg/kg in one soil sample collected from inflow location PS-4 at the 0-0.5 foot interval. In effluent area samples, PNAs were detected in both samples collected at PS-3 in concentrations of less than 0.50 mg/kg (Table 3). An unidentified PNA was detected in a sample collected at PS-2 at 1-1.5 feet (Table 3). No acid organic compounds were detected in any of the samples collected from R2 pond sediments (Appendix D).

Metals

The results of metal analyses for samples prepared by nitric acid digestion did not exceed TTLC values (Appendix F, Table 2). STLC values were exceeded for copper and lead in each of the four influent area samples and each of the four effluent area samples analyzed. Also, the STLCs for vanadium and zinc were exceeded in a sample collected from PS-1 at 1-1.5 feet, and a sample collected from PS-2 at 0-0.5 feet, respectively (Table

2, Appendix F). Reserved portions of samples for which STLCs were exceeded were analyzed using the WET sample preparation method. The results of these analyses were well below the STLCs for copper, lead, vanadium and zinc (Table 2, Appendix F).

Radioactivity

Gross alpha radioactivity in samples collected near the R2 pond inflow areas ranged from 1.59 ± 1.80 picocuries per gram (pCi/g) in the sample collected from 1-1.5 feet at PS-1, to 15.2 ± 4.16 pCi/g in the 0-0.5 foot sample also collected from PS-1 (Appendix G). Gross beta radioactivity ranged from 25.9 ± 4.44 pCi/g in the 1-1.5 foot sample collected at PS-4 to 31.5 ± 5.04 pCi/g in the 0-0.5 foot sample also collected at PS-4 (Appendix G).

In outflow area samples, gross alpha radioactivity ranged from 4.44 ± 2.64 pCi/g in the 1-1.5 foot sample collected at PS-3 to 13.0 ± 3.84 pCi/g in the 0-0.5 foot sample collected at PS-2. Gross beta radioactivity ranged from 27.1 ± 4.51 pCi/g in the 1-1.5 foot sample to 33.0 ± 5.25 in the 0-0.5 foot sample collected from PS-3 (Appendix G).

Gamma emitting radionuclides detected in samples collected near R2 pond influent and effluent included cesium-137, lead-212, lead-214 and potassium-40. Concentrations of gamma emitters are presented in Appendix G. The maximum concentration of cesium-137 determined in influent area sediment samples was 0.122 ± 0.0619 pCi/g in the 0-0.5 foot sample collected

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at PS-4. The maximum concentration of cesium-137 reported in effluent area samples was 0.397 ± 0.107 pCi/g in the 1-1.5, PS-2 sample. Cesium-137 is a man-made radionuclide; however, it is present at similar low concentrations in soils worldwide as a result of atmospheric fallout (Swoboda, 1990).

Lead-212, lead-214 and potassium-40 are radionuclides that occur naturally in soils at the Facility (Groundwater Resources Consultants, Inc., 1990). Lead-212 is the end product of the natural thorium-232 decay series. Lead-214 is the end product of the natural uranium-238 decay series. Concentrations of lead-212 and lead-214 in R2 pond sediments ranged from 0.682 ± 0.108 pCi/g to 1.94 ± 0.240 pCi/g, and from 0.463 ± 0.122 pCi/g to 1.40 ± 0.231 pCi/g, respectively. Concentrations of potassium-40 ranged from 15.6 ± 2.26 pCi/g to 22.6 ± 2.83 pCi/g.

SRE POND

Fourteen sediment samples were collected from the SRE pond. A description of sediment samples collected is provided in Table 1. Sample points PS-7 and PS-8 were located near the pond inflow area. Sample points PS-5 and PS-6 were located near the area of pond outflow (Figure 3). Samples collected from pond inflow areas were composed of fine sand. Samples collected from the outflow area were composed of clayey sand (Table 1).

All sediment samples collected from the SRE pond were analyzed for VOCs, B/NAs, metals, gross alpha and gross beta radioactivity and gamma

radiation. A sample collected from PS-8 at the depth interval 0-0.5 feet was also analyzed for petroleum hydrocarbons and total fuel hydrocarbons.

Organic Constituents

The organic constituents detected in sediment samples collected from SRE pond are summarized in Table 3. Hydrocarbons were detected in all but one of the 14 samples collected from both inflow and outflow areas of the SRE pond. VOCs and base/neutral compounds were reported in samples collected from PS-7 and PS-8 sample locations near the areas of pond inflow. VOCs and base/neutral compounds were not detected in sediment samples collected near the pond outflow area.

The surface sample (0-0.5 feet) collected from SRE pond influent location PS-8 was analyzed for petroleum and fuel hydrocarbons. Petroleum hydrocarbons in this sample were detected at 36 mg/kg (Table 3). Fuel hydrocarbons were reported at less than 5 mg/kg (Appendix E).

Hydrocarbons were detected in all sediment samples collected from the SRE pond with the exception of one sample collected from PS-5 at 1-1.5 feet. In general, the compounds detected were semi-quantified aliphatic hydrocarbons determined by method 8240 or 8270. Aliphatic hydrocarbon compounds, C20 through C28, ranged in concentrations from 0.1 mg/kg in several samples to 5 mg/kg in the 0-0.5 foot sample collected from PS-6. The total extractable hydrocarbons C15 through C28 determined by method 8270 in

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surface samples (0-0.5 foot) collected from PS-5, PS-6 and PS-7 were reported at 30 mg/kg, 30 mg/kg and 80 mg/kg, respectively.

VOCs were detected in samples collected from the two SRE pond influent locations (Table 3). The VOCs tetrachloroethylene (PCE), TCE, toluene and xylenes were reported at concentrations of less than 0.50 mg/kg in the sample collected from the 0-0.5 foot depth interval at PS-7. VOCs were not detected in the 1-1.5, 2-2.5, or 3-3.5 PS-7 depth intervals (Table 3).

At influent location PS-8, one or more VOCs were present in every sample collected (Table 3). VOCs reported at concentrations equal to or exceeding 1 mg/kg included TCE, methylene chloride and toluene. Methylene chloride was detected in samples collected from 2-2.5 feet at a concentration of 4.2 mg/kg and from 3-3.5 feet at a concentration of 3.7 mg/kg. The concentrations of toluene in the same samples were 3.6 mg/kg and 3.0 mg/kg, respectively. TCE was reported in the 2-2.5 foot sample at a concentration of 1.0 mg/kg (Table 3). Other VOCs detected in samples collected from PS-8 at concentrations of less than 1.0 mg/kg included 1,1-dichloroethane (1,1-DCA), 1,2-dichloroethylene (1,2-DCE), PCE, 1,1,1-trichloroethane (1,1,1-TCA), and xylenes (Table 3). No VOCs were detected in outflow area samples (Appendix B).

Base/neutral organic compounds were found in one of 14 sediment samples collected at the SRE pond. In the surface sediment sample collected at PS-7 near the area of pond inflow, several PNA compounds were reported ranging from 0.20 mg/kg of indeno(1,2,3-cd)pyrene to 0.80 mg/kg of fluoran-

there (Table 3). No acid organic compounds were detected in sediments collected from the SRE pond (Appendix D).

Metals

The results of analyses for metals indicate that none of the samples collected from the SRE pond exceeded TTLC values (Table 2). The results of analyses performed using nitric acid extraction on samples collected from both pond inflow and outflow locations indicated that concentrations of some metals exceeded STLC values (Table 2). The STLC values for lead were exceeded in every sample collected from the SRE pond with the exception of the 2-2.5 foot sample collected at PS-8. Concentrations of lead ranged from 4.4 mg/kg in the 2-2.5 foot PS-8 sample to 89.6 mg/kg in the 0-0.5 foot PS-7 sample (Appendix F). Other metals exceeding STLC values, primarily in surface soils, included copper, mercury, beryllium, cadmium, vanadium, barium and zinc (Appendix F).

Reserved portions of all SRE pond sediment samples for which STLC values were exceeded per SW-846 methodology were analyzed using the WET method of extraction prior to analyses (CCR 22). The results of these analyses indicated that none of the metals in SRE sediment samples exceeded the established STLC values (Table 2, Appendix F).

Radioactivity

Gross alpha and beta radioactivity, and gamma emitting radionuclides were determined for all samples collected from the SRE pond (Appendix G). Gross alpha radioactivity in inflow area samples ranged from 5.07 ± 2.54 pCi/g in the 2-2.5 foot sample collected at PS-7 to 10.30 ± 3.30 pCi/g in the 3-3.5 foot sample collected at PS-8. Gross beta radioactivity in inflow samples ranged from 30.3 ± 4.91 pCi/g in the PS-8, 3-3.5 foot sample to 35.2 ± 5.38 pCi/g in the PS-7, 2-2.5 foot sample.

At SRE pond outflow sample locations PS-5 and PS-6, gross alpha radioactivity ranged from 4.62 ± 2.76 pCi/g in the 0-0.5 foot sample at PS-5 to 13.1 ± 3.86 pCi/g in the 1-1.5 foot sample at the PS-6. Gross beta radioactivity ranged from 27.0 ± 4.59 pCi/g in the PS-5, 1-1.5 foot sample to 35.6 ± 5.57 pCi/g in the PS-6, 2-2.5 foot sample (Appendix G).

Cesium-137 was detected in low concentrations at all SRE pond sample locations. No other man-made gamma emitters were detected. Natural emitters lead-212, lead-214, and potassium-40 were also detected at all locations. The results of gamma analyses performed on SRE pond samples are reported in Appendix G.

PERIMETER POND

Thirteen sediment samples composed of clayey silt were collected from four locations, PS-9 through PS-12, at the Perimeter pond (Table 1). Samples designated PS-9 and PS-10 were collected near the areas of pond inflow. Samples designated PS-11 and PS-12 were collected near the pond outflow grate (Figure 4).

All samples collected from the Perimeter pond were analyzed for VOCs, B/NAs, metals, gross alpha and gross beta radioactivity, and gamma emitting radionuclides. A surface sample collected at PS-9 was also analyzed for fuel hydrocarbons and petroleum hydrocarbons.

Organic Constituents

Hydrocarbons were the primary organic constituents detected in Perimeter pond sediment samples. Low concentrations of three VOCs were detected in two samples collected from PS-9 near the area of pond inflow. TCE was reported in the 1-1.5 foot sample at a concentration of 0.07 mg/kg. Bromodichloromethane and chloroform were detected in the 2-2.5 foot sample at respective concentrations of 0.06 mg/kg and 0.09 mg/kg (Table 3). No other VOCs, or B/NA organic compounds were detected in Perimeter pond sediments (Appendices B, C and D).

Hydrocarbons were detected in almost all sediment sample collected from the Perimeter pond (Table 3). Petroleum hydrocarbons and fuel

hydrocarbons were detected in the surface sediment sample collected at PS-9 in concentrations of 45 mg/kg and 44 mg/kg, respectively (Appendix E).

The primary hydrocarbons identified as semi-quantified compounds by method 8270 in Perimeter pond sediments were aliphatic hydrocarbons of the C12 through C27 carbon range detected at concentrations equal to or less than 1 mg/kg (Table 3).

Aromatic hydrocarbons were also identified as semi-quantified compounds by method 8270 in the 2-2.5 foot sample collected from PS-11. Concentrations of aromatic hydrocarbons in this sample ranged from 3 to 20 mg/kg (Table 3). The concentration of total extractable hydrocarbons C18-C28 determined by method 8270 in the same sample was reported at 90 mg/kg.

Metals

All samples collected from Perimeter pond were extracted and analyzed for metals per SW-846 methodology. The results of these analyses were then compared to TTLC and STLC values (Table 2). None of the metals concentrations exceeded TTLC values. Concentrations of lead, arsenic, copper and vanadium in some of the samples exceeded STLC values. Reserved portions of these samples were then extracted by the WET method and analyzed for the metals of concern. The results of analyses using the WET method indicated that none of the samples had concentrations of these metals exceeding STLC values (Appendix F).

Radioactivity

The results of analyses for gross alpha radioactivity ranged from 2.35 ± 1.89 pCi/g to 11.7 ± 3.68 pCi/g in samples collected from Perimeter pond inflow areas, and from 6.07 ± 2.57 pCi/g to 12.0 ± 3.47 pCi/g in samples collected in the pond outflow area. Gross beta radioactivity in samples collected from inflow and outflow areas ranged from 29.7 ± 4.85 pCi/g to 37.1 ± 5.67 pCi/g, and from 26.2 ± 4.40 pCi/g to 34.3 ± 5.26 pCi/g, respectively.

Low concentrations of cesium-137 were detected in each sediment sample collected from Perimeter pond. The maximum concentration of cesium-137 detected was 0.215 ± 0.155 pCi/g in a surface sample collected at PS-12 (Appendix G). Natural emitters detected by gamma scan in Perimeter pond sediment samples included lead-212, lead-214 and potassium-40 (Appendix G).

DISCUSSION OF ANALYTICAL RESULTS

The primary contaminants detected in sediments collected from R2, SRE and Perimeter ponds were hydrocarbons. The types of hydrocarbons identified in pond sediments were mid to heavy weight hydrocarbons, indicating a variety of potential fuel or oil related sources. In general, the ranges of carbon atoms and the concentrations of hydrocarbons did not vary significantly at depths and between inflow and outflow locations at each pond.

Several PNA compounds were detected in samples collected from the R2 and SRE ponds. At the R2 pond, low concentrations of PNAs were found in samples collected from each inflow and outflow location. At the SRE pond, PNAs were found in sediments collected from one inflow location only. At both ponds, PNAs were most prevalent in surface samples. PNAs are typically associated with heavy weight hydrocarbons. PNAs are derived from coal oils and are commonly used as preservatives in kerosene or diesel carriers. No other base/neutral organic compounds, and no acid organic compounds were detected in samples collected from any of the three ponds. (Appendices C and D).

The analytical results of the pond sediment investigation indicate that VOCs were detected infrequently and at low concentrations (Table 3). TCE was reported in only one of eight R2 pond sediment samples at the laboratory detection limit for that compound. TCE was also reported at a

similar concentration in one of twelve samples collected from Perimeter pond (Table 3). These concentrations were well below California Title 22 STLC values for TCE (Table 2). No other VOCs were detected in samples collected from these two ponds, with the exception of low concentrations of bromodichloromethane and chloroform collected from one Perimeter pond sample (Table 3).

Several VOCs were reported in samples collected from SRE pond inflow locations. VOCs were not reported in samples collected near SRE outflow locations (Appendix B). At SRE pond inflow locations VOCs were found in each of the four samples collected from PS-8, and in the surface sample only collected from PS-7 (Table 3). VOCs exceeding 1 mg/kg in concentration included methylene chloride and toluene in the 2.0-2.5 foot and 3.0-3.5 foot samples collected from PS-8. Concentrations of methylene chloride in these samples were 4.2 mg/kg and 3.7 mg/kg, respectively. Respective toluene concentrations were 3.6 mg/kg and 3.0 mg/kg (Appendix B).

Samples collected from each of the three ponds were analyzed for metals per California Title 22 hazardous waste criteria (CCR 22). Concentrations of metals were compared to TTLC and STLC values. The WET sample extraction was performed when appropriate per Title 22 methodology. The results of these analyses indicate that none of the samples collected from the three ponds would be classified as hazardous for metals per Title 22 requirements.

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Gross alpha and gross beta radioactivity do not appear to be elevated in sediment samples collected from the R2, SRE or Perimeter ponds. The maximum concentration of gross alpha radioactivity in sediment samples was 15.2 ± 4.16 pCi/g in a surface sample collected near the inflow area of R2 pond (Appendix G). A maximum gross beta radioactivity concentration of 37.1 ± 5.67 pCi/g occurred in a 0-0.5 foot sample collected from Perimeter pond collected at inflow location PS-9. At R2 pond, concentrations of alpha radioactivity in surface samples exceeded those at depth. However concentrations of gross alpha radioactivity in samples collected from the other ponds, and concentrations of gross beta radioactivity in samples collected from any of the three ponds, do not show an apparent depth correlation.

The results of gamma scans conducted on samples indicate the presence of naturally occurring radionuclides in pond sediments. Concentrations of lead-212 and lead-214 are indicative of the natural thorium-232 and uranium-238 decay series, respectively. Previous investigations conducted at the Facility indicate that thorium-232 and uranium-238 and their decay products are the major source of alpha radioactivity in Facility soils (Groundwater Resources Consultants, Inc., 1990).

Potassium-40 was detected in concentrations as high as 29.9 ± 3.81 pCi/g in pond sediments. Potassium-40 is a naturally occurring radionuclide found to be present in Facility soils during previous investigations (Groundwater Resources Consultants, Inc., 1990). The majority of beta

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radioactivity present in Facility soils, including pond sediments are attributable to potassium-40.

Cesium-137 was detected in low concentrations in almost all pond sediment samples. Concentrations of this man-made radionuclide found in sediment samples are reflective of atmospheric fallout and similar to concentrations found in soils worldwide (Swoboda, 1990). Cesium-137 was not detected in Facility soil samples collected during the investigation of natural emitters in Facility soils conducted in 1989 (Groundwater Resources Consultants, Inc., 1990). At that time, however, laboratory detection limits for cesium-137 exceeded the concentrations of that compound determined in pond sediments.

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TABLE 1

SUMMARY OF POND SEDIMENT SAMPLE COLLECTION

<u>SAMPLE IDENTIFIER</u>	<u>DATE SAMPLED</u>	<u>SAMPLE DESCRIPTION</u>	<u>SAMPLE LOCATION DESCRIPTION</u>
PS-1 0 - 0.5	05/15/90	CLAYEY SILT	R2 POND INFLUENT
PS-1 1 - 1.5	05/15/90	CLAYEY SILT	R2 POND INFLUENT
PS-2 0 - 0.5	05/15/90	CLAYEY SILT	R2 POND EFFLUENT
PS-2 1 - 1.5	05/15/90	CLAYEY SILT	R2 POND EFFLUENT
PS-3 0 - 0.5	05/15/90	CLAYEY SILT	R2 POND EFFLUENT
PS-3 1 - 1.5	05/15/90	CLAYEY SILT	R2 POND EFFLUENT
PS-4 0 - 0.5	05/15/90	CLAYEY SILT	R2 POND INFLUENT
PS-4 1 - 1.5	05/15/90	CLAYEY SILT	R2 POND INFLUENT
PS-5 0 - 0.5	05/16/90	CLAYEY SAND	SRE POND EFFLUENT
PS-5 1 - 1.5	05/16/90	CLAYEY SAND	SRE POND EFFLUENT
PS-5 2 - 2.5	05/16/90	CLAYEY SAND	SRE POND EFFLUENT
PS-6 0 - 0.5	05/16/90	CLAYEY SAND	SRE POND EFFLUENT
PS-6 1 - 1.5	05/16/90	CLAYEY SAND	SRE POND EFFLUENT
PS-6 2 - 2.5	05/16/90	CLAYEY SAND	SRE POND EFFLUENT
PS-7 0 - 0.5	05/17/90	FINE SAND	SRE POND INFLUENT
PS-7 1 - 1.5	05/17/90	FINE SAND	SRE POND INFLUENT
PS-7 2 - 2.5	05/17/90	FINE SAND	SRE POND INFLUENT
PS-7 3 - 3.5	05/17/90	FINE SAND	SRE POND INFLUENT
PS-8 0 - 0.5	05/17/90	FINE SAND	SRE POND INFLUENT
PS-8 1 - 1.5	05/17/90	FINE SAND	SRE POND INFLUENT
PS-8 2 - 2.5	05/17/90	FINE SAND	SRE POND INFLUENT
PS-8 3 - 3.5	05/17/90	FINE SAND	SRE POND INFLUENT
PS-9 0 - 0.5	05/17/90	CLAYEY SILT	PERIMETER POND INFLUENT
PS-9 0 - 0.5	05/17/90	CLAYEY SILT	PERIMETER POND INFLUENT
PS-9 0 - 0.5	05/17/90	CLAYEY SILT	PERIMETER POND INFLUENT
PS-9 0 - 0.5	05/17/90	CLAYEY SILT	PERIMETER POND INFLUENT
PS-10 0 - 0.5	05/18/90	CLAYEY SILT	PERIMETER POND INFLUENT
PS-10 1 - 1.5	05/18/90	CLAYEY SILT	PERIMETER POND INFLUENT
PS-11 0 - 0.5	05/18/90	CLAYEY SILT	PERIMETER POND EFFLUENT
PS-11 1 - 1.5	05/18/90	CLAYEY SILT	PERIMETER POND EFFLUENT
PS-11 2 - 2.5	05/18/90	CLAYEY SILT	PERIMETER POND EFFLUENT
PS-12 0 - 0.5	05/18/90	CLAYEY SILT	PERIMETER POND EFFLUENT
PS-12 1 - 1.5	05/18/90	CLAYEY SILT	PERIMETER POND EFFLUENT
PS-12 2 - 2.5	05/18/90	CLAYEY SILT	PERIMETER POND EFFLUENT
PS-12 3 - 3.5	05/18/90	CLAYEY SILT	PERIMETER POND EFFLUENT

