

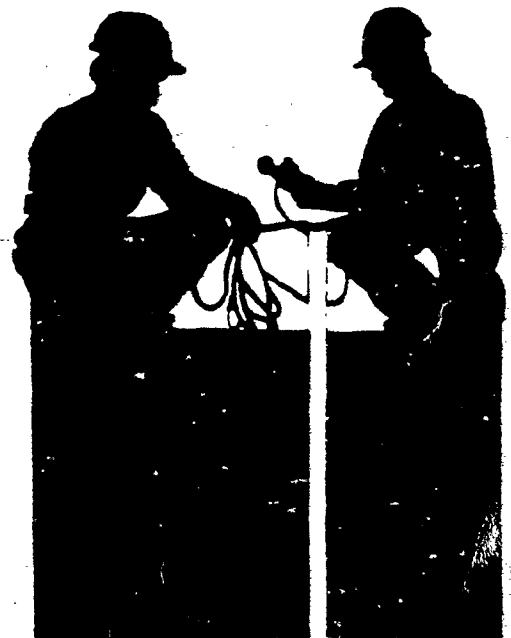
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FINAL

REMEDIAL INVESTIGATION REPORT

OCCIDENTAL CHEMICAL CORPORATION

Pottstown, Pennsylvania

March 1993



Engineers, Planners, Scientists
and Laboratory Services

REPORT

AR304188

FINAL

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FOR

**OCCIDENTAL CHEMICAL CORPORATION
POTTSTOWN, PENNSYLVANIA**

MARCH 1993

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EXECUTIVE SUMMARY

The Occidental Chemical (OxyChem) site (the Site) was placed on the National Priority List (NPL) in 1988 as a result of the presence of trichloroethene (TCE) and related volatile organic compounds (VOCs) in the bedrock aquifer. The use of TCE began in the 1940's when Firestone (Site owner prior to OxyChem) began PVC production. TCE was phased out of the process in 1987. During its use at the Site, the TCE transfer process from tank car to holding tank had resulted in small releases of the chemical onto the surface soils in the center of the facility.

This Remedial Investigation (RI) report presents the results of all work required in the Work Plan. The data obtained have been used to evaluate chemical migration routes and risks to public health or the environment. The primary focus of the RI has been to determine the extent and fate of chemicals at the Site, particularly TCE in the bedrock aquifer. The RI program has also involved site characterization, sampling of overburden soils and groundwater, surface water and sediment from several site drainage features, and background samples of several environmental media.

Over 31,000 analyses were performed for the RI with a percent completeness (usability of CLP results) of 98.2 percent documented through data validation. These analyses, and other RI efforts, have been used to define the chemical and physical characterization of the Site.

Chapter 1 includes the project background and a summary of the pre-RI investigations of the Site. The substantial extent of pre-RI investigation results allowed for the focused development of the RI Work Plan.

Chapter 2 describes the methodologies used in the RI field investigations. The investigations were performed in accordance with the Work Plan, the Quality Assurance Project Plan, and the Field Sampling Plan developed for this study. Specifics as to how these plans were implemented and rationale behind decisions made in response to site-specific conditions are discussed in Chapter 2.

Chapter 3 presents the physical characterization of the Site. Conclusions from the physical characterization include the following:

- Groundwater flow in the bedrock is controlled primarily by fractures in the rock and the types of rock comprising the aquifer; the sandstone units in the bedrock are more permeable than the shale and siltstone.
- The gradient in the bedrock aquifer is from the Schuylkill River radially inward to the center of the Site; this is an induced gradient resulting from the continual pumping of plant production wells near the center of the Site.

- There are no offsite wells hydraulically downgradient of the Site as a result of the induced gradient. A well inventory indicates there are no residential wells within a 1/2-mile radius of the Site.
- Unsaturated conditions predominate in the overburden in the production area of the plant; an overburden (alluvial) aquifer is present under portions of the floodplain.

Chapter 4 presents the chemical characterization of the Site. With respect to the bedrock aquifer, the following conclusions are made:

- Five VOCs are the identified chemicals of concern, and the extent of each (both areally and in depth) varies. These compounds are TCE, trans-1,2-DCE, vinyl chloride monomer (VCM), styrene, and ethylbenzene.
- TCE is the compound with the most widespread distribution in the aquifer.
- There is no migration of the chemicals offsite.

Chapter 5 presents the methodology and results of the human health risk and ecological assessments. Significant findings from these assessments are:

- There are no current risks, and no current receptors, associated with the bedrock groundwater. The human health risk assessment (RA) identified a risk associated with bedrock groundwater only in a future exposure scenario wherein it was assumed that the plant production well pumping was ceased, and the chemicals in the bedrock were allowed to migrate offsite. This future exposure scenario is additionally conservative in that it did not consider dispersion and dilution that would naturally occur if the plume was indeed allowed to migrate offsite.
- The RA does not indicate any unacceptable human health risk associated with other areas of the Site.
- The ecological evaluations and assessments indicate that none of the wetlands or habitats have been impaired by chemical releases from the Site.

Chapter 6 discusses the conclusions from the RI. It also identifies the two focus areas of the Feasibility Study (FS) which will be based on the RI results. These are: (1) The bedrock aquifer and (2) the earthen lagoon area. The distribution of the VOC chemicals in the bedrock aquifer defines the extent of a capture zone which will be targeted for remediation and is discussed further in the FS.

During the course of the study, the earthen lagoons were identified as an area which should be considered for remediation. OxyChem plans to remove the contents of the earthen lagoons from the floodplain; the alternatives associated with this will be developed further in the FS report. Removal will eliminate any future concerns with the lagoons with respect to flooding or leachate release to the river.

This RI report contains the validated results of all site samples collected for the RI. There are no data limitations requiring recommendation for additional RI work.

Prior to preparation of this RI report, an Interim Report was submitted in May 1991, in which extensive characterization of the nature, extent, fate, and transport of chemicals in the bedrock aquifer is presented: the groundwater conditions are further discussed in Appendix A to the Feasibility Study Report, Modeling of Potential Groundwater Recovery Scenarios. The extensive presentation of groundwater characterization in these documents permits the more succinct discussion in this document. Likewise, a thorough characterization of the earthen lagoons is presented in the March 1991 document (Results of Earthen Lagoon Investigation and Identification of Potential Remediation Technologies) and in Appendix D to this RI report; therefore, detailed discussions are not repeated in the main body of the RI text.

1.0 INTRODUCTION

1.1 SITE LOCATION AND OWNERSHIP

The Occidental Chemical (OxyChem) site (the Site) is located within a meander loop of the Schuylkill River approximately 1/2 mile southeast of the Borough of Pottstown, Pennsylvania. The general location of the site is shown in Figure 1-1. The coordinates of the location are approximately 40° 13' 34" north latitude and 75° 36' 14" west longitude.

The Site consists of about 250 acres and is an active chemical manufacturing plant. OxyChem owns the plant and also about 60 acres located to the northeast of the active plant. This property is vacant and has not been used in conjunction with plant operations in the past. OxyChem is the active operator of the Pottstown plant.

The plant was first owned by Jacobs Aircraft Engine Company (JAEC), who manufactured aircraft engines. The Defense Plant Corporation (DPC) purchased the plant from JAEC in 1942. JAEC continued to operate the plant and manufacture aircraft engines for DPC until late 1944. In 1945, DPC leased the plant to Firestone Tire and Rubber (FTR), who subsequently purchased the facilities in 1950. FTR manufactured tires and PVC plastic resins at the site until 1980, when the facilities were sold to Hooker Chemicals and Plastics Corporation (HCPC). Soon after purchase, HCPC became the Occidental Chemical Corporation (OxyChem). OxyChem has continued to manufacture PVC plastic resins at the site, but has not manufactured tires.

1.2 PROJECT BACKGROUND AND SITE FEATURES

1.2.1 Use of TCE and Other Chemicals at the Plant

TCE was used in the PVC manufacturing process at the plant since the late 1940s when Firestone first began production of PVC. The PVC manufacturing process used TCE as a minor constituent of the raw ingredients. TCE was phased out of the process as of 1987. TCE was brought to the plant in railroad tank cars and was unloaded via pumping to a holding tank from the plant's rail siding at a specified TCE unloading point. The TCE storage tank was an aboveground tank situated in a bermed retention basin. TCE (up to 4 percent) was added to the plant process water which was used in the PVC reactors. The majority of TCE combined with the PVC resin. A small amount remained in the process water. The spent reactor wastewaters were then sent, as they presently are, to an onsite industrial pretreatment system before being pumped to the Borough of Pottstown wastewater treatment plant.

The TCE transfer process from tank car to holding tank had resulted in small releases of TCE into local soils over the years. Firestone elected to sample and analyze plant production Wells (PW-1, PW-4, PW-6 and PW-9) in 1979 to determine if TCE had migrated from the unloading area through the overburden soils and into the groundwater via fractures in the underlying bedrock. The locations of these wells are shown on Figure 1-2. Analytical results revealed the presence of TCE in these wells at concentrations in the low tens of micrograms per liter (ug/l). In 1983 all nine production Wells (PW-1, PW-3, PW-4, PW-5, PW-6, PW-7, PW-8, PW-9 and PW-10) were sampled and analyzed. TCE was present in all the wells, with those wells nearest the TCE handling area having concentrations on the order of several milligrams per liter (mg/l).

A 1983 study confirmed the presence of TCE in the bedrock aquifer. The highest concentrations were detected in the vicinity of the TCE handling area. TCE was also detected in soils in the same area at concentrations up to 70 mg/l. Approximately 898 tons of soil were removed in early 1984 for disposal offsite at the Fondesdy disposal facility in Ohio in the fall of 1984.

Ethylbenzene and styrene are chemicals in the groundwater whose apparent source was also in the center of the Site. OxyChem has not used styrene in its manufacturing process and it is likely that the styrene was associated with Firestone's previous processes which included the manufacture of tires or latex. Ethylbenzene is also likely to have been used by Firestone, as it found with styrene; it is not a chemical used by OxyChem during its ownership of the plant.

1.2.2 Project Objectives

The primary focus of the Remedial Investigation (RI) has been to determine the extent and fate of chemicals at the Site, particularly TCE in the bedrock aquifer. The entire site has been investigated to identify and characterize potential source areas for observed chemical impact to groundwater.

This RI report presents the data obtained to evaluate chemical migration routes and risks to public health or the environment. The RI results enable an evaluation of the potential remedial alternatives with emphasis on risk reduction through actions that utilize treatment to permanently and significantly reduce the toxicity, mobility, and volume of hazardous substances.

1.2.3 Site Features

Figure 1-2 shows the significant Site features which were considered in the RI.

The closed landfill is located south of the manufacturing area of the plant. The 17-acre closed landfill is approximately 1,700 feet long, and ranges in width from 360 to 650 feet. The landfill was closed in 1985 in accordance with a Closure Plan approved by PADER. Closure included placement of an impermeable cap which prevents further waste addition and leachate production.

The 7-acre active landfill is located east of the closed landfill and includes a sedimentation pond northeast of the active landfill face. This landfill is approximately 1,000 feet long and 300 feet wide. The landfill is operated by OxyChem under a permit issued by PADER in 1977 (Permit No. 300001).

The four inactive earthen lagoons are located southeast of the production area. Each lagoon measures approximately 150 by 150 feet. The four lagoons are arranged in a square pattern and together cover an area of approximately 2.5 acres. Each lagoon is surrounded by an earthen dike approximately 5-feet high. The lagoons were operated in series, with the northernmost lagoon receiving the plant effluent. Throughout the use of the four earthen lagoons, sludge was first allowed to settle in concrete holding basins (still used today) located at the rear of the PVC manufacturing area (Figure 1-2). Unpolymerized PVC solids settled to the bottom of the basins. The supernatant water was skimmed off and sent directly to the Pottstown POTW. When a basin neared capacity (settled solids) the PVC sludge was diked to the northernmost lagoon. Sludge from the earthen lagoons was periodically removed and placed in the closed landfill. Lagoon 1 (northernmost lagoon) was the last lagoon to be dredged. The lagoon was filled to near capacity (approximately 15 feet thick) before the lined lagoons were brought on line in 1974. The remaining inactive earthen lagoons are filled with approximately six to ten feet of sludge. No further settling of sludge in the inactive earthen lagoons occurred after 1974.

The two active lined lagoons are located immediately northeast of the earthen lagoons. These lagoons each measure 165 feet by 330 feet and are approximately 12.5 feet deep. These lagoons currently hold PVC sludge which is recycled into the manufacturing process and resold as low grade PVC product. A 7-foot high chain link fence surrounds the two lagoons. A concrete trench approximately 2 to 3 feet wide conveys sludge into either lagoon from the concrete settling basins northwest of the lined lagoons. OxyChem currently operates these surface impoundments under RCRA Interim Status and has proposed to close these facilities by 1994 in accordance with a RCRA Closure Plan submitted in August 1991.