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TABLE 2

SOLUBLE THRESHOLD LIMIT CONCENTRATION (STLC) AND
TOTAL THRESHOLD LIMIT CONCENTRATION (TTLC) VALUES

<u>SUBSTANCE</u>	<u>STLC</u> mg/l	<u>TTLC</u> mg/kg
<u>Organic Compounds</u>		
Trichloroethylene	204	2,040
<u>Metals</u>		
Antimony and/or compounds	15	500
Arsenic and/or arsenic compounds	5.0	500
Barium and/or barium compounds (excluding barite)	100	10,000
Beryllium and/or beryllium compounds	0.75	75
Cadmium and/or cadmium compounds	1.0	100
Chromium (VI) compounds	5	500
Chromium and/or chromium (III) compounds	560	2,500
Cobalt and/or cobalt compounds	80	8,000
Copper and/or copper compounds	25	2,500
Lead and/or lead compounds	5.0	1,000
Mercury and/or mercury compounds	0.2	20
Molybdenum and/or molybdenum compounds	350	3,500
Nickel and/or nickel compounds	20	2,000
Selenium and/or selenium compounds	1.0	100
Silver and/or silver compounds	5	500
Thallium and/or thallium compounds	7.0	700
Vanadium and/or vanadium compounds	24	2,400
Zinc and/or zinc compounds	250	5,000

Source: California Code of Regulations, Title 22, Article II, Section 66699

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TABLE 3

SUMMARY OF ORGANIC COMPOUNDS DETECTED IN SOIL SAMPLES

<u>SAMPLE IDENTIFIER</u>	<u>SAMPLED^{1/} DEPTH INTERVAL (feet)</u>	<u>DATE SAMPLED</u>	<u>ORGANIC COMPOUND</u>	<u>CONCENTRATION OF CONTAMINANTS DETECTED (mg/kg)</u>	<u>ANALYTICAL METHOD</u>
<u>R2 Pond</u>					
PS-1	0-0.5	05/15/90	Benzo(a)pyrene	0.22	8270
			3,4-Benzofluoranthene	0.26	8270
			Benzo(ghi)perylene	0.23	8270
			Chrysene	0.23	8270
			Fluoranthene	0.29	8270
			Indeno(1,2,3-cd)pyrene	0.23	8270
			Pyrene	0.32	8270
			Petroleum Hydrocarbons	230	418.1
			Aliphatic Hydrocarbon C23	1	8270
			Aliphatic Hydrocarbon C25	2	8270
			Aliphatic Hydrocarbon C26	1	8270
			Aliphatic Hydrocarbon C26	1	8270
			Total Extractable Hydrocarbons C11-C28	30	8270
	1.0-1.5	05/15/90	Fluoranthene	0.19	8270
			Pyrene	0.19	8270
			Aliphatic Hydrocarbon C12	3	8270
			Aliphatic Hydrocarbon C13	1	8270
			Aliphatic Hydrocarbon C13	4	8270
			Aliphatic Hydrocarbon C14	4	8270
			Aliphatic Hydrocarbon C17	1	8270
			Total Extractable Hydrocarbons C8-C28	70	8270
PS-2	0-0.5	05/15/90	Aliphatic Hydrocarbon	0.4	8240
			Aliphatic Hydrocarbon	0.4	8240
			Aliphatic Hydrocarbon	0.3	8240
			Aliphatic Hydrocarbon C23	2	8270
			Aliphatic Hydrocarbon C25	4	8270
			Aliphatic Hydrocarbon C26	2	8270
			Aliphatic Hydrocarbon C26	2	8270
			Aliphatic Hydrocarbon C28	1	8270
			Total Extractable Hydrocarbons C9-C28	50	8270
	1.0-1.5	05/15/90	Aliphatic Hydrocarbon	0.9	8240
			Aliphatic Hydrocarbon	0.8	8240
			Aliphatic Hydrocarbon	0.8	8240
			Cyclic Hydrocarbon	0.8	8240
			Polynuclear Aromatic	1.0	8240
			Aliphatic Hydrocarbon C12	2	8270
			Aliphatic Hydrocarbon C13	3	8270
			Aliphatic Hydrocarbon C14	4	8270
			Aliphatic Hydrocarbon C14	2	8270
			Aliphatic Hydrocarbon C17	3	8270
			Total Extractable Hydrocarbons C10-C28	80	8270

GROUNDWATER RESOURCES CONSULTANTS, INC.

TABLE 3 (continued)
SUMMARY OF ORGANIC COMPOUNDS DETECTED IN SOIL SAMPLES

<u>SAMPLE IDENTIFIER</u>	<u>SAMPLED^{1/} DEPTH INTERVAL (feet)</u>	<u>DATE SAMPLED</u>	<u>ORGANIC COMPOUND</u>	<u>CONCENTRATION OF CONTAMINANTS DETECTED (mg/kg)</u>	<u>ANALYTICAL METHOD</u>
R2 Pond - (continued)					
PS-3	0-0.5	05/15/90	Trichloroethylene	0.08	8240
			Aliphatic Hydrocarbon	0.5	8240
			Aliphatic Hydrocarbon	1.0	8240
			Aliphatic Hydrocarbon	0.4	8240
			Cyclic Hydrocarbon	0.5	8240
			Polynuclear Aromatic	0.5	8240
			Benzo(a)pyrene	0.24	8270
			3,4-Benzofluoranthene	0.24	8270
			Benzo(ghi)perylene	0.46	8270
			Chrysene	0.18	8270
			Fluoranthene	0.20	8270
			Indeno(1,2,3-cd)pyrene	0.43	8270
			Pyrene	0.23	8270
			Aliphatic Hydrocarbon C13	2	8270
			Aliphatic Hydrocarbon C25	3	8270
			Aliphatic Hydrocarbon C26	4	8270
			Aliphatic Hydrocarbon C26	2	8270
			Total Extractable Hydrocarbons C9-C28	70	8270
	1.0-1.5	05/15/90	Aliphatic Hydrocarbon	0.8	8240
			Aliphatic Hydrocarbon	0.5	8240
			Aliphatic Hydrocarbon	0.7	8240
			Aliphatic Hydrocarbon	0.6	8240
			Polynuclear Aromatic	0.7	8240
			Benzo(ghi)perylene	0.26	8270
			Indeno(1,2,3-cd)pyrene	0.24	8270
			Aliphatic Hydrocarbon C13	3	8270
			Aliphatic Hydrocarbon C25	4	8270
			Aliphatic Hydrocarbon C26	3	8270
			Total Extractable Hydrocarbons C9-C25	70	8270
PS-4	0-0.5	05/15/90	Polynuclear Aromatic	2	8270
			Aliphatic Hydrocarbon C23	7	8270
			Aliphatic Hydrocarbon C25	6	8270
			Aliphatic Hydrocarbon C27	2	8270
			Aliphatic Hydrocarbon C28	2	8270
			Total Extractable Hydrocarbons C10-C28	70	8270
	1.0-1.5	05/15/90	Aliphatic Hydrocarbon	0.5	8240
			Aliphatic Hydrocarbon	1.0	8240
			Aromatic Hydrocarbon	0.7	8240
			Aromatic Hydrocarbon	0.9	8240
			Aliphatic Hydrocarbon	0.5	8240
			Aliphatic Hydrocarbon C24	10	8270
			Aliphatic Hydrocarbon C25	3	8270
			Aliphatic Hydrocarbon C27	9	8270
			Aliphatic Hydrocarbon C28	5	8270
			Total Extractable Hydrocarbons C8-C15	20	8270
			Total Extractable Hydrocarbons C20-C28	100	8270

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TABLE 3 (continued)
SUMMARY OF ORGANIC DETECTED IN SOIL SAMPLES

<u>SAMPLE IDENTIFIER</u>	<u>SAMPLED/ DEPTH INTERVAL (feet)</u>	<u>DATE SAMPLED</u>	<u>ORGANIC COMPOUND</u>	<u>CONCENTRATION OF CONTAMINANTS DETECTED (mg/kg)</u>	<u>ANALYTICAL METHOD</u>
<u>SRE Pond</u>					
PS-5	0-0.5	05/16/90	Aliphatic Hydrocarbon C20	1	8270
			Aliphatic Hydrocarbon C22	1	8270
			Aliphatic Hydrocarbon C24	1	8270
			Aliphatic Hydrocarbon C26	4	8270
			Aliphatic Hydrocarbon C27	1	8270
			Total Extractable Hydrocarbons C15-C28	30	8270
	2.0-2.5	05/16/90	Aliphatic Hydrocarbon C23	0.1	8270
			Aliphatic Hydrocarbon C25	0.8	8270
			Aliphatic Hydrocarbon C26	0.2	8270
			Aliphatic Hydrocarbon C27	0.3	8270
			Aliphatic Hydrocarbon C27	0.2	8270
PS-6	0-0.5	05/16/90	Aliphatic Hydrocarbon C21	1	8270
			Aliphatic Hydrocarbon C23	1	8270
			Aliphatic Hydrocarbon C25	5	8270
			Aliphatic Hydrocarbon C26	0.9	8270
			Aliphatic Hydrocarbon C27	1.3	8270
			Total Extractable Hydrocarbons C18-C28	30	8270
	1.0-1.5	05/16/90	Aliphatic Hydrocarbon	0.3	8240
			Aliphatic Hydrocarbon C24	0.2	8270
	2.0-2.5	05/16/90	Aliphatic Hydrocarbon C26	0.1	8270
PS-7	0-0.5	05/17/90	Tetrachloroethylene	0.10	8240
			Trichloroethylene	0.13	8240
			Toluene	0.42	8240
			Total Xylenes	0.08	8270
			Benzo(a)anthracene	0.24	8270
			Benzo(a)pyrene	0.24	8270
			Chrysene	0.42	8270
			Fluoranthene	0.80	8270
			Indeno(1,2,3-cd)pyrene	0.20	8270
			Phenanthrene	0.28	8270
			Pyrene	0.59	8270
			Aliphatic Hydrocarbon C24	5	8270
			Aliphatic Hydrocarbon C25	10	8270
			Aliphatic Hydrocarbon C26	4	8270
			Aliphatic Hydrocarbon C28	4	8270
			Aliphatic Hydrocarbon C28	3	8270
			Total Extractable Hydrocarbons C16-C28	80	8270
	1.0-1.5	05/17/90	Aliphatic Hydrocarbon C27	0.2	8270
	2.0-2.5	05/17/90	Aliphatic Hydrocarbon C22	0.2	8270
			Aliphatic Hydrocarbon C23	0.6	8270
			Aliphatic Hydrocarbon C25	1	8270
			Aliphatic Hydrocarbon C26	0.4	8270
			Aliphatic Hydrocarbon C27	0.3	8270

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TABLE 3 (continued)

SUMMARY OF ORGANIC COMPOUNDS DETECTED IN SOIL SAMPLES

SAMPLE IDENTIFIER	SAMPLED/ DEPTH INTERVAL (feet)	DATE SAMPLED	ORGANIC COMPOUND	CONCENTRATION OF CONTAMINANTS DETECTED (mg/kg)	ANALYTICAL METHOD
SRE Pond - (continued)					
PS-7 (cont'd)	3.0-3.5	05/17/90	Aliphatic Hydrocarbon	0.9	8240
			Aliphatic Hydrocarbon C26	0.2	8270
			Aliphatic Hydrocarbon C27	0.3	8270
PS-8	0-0.5	05/17/90	Trichloroethylene	0.22	8240
			Aliphatic Hydrocarbon C23	0.8	8270
			Aliphatic Hydrocarbon C24	0.8	8270
			Aliphatic Hydrocarbon C25	3	8270
			Aliphatic Hydrocarbon C26	1	8270
			Aliphatic Hydrocarbon C27	0.6	8270
			Petroleum Hydrocarbons	36	418.1
	1.0-1.5	05/17/90	1,2-Dichloroethylene	0.12	8240
			Aliphatic Hydrocarbon	0.9	8240
			Aliphatic Hydrocarbon C23	0.2	8270
			Aliphatic Hydrocarbon C25	1	8270
			Aliphatic Hydrocarbon C26	0.8	8270
			Aliphatic Hydrocarbon C27	0.5	8270
	2.0-2.5	05/17/90	1,1-Dichloroethane	0.13	8240
			1,2-Dichloroethylene	0.05	8240
			Methylene Chloride	4.2	8240
			Tetrachloroethylene	0.33	8240
			1,1,1-Trichloroethane	0.41	8240
			Trichloroethylene	1.0	8240
			Toluene	3.6	8240
			Total Xylenes	0.52	8240
			Aliphatic Hydrocarbon C24	0.4	8270
			Aliphatic Hydrocarbon C25	0.3	8270
			Aliphatic Hydrocarbon C26	0.2	8270
			3.0-3.5	05/17/90	1,1-Dichloroethane
	Ethylbenzene	0.10			8240
	Methylene Chloride	3.7			8240
	Tetrachloroethylene	0.25			8240
	1,1,1-Trichloroethane	0.4			8240
	Trichloroethylene	0.81			8240
	Toluene	3.0			8240
	Total Xylenes	0.37			8240
	Aliphatic Hydrocarbon C23	0.2			8270
	Aliphatic Hydrocarbon C25	0.5			8270
	Aliphatic Hydrocarbon C26	0.3			8270
	Aliphatic Hydrocarbon C27	0.1			8270
	Perimeter Pond				
PS-9	0-0.5	05/17/90	Aliphatic Hydrocarbon C24	0.8	8270
			Aliphatic Hydrocarbon C25	1	8270
			Aliphatic Hydrocarbon C26	0.2	8270
			Aliphatic Hydrocarbon C26	0.5	8270
			Aliphatic Hydrocarbon C26	0.2	8270
			Fuel Hydrocarbons C18-C23	44	8015
			Petroleum Hydrocarbons	45	418.1

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TABLE 3 (continued)

SUMMARY OF ORGANIC COMPOUNDS DETECTED IN SOIL SAMPLES

SAMPLE IDENTIFIER	SAMPLED ^{1/} DEPTH INTERVAL (feet)	DATE SAMPLED	ORGANIC COMPOUND	CONCENTRATION OF CONTAMINANTS DETECTED (mg/kg)	ANALYTICAL METHOD
Perimeter Pond - (continued)					
PS-9 (cont'd)	1.0-1.5	05/17/90	Trichloroethylene	0.07	8240
			Aliphatic Hydrocarbon C23	0.3	8270
			Aliphatic Hydrocarbon C25	0.4	8270
			Aliphatic Hydrocarbon C26	0.3	8270
	2.0-2.5	05/17/90	Bromodichloromethane	0.06	8240
			Chloroform	0.09	8240
			Aliphatic Hydrocarbon C23	0.4	8270
			Aliphatic Hydrocarbon C25	0.7	8270
			Aliphatic Hydrocarbon C26	0.4	8270
	3.0-3.5	05/17/90	Aliphatic Hydrocarbon C27	0.2	8270
			Aliphatic Hydrocarbon C25	0.5	8270
			Aliphatic Hydrocarbon C26	0.3	8270
PS-10	0-0.5	05/18/90	Aliphatic Hydrocarbon C26	0.2	8270
	1.0-1.5	05/18/90	Aliphatic Hydrocarbon C22	1	8270
			Aliphatic Hydrocarbon C22	0.7	8270
PS-11	0-0.5	05/18/90	Aliphatic Hydrocarbon C13	0.5	8270
			Aliphatic Hydrocarbon C23	0.4	8270
			Aliphatic Hydrocarbon C25	0.6	8270
			Aliphatic Hydrocarbon C26	0.4	8270
	1.0-1.5	05/18/90	Aliphatic Hydrocarbon C22	0.2	8270
			Aliphatic Hydrocarbon C23	0.2	8270
			Aliphatic Hydrocarbon C25	0.4	8270
			Aliphatic Hydrocarbon C26	0.4	8270
	2.0-2.5	05/18/90	Aromatic Hydrocarbon	10	8270
			Aromatic Hydrocarbon	20	8270
			Aromatic Hydrocarbon	10	8270
			Aromatic Hydrocarbon	3	8270
			Aromatic Hydrocarbon	6	8270
			Total Extractable Hydrocarbons C18-C28	90	8270
PS-12	0-0.5	05/18/90	Aliphatic Hydrocarbon C23	0.3	8270
			Aliphatic Hydrocarbon C26	0.2	8270
	1.0-1.5	05/18/90	Aliphatic Hydrocarbon C12	0.4	8270
			Aliphatic Hydrocarbon C13	0.4	8270
			Aliphatic Hydrocarbon C22	1	8270
			Aliphatic Hydrocarbon C23	0.3	8270
	2.0-2.5	05/18/90	Aliphatic Hydrocarbon C13	0.5	8270

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APPENDIX A

METHODS FOR COLLECTION OF SEDIMENT SAMPLES

GROUNDWATER RESOURCES CONSULTANTS, INC.

APPENDIX A

METHODS FOR COLLECTION OF SEDIMENT SAMPLES

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APPENDIX A

METHODS FOR COLLECTION OF SEDIMENT SAMPLES

Sediment samples were collected from the R2 pond, the SRE pond, and the Perimeter pond. Ponds were drained prior to sample collection. At each pond location, samples were collected at 0-0.5, 1-1.5, 2-2.5 and 3-3.5 foot depths, or until sampler refusal. At each sampled interval, pond sediments were collected in 2-inch diameter, 6-inch long brass soil tubes. Immediately after the sample was taken, the tubes were capped with Teflon-lined plastic end caps, labeled, packaged and placed in ice chests. Information regarding soil sample location and sample depth intervals was recorded on sample tube labels and on sample collection forms.

Letters of transmittal, chain-of-custody documentation and laboratory analyses request forms were prepared at the end of the sampling event and placed in a waterproof bag. The ice chest containing samples and sample documentation was clearly labeled and sealed to prevent tampering during transport to the laboratory. The samples were analyzed by Analytical Technologies, Inc. of San Diego, California.

R2 POND

The R2 Pond was sampled on May 15, 1990 by GWRC personnel assisted by Rocketdyne employees. Two observers from the California Regional Water Quality Control Board were also present. The R2 Pond was sampled at four points designated PS-1 through PS-4. Sample point PS-1 was located near the

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western influent entrance, sample point PS-4 was located near the eastern influent entrance and sample points PS-2 and PS-3 were located near the discharge grate (Figure 2). At all sampling points in the R2 pond, sediment depth was two feet or less. Consequently, all points were sampled at 0-0.5 and 1-1.5 feet only.

SRE POND

The SRE pond was sampled on May 16-17, 1990 by GWRC personnel assisted by two employees of the California Regional Water Quality Board. The SRE Pond was sampled at points designated as PS-5 through PS-8. Sample points PS-7 and 8 are located near the inflow channels at the southwest portion of the pond (Figure e). Points PS-5 and 6 were sampled at 0 - 0.5, 1 - 1.5, 2 - 2.5 feet. Sampler refusal occurred at 2.5 feet. Points PS-7 and PS-8 were sampled at 0 - 0.5, 1 - 1.5, 2 - 2.5 and 3 - 3.5 feet.

PERIMETER POND

The Perimeter Pond was sampled on May 17 and 18, 1990 by GWRC and Rockwell employees. The pond sediment was sampled at four points designated as PS-9 through PS-12. Sample points PS-9 and PS-10 were located near the pond inflow area and were each sampled at 0 - 0.5, 1 - 1.5, 2 - 2.5 and 3 - 3.5 feet (Figure 4). Sample points PS-11 and PS-12 were located near the outflow grate and were sampled at 0 - 0.5, 1 - 1.5, 2 - 2.5 and 3 - 3.5 feet (Figure 4).

*See
Prev. Page*PERIMETER POND

The Perimeter Pond was sampled on May 17 and 18, 1990 by GWRC and Rockwell employees. The pond sediment was sampled at four points designated as PS-9 through PS-12. Sample points PS-9 and PS-10 were located near the pond inflow area and were each sampled at 0 - 0.5, 1 - 1.5, 2 - 2.5 and 3 - 3.5 feet (Figure 4). Sample points PS-11 and PS-12 were located near the outflow grate and were sampled at 0 - 0.5, 1 - 1.5, 2 - 2.5 and 3 - 3.5 feet (Figure 4).

GROUNDWATER RESOURCES CONSULTANTS, INC.

APPENDIX B

**RESULTS OF ANALYSES FOR EPA PRIORITY VOLATILE ORGANIC COMPOUNDS
IN SEDIMENT SAMPLES COLLECTED FROM R2, SRE AND PERIMETER PONDS**

GROUNDWATER RESOURCES CONSULTANTS, INC.

APPENDIX B

RESULTS OF ANALYSES FOR EPA PRIORITY VOLATILE ORGANIC COMPOUNDS
IN SEDIMENT SAMPLES COLLECTED FROM R2, SRE AND PERIMETER PONDS

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| B-3 | RESULTS OF ANALYSES FOR EPA PRIORITY VOLATILE ORGANIC COMPOUNDS
IN SEDIMENT SAMPLES COLLECTED FROM SRE POND |

TABLE B-1
RESULTS OF ANALYSES FOR EPA PRIORITY VOLATILE ORGANIC COMPOUNDS
IN SEDIMENT SAMPLES COLLECTED FROM R2 POND

ORGANIC COMPOUND (micrograms per liter)	SAMPLE ID DEPTH INTERVAL (feet)	PS-1 0-0.5	PS-1 1.0-1.5	PS-2 0-0.5	PS-2 1.0-1.5	PS-3 0-0.5	PS-3 1.0-1.5	PS-4 0-0.5
Acetone.....		-1.0	-1.0	-1.0	-1.0	-1.0	-1.0	-1.0
Benzene.....		-0.05	-0.05	-0.05	-0.05	-0.05	-0.05	-0.05
Bromodichloromethane.....		-0.05	-0.05	-0.05	-0.05	-0.05	-0.05	-0.05
Bromoform.....		-0.3	-0.3	-0.3	-0.3	-0.3	-0.3	-0.3
Bromomethane.....		-0.50	-0.50	-0.50	-0.50	-0.50	-0.50	-0.50
Carbon tetrachloride.....		-0.05	-0.05	-0.05	-0.05	-0.05	-0.05	-0.05
Chlorobenzene.....		-0.05	-0.05	-0.05	-0.05	-0.05	-0.05	-0.05
Chloroethane.....		-0.05	-0.05	-0.05	-0.05	-0.05	-0.05	-0.05
Chloroform.....		-0.05	-0.05	-0.05	-0.05	-0.05	-0.05	-0.05
Chloromethane.....		-0.50	-0.50	-0.50	-0.50	-0.50	-0.50	-0.50
Dibromochloromethane.....		-0.05	-0.05	-0.05	-0.05	-0.05	-0.05	-0.05
1,1-Dichloroethane.....		-0.05	-0.05	-0.05	-0.05	-0.05	-0.05	-0.05
1,2-Dichloroethane.....		-0.05	-0.05	-0.05	-0.05	-0.05	-0.05	-0.05
1,1-Dichloroethylene.....		-0.05	-0.05	-0.05	-0.05	-0.05	-0.05	-0.05
1,2-Dichloroethylene.....		-0.05	-0.05	-0.05	-0.05	-0.05	-0.05	-0.05
1,2-Dichloropropane.....		-0.05	-0.05	-0.05	-0.05	-0.05	-0.05	-0.05
1,3-Dichloropropylene.....		-0.05	-0.05	-0.05	-0.05	-0.05	-0.05	-0.05
Ethylbenzene.....		-0.05	-0.05	-0.05	-0.05	-0.05	-0.05	-0.05
Methylene chloride.....		-0.3	-0.3	-0.3	-0.3	-0.3	-0.3	-0.3
1,1,2,2-Tetrachloroethane.....		-0.05	-0.05	-0.05	-0.05	-0.05	-0.05	-0.05
Tetrachloroethylene.....		-0.05	-0.05	-0.05	-0.05	-0.05	-0.05	-0.05
1,1,1-Trichloroethane.....		-0.05	-0.05	-0.05	-0.05	-0.05	-0.05	-0.05
1,1,2-Trichloroethane.....		-0.05	-0.05	-0.05	-0.05	-0.05	-0.05	-0.05
Trichloroethylene.....		-0.05	-0.05	-0.05	-0.05	0.08	-0.05	-0.05
Toluene.....		-0.10	-0.10	-0.10	-0.10	-0.10	-0.10	-0.10
Vinyl chloride.....		-0.05	-0.05	-0.05	-0.05	-0.05	-0.05	-0.05
Total Xylenes.....		-0.05	-0.05	-0.05	-0.05	-0.05	-0.05	-0.05
Date Sampled.....		05/15/90	05/15/90	05/15/90	05/15/90	05/15/90	05/15/90	05/15/90
Method.....		8240	8240	8240	8240	8240	8240	8240
Laboratory.....		ATI	ATI	ATI	ATI	ATI	ATI	ATI

(-) = Less than; numerical value represents the Limit of Detection for that compound
 (---) = Analysis not reported

TABLE B-1 (continued)
RESULTS OF ANALYSES FOR EPA PRIORITY VOLATILE ORGANIC COMPOUNDS
IN SEDIMENT SAMPLES COLLECTED FROM R2 POND

ORGANIC COMPOUND (micrograms per liter)	SAMPLE ID DEPTH INTERVAL (feet)	PS-4 1.0-1.5
Acetone.....		-1.0
Benzene.....		-0.05
Bromodichloromethane.....		-0.05
Bromoform.....		-0.3
Bromomethane.....		-0.50
Carbon tetrachloride.....		-0.05
Chlorobenzene.....		-0.05
Chloroethane.....		-0.05
Chloroform.....		-0.05
Chloromethane.....		-0.50
Dibromochloromethane.....		-0.05
1,1-Dichloroethane.....		-0.05
1,2-Dichloroethane.....		-0.05
1,1-Dichloroethylene.....		-0.05
1,2-Dichloroethylene.....		-0.05
1,2-Dichloropropane.....		-0.05
1,3-Dichloropropylene.....		-0.05
Ethylbenzene.....		-0.05
Methylene chloride.....		-0.3
1,1,2,2-Tetrachloroethane.....		-0.05
Tetrachloroethylene.....		-0.05
1,1,1-Trichloroethane.....		-0.05
1,1,2-Trichloroethane.....		-0.05
Trichloroethylene.....		-0.05
Toluene.....		-0.10
Vinyl chloride.....		-0.05
Total Xylenes.....		-0.05
Date Sampled.....		05/15/90
Method.....		8240
Laboratory.....		ATI

(-) = Less than; numerical value represents the Limit of Detection for that compound
(---) = Analysis not reported

TABLE B-2
RESULTS OF ANALYSES FOR EPA PRIORITY VOLATILE ORGANIC COMPOUNDS
IN SEDIMENT SAMPLES COLLECTED FROM SRE POND

ORGANIC COMPOUND (micrograms per liter)	SAMPLE ID DEPTH INTERVAL (feet)	PS-5 0-0.5	PS-5 1.0-1.5	PS-5 2.0-2.5	PS-6 0-0.5	PS-6 1.0-1.5	PS-6 2.0-2.5	PS-7 0-0.5
Acetone.....		-1.0	-1.0	-1.0	-1.0	-1.0	-1.0	-1.0
Benzene.....		-0.05	-0.05	-0.05	-0.05	-0.05	-0.05	-0.05
Bromodichloromethane.....		-0.05	-0.05	-0.05	-0.05	-0.05	-0.05	-0.05
Bromoform.....		-0.3	-0.3	-0.3	-0.3	-0.3	-0.3	-0.3
Bromomethane.....		-0.50	-0.50	-0.50	-0.50	-0.50	-0.50	-0.50
Carbon tetrachloride.....		-0.05	-0.05	-0.05	-0.05	-0.05	-0.05	-0.05
Chlorobenzene.....		-0.05	-0.05	-0.05	-0.05	-0.05	-0.05	-0.05
Chloroethane.....		-0.05	-0.05	-0.05	-0.05	-0.05	-0.05	-0.05
Chloroform.....		-0.05	-0.05	-0.05	-0.05	-0.05	-0.05	-0.05
Chloromethane.....		-0.50	-0.50	-0.50	-0.50	-0.50	-0.50	-0.50
Dibromochloromethane.....		-0.05	-0.05	-0.05	-0.05	-0.05	-0.05	-0.05
1,1-Dichloroethane.....		-0.05	-0.05	-0.05	-0.05	-0.05	-0.05	-0.05
1,2-Dichloroethane.....		-0.05	-0.05	-0.05	-0.05	-0.05	-0.05	-0.05
1,1-Dichloroethylene.....		-0.05	-0.05	-0.05	-0.05	-0.05	-0.05	-0.05
1,2-Dichloroethylene.....		-0.05	-0.05	-0.05	-0.05	-0.05	-0.05	-0.05
1,2-Dichloropropane.....		-0.05	-0.05	-0.05	-0.05	-0.05	-0.05	-0.05
1,3-Dichloropropylene.....		-0.05	-0.05	-0.05	-0.05	-0.05	-0.05	-0.05
Ethylbenzene.....		-0.05	-0.05	-0.05	-0.05	-0.05	-0.05	-0.05
Methylene chloride.....		-0.3	-0.3	-0.3	-0.3	-0.3	-0.3	-0.3
1,1,2,2-Tetrachloroethane.....		-0.05	-0.05	-0.05	-0.05	-0.05	-0.05	-0.05
Tetrachloroethylene.....		-0.05	-0.05	-0.05	-0.05	-0.05	-0.05	0.10
1,1,1-Trichloroethane.....		-0.05	-0.05	-0.05	-0.05	-0.05	-0.05	-0.05
1,1,2-Trichloroethane.....		-0.05	-0.05	-0.05	-0.05	-0.05	-0.05	-0.05
Trichloroethylene.....		-0.05	-0.05	-0.05	-0.05	-0.05	-0.05	0.13
Toluene.....		-0.10	-0.10	-0.10	-0.10	-0.10	-0.10	0.42
Vinyl chloride.....		-0.05	-0.05	-0.05	-0.05	-0.05	-0.05	-0.05
Total Xylenes.....		-0.05	-0.05	-0.05	-0.05	-0.05	-0.05	0.08
Date Sampled.....		05/16/90	05/16/90	05/16/90	05/16/90	05/16/90	05/16/90	05/17/90
Method.....		8240	8240	8240	8240	8240	8240	8240
Laboratory.....		ATI	ATI	ATI	ATI	ATI	ATI	ATI

(-) = Less than; numerical value represents the Limit of Detection for that compound
 (---) = Analysis not reported

TABLE B-2 (continued)
RESULTS OF ANALYSES FOR EPA PRIORITY VOLATILE ORGANIC COMPOUNDS
IN SEDIMENT SAMPLES COLLECTED FROM SRE POND

ORGANIC COMPOUND (micrograms per liter)	SAMPLE ID DEPTH INTERVAL (feet)	PS-7 1.0-1.5	PS-7 2.0-2.5	PS-7 3.0-3.5	PS-8 0-0.5	PS-8 1.0-1.5	PS-8 2.0-2.5	PS-8 3.0-3.5
Acetone.....		-1.0	-1.0	-1.0	-1.0	-1.0	-1.0	-1.0
Benzene.....		-0.05	-0.05	-0.05	-0.05	-0.05	-0.05	-0.05
Bromodichloromethane.....		-0.05	-0.05	-0.05	-0.05	-0.05	-0.05	-0.05
Bromoform.....		-0.3	-0.3	-0.3	-0.3	-0.3	-0.3	-0.3
Bromomethane.....		-0.50	-0.50	-0.50	-0.50	-0.50	-0.50	-0.50
Carbon tetrachloride.....		-0.05	-0.05	-0.05	-0.05	-0.05	-0.05	-0.05
Chlorobenzene.....		-0.05	-0.05	-0.05	-0.05	-0.05	-0.05	-0.05
Chloroethane.....		-0.05	-0.05	-0.05	-0.05	-0.05	-0.05	-0.05
Chloroform.....		-0.05	-0.05	-0.05	-0.05	-0.05	-0.05	-0.05
Chloromethane.....		-0.50	-0.50	-0.50	-0.50	-0.50	-0.50	-0.50
Dibromochloromethane.....		-0.05	-0.05	-0.05	-0.05	-0.05	-0.05	-0.05
1,1-Dichloroethane.....		-0.05	-0.05	-0.05	-0.05	-0.05	0.13	0.09
1,2-Dichloroethane.....		-0.05	-0.05	-0.05	-0.05	-0.05	-0.05	-0.05
1,1-Dichloroethylene.....		-0.05	-0.05	-0.05	-0.05	-0.05	-0.05	-0.05
1,2-Dichloroethylene.....		-0.05	-0.05	-0.05	-0.05	0.12	0.05	-0.05
1,2-Dichloropropane.....		-0.05	-0.05	-0.05	-0.05	-0.05	-0.05	-0.05
1,3-Dichloropropylene.....		-0.05	-0.05	-0.05	-0.05	-0.05	-0.05	-0.05
Ethylbenzene.....		-0.05	-0.05	-0.05	-0.05	-0.05	-0.05	0.10
Methylene chloride.....		-0.3	-0.3	-0.3	-0.3	-0.3	4.2	3.7
1,1,2,2-Tetrachloroethane.....		-0.05	-0.05	-0.05	-0.05	-0.05	-0.05	-0.05
Tetrachloroethylene.....		-0.05	-0.05	-0.05	-0.05	-0.05	0.33	0.25
1,1,1-Trichloroethane.....		-0.05	-0.05	-0.05	-0.05	-0.05	0.41	0.4
1,1,2-Trichloroethane.....		-0.05	-0.05	-0.05	-0.05	-0.05	-0.05	-0.05
Trichloroethylene.....		-0.05	-0.05	-0.05	0.22	-0.05	1.0	0.81
Toluene.....		-0.10	-0.10	-0.10	-0.10	-0.10	3.6	3.0
Vinyl chloride.....		-0.05	-0.05	-0.05	-0.05	-0.05	-0.05	-0.05
Total Xylenes.....		-0.05	-0.05	-0.05	-0.05	-0.05	0.52	0.37
Date Sampled.....		05/17/90	05/17/90	05/17/90	05/17/90	05/17/90	05/17/90	05/17/90
Method.....		8240	8240	8240	8240	8240	8240	8240
Laboratory.....		ATI	ATI	ATI	ATI	ATI	ATI	ATI

(-) = Less than; numerical value represents the Limit of Detection for that compound
(---) = Analysis not reported

TABLE B-3
RESULTS OF ANALYSES FOR EPA PRIORITY VOLATILE ORGANIC COMPOUNDS
IN SEDIMENT SAMPLES COLLECTED FROM PERIMETER POND

ORGANIC COMPOUND (micrograms per liter)	SAMPLE ID DEPTH INTERVAL (feet)	PS-9 0-1.5	PS-9 1.0-1.5	PS-9 2.0-2.5	PS-9 3.0-3.5	PS-10 0-0.5	PS-10 1.0-1.5	PS-11 0-0.5
Acetone.....		-1.0	-1.0	-1.0	-1.0	-1.0	-1.0	-1.0
Benzene.....		-0.05	-0.05	-0.05	-0.05	-0.05	-0.05	-0.05
Bromodichloromethane.....		-0.05	-0.05	0.06	-0.05	-0.05	-0.05	-0.05
Bromoform.....		-0.3	-0.3	-0.3	-0.3	-0.3	-0.3	-0.3
Bromomethane.....		-0.50	-0.50	-0.50	-0.50	-0.50	-0.50	-0.50
Carbon tetrachloride.....		-0.05	-0.05	-0.05	-0.05	-0.05	-0.05	-0.05
Chlorobenzene.....		-0.05	-0.05	-0.05	-0.05	-0.05	-0.05	-0.05
Chloroethane.....		-0.05	-0.05	-0.05	-0.05	-0.05	-0.05	-0.05
Chloroform.....		-0.05	-0.05	0.09	-0.05	-0.05	-0.05	-0.05
Chloromethane.....		-0.50	-0.50	-0.50	-0.50	-0.50	-0.50	-0.50
Dibromochloromethane.....		-0.05	-0.05	-0.05	-0.05	-0.05	-0.05	-0.05
1,1-Dichloroethane.....		-0.05	-0.05	-0.05	-0.05	-0.05	-0.05	-0.05
1,2-Dichloroethane.....		-0.05	-0.05	-0.05	-0.05	-0.05	-0.05	-0.05
1,1-Dichloroethylene.....		-0.05	-0.05	-0.05	-0.05	-0.05	-0.05	-0.05
1,2-Dichloroethylene.....		-0.05	-0.05	-0.05	-0.05	-0.05	0.05	-0.05
1,2-Dichloropropane.....		-0.05	-0.05	-0.05	-0.05	-0.05	-0.05	-0.05
1,3-Dichloropropylene.....		-0.05	-0.05	-0.05	-0.05	-0.05	-0.05	-0.05
Ethylbenzene.....		-0.05	-0.05	-0.05	-0.05	-0.05	-0.05	-0.05
Methylene chloride.....		-0.3	-0.3	-0.3	-0.3	-0.3	-0.3	-0.3
1,1,2,2-Tetrachloroethane.....		-0.05	-0.05	-0.05	-0.05	-0.05	-0.05	-0.05
Tetrachloroethylene.....		-0.05	-0.05	-0.05	-0.05	-0.05	-0.05	-0.05
1,1,1-Trichloroethane.....		-0.05	-0.05	-0.05	-0.05	-0.05	-0.05	-0.05
1,1,2-Trichloroethane.....		-0.05	-0.05	-0.05	-0.05	-0.05	-0.05	-0.05
Trichloroethylene.....		-0.05	0.07	-0.05	-0.05	-0.05	-0.05	-0.05
Toluene.....		-0.10	-0.10	-0.10	-0.10	-0.10	-0.10	-0.10
Vinyl chloride.....		-0.05	-0.05	-0.05	-0.05	-0.05	-0.05	-0.05
Total Xylenes.....		-0.05	-0.05	-0.05	-0.05	-0.05	-0.05	-0.05
Date Sampled.....		05/17/90	05/17/90	05/17/90	05/17/90	05/18/90	05/18/90	05/18/90
Method.....		8240	8240	8240	8240	8240	8240	8240
Laboratory.....		ATI	ATI	ATI	ATI	ATI	ATI	ATI

(-) = Less than; numerical value represents the Limit of Detection for that compound
(---) = Analysis not reported

TABLE B-3 (continued)
RESULTS OF ANALYSES FOR EPA PRIORITY VOLATILE ORGANIC COMPOUNDS
IN SEDIMENT SAMPLES COLLECTED FROM PERIMETER POND

ORGANIC COMPOUND (micrograms per liter)	SAMPLE ID DEPTH INTERVAL (feet)	PS-11 1.0-1.5	PS-11 2.0-2.5	PS-12 0-0.5	PS-12 1.0-1.5	PS-12 2.0-2.5	PS-12 3.0-3.5
Acetone.....		-1.0	-1.0	-1.0	-1.0	-1.0	-1.0
Benzene.....		-0.05	-0.05	-0.05	-0.05	-0.05	-0.05
Bromodichloromethane.....		-0.05	-0.05	-0.05	-0.05	-0.05	-0.05
Bromoform.....		-0.3	-0.3	-0.3	-0.3	-0.3	-0.3
Bromomethane.....		-0.50	-0.50	-0.50	-0.50	-0.50	-0.50
Carbon tetrachloride.....		-0.05	-0.05	-0.05	-0.05	-0.05	-0.05
Chlorobenzene.....		-0.05	-0.05	-0.05	-0.05	-0.05	-0.05
Chloroethane.....		-0.05	-0.05	-0.05	-0.05	-0.05	-0.05
Chloroform.....		-0.05	-0.05	-0.05	-0.05	-0.05	-0.05
Chloromethane.....		-0.50	-0.50	-0.50	-0.50	-0.50	-0.50
Dibromochloromethane.....		-0.05	-0.05	-0.05	-0.05	-0.05	-0.05
1,1-Dichloroethane.....		-0.05	-0.05	-0.05	-0.05	-0.05	-0.05
1,2-Dichloroethane.....		-0.05	-0.05	-0.05	-0.05	-0.05	-0.05
1,1-Dichloroethylene.....		-0.05	-0.05	-0.05	-0.05	-0.05	-0.05
1,2-Dichloroethylene.....		-0.05	-0.05	-0.05	-0.05	-0.05	-0.05
1,2-Dichloropropane.....		-0.05	-0.05	-0.05	-0.05	-0.05	-0.05
1,3-Dichloropropylene.....		-0.05	-0.05	-0.05	-0.05	-0.05	-0.05
Ethylbenzene.....		-0.05	-0.05	-0.05	-0.05	-0.05	-0.05
Methylene chloride.....		-0.3	-0.3	-0.3	-0.3	-0.3	-0.3
1,1,2,2-Tetrachloroethane.....		-0.05	-0.05	-0.05	-0.05	-0.05	-0.05
Tetrachloroethylene.....		-0.05	-0.05	-0.05	-0.05	-0.05	-0.05
1,1,1-Trichloroethane.....		-0.05	-0.05	-0.05	-0.05	-0.05	-0.05
1,1,2-Trichloroethane.....		-0.05	-0.05	-0.05	-0.05	-0.05	-0.05
Trichloroethylene.....		-0.05	-0.05	-0.05	-0.05	-0.05	-0.05
Toluene.....		-0.10	-0.10	-0.10	-0.10	-0.10	-0.10
Vinyl chloride.....		-0.05	-0.05	-0.05	-0.05	-0.05	-0.05
Total Xylenes.....		-0.05	-0.05	-0.05	-0.05	-0.05	-0.05
Date Sampled.....		05/18/90	05/18/90	05/18/90	05/18/90	05/18/90	05/18/90
Method.....		8240	8240	8240	8240	8240	8240
Laboratory.....		ATI	ATI	ATI	ATI	ATI	ATI

(-) = Less than; numerical value represents the Limit of Detection for that compound
(---) = Analysis not reported

GROUNDWATER RESOURCES CONSULTANTS, INC.

APPENDIX C

**RESULTS OF ANALYSES FOR EPA PRIORITY BASE/NEUTRAL ORGANIC COMPOUNDS
IN SEDIMENT SAMPLES COLLECTED FROM R2, SRE AND PERIMETER PONDS**

GROUNDWATER RESOURCES CONSULTANTS, INC.

APPENDIX C

RESULTS OF ANALYSES FOR EPA PRIORITY BASE/NEUTRAL ORGANIC COMPOUNDS
IN SEDIMENT SAMPLES COLLECTED FROM R2, SRE AND PERIMETER PONDS

TABLES

TABLE

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| C-2 | RESULTS OF ANALYSES FOR EPA PRIORITY BASE/NEUTRAL ORGANIC COMPOUNDS IN SEDIMENT SAMPLES COLLECTED FROM SRE POND |
| C-3 | RESULTS OF ANALYSES FOR EPA PRIORITY BASE/NEUTRAL ORGANIC COMPOUNDS IN SEDIMENT SAMPLES COLLECTED FROM PERIMETER POND |

GROUNDWATER RESOURCES CONSULTANTS, INC.