The two active lagoons are lined with an impermeable liner which prevents the migration of chemicals into the subsurface. The liner is made out of ethylene propylene diene monomer (EPDM). Until about mid-1987, PVC sludge was sent to these lagoons in the same manner as the sludge sent to the inactive earthen lagoons. By September 1987, PVC sludge from the plant and that stored in the lined lagoons was reclaimed. The spent PVC solids and liquid mixture are currently centrifuged to separate as much PVC solids as possible from the liquid. The liquid is sent directly to the local POTW. The solids are mixed with chemicals to slurry the mixture for transport to a spray dryer for drying and subsequent packaging for resale. The lagoons function as a backup system should the treatment system become overloaded.

Drainage features within the floodplain include the borrow area and sediment pond and closed landfill drainage swales. These are identified in Figure 1-2 and were also areas sampled during the RI. The former TCE handling area is located outside the 100-year floodplain and was the principal area of investigation near the manufacturing portion of the Site.

1.2.4 Regulatory Compliance History

The Pottstown plant has an established history of regulatory compliance at the state level concerning its onsite active and closed landfills and lined treatment lagoons. The initial application for a permit to operate a solid waste disposal facility was submitted by Firestone on April 6, 1970. On August 6, 1973, a permit for solid waste disposal was issued by the Pennsylvania Department of Environmental Resources (PADER) (Permit No. 300001).

On December 11, 1974, Firestone applied for a permit to expand the existing permitted landfill to accommodate new sulfite wastes generated from its experimental boiler house flue gas sulfur dioxide removal pilot plant. The permit was granted on September 1, 1977, and covered the area designated as the active landfill and the area to the west of the closed landfill, which was used for the disposal of sulfur dioxide waste products (sulfite). The waste product disposal area is part of the closed landfill which is now entirely capped. PADER issued a revised permit on January 10, 1983.

One requirement included in the revised permit was that the plant production wells be pumped continuously to act as a contingent leachate collection system. Plant process wells were installed between 1942 and 1947, with the majority pumped continuously from before the first waste disposal practices began at the Site.

During 1985, the closed landfill was officially closed and capped according to the PADER approved Landfill Closure Plan. A monitoring well network was installed around the closed and active landfills and lined lagoons to allow a quarterly groundwater monitoring program in the shallow overburden aquifer.

The active landfill is permitted and operated as a residual solid waste disposal facility. The types and volumes of waste additions are recorded. The landfill design was approved by PADER and has a drainage swale which parallels the base of the landfill and carries all surface water to a sediment settling basin. The active landfill and sediment settling pond are unlined.

On August 30, 1991, the EPA requested that OxyChem submit a Part B Application for surface impoundments because they are used to store hazardous waste as defined by RCRA. The waste is produced from the manufacture of PVC resin and consists of wastewater that contains a PVC slurry with residual vinyl chloride monomer (VCM). This wastewater was characterized as a RCRA hazardous waste (EPA Waste No. D043) in the final toxicity characteristic rule adopted by the EPA on September 25, 1990. The surface

impoundments include the concrete settling basins and the lined lagoons. OxyChem plans to close the surface impoundments in February 1994, and has submitted a RCRA Closure Plan, August 1991. The Part B Permit Application for the facility was submitted to EPA in September 1991.

1.2.5 History of the CERCLA Program

In 1985, the United States Environmental Protection Agency (USEPA) Field Investigation Team (FIT) from Region III investigated the Site to characterize existing site conditions. Groundwater and sediment samples were collected and analyzed. The OxyChem site was evaluated by the EPA in 1988 using the Hazard Ranking System. The groundwater score was 79.43 and the site was placed on the National Priority List (NPL) (Number 277). The evaluation identified the primary concern at the site to be TCE, trans-1,2-dichloroethene (trans-1,2-DCE), and VCM in the bedrock aquifer. The EPA requested OxyChem to perform an RI/FS. On December 2, 1989, the Consent Order (Docket No. III-89-20-DC) was signed between USEPA and OxyChem.

Table 1-1 presents the chronology of the major milestones and deliverables associated with this project since the Consent Order was signed. Table 1-2 presents a list of major activities associated with this RI Program. In addition to those listed, OxyChem has informed EPA of the project status through issuing monthly progress reports through the course of the work.

1.3 RESULTS FROM PRE-RI INVESTIGATIONS

1.3.1 Overview

The Work Plan presented a detailed summary of the previous investigations and analytical data generated at the OxyChem facility. The analyses included traditional groundwater quality parameters (e.g., hardness, total suspended solids, sulfate, chloride, and iron); volatile organics, metals, pesticides, and PCBs. The data were collected at various times over a 13-year period from 1976 to the beginning of the RI in 1989. This section summarizes the pertinent analytical data for groundwater, soils, and sediments. A more detailed discussion of the results can be found in the Work Plan. Appendix C of the Work Plan presents a compilation of the existing analytical results.

1.3.2 Pre-RI Monitoring Well Network

A total of 51 wells were considered for pre-RI monitoring, as listed on Table 1-3 and shown on Figure 1-3. Thirty (30) of these wells were completed in the bedrock and included: 9 plant production wells; 19 deep bedrock monitoring wells; and 2 shallow bedrock wells (OW-8A and OW-27A). Sixteen (16) of the wells were completed in the overburden, and 5 wells are wells screened across the overburden and shallow bedrock. Some of the overburden wells remained dry or did not produce enough water for sampling.

Ten plant water production wells were installed by JAEC or Firestone between 1942 and 1947. Production Well PW-2, formerly located in the northern corner of warehouse D, was grouted to ground surface to make way for plant expansion in 1952. Depth of production wells ranges from 220 to 470 feet.

Additional wells were installed as a result of the investigations listed below.

- 1976 Hydrogeologic Analysis of Existing and Proposed Landfill and Sludge Lagoons Site: 22 shallow, screened observation wells were installed in the overburden; 4 monitoring wells were installed in the closed landfill (which have since been abandoned); and 4 bedrock monitoring wells (still in use) were installed in the bedrock.
- 1983 Landfill Closure Plan and groundwater monitoring program: 3 bedrock wells (BR-A, BR-B and BR-C) were installed.
- 1986 Underground Storage Tank (UST) Monitoring Wells: 12 bedrock monitoring wells (BR-5 through BR-16) were installed.
- 1986 Landfill Post-Closure: 7 shallow, screened wells (OW-5A, OW-6A, OW-7A, OW-8A, OW-14A, OW-24A and OW-27A) were installed.

The seven post-closure wells, with the exception of OW-27A, were existing overburden wells installed in 1976, that were drilled deeper into bedrock. OW-27A was a new well and is completed in bedrock. OW-8A is screened specifically in the shallow bedrock. The remainder of the landfill post-closure wells are screened across both overburden and bedrock.

1.3.3 Bedrock Aquifer

1.3.3.1 Hydrogeological Study (1976)

The earliest water quality data for the bedrock aquifer were generated during a 1976 hydrogeologic investigation. The four shallow rock wells (BR-1 through BR-4) installed on the perimeter of the site along the Schuylkill River and the existing plant production wells (PW-1, PW-3, PW-4, PW-5, PW-6, PW-7, PW-8, PW-9, and PW-10) were sampled and analyzed for traditional water quality parameters. In addition, samples from the four rock wells were analyzed for heavy metals. The data represent two rounds of sampling (one for the process wells) and has no supporting QA/QC documentation.

Of the parameters analyzed, the chloride, sulfate, and iron content of the bedrock groundwater samples are comparable to concentrations reported in the regional study (Longwill and Wood, 1965). One metal, cadmium, was reported above the current Maximum Contaminant Level (MCL) (National Primary Drinking Water Regulations) of 0.01 mg/l for samples from BR-2 and BR-4. Reported concentrations were 0.016 and 0.017 mg/l, respectively.

1.3.3.2 TCE Study and Production Well Monitoring (1979 to 1983)

The plant began sampling and analyzing production wells in 1979 to monitor the presence of TCE in groundwater within the bedrock aquifer. Four wells (PW-1, PW-4, PW-6, and PW-9) were sampled in 1979. Up to seven wells (PW-1, PW-3, PW-4, PW-5, PW-6, PW-9, and PW-10) were sampled about every two months in 1980 and 1981. All of the process wells were sampled on a monthly basis during 1982 and 1983. Average TCE concentrations for each well are shown in Figure 1-4.

The TCE Study completed in 1983 generated information on the concentrations of TCE in the plant process wells and 3 monitoring wells (BR-A, BR-B, and BR-C) installed for the investigation. Samples were collected before and after the new wells were purged and analyses were performed by 2 labs. The post-purge sample results are the most relevant for discussion. Ethyl benzene was reported in samples from Wells BR-A and BR-B at post-purge concentrations of 7.4 mg/l and 1.6 mg/l, respectively. Both reported values are above the current MCL of 0.700 mg/l established for this compound. Toluene was present in Wells BR-A and BR-B at reported levels of 8.9 mg/l and 1.9 mg/l, respectively. The reported concentration for Well BR-A is above the MCL of 2.0 mg/l for toluene. VCM was reported detected in samples from Wells BR-A and BR-B at post-purge concentrations of 1.9 mg/l and 3.6 mg/l, respectively. The MCL for VCM is 0.002 mg/l. Lastly, styrene was detected at concentrations of 4.2 mg/l and 110.0 mg/l, respectively. The MCL for this compound is 0.005 mg/l.

TCE was detected in each production well. Concentrations in each well remained relatively constant throughout the 1979 and 1983 sampling period. The TCE concentrations reported for almost all of the samples analyzed during this period were above the MCL of 0.005 mg/l established for this compound. Groundwater TCE concentrations from production Well PW-1 averaged 0.01 mg/l, PW-3 averaged 0.05 mg/l, PW-4 averaged 0.06 mg/l, PW-5 averaged 0.14 mg/l, PW-6 averaged 0.02 mg/l, PW-7 averaged 0.01 mg/l, PW-8 averaged 2.95 mg/l, PW-9 averaged 0.05 mg/l, and PW-10 averaged 0.14 mg/l.

Table 1-4 summarizes the analytical results from the BR-A, BR-B, and BR-C sampling. Post-purge results in all 3 wells were higher than the MCL for TCE, with the higher concentrations (25 to 36 mg/l) in BR-A. Post-purge results for trans-1,2-DCE were also above the MCL (0.10 mg/l) for all 3 wells.

1.3.3.3 FIT III Analyses (1985)

In 1985, the USEPA FIT III sampled 2 plant production wells (PW-8 and PW-10), and 4 bedrock wells (BR-1, BR-2, BR-3, and BR-4). Samples were split between two laboratories. Analytical parameters included PPL VOCs, semivolatiles, metals, pesticides, and PCBs. Appendix C of the Work Plan contains copies of the available analytical data generated as part of the FIT investigation.

Table 1-4 lists the VOC concentrations for those compounds detected. VOC concentrations for samples collected from the perimeter bedrock wells (BR-1 through BR-4) were low, with many being at estimated levels. TCE was detected at a concentration below the MCL in one perimeter well (BR-1). Both laboratories detected trans-1,2-DCE in Well BR-1 at concentrations of 0.008 and 0.011 mg/l, respectively. VCM was not detected in any sample. Additional compounds were detected at low concentrations by both laboratories and are presented on Table 1-4.

Split samples were collected and analyzed by both laboratories for semi-volatile organic compounds (SVOCs). Concentrations for production Wells PW-8 and PW-10 were predominantly below detection limits for the SVOCs analyzed. Only one compound, bis (2-ethylhexyl) phthalate, a common laboratory contaminant, was detected in PW-10, at a concentration of 0.022 mg/l. Bis (2-ethylhexyl) phthalate was detected in wells BR-1, BR-2 and BR-4 by both laboratories. Table 1-5 summarizes the reported concentrations.

Table 1-6 contains the results of the metals analyses performed by the 2 laboratories. For filtered samples, lead was the only analyte detected above the 0.050 mg/l MCL for this compound. Neither pesticides nor PCBs were detected in the bedrock well samples.

1.3.3.4 Other Bedrock Aquifer Monitoring (1982 to 1988)

Post-Closure Groundwater monitoring was performed at the landfill. Analyses began in 1982, production wells PW-1, PW-3, PW-4, PW-5, PW-6, PW-7, and PW-9 were sampled for TCE. Priority Pollutant analyses began in 1982 with the sampling and analysis of production well PW-8. PW-8 was sampled again in 1985 through 1988. Production wells PW-5 and PW-10 were sampled in 1987 and 1988. Table 1-4 lists those VOCs detected for the respective sampling rounds. The TCE results from landfill post-closure monitoring in 1982 are similar to the TCE Study results from 1979 and 1983.

In 1985, production well PW-8 was analyzed by for SVOCs and pesticides. No compounds were detected.

Metals were analyzed in several of the production wells between 1982 and 1988. Metals were analyzed in samples from PW-9 in 1982; PW-8 in 1983, 1986, and 1988; and PW-5 and PW-10 in 1988. The results are listed on Table 1-6. Arsenic, cadmium, and lead were detected slightly above the MCLs for these analytes.