TABLE C-1

RESULTS OF ANALYSES FOR EPA PRIORITY BASE/NEUTRAL ORGANIC COMPOUNDS
IN SEDIMENT SAMPLES COLLECTED FROM R2 POND

ORGANIC COMPOUND (micrograms per liter)	SAMPLE ID DEPTH INTERVAL (feet)	PS-1 0-0.5	PS-1 1.0-1.5	PS-2 0-0.5	PS-2 1.0-1.5	PS-3 0-0.5	PS-3 1.0-1.5	PS-4 0-0.5
Acenaphthene.....		-0.17	-0.17	-0.17	-0.17	-0.17	-0.17	-0.17
Acenaphthylene.....		-0.17	-0.17	-0.17	-0.17	-0.17	-0.17	-0.17
Anthracene.....		-0.17	-0.17	-0.17	-0.17	-0.17	-0.17	-0.17
Benzidine.....		-1.7	-1.7	-1.7	-1.7	-1.7	-1.7	-1.7
Benzo(a)anthracene.....		-0.17(TR)	-0.17	-0.17	-0.17	-0.17	-0.17	-0.17
Benzo(a)pyrene.....		0.22	-0.17	-0.17	-0.17	0.24	-0.17	-0.17
3,4-Benzofluoranthene.....		0.26	-0.17	-0.17	-0.17	0.24	-0.17	-0.17
Benzo(ghi)perylene.....		0.23	-0.17	-0.17	-0.17	0.46	0.26	-0.17
Benzo(k)fluoranthene.....		-0.17	-0.17	-0.17	-0.17	-0.17	-0.17	-0.17
Bis(2-chloroethoxy) methane..		-0.17	-0.17	-0.17	-0.17	-0.17	-0.17	-0.17
Bis(2-chloroethyl) ether.....		-0.17	-0.17	-0.17	-0.17	-0.17	-0.17	-0.17
Bis(2-chloroisopropyl) ether..		-0.17	-0.17	-0.17	-0.17	-0.17	-0.17	-0.17
Bis(2-ethylhexyl) phthalate...		-0.17	-0.17	-0.17	-0.17	-0.17	-0.17	-0.17
4-Bromophenyl phenyl ether....		-0.17	-0.17	-0.17	-0.17	-0.17	-0.17	-0.17
Butyl benzyl phthalate.....		-0.17	-0.17	-0.17	-0.17	-0.17	-0.17	-0.17
2-Chloronaphthalene.....		-0.17	-0.17	-0.17	-0.17	-0.17	-0.17	-0.17
4-Chlorophenyl phenyl ether...		-0.17	-0.17	-0.17	-0.17	-0.17	-0.17	-0.17
Chrysene.....		0.23	-0.17	-0.17	-0.17	0.18	-0.17	-0.17
Dibenzo(a,h)anthracene.....		-0.17	-0.17	-0.17	-0.17	-0.17	-0.17	-0.17
1,2-Dichlorobenzene.....		-0.17	-0.17	-0.17	-0.17	-0.17	-0.17	-0.17
1,3-Dichlorobenzene.....		-0.17	-0.17	-0.17	-0.17	-0.17	-0.17	-0.17
1,4-Dichlorobenzene.....		-0.17	-0.17	-0.17	-0.17	-0.17	-0.17	-0.17
3,3'-Dichlorobenzidine.....		-0.34	-0.34	-0.34	-0.34	-0.34	-0.34	-0.34
Diethyl phthalate.....		-0.17	-0.17	-0.17	-0.17	-0.17	-0.17	-0.17
Dimethyl phthalate.....		-0.17	-0.17	-0.17	-0.17	-0.17	-0.17	-0.17
Di-n-butyl phthalate.....		-0.17	-0.17	-0.17	-0.17	-0.17	-0.17	-0.17
2,4-Dinitrotoluene.....		-0.17	-0.17	-0.17	-0.17	-0.17	-0.17	-0.17
2,6-Dinitrotoluene.....		-0.17	-0.17	-0.17	-0.17	-0.17	-0.17	-0.17
Di-n-octyl phthalate.....		-0.17	-0.17	-0.17	-0.17	-0.17	-0.17	-0.17
Fluoranthene.....		0.29	0.19	-0.17	-0.17	0.20	-0.17	-0.17
Fluorene.....		-0.17	-0.17	-0.17	-0.17	-0.17	-0.17	-0.17
Hexachlorobenzene.....		-0.17	-0.17	-0.17	-0.17	-0.17	-0.17	-0.17
Hexachlorobutadiene.....		-0.17	-0.17	-0.17	-0.17	-0.17	-0.17	-0.17
Hexachlorocyclopentadiene.....		-0.17	-0.17	-0.17	-0.17	-0.17	-0.17	-0.17
Hexachloroethane.....		-0.17	-0.17	-0.17	-0.17	-0.17	-0.17	-0.17
Indeno(1,2,3-cd) pyrene.....		0.23	-0.17	-0.17	-0.17	0.43	0.24	-0.17
Isophorone.....		-0.17	-0.17	-0.17	-0.17	-0.17	-0.17	-0.17
Naphthalene.....		-0.17	-0.17	-0.17	-0.17	-0.17	-0.17	-0.17
Nitrobenzene.....		-0.17	-0.17	-0.17	-0.17	-0.17	-0.17	-0.17
N-Nitrosodimethylamine.....		-0.17	-0.17	-0.17	-0.17	-0.17	-0.17	-0.17
N-Nitrosodi-n-propylamine.....		-0.17	-0.17	-0.17	-0.17	-0.17	-0.17	-0.17
N-Nitrosodiphenylamine.....		-0.17	-0.17	-0.17	-0.17	-0.17	-0.17	-0.17
Phenanthrene.....		-0.17	-0.17	-0.17	-0.17	-0.17	-0.17	-0.17
Pyrene.....		0.32	0.19	-0.17	-0.17	0.23	-0.17	-0.17
1,2,4-Trichlorobenzene.....		-0.17	-0.17	-0.17	-0.17	-0.17	-0.17	-0.17
Date Sampled.....		05/15/90	05/15/90	05/15/90	05/15/90	05/15/90	05/15/90	05/15/90

(-) = Less than; numerical value is the Limit of Detection for that compound

TR = Trace

Samples analyzed by EPA method 8270; Analyses performed by Analytical Technologies, Inc.

GROUNDWATER RESOURCES CONSULTANTS, INC.

TABLE C-1 (continued)

RESULTS OF ANALYSES FOR EPA PRIORITY BASE/NEUTRAL ORGANIC COMPOUNDS
IN SEDIMENT SAMPLES COLLECTED FROM R2 POND

ORGANIC COMPOUND (micrograms per liter)	SAMPLE ID DEPTH INTERVAL (feet)	PS-4 1.0-1.5
Acenaphthene.....		-0.17
Acenaphthylene.....		-0.17
Anthracene.....		-0.17
Benzidine.....		-1.7
Benzo(a)anthracene.....		-0.17
Benzo(a)pyrene.....		-0.17
3,4-Benzofluoranthene.....		-0.17
Benzo(ghi)perylene.....		-0.17
Benzo(k)fluoranthene.....		-0.17
Bis(2-chloroethoxy) methane..		-0.17
Bis(2-chloroethyl) ether.....		-0.17
Bis(2-chloroisopropyl) ether..		-0.17
Bis(2-ethylhexyl) phthalate...		-0.17
4-Bromophenyl phenyl ether....		-0.17
Butyl benzyl phthalate.....		-0.17
2-Chloronaphthalene.....		-0.17
4-Chlorophenyl phenyl ether...		-0.17
Chrysene.....		-0.17
Dibenzo(a,h)anthracene.....		-0.17
1,2-Dichlorobenzene.....		-0.17
1,3-Dichlorobenzene.....		-0.17
1,4-Dichlorobenzene.....		-0.17
3,3'-Dichlorobenzidine.....		-0.34
Diethyl phthalate.....		-0.17
Dimethyl phthalate.....		-0.17
Di-n-butyl phthalate.....		-0.17
2,4-Dinitrotoluene.....		-0.17
2,6-Dinitrotoluene.....		-0.17
Di-n-octyl phthalate.....		-0.17
Fluoranthene.....		-0.17
Fluorene.....		-0.17
Hexachlorobenzene.....		-0.17
Hexachlorobutadiene.....		-0.17
Hexachlorocyclopentadiene.....		-0.17
Hexachloroethane.....		-0.17
Indeno(1,2,3-cd) pyrene.....		-0.17
Isophorone.....		-0.17
Naphthalene.....		-0.17
Nitrobenzene.....		-0.17
N-Nitrosodimethylamine.....		-0.17
N-Nitrosodi-n-propylamine.....		-0.17
N-Nitrosodiphenylamine.....		-0.17
Phenanthrene.....		-0.17
Pyrene.....		-0.17
1,2,4-Trichlorobenzene.....		-0.17

Date Sampled..... 05/15/90

(-) = Less than; numerical value is the Limit of Detection for that compound

Samples analyzed by EPA method 8270; Analyses performed by Analytical Technologies, Inc.

GROUNDWATER RESOURCES CONSULTANTS, INC.

TABLE C-2

RESULTS OF ANALYSES FOR EPA PRIORITY BASE/NEUTRAL ORGANIC COMPOUNDS
IN SEDIMENT SAMPLES COLLECTED FROM SRE POND

ORGANIC COMPOUND (micrograms per liter)	SAMPLE ID DEPTH INTERVAL (feet)	PS-5	PS-5	PS-5	PS-6	PS-6	PS-6	PS-7
		0-0.5	1.0-1.5	2.0-2.5	0-0.5	1.0-1.5	2.0-2.5	0-0.5
Acenaphthene.....		-0.17	-0.17	-0.17	-0.17	-0.17	-0.17	-0.17
Acenaphthylene.....		-0.17	-0.17	-0.17	-0.17	-0.17	-0.17	-0.17
Anthracene.....		-0.17	-0.17	-0.17	-0.17	-0.17	-0.17	-0.17
Benzidine.....		-1.7	-1.7	-1.7	-1.7	-1.7	-1.7	-1.7
Benzo(a)anthracene.....		-0.17	-0.17	-0.17	-0.17	-0.17	-0.17	0.24
Benzo(a)pyrene.....		-0.17	-0.17	-0.17	-0.17	-0.17	-0.17	0.24
3,4-Benzofluoranthene.....		-0.17	-0.17	-0.17	-0.17	-0.17	-0.17	0.54
Benzo(ghi)perylene.....		-0.17	-0.17	-0.17	-0.17	-0.17	-0.17	0.23
Benzo(k)fluoranthene.....		-0.17	-0.17	-0.17	-0.17	-0.17	-0.17	-0.17
Bis(2-chloroethoxy) methane..		-0.17	-0.17	-0.17	-0.17	-0.17	-0.17	-0.17
Bis(2-chloroethyl) ether.....		-0.17	-0.17	-0.17	-0.17	-0.17	-0.17	-0.17
Bis(2-chloroisopropyl) ether..		-0.17	-0.17	-0.17	-0.17	-0.17	-0.17	-0.17
Bis(2-ethylhexyl) phthalate...		-0.17	-0.17	-0.17	-0.17	-0.17	-0.17	-0.17
4-Bromophenyl phenyl ether....		-0.17	-0.17	-0.17	-0.17	-0.17	-0.17	-0.17
Butyl benzyl phthalate.....		-0.17	-0.17	-0.17	-0.17	-0.17	-0.17	-0.17
2-Chloronaphthalene.....		-0.17	-0.17	-0.17	-0.17	-0.17	-0.17	-0.17
4-Chlorophenyl phenyl ether...		-0.17	-0.17	-0.17	-0.17	-0.17	-0.17	-0.17
Chrysene.....		-0.17	-0.17	-0.17	-0.17	-0.17	-0.17	0.42
Dibenzo(a,h)anthracene.....		-0.17	-0.17	-0.17	-0.17	-0.17	-0.17	-0.17
1,2-Dichlorobenzene.....		-0.17	-0.17	-0.17	-0.17	-0.17	-0.17	-0.17
1,3-Dichlorobenzene.....		-0.17	-0.17	-0.17	-0.17	-0.17	-0.17	-0.17
1,4-Dichlorobenzene.....		-0.17	-0.17	-0.17	-0.17	-0.17	-0.17	-0.17
3,3'-Dichlorobenzidine.....		-0.34	-0.34	-0.34	-0.34	-0.34	-0.34	-0.34
Diethyl phthalate.....		-0.17	-0.17	-0.17	-0.17	-0.17	-0.17	-0.17
Dimethyl phthalate.....		-0.17	-0.17	-0.17	-0.17	-0.17	-0.17	-0.17
Di-n-butyl phthalate.....		-0.17	-0.17	-0.17	-0.17	-0.17	-0.17	-0.17
2,4-Dinitrotoluene.....		-0.17	-0.17	-0.17	-0.17	-0.17	-0.17	-0.17
2,6-Dinitrotoluene.....		-0.17	-0.17	-0.17	-0.17	-0.17	-0.17	-0.17
Di-n-octyl phthalate.....		-0.17	-0.17	-0.17	-0.17	-0.17	-0.17	-0.17
Fluoranthene.....		-0.17	-0.17	-0.17	-0.17	-0.17	-0.17	0.80
Fluorene.....		-0.17	-0.17	-0.17	-0.17	-0.17	-0.17	-0.17
Hexachlorobenzene.....		-0.17	-0.17	-0.17	-0.17	-0.17	-0.17	-0.17
Hexachlorobutadiene.....		-0.17	-0.17	-0.17	-0.17	-0.17	-0.17	-0.17
Hexachlorocyclopentadiene.....		-0.17	-0.17	-0.17	-0.17	-0.17	-0.17	-0.17
Hexachloroethane.....		-0.17	-0.17	-0.17	-0.17	-0.17	-0.17	-0.17
Indeno(1,2,3-cd) pyrene.....		-0.17	-0.17	-0.17	-0.17	-0.17	-0.17	0.20
Isophorone.....		-0.17	-0.17	-0.17	-0.17	-0.17	-0.17	-0.17
Naphthalene.....		-0.17	-0.17	-0.17	-0.17	-0.17	-0.17	-0.17
Nitrobenzene.....		-0.17	-0.17	-0.17	-0.17	-0.17	-0.17	-0.17
N-Nitrosodimethylamine.....		-0.17	-0.17	-0.17	-0.17	-0.17	-0.17	-0.17
N-Nitrosodi-n-propylamine.....		-0.17	-0.17	-0.17	-0.17	-0.17	-0.17	-0.17
N-Nitrosodiphenylamine.....		-0.17	-0.17	-0.17	-0.17	-0.17	-0.17	-0.17
Phenanthrene.....		-0.17	-0.17	-0.17	-0.17	-0.17	-0.17	0.28
Pyrene.....		-0.17	-0.17	-0.17	-0.17	-0.17	-0.17	0.59
1,2,4-Trichlorobenzene.....		-0.17	-0.17	-0.17	-0.17	-0.17	-0.17	-0.17
Date Sampled.....		05/16/90	05/16/90	05/16/90	05/16/90	05/16/90	05/16/90	05/17/90

(-) = Less than; numerical value is the Limit of Detection for that compound

Samples analyzed by EPA method 8270; Analyses performed by Analytical Technologies, Inc.

GROUNDWATER RESOURCES CONSULTANTS, INC.

TABLE C-2 (continued)

RESULTS OF ANALYSES FOR EPA PRIORITY BASE/NEUTRAL ORGANIC COMPOUNDS
IN SEDIMENT SAMPLES COLLECTED FROM SRE POND

ORGANIC COMPOUND (micrograms per liter)	SAMPLE ID DEPTH INTERVAL (feet)	PS-7 1.0-1.5	PS-7 2.0-2.5	PS-7 3.0-3.5	PS-8 0-0.5	PS-8 1.0-1.5	PS-8 2.0-2.5	PS-8 3.0-3.5
Acenaphthene.....		-0.17	-0.17	-0.17	-0.17	-0.17	-0.17	-0.17
Acenaphthylene.....		-0.17	-0.17	-0.17	-0.17	-0.17	-0.17	-0.17
Anthracene.....		-0.17	-0.17	-0.17	-0.17	-0.17	-0.17	-0.17
Benzidine.....		-1.7	-1.7	-1.7	-1.7	-1.7	-1.7	-1.7
Benzo(a)anthracene.....		-0.17	-0.17	-0.17	-0.17	-0.17	-0.17	-0.17
Benzo(a)pyrene.....		-0.17	-0.17	-0.17	-0.17	-0.17	-0.17	-0.17
3,4-Benzofluoranthene.....		-0.17	-0.17	-0.17	-0.17	-0.17	-0.17	-0.17
Benzo(ghi)perylene.....		-0.17	-0.17	-0.17	-0.17	-0.17	-0.17	-0.17
Benzo(k)fluoranthene.....		-0.17	-0.17	-0.17	-0.17	-0.17	-0.17	-0.17
Bis(2-chloroethoxy) methane..		-0.17	-0.17	-0.17	-0.17	-0.17	-0.17	-0.17
Bis(2-chloroethyl) ether.....		-0.17	-0.17	-0.17	-0.17	-0.17	-0.17	-0.17
Bis(2-chloroisopropyl) ether..		-0.17	-0.17	-0.17	-0.17	-0.17	-0.17	-0.17
Bis(2-ethylhexyl) phthalate...		-0.17	-0.17	-0.17	-0.17	-0.17	-0.17	-0.17
4-Bromophenyl phenyl ether....		-0.17	-0.17	-0.17	-0.17	-0.17	-0.17	-0.17
Butyl benzyl phthalate.....		-0.17	-0.17	-0.17	-0.17	-0.17	-0.17	-0.17
2-Chloronaphthalene.....		-0.17	-0.17	-0.17	-0.17	-0.17	-0.17	-0.17
4-Chlorophenyl phenyl ether...		-0.17	-0.17	-0.17	-0.17	-0.17	-0.17	-0.17
Chrysene.....		-0.17	-0.17	-0.17	-0.17	-0.17	-0.17	-0.17
Dibenzo(a,h)anthracene.....		-0.17	-0.17	-0.17	-0.17	-0.17	-0.17	-0.17
1,2-Dichlorobenzene.....		-0.17	-0.17	-0.17	-0.17	-0.17	-0.17	-0.17
1,3-Dichlorobenzene.....		-0.17	-0.17	-0.17	-0.17	-0.17	-0.17	-0.17
1,4-Dichlorobenzene.....		-0.17	-0.17	-0.17	-0.17	-0.17	-0.17	-0.17
3,3'-Dichlorobenzidine.....		-0.34	-0.34	-0.34	-0.34	-0.34	-0.34	-0.34
Diethyl phthalate.....		-0.17	-0.17	-0.17	-0.17	-0.17	-0.17	-0.17
Dimethyl phthalate.....		-0.17	-0.17	-0.17	-0.17	-0.17	-0.17	-0.17
Di-n-butyl phthalate.....		-0.17	-0.17	-0.17	-0.17	-0.17	-0.17	-0.17
2,4-Dinitrotoluene.....		-0.17	-0.17	-0.17	-0.17	-0.17	-0.17	-0.17
2,6-Dinitrotoluene.....		-0.17	-0.17	-0.17	-0.17	-0.17	-0.17	-0.17
Di-n-octyl phthalate.....		-0.17	-0.17	-0.17	-0.17	-0.17	-0.17	-0.17
Fluoranthene.....		-0.17	-0.17	-0.17	-0.17	-0.17	-0.17	-0.17
Fluorene.....		-0.17	-0.17	-0.17	-0.17	-0.17	-0.17	-0.17
Hexachlorobenzene.....		-0.17	-0.17	-0.17	-0.17	-0.17	-0.17	-0.17
Hexachlorobutadiene.....		-0.17	-0.17	-0.17	-0.17	-0.17	-0.17	-0.17
Hexachlorocyclopentadiene.....		-0.17	-0.17	-0.17	-0.17	-0.17	-0.17	-0.17
Hexachloroethane.....		-0.17	-0.17	-0.17	-0.17	-0.17	-0.17	-0.17
Indeno(1,2,3-cd) pyrene.....		-0.17	-0.17	-0.17	-0.17	-0.17	-0.17	-0.17
Isophorone.....		-0.17	-0.17	-0.17	-0.17	-0.17	-0.17	-0.17
Naphthalene.....		-0.17	-0.17	-0.17	-0.17	-0.17	-0.17	-0.17
Nitrobenzene.....		-0.17	-0.17	-0.17	-0.17	-0.17	-0.17	-0.17
N-Nitrosodimethylamine.....		-0.17	-0.17	-0.17	-0.17	-0.17	-0.17	-0.17
N-Nitrosodi-n-propylamine.....		-0.17	-0.17	-0.17	-0.17	-0.17	-0.17	-0.17
N-Nitrosodiphenylamine.....		-0.17	-0.17	-0.17	-0.17	-0.17	-0.17	-0.17
Phenanthrene.....		-0.17	-0.17	-0.17	-0.17	-0.17	-0.17	-0.17
Pyrene.....		-0.17	-0.17	-0.17	-0.17	-0.17	-0.17	-0.17
1,2,4-Trichlorobenzene.....		-0.17	-0.17	-0.17	-0.17	-0.17	-0.17	-0.17
Date Sampled.....		05/17/90	05/17/90	05/17/90	05/17/90	05/17/90	05/17/90	05/17/90

(-) = Less than; numerical value is the Limit of Detection for that compound

Samples analyzed by EPA method 8270; Analyses performed by Analytical Technologies, Inc.

GROUNDWATER RESOURCES CONSULTANTS, INC.

TABLE C-3

RESULTS OF ANALYSES FOR EPA PRIORITY BASE/NEUTRAL ORGANIC COMPOUNDS
IN SEDIMENT SAMPLES COLLECTED FROM PERIMETER POND

ORGANIC COMPOUND (micrograms per liter)	SAMPLE ID DEPTH INTERVAL (feet)	PS-9 0-0.5	PS-9 1.0-1.5	PS-9 2.0-2.5	PS-9 3.0-3.5	PS-10 0-0.5	PS-10 1.0-1.5	PS-11 0-0.5
Acenaphthene.....		-0.17	-0.17	-0.17	-0.17	-0.17	-0.17	-0.17
Acenaphthylene.....		-0.17	-0.17	-0.17	-0.17	-0.17	-0.17	-0.17
Anthracene.....		-0.17	-0.17	-0.17	-0.17	-0.17	-0.17	-0.17
Benzidine.....		-1.7	-1.7	-1.7	-1.7	-1.7	-1.7	-1.7
Benzo(a)anthracene.....		-0.17	-0.17	-0.17	-0.17	-0.17	-0.17	-0.17
Benzo(a)pyrene.....		-0.17	-0.17	-0.17	-0.17	-0.17	-0.17	-0.17
3,4-Benzofluoranthene.....		-0.17	-0.17	-0.17	-0.17	-0.17	-0.17	-0.17
Benzo(ghi)perylene.....		-0.17	-0.17	-0.17	-0.17	-0.17	-0.17	-0.17
Benzo(k)fluoranthene.....		-0.17	-0.17	-0.17	-0.17	-0.17	-0.17	-0.17
Bis(2-chloroethoxy) methane..		-0.17	-0.17	-0.17	-0.17	-0.17	-0.17	-0.17
Bis(2-chloroethyl) ether.....		-0.17	-0.17	-0.17	-0.17	-0.17	-0.17	-0.17
Bis(2-chloroisopropyl) ether..		-0.17	-0.17	-0.17	-0.17	-0.17	-0.17	-0.17
Bis(2-ethylhexyl) phthalate...		-0.17	-0.17	-0.17	-0.17	-0.17	-0.17	-0.17
4-Bromophenyl phenyl ether....		-0.17	-0.17	-0.17	-0.17	-0.17	-0.17	-0.17
Butyl benzyl phthalate.....		-0.17	-0.17	-0.17	-0.17	-0.17	-0.17	-0.17
2-Chloronaphthalene.....		-0.17	-0.17	-0.17	-0.17	-0.17	-0.17	-0.17
4-Chlorophenyl phenyl ether...		-0.17	-0.17	-0.17	-0.17	-0.17	-0.17	-0.17
Chrysene.....		-0.17	-0.17	-0.17	-0.17	-0.17	-0.17	-0.17
Dibenzo(a,h)anthracene.....		-0.17	-0.17	-0.17	-0.17	-0.17	-0.17	-0.17
1,2-Dichlorobenzene.....		-0.17	-0.17	-0.17	-0.17	-0.17	-0.17	-0.17
1,3-Dichlorobenzene.....		-0.17	-0.17	-0.17	-0.17	-0.17	-0.17	-0.17
1,4-Dichlorobenzene.....		-0.17	-0.17	-0.17	-0.17	-0.17	-0.17	-0.17
3,3'-Dichlorobenzidine.....		-0.34	-0.34	-0.34	-0.34	-0.34	-0.34	-0.34
Diethyl phthalate.....		-0.17	-0.17	-0.17	-0.17	-0.17	-0.17	-0.17
Dimethyl phthalate.....		-0.17	-0.17	-0.17	-0.17	-0.17	-0.17	-0.17
Di-n-butyl phthalate.....		-0.17	-0.17	-0.17	-0.17	-0.17	-0.17	-0.17
2,4-Dinitrotoluene.....		-0.17	-0.17	-0.17	-0.17	-0.17	-0.17	-0.17
2,6-Dinitrotoluene.....		-0.17	-0.17	-0.17	-0.17	-0.17	-0.17	-0.17
Di-n-octyl phthalate.....		-0.17	-0.17	-0.17	-0.17	-0.17	-0.17	-0.17
Fluoranthene.....		-0.17	-0.17	-0.17	-0.17	-0.17	-0.17	-0.17
Fluorene.....		-0.17	-0.17	-0.17	-0.17	-0.17	-0.17	-0.17
Hexachlorobenzene.....		-0.17	-0.17	-0.17	-0.17	-0.17	-0.17	-0.17
Hexachlorobutadiene.....		-0.17	-0.17	-0.17	-0.17	-0.17	-0.17	-0.17
Hexachlorocyclopentadiene.....		-0.17	-0.17	-0.17	-0.17	-0.17	-0.17	-0.17
Hexachloroethane.....		-0.17	-0.17	-0.17	-0.17	-0.17	-0.17	-0.17
Indeno(1,2,3-cd) pyrene.....		-0.17	-0.17	-0.17	-0.17	-0.17	-0.17	-0.17
Isophorone.....		-0.17	-0.17	-0.17	-0.17	-0.17	-0.17	-0.17
Naphthalene.....		-0.17	-0.17	-0.17	-0.17	-0.17	-0.17	-0.17
Nitrobenzene.....		-0.17	-0.17	-0.17	-0.17	-0.17	-0.17	-0.17
N-Nitrosodimethylamine.....		-0.17	-0.17	-0.17	-0.17	-0.17	-0.17	-0.17
N-Nitrosodi-n-propylamine.....		-0.17	-0.17	-0.17	-0.17	-0.17	-0.17	-0.17
N-Nitrosodiphenylamine.....		-0.17	-0.17	-0.17	-0.17	-0.17	-0.17	-0.17
Phenanthrene.....		-0.17	-0.17	-0.17	-0.17	-0.17	-0.17	-0.17
Pyrene.....		-0.17	-0.17	-0.17	-0.17	-0.17	-0.17	-0.17
1,2,4-Trichlorobenzene.....		-0.17	-0.17	-0.17	-0.17	-0.17	-0.17	-0.17
Date Sampled.....		05/17/90	05/17/90	05/17/90	05/17/90	05/18/90	05/18/90	05/18/90

(-) = Less than; numerical value is the Limit of Detection for that compound

Samples analyzed by EPA method 8270; Analyses performed by Analytical Technologies, Inc.

GROUNDWATER RESOURCES CONSULTANTS, INC.

TABLE C-3 (continued)

RESULTS OF ANALYSES FOR EPA PRIORITY BASE/NEUTRAL ORGANIC COMPOUNDS
IN SEDIMENT SAMPLES COLLECTED FROM PERIMETER POND

ORGANIC COMPOUND (micrograms per liter)	SAMPLE ID DEPTH INTERVAL (feet)	PS-11 1.0-1.5	PS-11 2.0-2.5	PS-12 0-0.5	PS-12 1.0-1.5	PS-12 2.0-2.5	PS-12 3.0-3.5
Acenaphthene.....		-0.17	-0.17	-0.17	-0.17	-0.17	-0.17
Acenaphthylene.....		-0.17	-0.17	-0.17	-0.17	-0.17	-0.17
Anthracene.....		-0.17	-0.17	-0.17	-0.17	-0.17	-0.17
Benzidine.....		-1.7	-1.7	-1.7	-1.7	-1.7	-1.7
Benzo(a)anthracene.....		-0.17	-0.17	-0.17	-0.17	-0.17	-0.17
Benzo(a)pyrene.....		-0.17	-0.17	-0.17	-0.17	-0.17	-0.17
3,4-Benzofluoranthene.....		-0.17	-0.17	-0.17	-0.17	-0.17	-0.17
Benzo(ghi)perylene.....		-0.17	-0.17	-0.17	-0.17	-0.17	-0.17
Benzo(k)fluoranthene.....		-0.17	-0.17	-0.17	-0.17	-0.17	-0.17
Bis(2-chloroethoxy) methane..		-0.17	-0.17	-0.17	-0.17	-0.17	-0.17
Bis(2-chloroethyl) ether.....		-0.17	-0.17	-0.17	-0.17	-0.17	-0.17
Bis(2-chloroisopropyl) ether..		-0.17	-0.17	-0.17	-0.17	-0.17	-0.17
Bis(2-ethylhexyl) phthalate...		-0.17	-0.17	-0.17	-0.17	-0.17	-0.17
4-Bromophenyl phenyl ether....		-0.17	-0.17	-0.17	-0.17	-0.17	-0.17
Butyl benzyl phthalate.....		-0.17	-0.17	-0.17	-0.17	-0.17	-0.17
2-Chloronaphthalene.....		-0.17	-0.17	-0.17	-0.17	-0.17	-0.17
4-Chlorophenyl phenyl ether...		-0.17	-0.17	-0.17	-0.17	-0.17	-0.17
Chrysene.....		-0.17	-0.17	-0.17	-0.17	-0.17	-0.17
Dibenzo(a,h)anthracene.....		-0.17	-0.17	-0.17	-0.17	-0.17	-0.17
1,2-Dichlorobenzene.....		-0.17	-0.17	-0.17	-0.17	-0.17	-0.17
1,3-Dichlorobenzene.....		-0.17	-0.17	-0.17	-0.17	-0.17	-0.17
1,4-Dichlorobenzene.....		-0.17	-0.17	-0.17	-0.17	-0.17	-0.17
3,3'-Dichlorobenzidine.....		-0.34	-0.34	-0.34	-0.34	-0.34	-0.34
Diethyl phthalate.....		-0.17	-0.17	-0.17	-0.17	-0.17	-0.17
Dimethyl phthalate.....		-0.17	-0.17	-0.17	-0.17	-0.17	-0.17
Di-n-butyl phthalate.....		-0.17	-0.17	-0.17	-0.17	-0.17	-0.17
2,4-Dinitrotoluene.....		-0.17	-0.17	-0.17	-0.17	-0.17	-0.17
2,6-Dinitrotoluene.....		-0.17	-0.17	-0.17	-0.17	-0.17	-0.17
Di-n-octyl phthalate.....		-0.17	-0.17	-0.17	-0.17	-0.17	-0.17
Fluoranthene.....		-0.17	-0.17	-0.17	-0.17	-0.17	-0.17
Fluorene.....		-0.17	-0.17	-0.17	-0.17	-0.17	-0.17
Hexachlorobenzene.....		-0.17	-0.17	-0.17	-0.17	-0.17	-0.17
Hexachlorobutadiene.....		-0.17	-0.17	-0.17	-0.17	-0.17	-0.17
Hexachlorocyclopentadiene.....		-0.17	-0.17	-0.17	-0.17	-0.17	-0.17
Hexachloroethane.....		-0.17	-0.17	-0.17	-0.17	-0.17	-0.17
Indeno(1,2,3-cd) pyrene.....		-0.17	-0.17	-0.17	-0.17	-0.17	-0.17
Isophorone.....		-0.17	-0.17	-0.17	-0.17	-0.17	-0.17
Naphthalene.....		-0.17	-0.17	-0.17	-0.17	-0.17	-0.17
Nitrobenzene.....		-0.17	-0.17	-0.17	-0.17	-0.17	-0.17
N-Nitrosodimethylamine.....		-0.17	-0.17	-0.17	-0.17	-0.17	-0.17
N-Nitrosodi-n-propylamine.....		-0.17	-0.17	-0.17	-0.17	-0.17	-0.17
N-Nitrosodiphenylamine.....		-0.17	-0.17	-0.17	-0.17	-0.17	-0.17
Phenanthrene.....		-0.17	-0.17	-0.17	-0.17	-0.17	-0.17
Pyrene.....		-0.17	-0.17	-0.17	-0.17	-0.17	-0.17
1,2,4-Trichlorobenzene.....		-0.17	-0.17	-0.17	-0.17	-0.17	-0.17

Date Sampled..... 05/18/90 05/18/90 05/18/90 05/18/90 05/18/90 05/18/90

(-) = Less than; numerical value is the Limit of Detection for that compound

Samples analyzed by EPA method 8270; Analyses performed by Analytical Technologies, Inc.

GROUNDWATER RESOURCES CONSULTANTS, INC.

APPENDIX D

RESULTS OF ANALYSES FOR EPA PRIORITY ACID ORGANIC COMPOUNDS
IN SEDIMENT SAMPLES COLLECTED FROM R2, SRE AND PERIMETER PONDS

GROUNDWATER RESOURCES CONSULTANTS, INC.

APPENDIX D

RESULTS OF ANALYSES FOR EPA PRIORITY ACID ORGANIC COMPOUNDS
IN SEDIMENTS SAMPLES COLLECTED FROM R2, SRE AND PERIMETER PONDS

TABLES

TABLE

- | | |
|-----|--|
| D-1 | RESULTS OF ANALYSES FOR EPA PRIORITY ACID ORGANIC COMPOUNDS IN
SEDIMENT SAMPLES COLLECTED FROM R2 POND |
| D-2 | RESULTS OF ANALYSES FOR EPA PRIORITY ACID ORGANIC COMPOUNDS IN
SEDIMENT SAMPLES COLLECTED FROM SRE POND |
| D-3 | RESULTS OF ANALYSES FOR EPA PRIORITY ACID ORGANIC COMPOUNDS IN
SEDIMENT SAMPLES COLLECTED FROM PERIMETER POND |

TABLE D-1

**RESULTS OF ANALYSES FOR EPA PRIORITY ACID ORGANIC COMPOUNDS
IN SEDIMENT SAMPLES COLLECTED FROM R2 POND**

	SAMPLE IDENTIFIER.....							
ORGANIC COMPOUND (micrograms per liter)	PS-1 0-0.5	PS-1 1.0-1.5	PS-2 0-0.5	PS-2 1.0-1.5	PS-3 0-0.5	PS-3 1.0-1.5	PS-4 0-0.5	PS-4 1.0-1.5
2-Chlorophenol.....	-0.17	-0.17	-0.17	-0.17	-0.17	-0.17	-0.17	-0.17
2,4-Dichlorophenol.....	-0.17	-0.17	-0.17	-0.17	-0.17	-0.17	-0.17	-0.17
2,4-Dimethylphenol.....	-0.17	-0.17	-0.17	-0.17	-0.17	-0.17	-0.17	-0.17
4,6-Dinitro-o-cresol.....	-0.85	-0.85	-0.85	-0.85	-0.85	-0.85	-0.85	-0.85
2,4-Dinitrophenol.....	-0.85	-0.85	-0.85	-0.85	-0.85	-0.85	-0.85	-0.85
2-Nitrophenol.....	-0.17	-0.17	-0.17	-0.17	-0.17	-0.17	-0.17	-0.17
4-Nitrophenol.....	-0.85	-0.85	-0.85	-0.85	-0.85	-0.85	-0.85	-0.85
p-Chloro-m-cresol.....	-0.17	-0.17	-0.17	-0.17	-0.17	-0.17	-0.17	-0.17
Pentachlorophenol.....	-0.85	-0.85	-0.85	-0.85	-0.85	-0.85	-0.85	-0.85
Phenol.....	-0.17	-0.17	-0.17	-0.17	-0.17	-0.17	-0.17	-0.17
2,4,6-Trichlorophenol.....	-0.17	-0.17	-0.17	-0.17	-0.17	-0.17	-0.17	-0.17
Date Sampled.....								
Method.....	8270	8270	8270	8270	8270	8270	8270	8270
Laboratory.....	ATI	ATI	ATI	ATI	ATI	ATI	ATI	ATI

ATI = Analytical Technologies, Inc.

(-) = less than; numerical value is the Limit of Detection for that compound

TABLE D-2

**RESULTS OF ANALYSES FOR EPA PRIORITY ACID ORGANIC COMPOUNDS
IN SEDIMENT SAMPLES COLLECTED FROM SRE POND**

	SAMPLE IDENTIFIER.....							
ORGANIC COMPOUND (micrograms per liter)	PS-5 0-0.5	PS-5 1.0-1.5	PS-5 2.0-2.5	PS-6 0-0.5	PS-6 1.0-1.5	PS-6 2.0-2.5	PS-7 0-0.5	PS-7 1.0-1.5
2-Chlorophenol.....	-0.17	-0.17	-0.17	-0.17	-0.17	-0.17	-0.17	-0.17
2,4-Dichlorophenol.....	-0.17	-0.17	-0.17	-0.17	-0.17	-0.17	-0.17	-0.17
2,4-Dimethylphenol.....	-0.17	-0.17	-0.17	-0.17	-0.17	-0.17	-0.17	-0.17
4,6-Dinitro-o-cresol.....	-0.85	-0.85	-0.85	-0.85	-0.85	-0.85	-0.85	-0.85
2,4-Dinitrophenol.....	-0.85	-0.85	-0.85	-0.85	-0.85	-0.85	-0.85	-0.85
2-Nitrophenol.....	-0.17	-0.17	-0.17	-0.17	-0.17	-0.17	-0.17	-0.17
4-Nitrophenol.....	-0.85	-0.85	-0.85	-0.85	-0.85	-0.85	-0.85	-0.85
p-Chloro-m-cresol.....	-0.17	-0.17	-0.17	-0.17	-0.17	-0.17	-0.17	-0.17
Pentachlorophenol.....	-0.85	-0.85	-0.85	-0.85	-0.85	-0.85	-0.85	-0.85
Phenol.....	-0.17	-0.17	-0.17	-0.17	-0.17	-0.17	-0.17	-0.17
2,4,6-Trichlorophenol.....	-0.17	-0.17	-0.17	-0.17	-0.17	-0.17	-0.17	-0.17
Date Sampled.....	05/16/90	05/16/90	05/16/90	05/16/90	05/16/90	05/16/90	05/17/90	05/17/90
Method.....	8270	8270	8270	8270	8270	8270	8270	8270
Laboratory.....	ATI	ATI	ATI	ATI	ATI	ATI	ATI	ATI

ATI = Analytical Technologies, Inc.

(-) = less than; numerical value is the Limit of Detection for that compound

TABLE D-2 (continued)

RESULTS OF ANALYSES FOR EPA PRIORITY ACID ORGANIC COMPOUNDS
IN SEDIMENT SAMPLES COLLECTED FROM SRE POND

	SAMPLE IDENTIFIER.....					
ORGANIC COMPOUND (micrograms per liter)	PS-7 2.0-2.5	PS-7 3.0-3.5	PS-8 0-0.5	PS-8 1.0-1.5	PS-8 2.0-2.5	PS-8 3.0-3.5
2-Chlorophenol.....	-0.17	-0.17	-0.17	-0.17	-0.17	-0.17
2,4-Dichlorophenol.....	-0.17	-0.17	-0.17	-0.17	-0.17	-0.17
2,4-Dimethylphenol.....	-0.17	-0.17	-0.17	-0.17	-0.17	-0.17
4,6-Dinitro-o-cresol.....	-0.85	-0.85	-0.85	-0.85	-0.85	-0.85
2,4-Dinitrophenol.....	-0.85	-0.85	-0.85	-0.85	-0.85	-0.85
2-Nitrophenol.....	-0.17	-0.17	-0.17	-0.17	-0.17	-0.17
4-Nitrophenol.....	-0.85	-0.85	-0.85	-0.85	-0.85	-0.85
p-Chloro-m-cresol.....	-0.17	-0.17	-0.17	-0.17	-0.17	-0.17
Pentachlorophenol.....	-0.85	-0.85	-0.85	-0.85	-0.85	-0.85
Phenol.....	-0.17	-0.17	-0.17	-0.17	-0.17	-0.17
2,4,6-Trichlorophenol.....	-0.17	-0.17	-0.17	-0.17	-0.17	-0.17
Date Sampled.....	05/17/90	05/17/90	05/17/90	05/17/90	05/17/90	05/17/90
Method.....	8270	8270	8270	8270	8270	8270
Laboratory.....	ATI	ATI	ATI	ATI	ATI	ATI

ATI = Analytical Technologies, Inc.

(-) = less than; numerical value is the Limit of Detection for that compound

TABLE D-3

**RESULTS OF ANALYSES FOR EPA PRIORITY ACID ORGANIC COMPOUNDS
IN SEDIMENT SAMPLES COLLECTED FROM PERIMETER POND**

ORGANIC COMPOUND (micrograms per liter)	SAMPLE IDENTIFIER.....							
	PS-9 0-0.5	PS-9 1.0-1.5	PS-9 2.0-2.5	PS-9 3.0-3.5	PS-10 0-0.5	PS-10 1.0-1.5	PS-11 0-0.5	PS-11 1.0-1.5
2-Chlorophenol.....	-0.17	-0.17	-0.17	-0.17	-0.17	-0.17	-0.17	-0.17
2,4-Dichlorophenol.....	-0.17	-0.17	-0.17	-0.17	-0.17	-0.17	-0.17	-0.17
2,4-Dimethylphenol.....	-0.17	-0.17	-0.17	-0.17	-0.17	-0.17	-0.17	-0.17
4,6-Dinitro-o-cresol.....	-0.85	-0.85	-0.85	-0.85	-0.85	-0.85	-0.85	-0.85
2,4-Dinitrophenol.....	-0.85	-0.85	-0.85	-0.85	-0.85	-0.85	-0.85	-0.85
2-Nitrophenol.....	-0.17	-0.17	-0.17	-0.17	-0.17	-0.17	-0.17	-0.17
4-Nitrophenol.....	-0.85	-0.85	-0.85	-0.85	-0.85	-0.85	-0.85	-0.85
p-Chloro-m-cresol.....	-0.17	-0.17	-0.17	-0.17	-0.17	-0.17	-0.17	-0.17
Pentachlorophenol.....	-0.85	-0.85	-0.85	-0.85	-0.85	-0.85	-0.85	-0.85
Phenol.....	-0.17	-0.17	-0.17	-0.17	-0.17	-0.17	-0.17	-0.17
2,4,6-Trichlorophenol.....	-0.17	-0.17	-0.17	-0.17	-0.17	-0.17	-0.17	-0.17
Date Sampled.....	05/17/90	05/17/90	05/17/90	05/17/90	05/18/90	05/18/90	05/18/90	05/18/90
Method.....	8270	8270	8270	8270	8270	8270	8270	8270
Laboratory.....	ATI	ATI	ATI	ATI	ATI	ATI	ATI	ATI

ATI = Analytical Technologies, Inc.