Production wells PW-6 and PW-9 were sampled in 1978 for VCM and in 1980 for TCE and VCM. No VCM was detected in 1978. VCM was detected in well PW-6 in 1980 at a concentration of 0.01 mg/l. TCE was detected in both PW-6 and PW-9 at concentrations of 0.02 mg/l.

Monitoring wells BR-5 through BR-16 were installed in September, 1986 around three groups of underground storage tanks. The underground storage tanks have since been removed and the wells have never been sampled.

1.3.4 Overburden Aquifer

1.3.4.1 Closed Landfill Area

Overburden monitoring wells OW-5, OW-6, OW-9, OW-10, OW-11, OW-12, and OW-13 were sampled and analyzed in 1976 for standard water quality parameters, including iron and lead. Appendix C of the Work Plan contains the tabulated results from that study. Chloride, sulfate and iron concentrations were less than their drinking water standards. The concentrations of metals in OW-5 were below the MCLs.

Between 1979 and 1983 selected shallow overburden wells were sampled for TCE and iron. Monitoring wells OW-5 and OW-6 were sampled and analyzed on a regular basis, monitoring well OW-25 sampled periodically. Tables 1-7 and 1-8 list the metals and volatile organic analytical results for the overburden aquifer wells. TCE was not detected in either OW-5 or OW-6. TCE was detected once in four sampling events at OW-25 at a concentration of 0.02 mg/l.

Monitoring wells OW-6 and OW-25 were sampled and analyzed as part of the USEPA FIT III investigation in 1985, with split samples analyzed by 2 laboratories for PPL parameters. Tables 1-7, 1-8 and 1-9 list the results. The analyses show a disparity in VOC results between the 2 laboratories. One laboratory reported trans-1,2-DCE (0.01 mg/l), VCM (0.04 mg/l), toluene (0.002 mg/l), benzene (0.003 mg/l), acetone and methylene chloride (0.02 mg/l) for the sample from OW-25. The second laboratory did not detect any volatiles in their split sample. Also, one laboratory reported cadmium at a concentration of 0.06 mg/l in the filtered sample from OW-25, while the second laboratory did not detect any metals above MCLs.

Neither pesticides nor PCBs were detected in any of these shallow wells by the FIT analyses. SVOCs were not detected, except for bis(2-ethylhexyl) phthalate (a common laboratory chemical) in one sample from one of the laboratories.

Table 1-8 provides the results of 1982 metals analyses for 9 overburden wells in the vicinity of the closed landfill. No metals were detected at concentrations above MCLs.

Samples were also analyzed on a quarterly basis from wells around the closed landfill as part of the landfill post-closure monitoring program. These samples were analyzed for standard water quality parameters. On an annual basis these wells were sampled and analyzed for volatiles and select metals. These results are presented on Tables 1-7 and 1-8.

No volatile compounds of concern were detected at significant concentrations in either monitoring well OW-5 or OW-6 for the sample rounds between 1985 and 1988. TCE and trans-1,2-DCE were detected at identical concentrations of 0.01 and 0.002 mg/l, respectively, for the 1987 and 1988 sampling of OW-27A.

Chromium (0.130 mg/l) in well OW-5 was the only metal detected above its MCL for the sampling rounds between 1985 and 1988. No metals were present at significant concentrations in the samples from OW-6 during the 1985 to 1988 sampling period. No metals were present at significant concentrations in the two sample rounds from OW-27A.

Table 1-7 includes the results of VOC analyses for several other sampling events at OW-5, OW-6, and OW-27A between 1978 and 1988. The results indicate an absence of VOCs in the overburden aquifer.

1.3.4.2 Active Landfill Area

Overburden monitoring wells OW-7, OW-18, OW-19, OW-20 and OW-22 were sampled and analyzed in 1976 for standard water quality parameters, including iron and lead. Appendix C of the Work Plan contains the tabulated results from that study. Chloride, sulfate and iron concentrations were less than their drinking water standards. The concentration of lead in OW-19 (0.04 mg/l) was slightly above the 1986 amended proposed MCL for lead.

Between 1979 and 1983, the Pottstown Plant Laboratory sampled and analyzed selected shallow overburden wells for TCE and iron. Well OW-7 was sampled on a regular basis, with Well OW-19 sampled periodically. Tables 1-7 and 1-8 list the results of those analyses. TCE was reported at a concentration of 0.01 mg/l in OW-7 in 1979, and this was the only detection of TCE in OW-7 from five sampling rounds between 1979 and 1983. Well OW-19 was sampled twice in 1982 with TCE detected in the first round at a concentration of 0.13 mg/l. TCE was not detected the second time.

In 1982, a groundwater sample from Well OW-19 was analyzed for select heavy metals. The results are presented on Table 1-7. Selenium was detected above the 1986 amended proposed MCL, at a concentration of 0.38 mg/l. No other metals were present above MCL.

Overburden wells OW-7 and OW-14A were sampled on a quarterly basis between 1985 and 1988 as part of the post-closure groundwater monitoring program of the closed landfill adjacent to the active landfill. Samples from the quarterly sampling rounds were analyzed for standard water quality parameters. On an annual basis these wells were sampled and analyzed for volatiles and select metals. The results of the analyses are included in Appendix C of the Work Plan.

In 1985, no volatile compounds were detected in the samples from Well OW-7. In 1988, 0.005 mg/l of TCE was detected in a sample from OW-7A. In 1987 and 1988, trans-1,2-DCE was detected at estimated concentrations of 0.001 and 0.002 mg/l, respectively.

In 1986, arsenic, chromium and selenium were detected in OW-7 above the 1986 amended proposed MCLs at concentrations of 0.05, 0.08 and 0.02 mg/l, respectively. No metals at significant concentrations were detected in Well OW-14A when sampled in 1987 and 1988.

The overburden aquifer groundwater quality data for the vicinity of the active landfill include results from the PADER laboratory. Samples from well OW-7 (OW-7A) were collected in 1982, 1984, 1987 and 1988. The results are included on Tables 1-7, 1-8, and 1-9. In 1982, TCE was detected at an estimated concentration of 0.003 mg/l. In 1984, no volatiles were detected. In 1987, TCE was detected at a concentration of 0.011 mg/l. In 1988, no volatiles were detected.

Table 1-7 includes other VOC analytical results from OW-7 (OW-7A) performed by laboratories contracted to OxyChem. No VOCs were detected in this sampling conducted between 1978 and 1982.

1.3.4.3 Inactive Earthen and Lined Lagoon Areas

Overburden monitoring Wells OW-8, OW-16, OW-21 and OW-26 were sampled and analyzed in 1976 for standard water quality parameters, including iron and lead. Chloride, sulfate and iron concentrations were less than their drinking water standards. Concentrations of lead in all of the samples were above the 1986 amended proposed MCL.

Between 1979 and 1983, well OW-8 was sampled on a regular basis for TCE and iron. TCE was detected twice in 1982 at concentrations of 0.05 and 0.13 mg/l.

Well OW-8 (OW-8A) was analyzed for volatiles and metals between 1985 and 1988. The results are included in Appendix C of the Work Plan. No volatiles were detected in 1985. TCE was detected at an estimated concentration of 0.003 mg/l in 1987 and 0.002 mg/l in 1988. No metals were detected at significant concentrations in 1985. Arsenic and chromium were detected in 1986 above the 1986 amended proposed MCLs, at concentrations of 0.04 and 0.06 mg/l, respectively. No metals were detected at significant concentrations in 1987 or 1988.

Well OW-8 (OW-8A) was sampled and analyzed for PPL VOCs by the PADER laboratory in 1982, 1984, 1987, and 1988. Results are included on Table 1-7. No volatiles were detected except TCE in 1987, at an estimated concentration of 0.004 mg/l.

Well OW-8 (OW-8A) was also analyzed by laboratories contracted by OxyChem between 1978 and 1982. The results are included on Table 1-7. No VOCs were detected in these analyses.

1.3.5 Soils and Sediments

1.3.5.1 TCE Handling Area

The 1983 TCE Study generated data on the extent of TCE and PCE in the soils in the vicinity of the TCE handling area. The study concentrated in three areas: the TCE unloading valve; the vicinity of production well PW-8; and the vicinity of the former TCE holding tank. A total of 51 soil samples were analyzed for TCE and PCE. Figures 1-5 and 1-6 show the locations of the soil borings that were sampled as part of this study. Table 1-10 lists the analytical results of the soil sample analyses.

Generally, soil samples were collected at depths of 2 and 4 feet, with several from 8 feet. TCE was identified in the specific vicinity of the TCE unloading valve, beneath the railroad siding where TCE filled tank cars were parked, and beneath storage tanks 7, 8, and 18. In addition, samples from borings B-32 and B-18 showed the presence of TCE. Concentrations of TCE ranged from 73.0 mg/kg in the surface sample from boring B-9 to 0.3 mg/kg in the 2-foot sample from boring B-33. No TCE was found near production well PW-8. As a result of the findings of this study, the TCE laden soils were removed from the swale area adjacent to the railway tracks, near the TCE unloading valve, and in the TCE storage tanks area. Approximately 898 tons of soil were removed from this area in 1984. The excavation was in the center of the Site, with the majority of the removal occurring in the area adjacent to the former TCE rail car unloading station and centered around the former TCE unloading valve. The work plan for the delineation of the excavation area was approved by the PADER, and the results of the investigation were presented in a December 1983 report (Trichloroethylene Soil and Groundwater Investigation). Excavation depths to 5 feet within an approximate 150 foot by 80 foot area were identified in that report.

1.3.5.2 Sedimentation Pond

Split samples were collected from the sedimentation pond at the base of the active landfill during the FIT III investigation and were analyzed by laboratories for Priority Pollutant VOCs, SVOCs, metals, pesticides and PCBs. Table 1-11 lists the results of the VOC analyses. Low levels of TCE and trans-1,2-DCE were reported. Several other compounds were detected at low concentrations and are listed on Table 1-11. No VCM was detected by either laboratory.

Of the metals analyzed for by both laboratories, only arsenic and lead were slightly above the proposed MCLs. Table 1-12. lists the detected results of the metals analyses.

Three phthalates were reported by one laboratory, but not the other. No pesticides or PCBs were detected in the sediment sample from the sedimentation pond. Table 1-13 listed the detected results of the semivolatile analyses.

1.3.5.3 Inactive Earthen Lagoons

As part of the FIT III investigation 2 inactive earthen lagoons were sampled and analyzed for Priority Pollutant VOCs, semivolatiles, metals, pesticides, and PCBs. VOC analyses yielded similar results at similar concentrations by both laboratories (Table 1-14). TCE, trans 1,2-DCE, VCM, 1,2-dichloroethane (1,2-DCA), styrene, and ethyl benzene were detected.

One laboratory did not detect any SVOCs. The other laboratory reported benzoic acids in one sample and bis (2-ethylhexyl) phthalate in 2 samples.

Table 1-1
RI Major Milestones and Deliverables

Occidental Chemical Corporation
Pottstown, Pennsylvania

<u>Submittal/Approval Dates</u>	<u>Milestones/Deliverables</u>
June 1990	Sampling Plan for Inactive Earthen Lagoons
November 1990	Remedial Investigation Work Plan, HASP, FSP, QAPP
September 1990	Results of 1990 Maintenance Plant Period Work
May 1991	Interim Report
March 1991	Results of the Earthen Lagoon Investigation and Identification of Potential Remediation Technologies
January 1991	Phase I SVS Report
June 1991	Phase II SVS Report
July 1991	Well Inventory Report
July 1991	Recommendation for CLP Round 1 Sampling
December 1991	Recommendation for CLP Round 2 Sampling

TABLE 1-2

SUMMARY OF RI FIELD INVESTIGATION ACTIVITIES
OCCIDENTAL CHEMICAL CORPORATION
POTTSTOWN, PENNSYLVANIA

June 25-July 8, 1990	Reconnaissance borehole TB-3 drilled to 100 feet. Geophysical logging, a camera survey and packer testing were completed and samples for analysis collected. Steel casing to depth grouted in-place.
August 6-14, 1990	Inactive Earthen Lagoons test boring and sampling program completed.
November 26, 1990	Phase I soil vapor survey in the former main production area of the site initiated.
December 18, 1990	Drilling of 10 reconnaissance boreholes was initiated.
December 18, 1990	The Schuylkill River sediments and surface water sampling was initiated.
January, 1991	Six reconnaissance boreholes were completed.
January 8-10, 1991	The sediment pond and swale surface water sampling conducted.
January 14-17, 1991	Storm sewer outfalls sediment and surface water sampling conducted.
January 15-16, 1991	Borrow area sediment sampling completed.
January 17-18, 1991	Schuylkill River sediment and surface water sampling continues. Off-site background soil sampling initiated.
January 23, 1991	NX-rock coring of reconnaissance borehole TB-1 initiated.
January 28, 1991	Downhole camera survey and geophysical logging of the reconnaissance boreholes initiated.