(-) = less than; numerical value is the Limit of Detection for that compound

TABLE D-3 (continued)

RESULTS OF ANALYSES FOR EPA PRIORITY ACID ORGANIC COMPOUNDS
IN SEDIMENT SAMPLES COLLECTED FROM PERIMETER POND

ORGANIC COMPOUND (micrograms per liter)	SAMPLE IDENTIFIER.....				
	PS-11 2.0-2.5	PS-12 0-0.5	PS-12 1.0-1.5	PS-12 2.0-2.5	PS-12 3.0-3.5
2-Chlorophenol.....	-0.17	-0.17	-0.17	-0.17	-0.17
2,4-Dichlorophenol.....	-0.17	-0.17	-0.17	-0.17	-0.17
2,4-Dimethylphenol.....	-0.17	-0.17	-0.17	-0.17	-0.17
4,6-Dinitro-o-cresol.....	-0.85	-0.85	-0.85	-0.85	-0.85
2,4-Dinitrophenol.....	-0.85	-0.85	-0.85	-0.85	-0.85
2-Nitrophenol.....	-0.17	-0.17	-0.17	-0.17	-0.17
4-Nitrophenol.....	-0.85	-0.85	-0.85	-0.85	-0.85
p-Chloro-m-cresol.....	-0.17	-0.17	-0.17	-0.17	-0.17
Pentachlorophenol.....	-0.85	-0.85	-0.85	-0.85	-0.85
Phenol.....	-0.17	-0.17	-0.17	-0.17	-0.17
2,4,6-Trichlorophenol.....	-0.17	-0.17	-0.17	-0.17	-0.17
Date Sampled.....	05/18/90	05/18/90	05/18/90	05/18/90	05/18/90
Method.....	8270	8270	8270	8270	8270
Laboratory.....	ATI	ATI	ATI	ATI	ATI

ATI = Analytical Technologies, Inc.

(-) = less than; numerical value is the Limit of Detection for that compound

GROUNDWATER RESOURCES CONSULTANTS, INC.

APPENDIX E

**RESULTS OF ANALYSES FOR
HYDROCARBONS AND SEMI-QUANTIFIED ORGANIC COMPOUNDS
IN SEDIMENT SAMPLES COLLECTED FROM R2, SRE AND PERIMETER PONDS**

GROUNDWATER RESOURCES CONSULTANTS, INC.

APPENDIX E

RESULTS OF ANALYSES FOR
HYDROCARBONS AND SEMI-QUANTIFIED ORGANIC COMPOUNDS
IN SEDIMENT SAMPLES COLLECTED FROM R2, SRE AND PERIMETER PONDS

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| E-2 | RESULTS OF ANALYSES FOR HYDROCARBONS AND SEMI-QUANTIFIED ORGANIC COMPOUNDS IN SEDIMENT SAMPLES COLLECTED FROM SRE POND |
| E-3 | RESULTS OF ANALYSES FOR HYDROCARBONS AND SEMI-QUANTIFIED ORGANIC COMPOUNDS IN SEDIMENT SAMPLES COLLECTED FROM PERIMETER POND |

GROUNDWATER RESOURCES CONSULTANTS, INC.

TABLE E-1
RESULTS OF ANALYSES FOR HYDROCARBONS AND
SEMI-QUANTIFIED ORGANIC COMPOUNDS
IN SEDIMENT SAMPLES COLLECTED FROM R2 POND

SAMPLE IDENTIFIER	SAMPLED ^{3/} DEPTH INTERVAL (feet)	DATE SAMPLED	ORGANIC COMPOUND	CONCENTRATION OF CONTAMINANTS DETECTED (mg/kg)	ANALYTICAL METHOD
PS-1	0-0.5	05/15/90	Petroleum Hydrocarbons	230	418.1
			Fuel Hydrocarbons	-5.0	8015
			Aliphatic Hydrocarbon C23	1	8270
			Aliphatic Hydrocarbon C25	2	8270
			Aliphatic Hydrocarbon C26	1	8270
			Aliphatic Hydrocarbon C26	1	8270
			Total Extractable Hydrocarbons C11-C28	30	8270
	1.0-1.5	05/15/90	Aliphatic Hydrocarbon C12	3	8270
			Aliphatic Hydrocarbon C13	1	8270
			Aliphatic Hydrocarbon C13	4	8270
			Aliphatic Hydrocarbon C14	4	8270
			Aliphatic Hydrocarbon C17	1	8270
			Total Extractable Hydrocarbons C8-C28	70	8270
PS-2	0-0.5	05/15/90	Aliphatic Hydrocarbon	0.4	8240
			Aliphatic Hydrocarbon	0.4	8240
			Aliphatic Hydrocarbon	0.3	8240
			Aliphatic Hydrocarbon C23	2	8270
			Aliphatic Hydrocarbon C25	4	8270
			Aliphatic Hydrocarbon C26	2	8270
			Aliphatic Hydrocarbon C26	2	8270
			Aliphatic Hydrocarbon C28	1	8270
	1.0-1.5	05/15/90	Total Extractable Hydrocarbons C9-C28	50	8270
			Aliphatic Hydrocarbon	0.9	8240
			Aliphatic Hydrocarbon	0.8	8240
			Aliphatic Hydrocarbon	0.8	8240
			Cyclic Hydrocarbon	0.8	8240
			Polynuclear Aromatic	1.0	8240
			Aliphatic Hydrocarbon C12	2	8270
			Aliphatic Hydrocarbon C13	3	8270
PS-3	0-0.5	05/15/90	Aliphatic Hydrocarbon C14	4	8270
			Aliphatic Hydrocarbon C14	2	8270
			Aliphatic Hydrocarbon C17	3	8270
			Total Extractable Hydrocarbons C10-C28	80	8270
			Aliphatic Hydrocarbon	0.5	8240
			Aliphatic Hydrocarbon	1.0	8240
			Aliphatic Hydrocarbon	0.4	8240
			Cyclic Hydrocarbon	0.5	8240
			Polynuclear Aromatic	0.5	8240
			Aliphatic Hydrocarbon C13	2	8270
			Aliphatic Hydrocarbon C25	3	8270
			Aliphatic Hydrocarbon C26	4	8270
			Aliphatic Hydrocarbon C26	2	8270
			Total Extractable Hydrocarbons C9-C28	70	8270

(-) = Less than; numerical value is the limit of detection for that compound

NOTE: Laboratory analyses performed by Analytical Technologies, Inc.

GROUNDWATER RESOURCES CONSULTANTS, INC.

TABLE E-1 (continued)
RESULTS OF ANALYSES FOR HYDROCARBONS AND
SEMI-QUANTIFIED ORGANIC COMPOUNDS
IN SEDIMENT SAMPLES COLLECTED FROM R2 POND

SAMPLE IDENTIFIER	SAMPLED/ DEPTH INTERVAL (feet)	DATE SAMPLED	ORGANIC COMPOUND	CONCENTRATION OF CONTAMINANTS DETECTED (mg/kg)	ANALYTICAL METHOD
PS-3 (cont'd)	1.0-1.5	05/15/90	Aliphatic Hydrocarbon	0.8	8240
			Aliphatic Hydrocarbon	0.5	8240
			Aliphatic Hydrocarbon	0.7	8240
			Aliphatic Hydrocarbon	0.6	8240
			Polynuclear Aromatic	0.7	8240
			Aliphatic Hydrocarbon C13	3	8270
			Aliphatic Hydrocarbon C25	4	8270
			Aliphatic Hydrocarbon C26	3	8270
			Total Extractable Hydrocarbons C9-C25	70	8270
PS-4	0-0.5	05/15/90	Polynuclear Aromatic	2	8270
			Aliphatic Hydrocarbon C23	7	8270
			Aliphatic Hydrocarbon C25	6	8270
			Aliphatic Hydrocarbon C27	2	8270
			Aliphatic Hydrocarbon C28	2	8270
			Total Extractable Hydrocarbons C10-C28	70	8270
	1.0-1.5	05/15/90	Aliphatic Hydrocarbon	0.5	8240
			Aliphatic Hydrocarbon	1.0	8240
			Aromatic Hydrocarbon	0.7	8240
			Aromatic Hydrocarbon	0.9	8240
			Aliphatic Hydrocarbon	0.5	8240
			Aliphatic Hydrocarbon C24	10	8270
			Aliphatic Hydrocarbon C25	3	8270
			Aliphatic Hydrocarbon C27	9	8270
			Aliphatic Hydrocarbon C28	5	8270
			Total Extractable Hydrocarbons C8-C15	20	8270
			Total Extractable Hydrocarbons C20-C28	100	8270

(-) = Less than; numerical value is the limit of detection for that compound

NOTE: Laboratory analyses performed by Analytical Technologies, Inc.

GROUNDWATER RESOURCES CONSULTANTS, INC.

TABLE E-2
RESULTS OF ANALYSES FOR HYDROCARBONS AND
SEMI-QUANTIFIED ORGANIC COMPOUNDS
IN SEDIMENT SAMPLES COLLECTED FROM SRE POND

SAMPLE IDENTIFIER	SAMPLED ^{1/} DEPTH INTERVAL (feet)	DATE SAMPLED	ORGANIC COMPOUND	CONCENTRATION OF CONTAMINANTS DETECTED (mg/kg)	ANALYTICAL METHOD
PS-5	0-0.5	05/16/90	Aliphatic Hydrocarbon C20	1	8270
			Aliphatic Hydrocarbon C22	1	8270
			Aliphatic Hydrocarbon C24	1	8270
			Aliphatic Hydrocarbon C26	4	8270
			Aliphatic Hydrocarbon C27	1	8270
			Total Extractable Hydrocarbons C15-C28	30	8270
	2.0-2.5	05/16/90	Aliphatic Hydrocarbon C23	0.1	8270
			Aliphatic Hydrocarbon C25	0.8	8270
			Aliphatic Hydrocarbon C26	0.2	8270
			Aliphatic Hydrocarbon C27	0.3	8270
			Aliphatic Hydrocarbon C27	0.2	8270
PS-6	0-0.5	05/16/90	Aliphatic Hydrocarbon C21	1	8270
			Aliphatic Hydrocarbon C23	1	8270
			Aliphatic Hydrocarbon C25	5	8270
			Aliphatic Hydrocarbon C26	0.9	8270
			Aliphatic Hydrocarbon C27	1.3	8270
			Total Extractable Hydrocarbons C18-C28	30	8270
	1.0-1.5	05/16/90	Aliphatic Hydrocarbon	0.3	8240
			Aliphatic Hydrocarbon C24	0.2	8270
	2.0-2.5	05/16/90	Aliphatic Hydrocarbon C26	0.1	8270
PS-7	0-0.5	05/17/90	Aliphatic Hydrocarbon C24	5	8270
			Aliphatic Hydrocarbon C25	10	8270
			Aliphatic Hydrocarbon C26	4	8270
			Aliphatic Hydrocarbon C28	4	8270
			Aliphatic Hydrocarbon C28	3	8270
			Total Extractable Hydrocarbons C16-C28	80	8270
	1.0-1.5	05/17/90	Aliphatic Hydrocarbon C27	0.2	8270
	2.0-2.5	05/17/90	Aliphatic Hydrocarbon C22	0.2	8270
			Aliphatic Hydrocarbon C23	0.6	8270
			Aliphatic Hydrocarbon C25	1	8270
			Aliphatic Hydrocarbon C26	0.4	8270
			Aliphatic Hydrocarbon C27	0.3	8270
	3.0-3.5	05/17/90	Aliphatic Hydrocarbon	0.9	8240
			Aliphatic Hydrocarbon C26	0.2	8270
			Aliphatic Hydrocarbon C27	0.3	8270
PS-8	0-0.5	05/17/90	Petroleum Hydrocarbons	36	418.1
			Fuel Hydrocarbons	-5.0	8015
			Aliphatic Hydrocarbon C23	0.8	8270
			Aliphatic Hydrocarbon C24	0.8	8270
			Aliphatic Hydrocarbon C25	3	8270
			Aliphatic Hydrocarbon C26	1	8270
			Aliphatic Hydrocarbon C27	0.6	8270

(-) = Less than; numerical value is the limit of detection for that compound

NOTE: Laboratory analyses performed by Analytical Technologies, Inc.

GROUNDWATER RESOURCES CONSULTANTS, INC.

TABLE E-2 (continued)
RESULTS OF ANALYSES FOR HYDROCARBONS AND
SEMI-QUANTIFIED ORGANIC COMPOUNDS
IN SEDIMENT SAMPLES COLLECTED FROM SRE POND

<u>SAMPLE IDENTIFIER</u>	<u>SAMPLED/ DEPTH INTERVAL (feet)</u>	<u>DATE SAMPLED</u>	<u>ORGANIC COMPOUND</u>	<u>CONCENTRATION OF CONTAMINANTS DETECTED (mg/kg)</u>	<u>ANALYTICAL METHOD</u>
PS-8 (cont'd)	1.0-1.5	05/17/90	Aliphatic Hydrocarbon	0.9	8240
			Aliphatic Hydrocarbon C23	0.2	8270
			Aliphatic Hydrocarbon C25	1	8270
			Aliphatic Hydrocarbon C26	0.8	8270
			Aliphatic Hydrocarbon C27	0.5	8270
	2.0-2.5	05/17/90	Aliphatic Hydrocarbon C24	0.4	8270
			Aliphatic Hydrocarbon C25	0.3	8270
			Aliphatic Hydrocarbon C26	0.2	8270
	3.0-3.5	05/17/90	Aliphatic Hydrocarbon C23	0.2	8270
			Aliphatic Hydrocarbon C25	0.5	8270
			Aliphatic Hydrocarbon C26	0.3	8270
			Aliphatic Hydrocarbon C27	0.1	8270

(-) = Less than; numerical value is the limit of detection for that compound

NOTE: Laboratory analyses performed by Analytical Technologies, Inc.

GROUNDWATER RESOURCES CONSULTANTS, INC.

TABLE E-3
RESULTS OF ANALYSES FOR HYDROCARBONS AND
SEMI-QUANTIFIED ORGANIC COMPOUNDS
IN SEDIMENT SAMPLES COLLECTED FROM PERIMETER POND

SAMPLE IDENTIFIER	SAMPLED ^{1/} DEPTH INTERVAL (feet)	DATE SAMPLED	ORGANIC COMPOUND	CONCENTRATION OF CONTAMINANTS DETECTED (mg/kg)	ANALYTICAL METHOD
PS-9	0-0.5	05/17/90	Petroleum Hydrocarbons	45	418.1
			Fuel Hydrocarbons C18-C23	44	8015
			Aliphatic Hydrocarbon C24	0.8	8270
			Aliphatic Hydrocarbon C25	1	8270
			Aliphatic Hydrocarbon C26	0.2	8270
			Aliphatic Hydrocarbon C26	0.5	8270
			Aliphatic Hydrocarbon C26	0.2	8270
	1.0-1.5	05/17/90	Aliphatic Hydrocarbon C23	0.3	8270
			Aliphatic Hydrocarbon C25	0.4	8270
			Aliphatic Hydrocarbon C26	0.3	8270
	2.0-2.5	05/17/90	Aliphatic Hydrocarbon C23	0.4	8270
			Aliphatic Hydrocarbon C25	0.7	8270
			Aliphatic Hydrocarbon C26	0.4	8270
	3.0-3.5	05/17/90	Aliphatic Hydrocarbon C27	0.2	8270
			Aliphatic Hydrocarbon C25	0.5	8270
			Aliphatic Hydrocarbon C26	0.3	8270
PS-10	0-0.5	05/18/90	Aliphatic Hydrocarbon C26	0.2	8270
	1.0-1.5	05/18/90	Aliphatic Hydrocarbon C22	1	8270
			Aliphatic Hydrocarbon C22	0.7	8270
PS-11	0-0.5	05/18/90	Aliphatic Hydrocarbon C13	0.5	8270
			Aliphatic Hydrocarbon C23	0.4	8270
			Aliphatic Hydrocarbon C25	0.6	8270
			Aliphatic Hydrocarbon C26	0.4	8270
	1.0-1.5	05/18/90	Aliphatic Hydrocarbon C22	0.2	8270
			Aliphatic Hydrocarbon C23	0.2	8270
			Aliphatic Hydrocarbon C25	0.4	8270
			Aliphatic Hydrocarbon C26	0.4	8270
	2.0-2.5	05/18/90	Aromatic Hydrocarbon	10	8270
			Aromatic Hydrocarbon	20	8270
			Aromatic Hydrocarbon	10	8270
			Aromatic Hydrocarbon	3	8270
			Aromatic Hydrocarbon	6	8270
			Total Extractable Hydrocarbons C18-C28	90	8270
PS-12	0-0.5	05/18/90	Aliphatic Hydrocarbon C23	0.3	8270
			Aliphatic Hydrocarbon C26	0.2	8270
	1.0-1.5	05/18/90	Aliphatic Hydrocarbon C12	0.4	8270
			Aliphatic Hydrocarbon C13	0.4	8270
			Aliphatic Hydrocarbon C22	1	8270
			Aliphatic Hydrocarbon C23	0.3	8270
	2.0-2.5	05/18/90	Aliphatic Hydrocarbon C13	0.5	8270

(-) = Less than; numerical value is the limit of detection for that compound

NOTE: Laboratory analyses performed by Analytical Technologies, Inc.

GROUNDWATER RESOURCES CONSULTANTS, INC.

APPENDIX F

**RESULTS OF ANALYSES FOR METALS
IN SOIL SAMPLES COLLECTED FROM R2, SRE AND PERIMETER PONDS**

GROUNDWATER RESOURCES CONSULTANTS, INC.

APPENDIX F

RESULTS OF ANALYSES FOR METALS
IN SOIL SAMPLES COLLECTED FROM R2, SRE AND PERIMETER PONDS

TABLES

TABLE

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| F-1 | RESULTS OF ANALYSES FOR METALS IN SOIL SAMPLES COLLECTED FROM R2 POND |
| F-2 | RESULTS OF ANALYSES FOR METALS IN SOIL SAMPLES COLLECTED FROM SRE POND |
| F-3 | RESULTS OF ANALYSES FOR METALS IN SOIL SAMPLES COLLECTED FROM PERIMETER POND |

TABLE F-1

**RESULTS OF ANALYSES FOR METALS
IN SOIL SAMPLES COLLECTED FROM R2 POND**

SAMPLE IDENTIFIER: SAMPLE DEPTH:	PS-1 0 - 0.5		PS-1 1.0 - 1.5		PS-2 0 - 0.5		PS-2 1.0 - 1.5	
CONSTITUENT	mg/kg	mg/l	mg/kg	mg/l	mg/kg	mg/l	mg/kg	mg/l
Antimony.....	-3.0	---	-3.0	---	-3.0	---	-3.0	---
Arsenic.....	2.0	---	3.1	---	2.6	---	2.4	---
Barium.....	54.3	---	69.9	---	77.2	---	67.8	---
Beryllium.....	-0.5	---	0.5	---	-0.5	---	-0.5	---
Cadmium.....	-0.5	---	-0.5	---	0.6	---	0.5	---
Chromium (total).....	13.7	---	17.8	---	16.7	---	18.0	---
Cobalt.....	4.2	---	6.1	---	4.9	---	6.2	---
Copper.....	56.4	3.7	110	3.3	59.5	-0.2	88.5	2.1
Lead.....	13.3	0.6	9.6	0.5	17.4	0.6	19.1	0.9
Mercury.....	-0.25	---	-0.25	---	-0.25	---	-0.25	---
Molybdenum.....	-1.0	---	-1.0	---	-1.0	---	-1.0	---
Nickel.....	11.9	---	11.9	---	13.8	---	17.0	---
Selenium.....	-1.0	---	-1.0	---	-1.0	---	-1.0	---
Silver.....	3.7	---	1.1	---	3.0	---	4.7	---
Thallium.....	-1.0	---	-1.0	---	-1.0	---	-1.0	---
Vanadium.....	17.0	---	29.6	---	20.5	---	22.2	---
Zinc.....	203	---	117	---	250	18.5	226	---
Extraction Method.....	3050	WET	3050	WET	3050	WET	3050	WET
Date Sampled.....	05/15/90	05/15/90	05/15/90	05/15/90	05/15/90	05/15/90	05/15/90	05/15/90

ATI = Analyses performed by Analytical Technologies, Inc.

(-) = Less than; numerical value is the Limit of Detection for that compound

(---) = Analysis not performed

3050 = EPA sample preparation method from SW-846 1986

WET = From California Code of Regulations, Title 22, Article II, Sec. 66700.

TABLE F-1 (continued)

RESULTS OF ANALYSES FOR METALS
IN SOIL SAMPLES COLLECTED FROM R2 POND

SAMPLE IDENTIFIER: SAMPLE DEPTH:	PS-3 0 - 0.5		PS-3 1.0 - 1.5		PS-4 0 - 0.5		PS-4 1.0 - 1.5	
CONSTITUENT	mg/kg	mg/l	mg/kg	mg/l	mg/kg	mg/l	mg/kg	mg/l
Antimony.....	-3.0	---	-3.0	---	-3.0	---	-3.0	---
Arsenic.....	2.1	---	3.2	---	2.3	---	2.4	---
Barium.....	69.0	---	68.3	---	52.5	---	40.8	---
Beryllium.....	-0.5	---	-0.5	---	-0.5	---	-0.5	---
Cadmium.....	0.5	---	0.6	---	-0.5	---	-0.5	---
Chromium (total).....	15.8	---	17.9	---	11.4	---	10.9	---
Cobalt.....	4.7	---	7.5	---	4.4	---	4.3	---
Copper.....	56.7	-0.2	73.0	0.5	81.4	1.7	38.0	1.4
Lead.....	16.2	0.9	19.1	1.1	14.0	0.9	12.1	0.6
Mercury.....	-0.25	---	-0.25	---	-0.25	---	-0.25	---
Molybdenum.....	-1.0	---	1.1	---	1.3	---	2.1	---
Nickel.....	13.3	---	17.7	---	10.7	---	9.2	---
Selenium.....	-1.0	---	-1.0	---	-1.0	---	-1.0	---
Silver.....	3.6	---	3.3	---	-1.0	---	-1.0	---
Thallium.....	-1.0	---	-1.0	---	-1.0	---	-1.0	---
Vanadium.....	17.7	---	21.9	0.6	14.4	---	14.3	---
Zinc.....	246	---	199	---	208	---	100	---
Extraction Method.....	3050	WET	3050	WET	3050	WET	3050	WET
Date Sampled.....	05/15/90	05/15/90	05/15/90	05/15/90	05/15/90	05/15/90	05/15/90	05/15/90

ATI = Analyses performed by Analytical Technologies, Inc.

(-) = Less than; numerical value is the Limit of Detection for that compound

(---) = Analysis not performed

3050 = EPA sample preparation method from SW-846m 1986

WET = From California Code of Regulations, Title 22, Article II, Sec. 66700.

TABLE F-2

RESULTS OF ANALYSES FOR METALS
IN SOIL SAMPLES COLLECTED FROM SRE POND

SAMPLE IDENTIFIER: SAMPLE DEPTH:	PS-5 0 - 0.5		PS-5 1.0 - 1.5		PS-5 2.0 - 2.5		PS-6 0 - 0.5	
CONSTITUENT	mg/kg	mg/l	mg/kg	mg/l	mg/kg	mg/l	mg/kg	mg/l
Antimony.....	-3.0	---	-3.0	---	-3.0	---	-3.0	---
Arsenic.....	2.2	---	1.8	---	3.7	---	3.6	---
Barium.....	56.5	---	51.6	---	59.3	---	107	---
Beryllium.....	-0.5	---	-0.5	---	-0.5	---	0.9	-0.05
Cadmium.....	-0.5	---	-0.5	---	-0.5	---	-0.5	---
Chromium (total).....	15.8	---	12.2	---	12.4	---	24.7	---
Cobalt.....	3.8	---	4.1	---	4.4	---	7.0	---
Copper.....	53.3	3.4	24.4	---	11.8	---	51.8	3.5
Lead.....	21.2	1.6	5.2	0.7	6.0	-0.3	36.9	1.8
Mercury.....	0.78	-0.005	-0.25	---	-0.25	---	1.3	-0.005
Molybdenum.....	-1.0	---	-1.0	---	-1.0	---	-1.0	---
Nickel.....	7.6	---	6.6	---	7.1	---	13.8	---
Selenium.....	-1.0	---	-1.0	---	-1.0	---	-1.0	---
Silver.....	-1.0	---	-1.0	---	-1.0	---	-1.0	---
Thallium.....	-1.0	---	-1.0	---	-1.0	---	-1.0	---
Vanadium.....	23.1	---	23.7	---	24.1	0.5	39.8	0.9
Zinc.....	165	---	49.1	---	42.2	---	326	---
Extraction Method.....	3050	WET	3050	WET	3050	WET	3050	WET
Date Sampled.....	05/16/90	05/16/90	05/16/90	05/16/90	05/16/90	05/16/90	05/16/90	05/16/90

ATI = Analyses performed by Analytical Technologies, Inc.

(-) = Less than; numerical value is the Limit of Detection for that compound

(---) = Analysis not performed

3050 = EPA sample preparation method from SW-846m 1986

WET = From California Code of Regulations, Title 22, Article II, Sec. 66700.

TABLE F-2 (continued)

**RESULTS OF ANALYSES FOR METALS
IN SOIL SAMPLES COLLECTED FROM SRE POND**

SAMPLE IDENTIFIER: SAMPLE DEPTH:	PS-6 1.0 - 1.5		PS-6 2.0 - 2.5		PS-7 0 - 0.5		PS-7 1.0 - 1.5	
CONSTITUENT	mg/kg	mg/l	mg/kg	mg/l	mg/kg	mg/l	mg/kg	mg/l
Antimony.....	-3.0	---	-3.0	---	-3.0	---	-3.0	---
Arsenic.....	2.1	---	1.7	---	3.0	---	1.7	---
Barium.....	66.5	---	56.3	---	71.2	---	45.6	---
Beryllium.....	-0.5	---	-0.5	---	-0.5	---	-0.5	---
Cadmium.....	-0.5	---	-0.5	---	4.6	0.2	-0.5	---
Chromium (total).....	15.1	---	13.4	---	25.0	---	9.0	---
Cobalt.....	4.4	---	4.3	---	5.5	---	4.2	---
Copper.....	9.4	---	15.3	---	46.0	1.0	8.7	---
Lead.....	6.0	0.5	7.7	0.5	89.6	1.9	7.2	0.7
Mercury.....	-0.25	---	-0.25	---	1.3	-0.005	-0.25	---
Molybdenum.....	-1.0	---	-1.0	---	-1.0	---	-1.0	---
Nickel.....	7.3	---	6.8	---	17.3	---	5.9	---
Selenium.....	-1.0	---	-1.0	---	-1.0	---	-1.0	---
Silver.....	-1.0	---	-1.0	---	-1.0	---	-1.0	---
Thallium.....	-1.0	---	-1.0	---	-1.0	---	-1.0	---
Vanadium.....	24.7	0.3	22.2	---	19.3	---	18.0	---
Zinc.....	44.7	---	56.1	---	1460	67.0	66.0	---
Extraction Method.....	3050	WET	3050	WET	3050	WET	3050	WET
Date Sampled.....	05/16/90	05/16/90	05/16/90	05/17/90	05/17/90	05/17/90	05/17/90	05/17/90

ATI = Analyses performed by Analytical Technologies, Inc.

(-) = Less than; numerical value is the Limit of Detection for that compound

(-) = Analysis not performed

3050 = EPA sample preparation method from SW-846m 1986

WET = From California Code of Regulations, Title 22, Article II, Sec. 66700.

TABLE F-2 (continued)

RESULTS OF ANALYSES FOR METALS
IN SOIL SAMPLES COLLECTED FROM SRE POND

SAMPLE IDENTIFIER: SAMPLE DEPTH:	PS-7 2.0 - 2.5		PS-7 3.0 - 3.5		PS-8 0 - 0.5		PS-8 1.0 - 1.5	
CONSTITUENT	mg/kg	mg/l	mg/kg	mg/l	mg/kg	mg/l	mg/kg	mg/l
Antimony.....	-3.0	---	-3.0	---	-3.0	---	-3.0	---
Arsenic.....	1.7	---	1.2	---	2.4	---	1.8	---
Barium.....	59.8	---	35.2	---	51.6	---	40.2	---
Beryllium.....	-0.5	---	-0.5	---	-0.5	---	-0.5	---
Cadmium.....	-0.5	---	-0.5	---	-0.5	---	-0.5	---
Chromium (total).....	13.7	---	9.0	---	11.0	---	8.2	---
Cobalt.....	4.7	---	4.1	---	5.9	---	4.0	---
Copper.....	15.5	---	10.5	---	11.0	---	13.1	---
Lead.....	10.1	0.6	6.8	0.5	6.3	-0.3	5.2	0.3
Mercury.....	0.30	---	-0.25	---	0.36	-0.005	-0.25	---
Molybdenum.....	-1.0	---	-1.0	---	-1.0	---	-1.0	---
Nickel.....	8.5	---	6.0	---	6.2	---	4.9	---
Selenium.....	-1.0	---	-1.0	---	-1.0	---	-1.0	---
Silver.....	-1.0	---	-1.0	---	-1.0	---	-1.0	---
Thallium.....	-1.0	---	-1.0	---	-1.0	---	-1.0	---
Vanadium.....	23.9	---	15.9	---	21.5	---	17.6	---
Zinc.....	90.8	---	111	---	46.8	---	37.2	---
Extraction Method.....	3050	WET	3050	WET	3050	WET	3050	WET
Date Sampled.....	05/17/90	05/17/90	05/17/90	05/17/90	05/17/90	05/17/90	05/17/90	05/17/90

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(---) = Analysis not performed

3050 = EPA sample preparation method from SW-846m 1986

WET = From California Code of Regulations, Title 22, Article II, Sec. 66700.

TABLE F-2 (continued)

**RESULTS OF ANALYSES FOR METALS
IN SOIL SAMPLES COLLECTED FROM SRE POND**

SAMPLE IDENTIFIER: SAMPLE DEPTH:	PS-8 2.0 - 2.5		PS-8 3.0 - 3.5					
	mg/kg	mg/l	mg/kg	mg/l	mg/kg	mg/l	mg/kg	mg/l
Antimony.....	-3.0	---	-3.0	---				
Arsenic.....	1.3	---	1.7	---				
Barium.....	31.4	---	50.3	---				
Beryllium.....	-0.5	---	-0.5	---				
Cadmium.....	-0.5	---	-0.5	---				
Chromium (total).....	8.3	---	11.7	---				
Cobalt.....	3.2	---	4.2	---				
Copper.....	9.9	---	13.5	---				
Lead.....	4.4	---	6.0	-0.3				
Mercury.....	-0.25	---	-0.25	---				
Molybdenum.....	-1.0	---	-1.0	---				
Nickel.....	5.2	---	6.8	---				
Selenium.....	-1.0	---	-1.0	---				
Silver.....	-1.0	---	-1.0	---				
Thallium.....	-1.0	---	-1.0	---				
Vanadium.....	13.9	---	21.1	---				
Zinc.....	32.3	---	47.9	---				
Extraction Method.....	3050	WET	3050	WET				
Date Sampled.....	05/17/90	05/17/90	05/17/90	05/17/90				

ATI = Analyses performed by Analytical Technologies, Inc.

(-) = Less than; numerical value is the Limit of Detection for that compound

(---) = Analysis not performed

3050 = EPA sample preparation method from SW-846m 1986

WET = From California Code of Regulations, Title 22, Article II, Sec. 66700.

TABLE F-3

**RESULTS OF ANALYSES FOR METALS
IN SOIL SAMPLES COLLECTED FROM PERIMETER POND**

SAMPLE IDENTIFIER: SAMPLE DEPTH:	PS-9 0 - 0.5		PS-9 1.0 - 1.5		PS-9 2.0 - 2.5		PS-9 3.0 - 3.5	
CONSTITUENT	mg/kg	mg/l	mg/kg	mg/l	mg/kg	mg/l	mg/kg	mg/l
Antimony.....	-3.0	---	-3.0	---	-3.0	---	-3.0	---
Arsenic.....	3.2	---	1.9	---	4.0	---	3.3	---
Barium.....	26.4	---	28.9	---	33.3	---	46.8	---
Beryllium.....	-0.5	---	-0.5	---	-0.5	---	-0.5	---
Cadmium.....	-0.5	---	-0.5	---	-0.5	---	-0.5	---
Chromium (total).....	8.3	---	8.7	---	9.3	---	12.8	---
Cobalt.....	3.6	---	3.4	---	3.4	---	4.5	---
Copper.....	10.5	---	9.5	---	13.0	---	14.8	---
Lead.....	5.9	-0.3	7.5	-0.3	7.2	-0.3	7.3	0.3
Mercury.....	-0.25	---	-0.25	---	-0.25	---	-0.25	---
Molybdenum.....	-1.0	---	-1.0	---	-1.0	---	-1.0	---
Nickel.....	5.8	---	6.0	---	6.6	---	9.0	---
Selenium.....	-1.0	---	-1.0	---	-1.0	---	-1.0	---
Silver.....	-1.0	---	-1.0	---	-1.0	---	-1.0	---
Thallium.....	-1.0	---	-1.0	---	-1.0	---	-1.0	---
Vanadium.....	11.1	---	13.6	---	13.9	---	19.3	---
Zinc.....	44.5	---	40.4	---	40.0	---	45.6	---
Extraction Method.....	3050	WET	3050	WET	3050	WET	3050	WET
Date Sampled.....	05/17/90	05/17/90	05/17/90	05/17/90	05/17/90	05/17/90	05/17/90	05/17/90

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(---) = Analysis not performed

3050 = EPA sample preparation method from SW-846m 1986

WET = From California Code of Regulations, Title 22, Article II, Sec. 66700.

TABLE F-3 (continued)

RESULTS OF ANALYSES FOR METALS
IN SOIL SAMPLES COLLECTED FROM PERIMETER POND

SAMPLE IDENTIFIER:	PS-10		PS-10		PS-11		PS-11	
SAMPLE DEPTH:	0 - 0.5		1.0 - 1.5		0 - 0.5		1.0 - 1.5	
CONSTITUENT	mg/kg	mg/l	mg/kg	mg/l	mg/kg	mg/l	mg/kg	mg/l
Antimony.....	-3.0	---	-3.0	---	-3.0	---	-3.0	---
Arsenic.....	11.2	0.6	7.0	0.4	16.5	1.5	15.4	1.3
Barium.....	44.2	---	37.2	---	70.1	---	53.9	---
Beryllium.....	-0.5	---	-0.5	---	-0.5	---	-0.5	---
Cadmium.....	-0.5	---	-0.5	---	-0.5	---	-0.5	---
Chromium (total).....	12.6	---	11.4	---	16.9	---	15.8	---
Cobalt.....	4.7	---	3.6	---	6.2	---	5.9	---
Copper.....	15.1	---	6.4	---	36.8	2.9	20.8	---
Lead.....	8.4	0.4	3.9	---	12.8	0.8	10.5	0.5
Mercury.....	-0.25	---	-0.25	---	-0.25	---	-0.25.3	---
Molybdenum.....	-1.0	---	-1.0	---	-1.0	---	-1.0	---
Nickel.....	9.4	---	7.4	---	14.5	---	13.1	---
Selenium.....	-1.0	---	-1.0	---	-1.0	---	-1.0	---
Silver.....	-1.0	---	-1.0	---	-1.0	---	-1.0	---
Thallium.....	-1.0	---	-1.0	---	-1.0	---	-1.0	---
Vanadium.....	20.5	---	17.7	---	25.2	0.8	23.6	---
Zinc.....	53.5	---	43.0	---	92.1	---	86.9	---
Extraction Method.....	3050	WET	3050	WET	3050	WET	3050	WET
Date Sampled.....	05/18/90	05/18/90	05/18/90	05/18/90	05/18/90	05/18/90	05/18/90	05/18/90

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(---) = Analysis not performed

3050 = EPA sample preparation method from SW-846m 1986

WET = From California Code of Regulations, Title 22, Article II, Sec. 66700.

TABLE F-3 (continued)

**RESULTS OF ANALYSES FOR METALS
IN SOIL SAMPLES COLLECTED FROM PERIMETER POND**

SAMPLE IDENTIFIER: SAMPLE DEPTH:	PS-11 2.0 - 2.5		PS-12 0 - 0.5		PS-12 1.0 - 1.5		PS-12 2.0 - 2.5	
CONSTITUENT	mg/kg	mg/l	mg/kg	mg/l	mg/kg	mg/l	mg/kg	mg/l
Antimony.....	-3.0	---	-3.0	---	-3.0	---	-3.0	---
Arsenic.....	13.9	1.2	14.5	1.2	19.9	0.5	16.8	0.6
Barium.....	54.4	---	55.7	---	56.3	---	60.4	---
Beryllium.....	-0.5	---	0.5	---	0.6	---	0.6	---
Cadmium.....	-0.5	---	-0.5	---	-0.5	---	-0.5	---
Chromium (total).....	15.7	---	14.9	---	19.2	---	20.1	---
Cobalt.....	5.6	---	5.3	---	6.6	---	7.7	---
Copper.....	10.5	---	28.8	1.3	18.9	---	17.1	---
Lead.....	6.2	0.4	12.7	0.7	9.6	-0.3	11.0	-0.3
Mercury.....	-0.25	---	-0.25	---	-0.25	---	-0.25	---
Molybdenum.....	-1.0	---	-1.0	---	-1.0	---	-1.0	---
Nickel.....	11.1	---	11.8	---	16.4	---	17.2	---
Selenium.....	-1.0	---	-1.0	---	-1.0	---	-1.0	---
Silver.....	-1.0	---	-1.0	---	-1.0	---	-1.0	---
Thallium.....	-1.0	---	-1.0	---	-1.0	---	-1.0	---
Vanadium.....	22.5	---	22.4	---	27.7	0.6	29.1	0.5
Zinc.....	45.7	---	96.5	---	65.5	---	68.7	---
Extraction Method.....	3050	WET	3050	WET	3050	WET	3050	WET
Date Sampled.....	05/18/90	05/18/90	05/18/90	05/18/90	05/18/90	05/18/90	05/18/90	05/18/90

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(---) = Analysis not performed

3050 = EPA sample preparation method from SW-846m 1986

WET = From California Code of Regulations, Title 22, Article II, Sec. 66700.

TABLE F-3 (continued)

RESULTS OF ANALYSES FOR METALS
IN SOIL SAMPLES COLLECTED FROM PERIMETER POND

SAMPLE IDENTIFIER:		PS-12						
SAMPLE DEPTH:		3.0 - 3.5						
CONSTITUENT	mg/kg	mg/l	mg/kg	mg/l	mg/kg	mg/l	mg/kg	mg/l
Antimony.....	-3.0	---						
Arsenic.....	14.8	0.7						
Barium.....	44.2	---						
Beryllium.....	-0.5	---						
Cadmium.....	-0.5	---						
Chromium (total).....	14.4	---						
Cobalt.....	5.4	---						
Copper.....	18.4	---						
Lead.....	7.3	-0.3						
Mercury.....	-0.25	---						
Molybdenum.....	-1.0	---						
Nickel.....	11.1	---						
Selenium.....	-1.0	---						
Silver.....	-1.0	---						
Thallium.....	-1.0	---						
Vanadium.....	22.8	---						
Zinc.....	56.8	---						
Extraction Method.....	3050	WET						
Date Sampled.....	05/18/90	05/18/90						

ATI = Analyses performed by Analytical Technologies, Inc.

(-) = Less than; numerical value is the Limit of Detection for that compound

(---) = Analysis not performed

3050 = EPA sample preparation method from SW-846m 1986

WET = From California Code of Regulations, Title 22, Article II, Sec. 66700.

GROUNDWATER RESOURCES CONSULTANTS, INC.

APPENDIX G

R2, SRE AND PERIMETER PONDS SEDIMENT RADIATION DATA

GROUNDWATER RESOURCES CONSULTANTS, INC.

APPENDIX G

R2, SRE AND PERIMETER PONDS SEDIMENT RADIATION DATA

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| G-1 | R2 POND SEDIMENT RADIATION DATA |
| G-2 | SRE POND SEDIMENT RADIATION DATA |
| G-3 | PERIMETER POND SEDIMENT RADIATION DATA |

TABLE G-1

R2 POND SEDIMENT RADIATION DATA

SAMPLE IDENTIFIER	DATE SAMPLED	GROSS ALPHA RADIOACTIVITY (pCi/g)	GROSS BETA RADIOACTIVITY (pCi/g)	* * * * *					* * * * *					* * * * *				
				CS-137					Pb 212					Pb 214				
PS-1 0 - 0.5	05/15/90	15.2 ± 4.16	28.5 ± 4.75	0.115 ± 0.0465	0.857 ± 0.119	0.582 ± 0.114	15.7 ± 2.10											
PS-1 1 - 1.5	05/15/90	1.59 ± 1.80	29.6 ± 4.83	0.0255 ± 0.0432	0.682 ± 0.108	0.463 ± 0.122	18.0 ± 2.45											
PS-2 0 - 0.5	05/15/90	13.0 ± 3.84	30.1 ± 4.8	0.370 ± 0.100	1.7 ± 0.243	1.02 ± 0.237	19.9 ± 3.12											
PS-2 1 - 1.5	05/15/90	8.83 ± 3.42	32.3 ± 5.16	0.397 ± 0.107	1.3 ± 0.216	1.04 ± 0.247	19.7 ± 3.41											
PS-3 0 - 0.5	05/15/90	9.16 ± 3.41	33.0 ± 5.25	0.277 ± 0.0771	1.55 ± 0.199	1.31 ± 0.217	15.6 ± 2.26											
PS-3 1 - 1.5	05/15/90	4.44 ± 2.64	27.1 ± 4.51	0.292 ± 0.0866	1.94 ± 0.240	1.40 ± 0.231	18.6 ± 2.56											
PS-4 0 - 0.5	05/15/90	11.6 ± 3.62	31.5 ± 5.04	0.122 ± 0.0619	1.24 ± 0.162	0.908 ± 0.169	21.6 ± 2.73											
PS-4 1 - 1.5	05/15/90	9.04 ± 3.21	25.9 ± 4.44	0.0594 ± 0.0548	0.736 ± 0.112	0.597 ± 0.132	22.6 ± 2.83											