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	Schulykill River sediment and surface water sampling completed.
	Background soil sampling (on-site).
	Quality Assurance Field Audit performed.
February, 1991	The upper 100 feet of two reconnaissance borings in the center of the plant were drilled.
	The borehole camera survey and geophysical logging of reconnaissance borehole.
February 6, 1991	Packer testing of reconnaissance boreholes commenced.
March, 1991	The packer testing programs for six of the reconnaissance boreholes completed.
	The NX rock coring of TB-1 completed.
	Reconnaissance borehole TB-2 was completed; geophysical logging and camera survey was conducted.
March 4-5, 1991	Lined Lagoon drilling and sampling program completed.
April 11, 1991	The remaining two offsite background soil samples were collected.
April 12, 1991	Reconnaissance borehole TB-1 was drilled to completion depth. Geophysical logging and camera survey were conducted.
April 15, 1991	The field work for the Phase II Soil Vapor Survey was initiated.
April 27, 1991	The packer testing of TB-1 completed.
May, 1991	Bedrock borehole drill cuttings characterized for disposal.

AR304222

June, 1991	Seven of nine monitoring wells completed in reconnaissance boreholes. Three of five additional bedrock boreholes were drilled and completed as monitoring wells. An offsite well inventory was initiated. Drilling of reconnaissance boreholes TB-3 resumed.
July, 1991	Existing production wells were sampled for the purpose of assessing potential groundwater treatment options. The packer testing of TB-3 completed. The remaining two additional bedrock boreholes were completed.
July 8, 1991	TB-1 drilling resumed.
July 13, 1991	Wetlands investigation initiated.
July 29, 1991	The first round of groundwater sampling for CLP analysis was initiated. A total of 29 wells sampled.
August, 1991	Borehole TB-1 was drilled to completion depth with packer testing of two intervals. The well was installed August 5. Field mapping of the plant communities in the flood plain was performed.
August 1-2, 1991	Contingent soil boring program completed.
August 14, 1991	Construction of TB-3 monitoring well initiated.
September, 1991	Well surveying was completed with the exception of four new wells. General site maintenance activities associated with completion of the RI drilling program was conducted.

AR304223

September 9, 1991	Construction of TB-3 was completed.
September 17-20, 1991	Wetlands investigation continued.
September 24, 1991	The first round of groundwater sampling for CLP parameters was completed.
October 1991	Bulk samples of earthen lagoon material were collected.
January 13-23, 1992	The second round of groundwater sampling for CLP analysis conducted. A total of 11 wells sampled.
January 29-31, 1992	Completion of well survey.
January, 1992	Initiated pumping test for styrene treatability at well BR-B.

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TABLE 1-3

PRE-RI MONITORING WELL
COMPLETION DETAILS
OCCIDENTAL CHEMICAL CORPORATION RI/FS

OLD WELL ID	NEW WELL ID	WELL COMPLETION	OUTER WELL		SURFACE ELEVATION (ft)	STICK UP (ft)	WELL ELEVATION (ft)	GAUGE ELEVATION (0.0)	WELL YIELD (GPN)	SCREEN INTERVAL (ft)	WELL DIAMETER (in)	GROUNDWATER ELEVATION (from surface elevation)					
			TD (ft)	Current (ft)								6/21/89 DTW	6/21/89 ELEV	7/7/89 DTW	7/7/89 ELEV	9/15/89 DTW	9/15/89 ELEV
OK5	OK5A	OB/BR	NA	30.00	125.30	1.70	127.00		10.00	10.0	2.00	1.47	113.83	10.85	116.15	14.68	112.32
OK6	OK6A	OB/BR	NA	30.00	123.39	1.30	124.69		5.00	15.0	2.00	0.31	116.08	7.32	117.37	12.25	112.44
OK7	OK7A	OB/BR	NA	32.00	123.20	3.30	126.50		4.00	15.0	2.00	0.81	115.39	7.23	119.27	NA	NA
OK8	OK8A	BEDROCK	NA	29.00	120.56	1.80	122.36		4.00	15.0	2.00	0.75	111.81	7.32	115.04	12.75	109.61
OK9	OK9	OVERBURDEN	NA	19.50	124.16	2.00	126.16		0.80	10.0	1.25	NA	NA	6.15	120.01	12.68	113.48
OK10	OK10	OVERBURDEN	NA	20.50	124.44	1.85	126.29		0.67	10.0	1.25	NA	NA	6.46	119.83	DRY	NA
OK11	OK11	OVERBURDEN	NA	21.50	125.66	1.30	126.96		BAIL	10.0	1.25	NA	116.91	10.47	116.49	17.77	109.19
OK12	OK12	OVERBURDEN	NA	24.50	134.29	2.00	136.29		1.30	10.0	1.25	9.38	114.91	19.25	117.04	21.64	114.65
OK13	OK13	OVERBURDEN	NA	15.75	124.88	2.10	126.98		BAIL	10.0	2.00	NA	NA	NA	NA	12.00	114.98
OK14	OK14A	OB/BR	NA	39.00	143.21	2.40	145.61		1.00	15.0	2.00	7.12	116.09	27.35	118.25	28.75	116.86
OK15	OK15	OVERBURDEN	NA	15.00	123.26	1.70	124.96		BAIL	10.0	2.00	NA	NA	NA	NA	NA	NA
OK16	OK16	OVERBURDEN	NA	9.00	120.23	1.90	122.13		BAIL	5.0	2.00	NA	NA	NA	NA	8.88	113.25
OK17	OK17	OVERBURDEN	NA	11.00	119.87	2.10	121.97		DRY	5.0	2.00	NA	NA	7.22	114.75	DRY	NA
OK18	OK18	OVERBURDEN	NA	11.50	122.09	1.80	123.89		BAIL	5.0	2.00	NA	NA	3.73	120.16	11.17	112.72
OK19	OK19	OVERBURDEN	NA	15.50	122.66	2.40	125.06		BAIL	10.0	2.00	NA	NA	8.82	116.24	17.50	107.56
OK20	OK20	OVERBURDEN	NA	12.00	120.78	2.20	122.98		0.30	5.0	2.00	NA	NA	NA	NA	DRY	NA
OK21	OK21	OVERBURDEN	NA	13.50	121.55	1.70	123.25		2.31	5.0	2.00	NA	NA	4.25	119.00	9.89	113.36
OK22	OK22	OVERBURDEN	NA	17.75	123.25	1.65	124.90		3.00	10.0	2.00	5.78	117.47	5.64	119.26	11.06	113.84
OK23	OK23	OVERBURDEN	NA	37.00	160.07	1.80	161.87		DRY	5.0	2.00	NA	NA	NA	NA	NA	NA
OK24	OK24A	OB/BR	NA	23.00	126.03	1.85	127.88		3.00	15.0	2.00	11.29	114.74	11.90	115.98	13.20	114.68
OK25	OK25	OVERBURDEN	NA	16.25	121.38	2.00	123.38		BAIL	5.0	2.00	NA	NA	8.38	115.00	10.39	112.99
OK26	OK26	OVERBURDEN	NA	11.50	122.85	2.10	124.95		BAIL	5.0	2.00	NA	NA	NA	NA	10.84	114.11
OK27A	OK27A	BEDROCK	24	60.00	NA	NA	NA		2.00	31.0	2.00	10.30	NA	14.03	NA	20.08	NA
PW1	PW1	BEDROCK	42	387.0	85.56	0.94	186.50		108.00	OPEN	10.00	54.58	131.92 NP	51.12	134.88 NP	64.49	122.01 NP
PW3	PW3	BEDROCK	47	265.0	64.46	0.00	164.46		150.00	OPEN	10.00	NA	NA	NA	NA	NA	NA
PW4	PW4	BEDROCK	50	258.0	156.15	0.00	156.15		70.00	OPEN	10.00	NA	NA	NA	NA	NA	NA
PW5	PW5	BEDROCK	36	220.0	135.92	0.71	136.63		120.00	OPEN	10.00	48.00	88.63 P	19.21	117.42 NP	66.00	70.63 P
PW6	PW6	BEDROCK	35	385.0	152.49	0.00	152.49		193.00	OPEN	10.00	NA	NA	NA	NA	85.00	68.29 NP
PW7	PW7	BEDROCK	37	350.0	130.27	0.86	131.13		61.00	OPEN	10.00	17.11	114.02 NP	16.73	114.40 NP	20.11	111.02 NP
PW8	PW8	BEDROCK	35	339.0	145.41	0.74	146.15		73.00	OPEN	10.00	71.64	74.51 P	28.05	118.10	104.40	41.75 P
PW9	PW9	BEDROCK	38	350.0	152.96	0.00	152.59		117.00	OPEN	10.00	54.31	98.65 NP	50.23	102.73	69.97	82.99 NP
PW10	PW10	BEDROCK	75	470.0	147.14	0.61	147.75		61.00	OPEN	10.00	59.62	88.13 NP	30.88	116.87	86.32	61.49 P
BRA	BRA	BEDROCK	19	65.00	151.98	1.94	153.92		3.50	OPEN	8.00	47.95	105.97	31.63	122.29	58.50	95.42

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(Table 1-3, cont.)

OLD WELL ID	NEW WELL ID	AQUIFER	OUTER WELL		WELL TO (ft)	WELL TO (ft)	SURFACE ELEVATION (ft)	STICK UP (ft)	WELL ELEVATION (ft)	GAUGE ELEVATION (0.0)	WELL YIELD (GPM)	SCREEN INTERVAL (ft)	WELL DIAMETER (in)	GROUNDWATER ELEVATION (from surface elevation)					
			CASING TD (ft)	Current										6/21/89 DTW	6/21/89 ELEV	7/7/89 DTW	7/7/89 ELEV	9/15/89 DTW	9/15/89 ELEV
RWB	BRB	BEDROCK	19		90.00		150.10 (3.28)		153.38		4.00	OPEN	8.00	53.58	99.80	32.81	120.57	62.38	91.00
RWC	BRC	BEDROCK	19.5		90.00		146.37 (3.21)		149.58		1.00	OPEN	8.00	50.21	99.37	29.63	119.95	63.27	86.31
RW1	BR1	BEDROCK	46.5		117.00		134.93	0.30	135.23		17.60	OPEN	6.00	21.04	114.19	19.05	116.18	23.93	111.30
RW2	BR2	BEDROCK	32.0		125.00		124.42	0.40	124.82		19.35	OPEN	6.00	8.19	116.63	8.52	116.30	11.70	113.12
RW3	BR3	BEDROCK	29.0		119.00		123.27	0.70	123.97		21.43	OPEN	6.00	8.00	115.97	7.98	115.99	11.28	112.69
RW4	BR4	BEDROCK	28.0		119.00		121.47	1.10	122.57		21.43	OPEN	6.00	NA	NA	4.28	117.19	12.93	109.64
RW5	BR5	BEDROCK	19		74.00		153.57	0.47	154.04		2.00	OPEN	5.00	39.15	114.89	38.71	115.33	42.35	111.69
RW6	BR6	BEDROCK	19		70.00		144.90	1.15	146.05		10.00	OPEN	5.00	30.20	115.85	30.14	115.91	33.59	112.46
RW7	BR7	BEDROCK	19		55.00		145.20	1.35	146.55		3.00	OPEN	5.00	29.51	117.04	29.45	117.10	33.25	113.30
RW8	BR8	BEDROCK	19		65.00		145.78	0.24	146.62		2.00	OPEN	5.00	31.14	114.88	30.93	115.09	34.38	111.64
RW9	BR9	BEDROCK	19		80.00		169.46	0.94	170.40		3.00	OPEN	5.00	46.78	123.62	47.21	123.19	52.65	116.14
RW10	BR10	BEDROCK	19		100.00		167.62	1.17	168.79		1.00	OPEN	5.00	48.40	120.39	47.83	120.96	53.89	114.90
RW11	BR11	BEDROCK	19		73.00		169.82	1.33	171.15		1.00	OPEN	5.00	49.05	122.10	48.29	122.86	55.10	116.05
RW12	BR12	BEDROCK	19		90.00		173.06	1.06	174.12		1.50	OPEN	5.00	48.37	125.75	48.95	125.17	54.93	119.19
RW13	BR13	BEDROCK	19		100.00		151.94	1.32	153.26		2.00	OPEN	5.00	49.73	103.53	31.95	121.31	61.81	91.45
RW14	BR14	BEDROCK	19		94.00		152.73	1.01	153.74		1.00	OPEN	5.00	50.21	103.53	33.39	120.35	62.11	91.63
RW15	BR15	BEDROCK	20		94.00		152.59	0.27	152.32		2.00	OPEN	5.00	48.00	104.86	31.20	121.66	60.59	91.19
RW16	BR16	BEDROCK	19		94.00		155.44	1.76	157.20		2.00	OPEN	5.00	49.78	107.42	NA	NA	57.46	99.74
SG1	SG1	RIVER								113.12					114.80		114.68		112.0
SG2	SG2	RIVER								112.70					113.80		113.82		111.0
SG3	SG3	RIVER								109.78					112.82		112.62		109.78

OB/BR : Well screened across both overburden and shallow bedrock

NA : Not Available

BAIL : No sustained yield, well was hand bailed

DTW : Depth to water measured from top of casing

ELEV : Groundwater elevation from surface elevation

NP : Not pumping

P : Pumping

SOURCE : BCM Engineers (BCM Project No. 00-4064-08)

R304226

TABLE 1-4

BEDROCK AQUIFER EXISTING VOLATILE ORGANIC ANALYTICAL RESULTS
OCCIDENTAL CHEMICAL CORPORATION, POTTSVILLE, PENNSYLVANIA

SAMPLE LOCATION	SAMPLE NAME	DATE	LABORATORY	PHASE	TCE (mg/l)	Trans- 1,2-DCE (mg/l)	Vinyl Chloride (mg/l)	Toluene (mg/l)	Benzene (mg/l)	Ethyl- benzene (mg/l)	Chloro- form (mg/l)	Acetone (mg/l)	Methylene Chloride (mg/l)	Xylenes (mg/l)	Trans 1,3- Dichloro- propene (mg/l)	Trichloro- fluoro- methane (mg/l)	1,1 Di Chloro- ethane (mg/l)	1,2 Di Chloro- ethane (mg/l)	Bromo- Dichloro- methane (mg/l)	Tetra- chloro- ethane (mg/l)	Styrene (mg/l)
BR1	BR1	9/27/85	NUS	AQ	0.004 J	0.008	ND	ND	0.002 J	NT	ND	0.008 J	ND	ND	ND	ND	ND	NT	ND	ND	NT
BR2	BR2	9/27/85	Nanco	AQ	ND	0.011	ND	0.002	0.002	NT	ND	ND	ND	ND	ND	ND	ND	NT	ND	ND	NT
BR3	BR2	9/27/85	NUS	AQ	ND	ND	ND	0.002	ND	NT	ND	0.006	0.007	ND	ND	ND	ND	NT	ND	ND	NT
BR3	BR3	10/3/85	NUS	AQ	ND	ND	ND	0.001 J	ND	NT	ND	ND	0.003 J, B	0.001 J	ND	ND	ND	NT	ND	ND	NT
BR4	BR3	10/3/85	Nanco	AQ	ND	ND	ND	0.003	0.003	NT	ND	0.012	0.006	ND	ND	ND	ND	NT	ND	ND	NT
BR4	BR4	9/27/85	NUS	AQ	ND	ND	ND	ND	ND	NT	ND	ND	ND	ND	ND	ND	ND	NT	ND	ND	NT
BR4	BR4	9/27/85	Nanco	AQ	ND	ND	ND	ND	ND	NT	ND	ND	0.007	ND	ND	ND	ND	NT	ND	ND	NT
P41	P41	11/79	OXY-POIT	AQ	0.005	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT
P41	P41	10/80	OXY-POIT	AQ	0.070	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT
P41	P41	3/81	OXY-POIT	AQ	0.012	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT
P41	P41	3/82	RMC	AQ	0.002	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT
P41	P41	4/82	OXY-POIT	AQ	0.004	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT
P41	P41	5/82	OXY-POIT	AQ	0.005	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT
P41	P41	6/21/82	OXY-POIT	AQ	ND	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT
P41	P41	7/82	OXY-POIT	AQ	ND	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT
P41	P41	8/26/82	OXY-POIT	AQ	0.001	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT
P41	P41	9/82	OXY-POIT	AQ	0.033	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT
P41	P41	10/82	OXY-POIT	AQ	0.001	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT
P41	P41	11/82	OXY-POIT	AQ	0.001	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT
P41	P41	1/83	OXY-POIT	AQ	0.001	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT
P41	P41	4/83	OXY-POIT	AQ	0.001	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT
P41	P41	6/83	OXY-POIT	AQ	0.015	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT
P41	P41	7/83	OXY-POIT	AQ	0.020	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT
P41	P41	8/83	OXY-POIT	AQ	0.049	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT
P41	P41	9/83	OXY-POIT	AQ	0.005	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT
P41	P41	11/83	OXY-POIT	AQ	0.002	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT
P43	P43	10/80	OXY-POIT	AQ	0.066	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT
P43	P43	12/80	OXY-POIT	AQ	0.033	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT
P43	P43	3/81	OXY-POIT	AQ	0.041	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT

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(Table 1-4, cont.)

SAMPLE NAME	DATE	LABORATORY	PHASE	TCE (mg/l)	Trans- 1,2-DCE (mg/l)	Vinyl chloride (mg/l)	Toluene (mg/l)	Benzene (mg/l)	Ethyl- benzene (mg/l)	Chloro- form (mg/l)	Acetone (mg/l)	Methylene chloride (mg/l)	Xylenes (mg/l)	Trans 1,3- Dichloro- propene (mg/l)	Trichloro- fluoro- methane (mg/l)	1,1 Di chloro- ethane (mg/l)	1,2-Di chloro- ethane (mg/l)	Bromo- Dichloro- methane (mg/l)	Tetra- chloro- ethene (mg/l)	Styrene (mg/l)
P43	4/81	OXY-POTT	AQ	0.027	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT
P43	3/82	RMC	AQ	0.045/0.053	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT
P43	3/82	OXY-GI	AQ	0.036	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT
P43	4/82	OXY-POTT	AQ	0.061	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT
P43	5/82	OXY-POTT	AQ	0.051	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT
P43	6/21/82	OXY-POTT	AQ	0.040	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT
P43	7/82	OXY-POTT	AQ	0.049	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT
P43	8/26/82	OXY-POTT	AQ	0.057	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT
P43	9/82	OXY-POTT	AQ	0.030	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT
P43	10/82	OXY-POTT	AQ	0.042	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT
P43	11/82	OXY-POTT	AQ	0.056	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT
P43	1/83	OXY-POTT	AQ	0.073	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT
P43	2/83	OXY-POTT	AQ	0.065	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT
P43	2/83	OXY-POTT	AQ	0.097	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT
P43	3/24/83	OXY-POTT	AQ	0.075	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT
P43	4/23	OXY-POTT	AQ	0.055	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT
P43	5/83	OXY-POTT	AQ	0.082	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT
P43	7/83	OXY-POTT	AQ	0.026	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT
P43	8/83	OXY-POTT	AQ	0.031	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT
P43	9/83	OXY-POTT	AQ	0.016	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT
P43	10/83	OXY-POTT	AQ	0.019	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT
P43	11/83	OXY-POTT	AQ	0.017	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT
P44	11/79	OXY-POTT	AQ	0.003	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT
P44	10/80	OXY-POTT	AQ	0.021	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT
P44	12/80	OXY-POTT	AQ	0.006	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT
P44	3/81	OXY-POTT	AQ	0.009	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT
P44	3/82	RMC	AQ	0.020	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT
P44	4/82	OXY-POTT	AQ	0.029	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT
P44	5/82	OXY-POTT	AQ	0.028	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT
P44	6/21/82	OXY-POTT	AQ	0.026	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT
P44	7/82	OXY-POTT	AQ	0.122	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT
P44	8/26/82	OXY-POTT	AQ	0.048	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT
P44	9/82	OXY-POTT	AQ	0.043	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT
P44	10/82	OXY-POTT	AQ	0.044	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT
P44	11/82	OXY-POTT	AQ	0.041	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT
P44	1/83	OXY-POTT	AQ	0.093	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT

P44

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(Table 1-4, cont.)

SAMPLE LOCATION	SAMPLE NAME	SAMPLE DATE	LABORATORY	PHASE	TCE (mg/L)	Trans-1,2-DCE (mg/L)	Vinyl Chloride (mg/L)	Toluene (mg/L)	Benzene (mg/L)	Ethylbenzene (mg/L)	Chloroform (mg/L)	Acetone (mg/L)	Methylene Chloride (mg/L)	Xylenes (mg/L)	Trans 1,3-Dichloropropene (mg/L)	Trichloroethane (mg/L)	1,1-Dichloroethane (mg/L)	1,2-Dichloroethane (mg/L)	Bromoethane (mg/L)	Tetra-chloroethene (mg/L)	Styrene (mg/L)
P45	P44	2/83	OXY-POIT	AQ	0.100	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT
	P44	2/83	OXY-POIT	AQ	0.120	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT
	P44	3/24/83	OXY-POIT	AQ	0.081	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT
	P44	4/83	OXY-POIT	AQ	0.068	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT
	P44	5/83	OXY-POIT	AQ	0.132	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT
	P44	7/83	OXY-POIT	AQ	0.092	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT
	P44	11/83	OXY-POIT	AQ	0.142	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT
	P45	10/80	OXY-POIT	AQ	0.087	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT
	P45	12/80	OXY-POIT	AQ	0.087	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT
	P45	3/81	OXY-POIT	AQ	0.186	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT
	P45	3/82	RMC	AQ	0.065	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT
	P45	3/82	OXY	AQ	0.046/0.016	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT
	P45	4/82	OXY-POIT	AQ	0.015	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT
	P45	5/82	OXY-POIT	AQ	0.094	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT
	P45	6/21/82	OXY-POIT	AQ	0.030	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT
	P45	7/82	OXY-POIT	AQ	0.018	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT
	P45	8/26/82	OXY-POIT	AQ	0.195	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT
	P45	9/82	OXY-POIT	AQ	0.169	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT
P46	P45	10/82	OXY-POIT	AQ	0.139	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT
	P45	11/82	OXY-POIT	AQ	0.139	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT
	P45	1/83	OXY-POIT	AQ	0.216	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT
	P45	2/83	OXY-POIT	AQ	0.175	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT
	P45	2/83	OXY-POIT	AQ	0.221	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT
	P45	3/24/83	OXY-POIT	AQ	0.078	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT
	P45	4/83	OXY-POIT	AQ	0.079	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT
	P45	5/83	OXY-POIT	AQ	0.008	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT
	P45	7/83	OXY-POIT	AQ	0.083	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT
	P45	8/83	OXY-POIT	AQ	0.185	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT
	P45	9/83	OXY-POIT	AQ	0.196	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT
	P45	10/83	OXY-POIT	AQ	0.379	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT
	P45	11/83	OXY-POIT	AQ	0.393	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT
	P45	6/2/87	RMC	AQ	0.165	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT
	P45	6/23/88	RMC	AQ	0.060	0.020	ND	ND	ND	ND	ND	ND	ND	ND	0.045	0.006	ND	ND	ND	ND	ND
	P46	11/79	OXY-POIT	AQ	0.021	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT
	P46	2/80	OXY-POIT	AQ	0.016	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT

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(Table 1-4, cont.)

SAMPLE LOCATION	SAMPLE NAME	SAMPLE DATE	LABORATORY	PHASE	TCE (mg/l)	Trans-1,2-DCE (mg/l)	Vinyl Chloride (mg/l)	Toluene (mg/l)	Benzene (mg/l)	Ethylbenzene (mg/l)	Chloroform (mg/l)	Acetone (mg/l)	Methylene Chloride (mg/l)	Xylenes (mg/l)	Trans 1,3-Dichloro propene (mg/l)	Trichloro-Fluoromethane (mg/l)	1,1 Di Chloro ethane (mg/l)	1,2 Di Chloro ethane (mg/l)	Bromo-Dichloro-methane (mg/l)	Tetra-chloro-ethene (mg/l)	Styrene (mg/l)
P46	4/80	OXY-POTT	AQ		0.017	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT
P46	7/80	OXY-POTT	AQ		0.010	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT
P46	11/80	OXY-POTT	AQ		0.009	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT
P46	12/80	OXY-POTT	AQ		0.017	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT
P46	2/81	OXY-POTT	AQ		0.019	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT
P46	4/81	OXY-POTT	AQ		0.014	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT
P46	7/81	OXY-POTT	AQ		0.016	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT
P46	10/81	OXY-POTT	AQ		0.010	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT
P46	2/82	OXY-POTT	AQ		0.020	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT
P46	3/82	RHC	AQ		0.009	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT
P46	3/82	OXY	AQ		0.005	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT
P46	4/82	OXY-POTT	AQ		0.033	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT
P46	5/82	OXY-POTT	AQ		0.009	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT
P46	6/21/82	OXY-POTT	AQ		0.012	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT
P46	7/82	OXY-POTT	AQ		0.040	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT
P46	8/26/82	OXY-POTT	AQ		0.044	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT
P46	9/82	OXY-POTT	AQ		0.012	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT
P46	10/82	OXY-POTT	AQ		0.024	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT
P46	11/82	OXY-POTT	AQ		0.008	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT
P46	1/83	OXY-POTT	AQ		0.008	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT
P46	2/83	OXY-POTT	AQ		0.012	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT
P46	2/83	OXY-POTT	AQ		0.017	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT
P46	3/26/83	OXY-POTT	AQ		0.016	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT
P46	4/83	OXY-POTT	AQ		0.019	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT
P46	5/83	OXY-POTT	AQ		0.016	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT
P46	7/83	OXY-POTT	AQ		0.012	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT
P46	8/83	OXY-POTT	AQ		0.012	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT
P46	9/83	OXY-POTT	AQ		0.010	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT
P46	10/83	OXY-POTT	AQ		0.020	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT
P46	11/83	OXY-POTT	AQ		0.078	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT
60	6/12/78	GOLDB	AQ		NT	NT	NO	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT
60	4/28/80	GOLDB	AQ		0.017	NT	0.011	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT
60-dcp		GOLDB	AQ		NT	NT	NO	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT
P47	3/82	RHC	AQ		0.005	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT
P47	4/82	OXY-POTT	AQ		0.007	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT

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(Table 1-4, cont.)