TABLE G-2

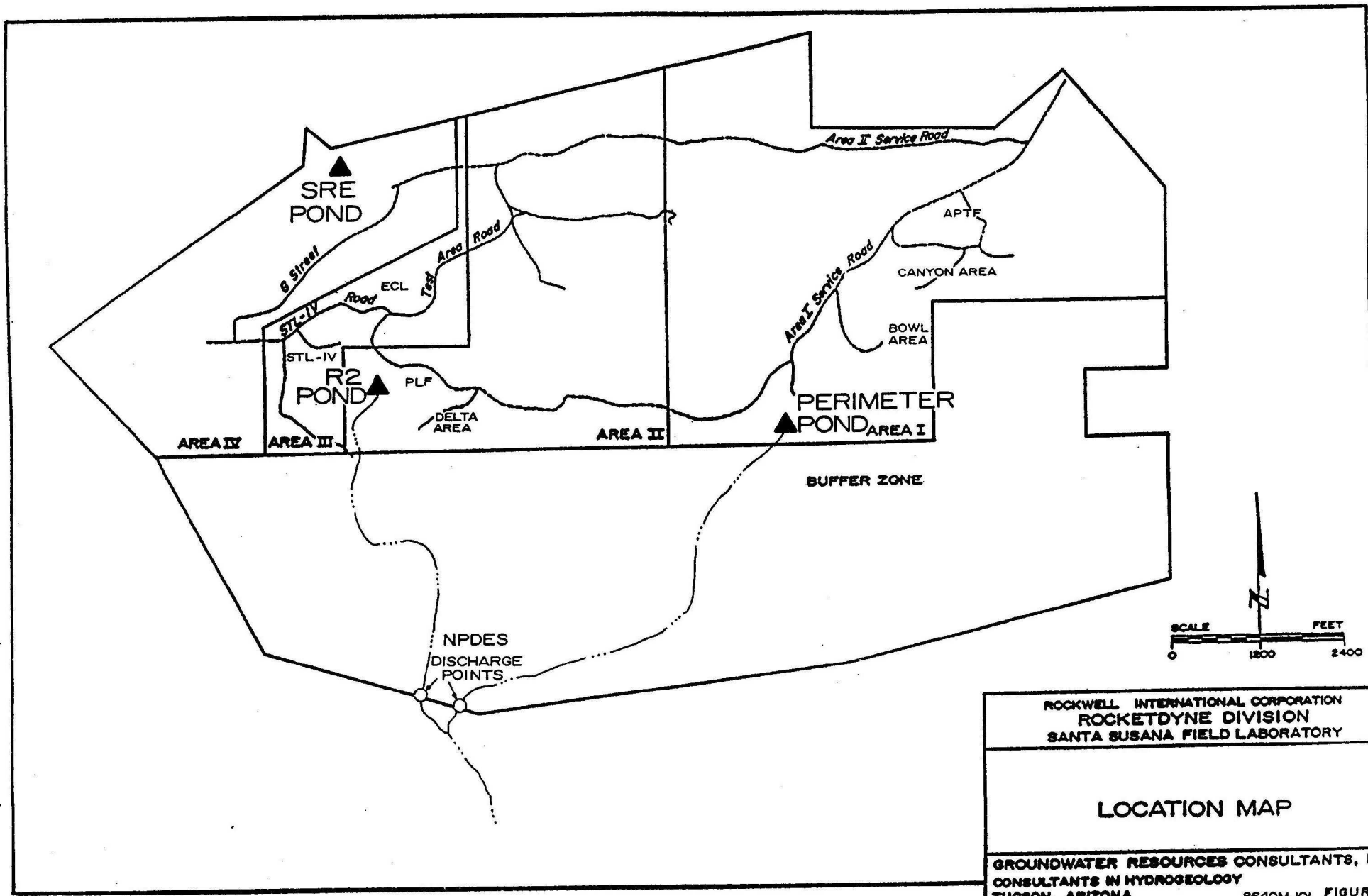
SRE POND SEDIMENT RADIATION DATA

SAMPLE IDENTIFIER	DATE SAMPLED	GROSS ALPHA RADIOACTIVITY (pCi/g)	GROSS BETA RADIOACTIVITY (pCi/g)	CS-137	GAMMA RADIATION	Pb 212 (pCi/g)	Pb 214	K 40
PS-5 0 - 0.5	05/16/90	4.62 ± 2.76	27.5 ± 4.56	0.623 ± 0.105	0.781 ± 0.113	0.659 ± 0.136	17.9 ± 2.39	17.9 ± 2.39
PS-5 1 - 1.5	05/16/90	6.03 ± 2.63	27.0 ± 4.59	0.0404 ± 0.0507	1.30 ± 0.172	0.976 ± 0.179	22.9 ± 2.93	22.9 ± 2.93
PS-5 2 - 2.5	05/16/90	7.50 ± 2.86	35.4 ± 5.56	1.90 ± 0.239	1.13 ± 0.158	0.730 ± 0.166	22.0 ± 2.92	22.0 ± 2.92
PS-6 0 - 0.5	05/16/90	4.56 ± 2.63	31.5 ± 5.06	1.20 ± 0.176	1.15 ± 0.172	0.825 ± 0.175	27.3 ± 3.50	27.3 ± 3.50
PS-6 1 - 1.5	05/16/90	13.1 ± 3.86	34.7 ± 5.37	0.234 ± 0.0660	1.16 ± 0.164	0.836 ± 0.173	19.6 ± 2.66	19.6 ± 2.66
PS-6 2 - 2.5	05/16/90	8.31 ± 3.02	35.6 ± 5.57	0.110 ± 0.0739	1.58 ± 0.225	1.13 ± 0.219	28.9 ± 3.87	28.9 ± 3.87
PS-7 0 - 0.5	05/17/90	7.09 ± 2.79	32.8 ± 5.31	0.634 ± 0.126	1.03 ± 0.180	0.878 ± 0.206	22.7 ± 3.26	22.7 ± 3.26
PS-7 1 - 1.5	05/17/90	7.29 ± 3.12	32.9 ± 5.21	0.0382 ± 0.0469	1.21 ± 0.160	0.870 ± 0.150	19.8 ± 2.52	19.8 ± 2.52
PS-7 2 - 2.5	05/17/90	5.07 ± 2.54	35.2 ± 5.38	0.159 ± 0.0564	1.00 ± 0.167	0.892 ± 0.172	28.4 ± 3.54	28.4 ± 3.54
PS-7 3 - 3.5	05/17/90	7.67 ± 2.90	33.0 ± 5.29	0.339 ± 0.0755	0.819 ± 0.123	0.530 ± 0.119	18.9 ± 2.52	18.9 ± 2.52
PS-8 0 - 0.5	05/17/90	7.14 ± 2.83	33.0 ± 5.23	0.0506 ± 0.0611	1.33 ± 0.0206	1.27 ± 0.217	29.9 ± 3.81	29.9 ± 3.81
PS-8 1 - 1.5	05/17/90	6.48 ± 2.82	31.00 ± 4.91	0.0330 ± 0.0434	1.05 ± 0.149	0.668 ± 0.151	25.5 ± 3.15	25.5 ± 3.15
PS-8 2 - 2.5	05/17/90	8.26 ± 3.07	32.50 ± 5.20	0.0891 ± 0.0492	0.919 ± 0.138	0.736 ± 0.150	25.7 ± 3.17	25.7 ± 3.17
PS-8 3 - 3.5	05/17/90	10.30 ± 3.30	30.3 ± 4.91	0.0716 ± 0.0559	1.11 ± 0.168	0.824 ± 0.175	19.0 ± 2.72	19.0 ± 2.72

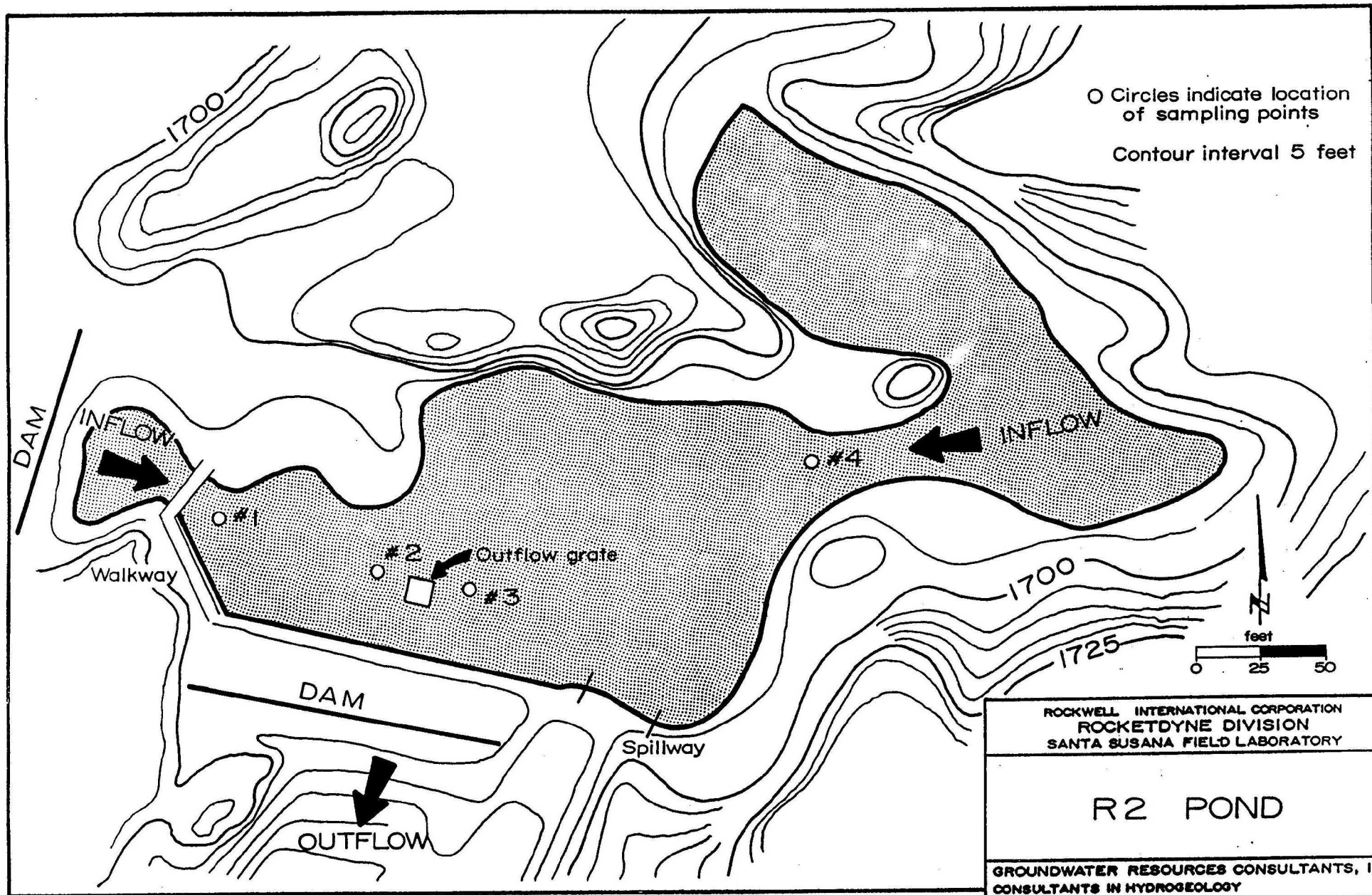
TABLE G-3

PERIMETER POND SEDIMENT RADIATION DATA

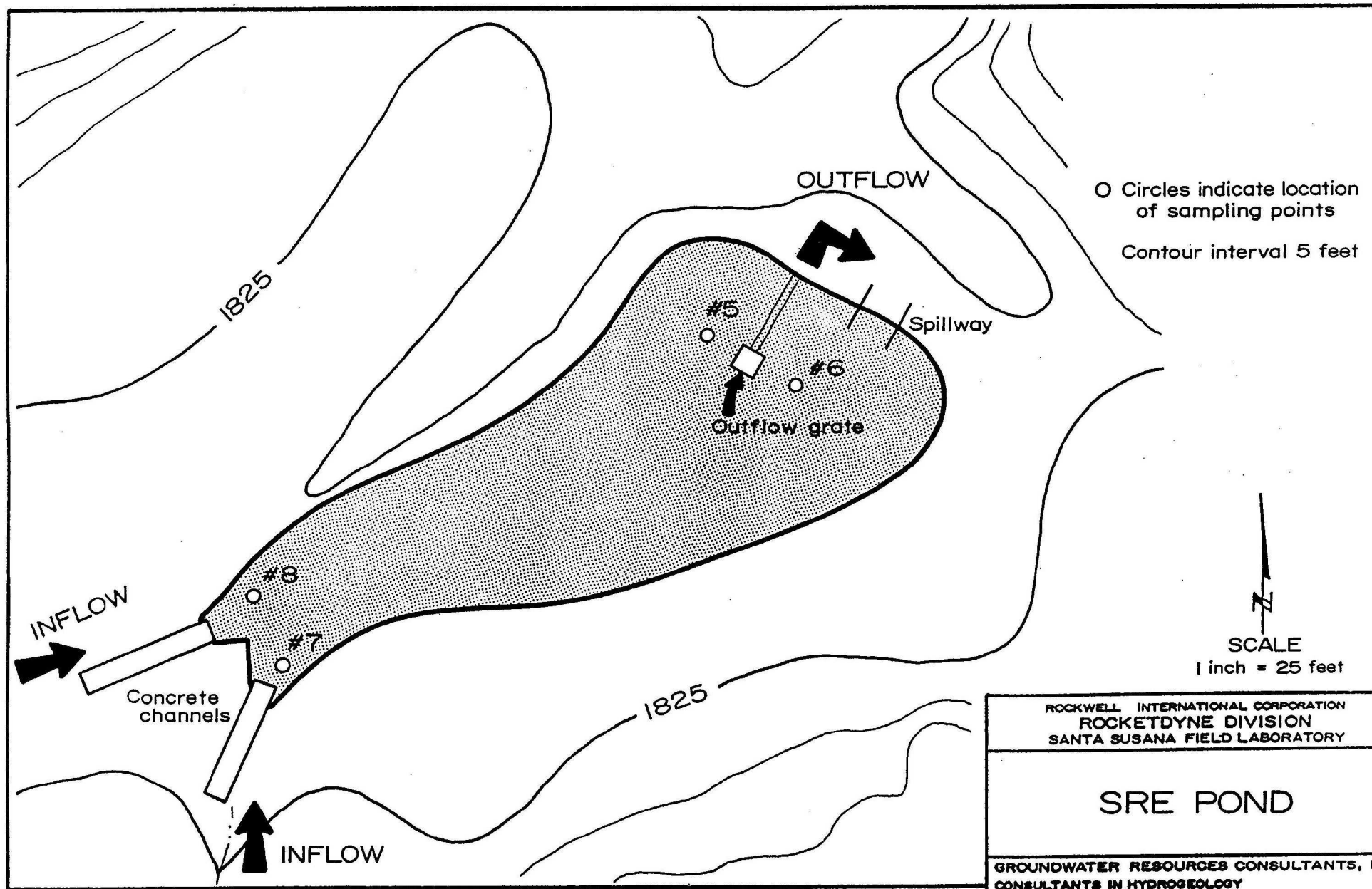
SAMPLE IDENTIFIER	DATE SAMPLED	GROSS ALPHA RADIOACTIVITY (pci/g)	GROSS BETA RADIOACTIVITY (pci/g)	CS-137	Pb 212	Pb 214	K 40
PS-9 0 - 0.5	05/17/90	5.36 ± 2.51	37.1 ± 5.67	0.0160 ± 0.0534	0.918 ± 0.143	0.690 ± 0.144	26.8 ± 3.40
PS-9 1 - 1.5	05/17/90	9.11 ± 3.26	35.9 ± 5.47	0.00435 ± 0.03474	0.810 ± 0.120	0.636 ± 0.126	22.2 ± 2.79
PS-9 2 - 2.5	05/17/90	7.85 ± 3.00	29.7 ± 4.85	0.00886 ± 0.0499	0.933 ± 0.160	0.917 ± 0.159	22.8 ± 2.92
PS-9 3 - 3.5	05/17/90	8.00 ± 2.88	32.1 ± 5.23	0.0424 ± 0.05813	1.31 ± 0.184	0.849 ± 0.178	26.6 ± 3.42
PS-10 0 - 0.5	05/18/90	2.35 ± 1.89	31.8 ± 5.05	0.0249 ± 0.0422	0.655 ± 0.106	0.458 ± 0.122	20.0 ± 2.64
PS-10 1 - 1.5	05/18/90	11.7 ± 3.68	34.20 ± 5.24	0.0398 ± 0.0676	1.66 ± 0.226	1.07 ± 0.226	24.9 ± 3.41
PS-11 0 - 0.5	05/18/90	8.44 ± 3.09	30.80 ± 5.07	0.110 ± 0.0961	1.43 ± 0.242	1.45 ± 0.278	23.4 ± 3.82
PS-11 1 - 1.5	05/18/90	6.07 ± 2.57	29.4 ± 4.82	0.0709 ± 0.0517	1.82 ± 0.245	0.883 ± 0.202	23.6 ± 3.33
PS-11 2 - 2.5	05/18/90	8.93 ± 3.13	27.1 ± 4.54	0.0458 ± 0.0556	1.78 ± 0.231	1.57 ± 0.257	22.8 ± 2.99
PS-12 0 - 0.5	05/18/90	11.0 ± 3.56	34.3 ± 5.26	0.215 ± 0.155	1.87 ± 0.287	1.18 ± 0.332	23.0 ± 4.03
PS-12 1 - 1.5	05/18/90	9.92 ± 3.35	30.1 ± 4.87	0.00263 ± 0.0803	2.00 ± 0.280	1.17 ± 0.253	27.9 ± 3.94
PS-12 2 - 2.5	05/18/90	12.0 ± 3.47	32.9 ± 5.17	0.0194 ± 0.0730	1.94 ± 0.273	1.23 ± 0.238	26.7 ± 3.73
PS-12 3 - 3.5	05/18/90	8.33 ± 3.01	26.2 ± 4.40	0.0265 ± 0.0767	1.43 ± 0.226	1.16 ± 0.220	27.6 ± 3.76



ROCKWELL INTERNATIONAL CORPORATION ROCKETDYNE DIVISION SANTA SUSANA FIELD LABORATORY	
LOCATION MAP	
GROUNDWATER RESOURCES CONSULTANTS, INC. CONSULTANTS IN HYDROGEOLOGY TUCSON, ARIZONA	8640M-101 FIGURE 1



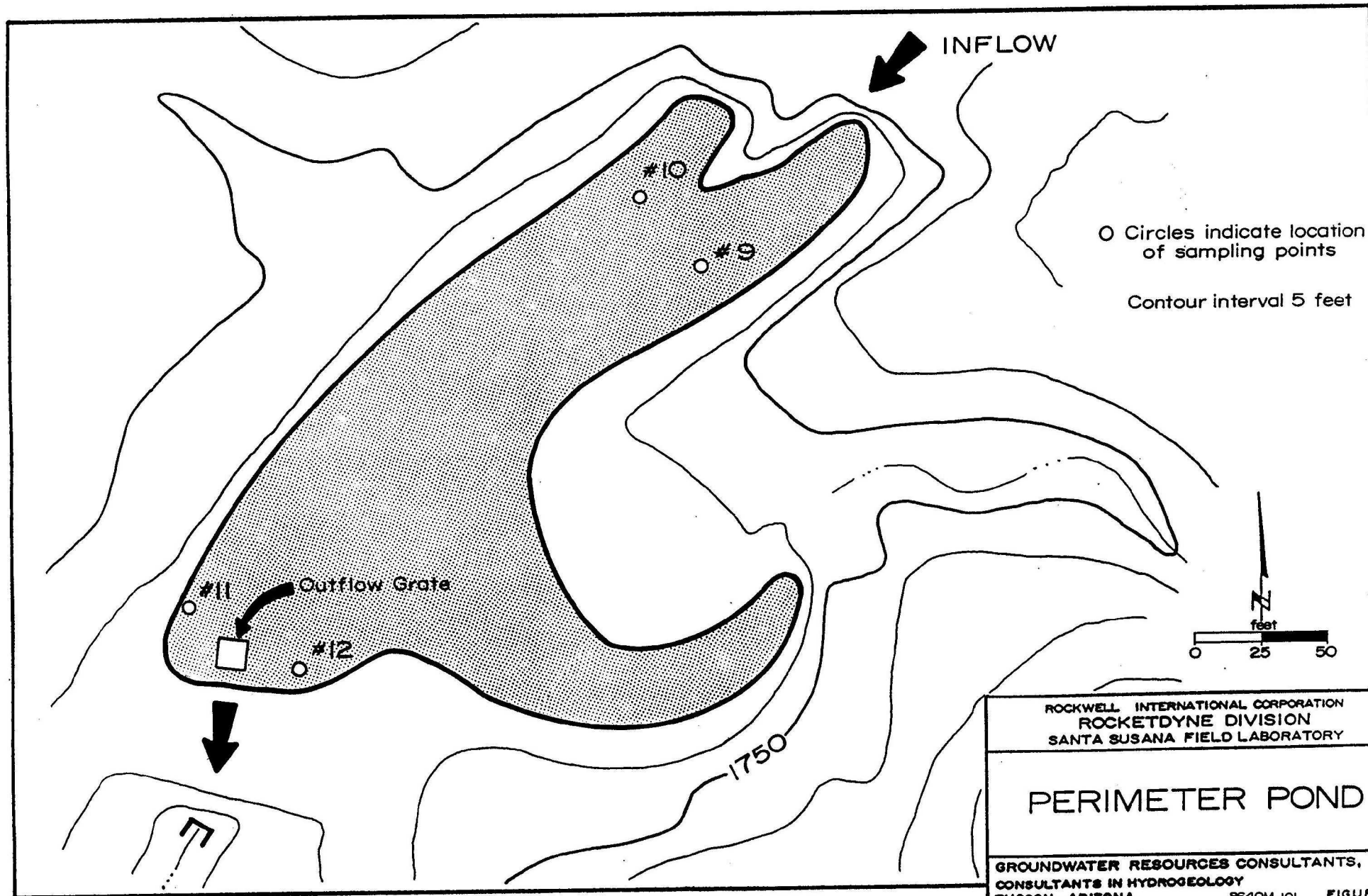
GROUNDWATER RESOURCES CONSULTANTS, INC.



ROCKWELL INTERNATIONAL CORPORATION
ROCKETDYNE DIVISION
SANTA SUSANA FIELD LABORATORY

SRE POND

GROUNDWATER RESOURCES CONSULTANTS, INC.
CONSULTANTS IN HYDROGEOLOGY
TUCSON, ARIZONA 8640M-101 FIGURE 3



GROUNDWATER RESOURCES CONSULTANTS, INC.