SAMPLE LOCATION	SAMPLE NAME	DATE	LABORATORY PHASE	ICE (mg/l)	Trans-1,2-DCE (mg/l)	Vinyl Chloride (mg/l)	Toluene (mg/l)	Benzene (mg/l)	Ethylbenzene (mg/l)	Chloroform (mg/l)	Acetone (mg/l)	Methylene Chloride (mg/l)	Xylenes (mg/l)	Trans 1,3-Dichloro-2-propene (mg/l)				1,1-Di Chloro-2-ethene (mg/l)		1,2-Di Chloro-2-ethene (mg/l)		Bromo-1,1,2-trichloro-2-ethane (mg/l)		Tetra-chloro-ethene (mg/l)		Styrene (mg/l)
P47	5/82	OXY-POIT	AQ	0.804	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT
P47	6/21/82	OXY-POIT	AQ	0.010	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT
P47	7/82	OXY-POIT	AQ	0.004	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT
P47	8/26/82	OXY-POIT	AQ	0.003	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT
P47	9/82	OXY-POIT	AQ	0.005	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT
P47	10/82	OXY-POIT	AQ	0.004	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT
P47	11/82	OXY-POIT	AQ	0.004	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT
P47	1/83	OXY-POIT	AQ	0.004	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT
P47	2/83	OXY-POIT	AQ	0.033	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT
P47	2/83	OXY-POIT	AQ	0.007	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT
P47	3/24/83	OXY-POIT	AQ	0.006	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT
P47	4/83	OXY-POIT	AQ	0.006	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT
P47	5/83	OXY-POIT	AQ	0.006	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT
P47	7/83	OXY-POIT	AQ	0.009	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT
P47	8/83	OXY-POIT	AQ	0.008	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT
P47	9/83	OXY-POIT	AQ	0.007	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT
P47	10/83	OXY-POIT	AQ	0.007	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT
P47	11/83	OXY-POIT	AQ	0.007	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT
P48	3/82	RMC	AQ	0.803	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT
	4/82	OXY-POIT	AQ	1.300	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT
	5/82	OXY-POIT	AQ	0.574	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT
	6/21/82	OXY-POIT	AQ	2.470	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT
	6/23/82	OXY-POIT	AQ	3.430	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT
	6/25/82	OXY-POIT	AQ	2.820	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT
	7/82	OXY-POIT	AQ	2.380	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT
	8/26/82	OXY-POIT	AQ	2.090	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT
	9/82	OXY-POIT	AQ	1.945	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT
	10/82	OXY-POIT	AQ	1.820	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT
	11/82	OXY-POIT	AQ	3.140	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT
	1/83	OXY-POIT	AQ	14.500	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT
	2/83	OXY-POIT	AQ	0.419	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT
P48	2/83	OXY-POIT	AQ	2.840	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT
P48	3/24/83	OXY-POIT	AQ	2.320	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT
P48	4/83	OXY-POIT	AQ	2.271	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT
P48	5/83	OXY-POIT	AQ	1.818	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT
P48	7/83	OXY-POIT	AQ	2.371	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT

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(Table 1-4, cont.)

SAMPLE LOCATION	SAMPLE NAME	DATE	LABORATORY PHASE	TCE (mg/l)	Trans-1,2-DCE (mg/l)	Vinyl Chloride (mg/l)	Toluene (mg/l)	Benzene (mg/l)	Ethylbenzene (mg/l)	Chloroform (mg/l)	Acetone (mg/l)	Methylene Chloride (mg/l)	Xylenes (mg/l)	Trans 1,3- Trichloro-			1,1 Di Chloro- ethene (mg/l)	1,2-Di Chloro- ethene (mg/l)	Bromo- Dichloro- methane (mg/l)	Tetra- chloro- ethene (mg/l)	Styrene (mg/l)	
														Dichloro- propene (mg/l)	Fluoro- methane (mg/l)	Chloro- ethene (mg/l)						
P49	P48	8/83	OXY-POIT	AQ	2.000	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	
	P48	9/83	OXY-POIT	AQ	8.130	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	
	P48	10/83	OXY-POIT	AQ	2.334	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	
	P48	11/83	OXY-POIT	AQ	1.068	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	
	D48	8/4/83	RHC	AQ	2.430	0.812	0.028	ND	ND	NT	ND	ND	ND	ND	ND	ND	0.003	NT	NT	ND	NT	
	80	5/21/85	RHC	AQ	1.530	0.930	0.098	0.000	ND	NT	ND	ND	ND	ND	ND	ND	0.004	NT	ND	ND	NT	
	80	8/27/85	RHC	AQ	2.800	1.600	ND	ND	ND	NT	ND	ND	ND	ND	ND	ND	ND	NT	ND	ND	NT	
	80	FBI(8/27/85	RHC	AQ	ND	ND	ND	ND	ND	NT	ND	ND	ND	ND	ND	ND	ND	NT	ND	ND	NT	
	P48	10/3/85	NUS	AQ	1.500	0.730	ND	ND	ND	NT	ND	ND	0.810	ND	ND	ND	ND	NT	ND	ND	NT	
	P48	10/3/85	Marco	AQ	1.300	1.000	0.140	0.026	0.044	NT	ND	0.140	0.810	ND	ND	ND	ND	NT	ND	ND	NT	
	P48	6/24/86	RHC	AQ	0.138	3.980	ND	ND	ND	NT	ND	ND	ND	ND	ND	ND	ND	0.002	ND	ND	NT	
	P48	6/2/86	RHC	AQ	0.225	0.375	0.026	ND	0.225	NT	ND	ND	ND	ND	ND	ND	0.002	NT	0.017	ND	NT	
	D48	7/28/88	RHC	AQ	1.200	0.430	0.026	ND	ND	NT	0.061	ND	ND	ND	ND	0.020	ND	ND	0.017	ND	NT	
	D48	8/25/88	RHC	AQ	1.500	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	
	P49	6/12/78	GOLDB	AQ	NT	NT	ND	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	
	90	4/28/80	GOLDB	AQ	0.023	NT	ND	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	
	P49	8/9/82	RHC	AQ	0.031	0.015	ND	0.000	NT	0.004	0.004	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.004	NT
	P49	8/9/82	RHC	AQ	0.028	0.015	ND	ND	ND	0.004	0.004	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.004	NT
P49	P49	11/79	OXY-POIT	AQ	0.025	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	
	P49	4/80	OXY-POIT	AQ	0.023	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	
	P49	7/80	OXY-POIT	AQ	0.010	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	
	P49	11/80	OXY-POIT	AQ	0.011	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	
	P49	12/80	OXY-POIT	AQ	0.017	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	
	P49	2/81	OXY-POIT	AQ	0.019	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	
	P49	7/81	OXY-POIT	AQ	0.071	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	
	P49	10/81	OXY-POIT	AQ	0.012	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	
	P49	2/82	OXY-POIT	AQ	0.048	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	
	P49	3/82	RHC	AQ	0.032	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	
	P49	3/82	OXY	AQ	0.031	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	
	P49	4/82	OXY-POIT	AQ	0.076	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	
	P49	5/82	OXY-POIT	AQ	0.106	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	
	P49	6/21/82	OXY-POIT	AQ	0.166	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	
	P49	7/82	OXY-POIT	AQ	0.038	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	
	P49	8/9/82	OXY-POIT	AQ	0.031/0.028	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT

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(Table 1-4, cont.)

SAMPLE LOCATION	SAMPLE NAME	DATE	LABORATORY PHASE	TCE (mg/l)	Trans-1,2-DCE (mg/l)	Vinyl Chloride (mg/l)	Toluene (mg/l)	Benzene (mg/l)	Ethylbenzene (mg/l)	Chloroform (mg/l)	Acetone (mg/l)	Methylene Chloride (mg/l)	Xylenes (mg/l)	Trans 1,3-Trichloro-			1,1-Di Chloro-ethene (mg/l)	1,2-Di Chloro-ethane (mg/l)	Bromo-Dichloro-methane (mg/l)	Tetra-chloro-ethene (mg/l)	Styrene (mg/l)	
														Dichloro-propene (mg/l)	Fluoro-methane (mg/l)	Chloro-ethene (mg/l)						
PU10	P49	8/26/82	OXY-POIT	AQ	0.021	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	
	P49	9/82	OXY-POIT	AQ	0.032	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	
	P49	10/82	OXY-POIT	AQ	0.015	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	
	P49	11/82	OXY-POIT	AQ	0.025	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	
	P49	12/82	OXY-POIT	AQ	0.023	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	
	P49	1/83	OXY-POIT	AQ	0.025	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	
	P49	2/83	OXY-POIT	AQ	0.002	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	
	P49	3/14/83	OXY-POIT	AQ	0.021	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	
	P49	3/24/83	OXY-POIT	AQ	0.110	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	
	P49	4/83	OXY-POIT	AQ	0.046	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	
	P49	5/83	OXY-POIT	AQ	0.042	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	
	P49	6/83	OXY-POIT	AQ	0.029	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	
	P49	7/83	OXY-POIT	AQ	0.034	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	
	P49	8/83	OXY-POIT	AQ	0.038	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	
	P49	9/83	OXY-POIT	AQ	0.199	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	
	P49	10/83	OXY-POIT	AQ	0.039	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	
	P49	11/83	OXY-POIT	AQ	0.058	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	
		P410	12/80	OXY-POIT	AQ	0.350	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT
		P410	3/81	OXY-POIT	AQ	0.409	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT
		P410	4/82	OXY-POIT	AQ	0.036	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT
		P410	5/82	OXY-POIT	AQ	0.047	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT
		P410	6/21/82	OXY-POIT	AQ	0.083	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT
		P410	7/82	OXY-POIT	AQ	0.337	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT
		P410	8/26/82	OXY-POIT	AQ	0.293	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT
		P410	9/82	OXY-POIT	AQ	0.042	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT
		P410	10/82	OXY-POIT	AQ	0.022	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT
	P410	11/82	OXY-POIT	AQ	0.020	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	
	P410	1/83	OXY-POIT	AQ	0.014	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	
	P410	2/83	OXY-POIT	AQ	0.049	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	
	P410	2/83	OXY-POIT	AQ	0.072	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	
	P410	3/24/83	OXY-POIT	AQ	0.068	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	
	P410	4/83	OXY-POIT	AQ	0.096	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	
	P410	5/83	OXY-POIT	AQ	0.240	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	
	P410	7/83	OXY-POIT	AQ	0.231	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	
	P410	8/83	OXY-POIT	AQ	0.096	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	
	P410	9/83	OXY-POIT	AQ	0.109	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	

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(Table 1-4, cont.)

SAMPLE NAME	LOCATION	DATE	LABORATORY	PHASE	TCE (mg/L)	Trans- 1,2-DCE (mg/L)	Vinyl Chloride (mg/L)	Toluene (mg/L)	Benzene (mg/L)	Ethyl- benzene (mg/L)	Chloro- form (mg/L)	Acetone (mg/L)	Methylene Chloride (mg/L)	Xylenes (mg/L)	Trans 1,3- Dichloro- propene (mg/L)	Trichloro- fluoro- methane (mg/L)	1,1 Di Chloro- ethane (mg/L)	1,2-Di Chloro- ethane (mg/L)	Bromo- Dichloro- methane (mg/L)	Tetra- chloro- ethene (mg/L)	Styrene (mg/L)
PW10	10/83	OXY-POIT	AQ		0.103	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT
PW10	11/83	OXY-POIT	AQ		0.243	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT
PW10	10/3/85	NUS	AQ		0.190	0.250	0.011	ND	ND	NT	ND	0.010	0.027	ND	ND	ND	ND	ND	ND	ND	NT
PW10	10/3/85	Nanco	AQ		0.180	0.230	0.042	ND	0.002	NT	ND	0.010	0.027	ND	ND	ND	ND	ND	ND	ND	NT
PW10	6/2/87	RHC	AQ		0.248	0.167	0.010	ND	ND	NT	ND	ND	ND	ND	ND	0.001	ND	ND	ND	ND	NT
PW10	6/23/88	RHC	AQ		0.076	0.100	0.008	ND	ND	NT	ND	ND	ND	ND	ND	0.001	ND	ND	ND	ND	NT
BOA	POSTPUMP	BCH	AQ		25.000	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.002	4.200
BRB	POSTPUMP	OXY-GI	AQ		36.000	9.200	1.900	8.900	ND	6.500	ND	ND	ND	ND	ND	ND	0.054	0.053	ND	ND	110.000
BRB	POSTPUMP	BCH	AQ		2.300	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
BRB	POSTPUMP	OXY-GI	AQ		2.200	4.000	3.600	1.900	ND	1.600	ND	ND	ND	ND	ND	ND	0.036	0.017	ND	ND	ND
BRC	POSTPUMP	BCH	AQ		1.000	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
BRC	POSTPUMP	OXY-GI	AQ		1.000	0.110	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND

NT : Not Tested

ND : Not Detected

J : Estimated concentration

B : Found in Method Blank

SOURCE : BCH Engineers (BCH Project No. 00-4064-08)

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TABLE 1-5

BEDROCK AQUIFER EXISTING SEMIVOLATILE ORGANIC ANALYTICAL RESULTS
OCCIDENTAL CHEMICAL CORPORATION, POTTSTOWN, PENNSYLVANIA

SAMPLE LOCATION	SAMPLE NAME	SAMPLE DATE	LABORATORY	PHASE	Bis- (2-ethylhexyl) phthalate (mg/l)	Di-N- Octyl phthalate (mg/l)	Benzo (K) Fluor- anthene (mg/l)	Benzoic Acids (mg/l)	Butyl Benzyl phthalate (mg/l)
RV1	RV1	9/27/85	NUS	AQ	0.013	ND	ND	ND	ND
RV1	RV1	9/27/85	Nanco	AQ	0.049	ND	0.011	ND	ND
RV2	RV2	9/27/85	NUS	AQ	0.018	ND	ND	ND	ND
RV2	RV2	9/27/85	Nanco	AQ	0.032	ND	ND	ND	ND
RV3	RV3	10/3/85	NUS	AQ	ND	ND	ND	ND	ND
RV3	RV3	10/3/85	Nanco	AQ	ND	ND	ND	ND	ND
RV4	RV4	9/27/85	NUS	AQ	ND	ND	ND	ND	ND
RV4	RV4	9/27/85	Nanco	AQ	0.071	ND	ND	ND	ND
PT10	PT10	10/3/85	NUS	AQ	ND	ND	ND	ND	ND
PT10	PT10	10/3/85	Nanco	AQ	0.022	ND	ND	ND	ND

ND : Not Detected

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TABLE 1-6

BEDROCK AQUIFER EXISTING METALS ANALYTICAL RESULTS
OCCIDENTAL CHEMICAL CORPORATION, POTTSTOWN, PA

SAMPLE LOCATION	SAMPLE NAME	LABORATORY PHASE	DATE	Aluminum (mg/L)	Arsenic (mg/L)	Barium (mg/L)	Cadmium (mg/L)	Calcium (mg/L)	Chromium (mg/L)	Cobalt (mg/L)	Copper (mg/L)	Iron (mg/L)	Lead (mg/L)	Magnesium (mg/L)	Manganese (mg/L)	Nickel (mg/L)	Mercury (mg/L)	Potassium (mg/L)	Selenium (mg/L)	Silver (mg/L)	Sodium (mg/L)	Thallium (mg/L)	Vanadium (mg/L)	Zinc (mg/L)
PW5	DW5 F	06/23/8	RHC	AQ	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	0.020
	PW5 F	05/02/8	RHC	AQ	--	0.022	--	--	0.014	--	0.017	--	--	--	--	--	--	--	--	--	--	--	--	0.030
PW8	DW8 F	08/04/8	RHC	AQ	--	0.002	--	--	0.020	--	--	0.060	0.001	1.660	--	--	--	--	0.0020	--	--	--	--	0.010
	DW8 F	05/21/8	RHC	AQ	--	0.002	--	--	0.034	--	0.081	0.500	0.006	1.110	--	0.070	--	--	0.0030	--	--	--	--	0.130
	DW8 F	10/03/8	NUS	AQ	0.138	--	--	611.000	0.013	--	--	0.706	--	240.000	1.450	--	--	0.777	--	--	40.900	--	--	--
	DW8 F	10/03/8	Nanco	AQ	--	--	--	659.000	0.026	--	--	0.543	--	252.000	1.500	4.000	0.0004	0.723	--	0.002	46.100	--	--	0.022
	DW8 F	06/24/8	RHC	AQ	--	--	--	--	0.014	--	0.025	--	--	--	--	0.030	--	--	0.0050	--	--	--	--	--
	DW8 F	06/23/8	RHC	AQ	--	--	--	--	--	--	0.021	--	--	--	--	--	--	--	--	--	--	--	--	0.020
	PW8 F	05/02/8	RHC	AQ	--	0.031	--	--	0.023	--	0.074	--	--	--	--	0.060	--	--	--	--	--	--	--	0.020
PW9	DW9 F	08/09/8	RHC	AQ	--	--	--	--	0.002	--	--	--	--	--	0.850	--	0.0009	--	--	--	--	--	--	--
	DW9 F	08/09/8	RHC(dup)	AQ	--	--	--	--	0.002	--	--	0.120	--	--	0.850	--	0.0020	--	--	--	--	--	--	0.010
	DW9 F	12/07/8	RHC	AQ	--	0.002	--	--	--	--	--	--	--	--	0.510	--	0.0005	--	--	--	--	--	--	--
PW10	DW10 F	10/03/8	NUS	AQ	0.178	--	--	547.000	ND	--	--	--	--	246.000	0.043	--	--	0.665	--	0.012	18.500	--	--	0.050
	DW10 F	10/03/8	Nanco	AQ	--	--	--	536.000	ND	--	0.170	0.293	0.005	244.000	0.026	3.980	0.0004	0.615	--	--	15.400	--	--	0.024
	DW10 F	06/23/8	RHC	AQ	--	0.003	--	0.002	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	0.030
	PW10 F	05/02/8	RHC	AQ	--	0.031	--	--	0.022	--	0.009	--	--	--	--	--	--	--	0.0010	--	--	--	--	0.030
RW1	Well 1 F	08/09/8	RHC	AQ	--	--	--	--	0.001	--	--	3.500	--	--	1.430	--	0.0003	--	--	--	--	--	--	0.010
	Well 1 F	08/09/8	RHC(dup)	AQ	--	--	--	--	--	--	--	6.500	--	--	1.640	--	0.0002	--	--	--	--	--	--	--
	Well 1 F	12/07/8	RHC	AQ	--	0.003	--	0.001	--	--	--	0.370	--	--	1.180	0.020	0.0001	--	0.0010	--	--	--	--	--
	RW1 UF	9/27/85	NUS	AQ	--	--	0.295	49.200	--	--	0.034	977.000	--	18.000	1.470	0.047	--	1.300	--	--	22.400	--	--	0.084
	RW1 UF	9/27/85	Nanco	AQ	0.236	--	0.309	44.000	0.046	--	0.064	981.000	0.006	16.900	1.390	4.770	0.0006	0.942	--	--	20.700	0.044	--	0.122
	RW1 F	9/27/85	NUS	AQ	--	--	0.199	49.100	--	--	--	1.590	--	18.000	1.180	--	--	1.270	--	--	21.100	--	--	--
	RW1 UF	9/27/85	Nanco	AQ	0.115	--	0.197	54.000	--	--	--	0.142	0.280	19.200	1.550	3.270	0.0004	2.000	--	--	22.800	--	--	0.439
RW2	Well 2 F	08/09/8	RHC	AQ	--	0.004	--	--	--	--	--	--	--	--	--	--	0.0002	--	--	--	--	--	--	--
	Well 2 F	12/07/8	RHC	AQ	--	0.010	--	--	--	--	--	0.120	--	--	--	--	0.0005	--	0.0001	--	--	--	--	--
	RW2 UF	09/27/8	NUS	AQ	0.238	0.013	0.509	46.400	--	--	--	198.000	0.067	13.300	6.590	0.049	--	--	--	--	6.760	--	--	0.050
	RW2 UF	09/27/8	Nanco	AQ	0.980	0.083	0.533	0.006	--	--	0.034	203.000	0.048	13.100	0.588	13.900	0.0009	0.632	--	--	6.700	--	--	0.097
	RW2 F	09/27/8	NUS	AQ	--	--	--	41.800	--	--	--	0.027	--	13.500	0.024	--	--	0.717	--	--	7.500	--	--	--
	RW2 F	09/27/8	Nanco	AQ	--	--	--	42.200	--	--	--	0.046	--	12.900	0.028	3.840	0.0007	0.812	--	--	5.600	0.013	--	0.050

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SAMPLE LOCATION	SAMPLE NAME	DATE	Barium (mg/L)	Arsenic (mg/L)	Cadmium (mg/L)	Calcium (mg/L)	Chromium (mg/L)	Cobalt (mg/L)	Copper (mg/L)	Iron (mg/L)	Lead (mg/L)	Magnesium (mg/L)	Manganese (mg/L)	Nickel (mg/L)	Mercury (mg/L)	Potassium (mg/L)	Selenium (mg/L)	Silver (mg/L)	Sodium (mg/L)	Thallium (mg/L)	Vanadium (mg/L)	Zinc (mg/L)
R13	R13	UF 10/03/8	..	..	0.715	..	51.000	..	..	1053.000	0.007	13.300	3.530	..	..	0.507	..	..	6.880	..	..	..
	R13	UF 10/03/8	..	2.670	1.240	..	51.700	1.150	..	1432.000	0.020	11.600	3.770	43.300	0.0003	..	..	..	5.200	..	0.135	0.129
	R13	F 10/03/8	..	0.198	..	..	42.700	..	..	0.754	..	11.600	0.481	..	..	0.667	..	..	6.530	..	..	..
	R13	UF 10/03/8	..	..	..	..	44.500	..	..	0.361	..	10.300	0.343	2.170	0.0003	0.811	..	..	3.300	..	..	0.067
R14	R14	UF 09/27/8	..	2.000	0.426	0.005	21.900	0.027	0.086	..	0.001	8.420	4.000	0.080	0.0002	..	..	0.003	22.600	0.024	0.112	0.228
	R14	UF 09/27/8	..	8.700	0.519	0.092	29.600	1.140	0.386	142.800	0.045	8.000	7.420	5.850	0.0002	1.320	..	0.002	23.400	..	..	0.400
	R14	F 09/27/8	..	..	..	..	22.000	..	..	0.069	..	7.640	0.250	..	..	1.010	..	..	23.800	..	..	..
	R14	F 09/27/8	..	..	..	..	24.100	..	..	0.092	..	6.800	0.355	3.750	0.0004	0.717	..	..	17.300	..	..	0.075
FIELD BLANK	F	08/09/8	..	..	..	..	..	0.002	..	..	..	..	..	..	..	..	..	..	..	..	..	..
FIELD BLANK	F	12/07/8	..	..	..	..	..	0.003	..	..	..	..	..	..	..	..	..	..	..	..	..	..
FIELD BLANK	F	12/07/8	..	..	..	..	..	0.001	..	..	..	..	..	..	..	..	..	..	..	..	..	..
FIELD BLANK	F	05/21/8	..	..	0.001	..	..	..	..	..	..	..	..	..	..	0.0010	..	..	..	..	..	0.030

NT : Not Tested
 ND : Not Detected
 -- : Not currently determined as to Not Detected (ND) or Not Tested (NT)
 F : Filtered sample
 UF : Unfiltered sample

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TABLE 1-7

OVERBURDEN AQUIFER EXISTING VOLATILE ORGANIC ANALYTICAL RESULTS
OCCIDENTAL CHEMICAL CORPORATION, POTTSTOWN, PENNSYLVANIA

SAMPLE LOCATION	SAMPLE NAME	SAMPLE DATE	LABORATORY PHASE	TCE (mg/L)	Trans- Vinyl 1,2-DCE Chloride (mg/L)	Toluene (mg/L)	Benzene (mg/L)	Chloro- form (mg/L)	Acetone Chloride (mg/L)	Methylene Chloride (mg/L)
OW5	5S	02/10/78	Gollob	AQ	NT	NT	NT	NT	NT	NT
	5S	06/12/78	Gollob	AQ	NT	NT	NT	NT	NT	NT
	Well 5	04/81	OXY-POTT	AQ	NT	NT	NT	NT	NT	NT
	Well 5	07/81	OXY-POTT	AQ	ND	NT	NT	NT	NT	NT
	Well 5	10/81	OXY-POTT	AQ	ND	NT	NT	NT	NT	NT
	Well 5	02/82	OXY-POTT	AQ	ND	NT	NT	NT	NT	NT
	Well 5	07/14/82	Wastex	AQ	ND	ND	ND	ND	ND	ND
	MW 5	07/14/82	PADER	AQ	ND	ND	ND	ND	ND	ND
	Seep near	04/18/84	PADER	AQ	ND	ND	ND	ND	ND	ND
	MW 5	04/18/84	PADER	AQ	ND	ND	ND	ND	ND	ND
	5S	04/16/85	RMC	AQ	<0.001	ND	ND	ND	ND	0.005
OW5A	MW 5	06/02/87	NA	AQ	ND	ND	ND	ND	ND	ND
	Well #5	06/23/88	RMC	AQ	ND	ND	ND	ND	ND	ND
	Well #5	06/23/88	PADER	AQ	ND	ND	ND	ND	ND	ND
OW6	6S	02/10/78	Gollob	AQ	NT	NT	NT	NT	NT	NT
	6S	06/12/78	Gollob	AQ	NT	NT	NT	NT	NT	NT
	6S	04/28/80	Gollob	AQ	NT	NT	NT	NT	NT	NT
	Well 6	10/79	OXY-POTT	AQ	NT	NT	NT	NT	NT	NT
	Well 6	02/80	OXY-POTT	AQ	ND	NT	NT	NT	NT	NT
	Well 6	04/80	OXY-POTT	AQ	ND	NT	NT	NT	NT	NT
	Well 6	04/81	OXY-POTT	AQ	ND	NT	NT	NT	NT	NT
	Well 6	07/81	OXY-POTT	AQ	ND	NT	NT	NT	NT	NT
	Well 6	10/81	OXY-POTT	AQ	ND	NT	NT	NT	NT	NT
	Well 6	02/82	OXY-POTT	AQ	ND	NT	NT	NT	NT	NT
	Well 6	07/14/82	Wastex	AQ	ND	ND	ND	ND	ND	ND
	MW 6	07/14/82	PADER	AQ	ND	ND	ND	ND	ND	ND
OW6A	MW 6	04/18/84	PADER	AQ	ND	ND	ND	ND	ND	ND
	6S	04/16/85	RMC	AQ	ND	ND	ND	ND	ND	0.004
	MW 6	09/27/85	MUS	AQ	ND	ND	ND	ND	ND	ND
	MW 6	09/27/85	Nanco	AQ	ND	ND	ND	ND	ND	0.028

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(Table 1-7, cont.)

SAMPLE LOCATION	SAMPLE NAME	SAMPLE DATE	LABORATORY PHASE	TCE (mg/L)	Trans- Vinyl 1,2-DCE Chloride (mg/L)	Toluene (mg/L)	Benzene (mg/L)	Chloro- form (mg/L)	Acetone (mg/L)	Methylene Chloride (mg/L)
OW7	MW 6	06/02/87	NA	AQ	ND	ND	ND	ND	ND	ND
	Well 6	06/23/88	RMC	AQ	ND	ND	ND	ND	ND	ND
	Well 6	06/23/88	PADER	AQ	ND	ND	ND	ND	ND	ND
	7S	02/10/78	Gollob	AQ	NT	NT	NT	NT	NT	NT
	7S	06/12/78	Gollob	AQ	NT	NT	NT	NT	NT	NT
	Well 7	10/79	OXY-POTT	AQ	0.012	NT	NT	NT	NT	NT
	Well 7	02/80	OXY-POTT	AQ	ND	NT	NT	NT	NT	NT
	Well 7	04/80	OXY-POTT	AQ	ND	NT	NT	NT	NT	NT
	7S	04/28/80	OXY-POTT	AQ	NT	NT	NT	NT	NT	NT
	Well 7	02/82	OXY-POTT	AQ	ND	NT	NT	NT	NT	NT
OW7A	Well 7	07/14/82	Wastex	AQ	ND	ND	ND	ND	ND	ND
	MW 7	07/14/82	PADER	AQ	0.003	ND	ND	ND	ND	ND
	MW 7	04/18/84	PADER	AQ	ND	ND	ND	ND	ND	ND
	7S	04/16/85	RMC	AQ	<0.001	ND	ND	ND	ND	ND
	MW7	06/02/87	NA	AQ	0.007	ND	ND	ND	ND	ND
	Well 7	06/06/87	PADER	AQ	0.011	ND	ND	ND	ND	ND
	Well 7	06/23/88	PADER	AQ	ND	ND	ND	ND	ND	ND
	Well 7	06/23/88	RMC	AQ	0.005	ND	ND	ND	ND	ND
	8S	02/10/78	Gollob	AQ	NT	NT	NT	NT	NT	NT
	8S	06/12/78	Gollob	AQ	NT	NT	NT	NT	NT	NT
OW8	8S	04/28/80	Gollob	AQ	NT	NT	NT	NT	NT	NT
	Well 8	07/14/82	Wastex	AQ	ND	ND	ND	ND	ND	ND
	MW 8	07/14/82	PADER	AQ	ND	ND	ND	ND	ND	ND
	MW 8	04/18/84	PADER	AQ	ND	ND	ND	ND	ND	ND
	8S	04/16/85	RMC	AQ	ND	ND	ND	ND	ND	ND
	Well 8	06/02/87	PADER	AQ	0.004	ND	ND	ND	ND	ND
	MW 8	06/02/87	RMC	AQ	0.003	ND	ND	ND	ND	ND
	Well 8	06/23/88	PADER	AQ	ND	ND	ND	0.005	ND	ND
	Well 8	06/23/88	RMC	AQ	0.002	ND	ND	ND	ND	ND
	MW 14	06/02/87	RMC	AQ	ND	0.001	ND	ND	ND	ND
OW14	Well 14A	06/23/88	RMC	AQ	ND	0.002	ND	ND	ND	ND
	MW 24A	06/02/87	RMC	AQ	ND	ND	ND	ND	ND	ND

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(Table 1-7, cont.)

SAMPLE LOCATION	SAMPLE NAME	SAMPLE DATE	LABORATORY	PHASE	TCE (mg/L)	Trans-1,2-DCE (mg/L)	Vinyl Chloride (mg/L)	Toluene (mg/L)	Benzene (mg/L)	Chloroform (mg/L)	Acetone (mg/L)	Methylene Chloride (mg/L)
24A		06/23/88	RMC	AQ	ND	ND	ND	ND	ND	ND	ND	ND
OW25	MW 25	10/03/85	NUS	AQ	ND	ND	ND	ND	ND	ND	ND	ND
	MW 25	10/03/85	Nanco	AQ	ND	0.014	0.044	0.002	0.003	ND	0.014	0.020
OW27A	MW 27	06/02/87	RMC	AQ	0.010	0.002	ND	ND	ND	0.002	ND	ND
	Well 27	06/23/88	RMC	AQ	0.010	0.002	ND	ND	ND	ND	ND	ND
	Well 27	06/23/88	PADER	AQ	ND	ND	ND	ND	ND	ND	ND	ND

NT : Not Tested
 ND : Not Detected
 NA : Not Available
 TCE : Trichloroethane
 DCE : Dichloroethane

Note: OW8A and OW27A have been reclassified as bedrock wells in the RI.
OW24A has been reclassified as an overburden/bedrock well.

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TABLE 1-8

OVERBURDEN AQUIFER METALS ANALYTICAL RESULTS
OCCIDENTAL CHEMICAL CORPORATION, POTTSTOWN PENNSYLVANIA

SAMPLE LOCATION	SAMPLE NAME	SAMPLE DATE	LABORATORY	PHASE	Aluminum (mg/l)	Antimony (mg/l)	Arsenic (mg/l)	Barium (mg/l)	Beryllium (mg/l)	Cadmium (mg/l)	Calcium (mg/l)	Chromium (mg/l)	Cobalt (mg/l)	Copper (mg/l)	Iron (mg/l)	Lead (mg/l)	Magnesium (mg/l)	Manganese (mg/l)	Mercury (mg/l)
2 LF	MW2	09/27/85	Nanco	AQ	NT	0.080	5.60	74.700	0.824	0.013	0.05	0.45	0.36	0.0001	0.0002	0.05	0.0001	0.0002	0.0001
	MW2	09/27/85	Nanco	AQ	471.000	0.297	5.60	107.000	0.824	0.013	0.05	0.45	0.36	0.0001	0.0002	0.05	0.0001	0.0002	0.0001
	MW2	09/27/85	NUS	AQ	0.205	0.016	4.15	86.700	0.173	0.013	0.05	0.45	0.36	0.0001	0.0002	0.05	0.0001	0.0002	0.0001
	MW2	09/27/85	NUS	AQ	128.000	0.016	4.15	86.700	0.173	0.013	0.05	0.45	0.36	0.0001	0.0002	0.05	0.0001	0.0002	0.0001
OW5	MW5	07/14/82	DER	AQ	NT	0.080	5.60	74.700	0.824	0.013	0.05	0.45	0.36	0.0001	0.0002	0.05	0.0001	0.0002	0.0001
	Well 5	07/14/82	Wastex	AQ	471.000	0.297	5.60	107.000	0.824	0.013	0.05	0.45	0.36	0.0001	0.0002	0.05	0.0001	0.0002	0.0001
	Well 5	08/09/82	RMC	AQ	0.205	0.016	4.15	86.700	0.173	0.013	0.05	0.45	0.36	0.0001	0.0002	0.05	0.0001	0.0002	0.0001
	Well 5	12/07/82	RMC	AQ	128.000	0.016	4.15	86.700	0.173	0.013	0.05	0.45	0.36	0.0001	0.0002	0.05	0.0001	0.0002	0.0001
	Well 5	01/13/83	OXY-POTT	AQ	NT	0.080	5.60	74.700	0.824	0.013	0.05	0.45	0.36	0.0001	0.0002	0.05	0.0001	0.0002	0.0001
	Well 5	04/14/83	OXY-POTT	AQ	471.000	0.297	5.60	107.000	0.824	0.013	0.05	0.45	0.36	0.0001	0.0002	0.05	0.0001	0.0002	0.0001
	Well 5	07/21/83	OXY-POTT	AQ	0.205	0.016	4.15	86.700	0.173	0.013	0.05	0.45	0.36	0.0001	0.0002	0.05	0.0001	0.0002	0.0001
	Well 5	10/27/83	OXY-POTT	AQ	128.000	0.016	4.15	86.700	0.173	0.013	0.05	0.45	0.36	0.0001	0.0002	0.05	0.0001	0.0002	0.0001
	Well 5	02/02/84	OXY-POTT	AQ	NT	0.080	5.60	74.700	0.824	0.013	0.05	0.45	0.36	0.0001	0.0002	0.05	0.0001	0.0002	0.0001
	Well 5	04/18/84	DER	AQ	9.520	0.016	4.15	86.700	0.173	0.013	0.05	0.45	0.36	0.0001	0.0002	0.05	0.0001	0.0002	0.0001
	MW5	04/18/84	DER	AQ	51.000	0.016	4.15	86.700	0.173	0.013	0.05	0.45	0.36	0.0001	0.0002	0.05	0.0001	0.0002	0.0001
	MW5	08/02/84	OXY-POTT	AQ	NT	0.080	5.60	74.700	0.824	0.013	0.05	0.45	0.36	0.0001	0.0002	0.05	0.0001	0.0002	0.0001
	Well 5	08/02/84	OXY-POTT	AQ	471.000	0.297	5.60	107.000	0.824	0.013	0.05	0.45	0.36	0.0001	0.0002	0.05	0.0001	0.0002	0.0001
	Well 5	11/08/84	OXY-POTT	AQ	0.205	0.016	4.15	86.700	0.173	0.013	0.05	0.45	0.36	0.0001	0.0002	0.05	0.0001	0.0002	0.0001
	SS	04/16/85	Wastex	AQ	NT	0.080	5.60	74.700	0.824	0.013	0.05	0.45	0.36	0.0001	0.0002	0.05	0.0001	0.0002	0.0001
	MW5	04/16/85	RMC	AQ	9.520	0.016	4.15	86.700	0.173	0.013	0.05	0.45	0.36	0.0001	0.0002	0.05	0.0001	0.0002	0.0001
OW5A	MW5	07/25/85	OXY-POTT	AQ	51.000	0.016	4.15	86.700	0.173	0.013	0.05	0.45	0.36	0.0001	0.0002	0.05	0.0001	0.0002	0.0001
	MW5	10/24/85	OXY-POTT	AQ	NT	0.080	5.60	74.700	0.824	0.013	0.05	0.45	0.36	0.0001	0.0002	0.05	0.0001	0.0002	0.0001
	MW5	06/23/85	DER	AQ	0.310	0.016	4.15	86.700	0.173	0.013	0.05	0.45	0.36	0.0001	0.0002	0.05	0.0001	0.0002	0.0001
	MW5	06/23/85	DER	AQ	NT	0.080	5.60	74.700	0.824	0.013	0.05	0.45	0.36	0.0001	0.0002	0.05	0.0001	0.0002	0.0001
	MW5	03/14/86	OXY-POTT	AQ	0.310	0.016	4.15	86.700	0.173	0.013	0.05	0.45	0.36	0.0001	0.0002	0.05	0.0001	0.0002	0.0001
	Well 5	06/04/86	RMC	AQ	NT	0.080	5.60	74.700	0.824	0.013	0.05	0.45	0.36	0.0001	0.0002	0.05	0.0001	0.0002	0.0001
	MW5	06/04/86	DER	AQ	0.310	0.016	4.15	86.700	0.173	0.013	0.05	0.45	0.36	0.0001	0.0002	0.05	0.0001	0.0002	0.0001
	MW5	06/02/87	RMC	AQ	NT	0.080	5.60	74.700	0.824	0.013	0.05	0.45	0.36	0.0001	0.0002	0.05	0.0001	0.0002	0.0001
	MW5	06/23/88	RMC	AQ	0.310	0.016	4.15	86.700	0.173	0.013	0.05	0.45	0.36	0.0001	0.0002	0.05	0.0001	0.0002	0.0001
	MW5	06/23/88	DER	AQ	NT	0.080	5.60	74.700	0.824	0.013	0.05	0.45	0.36	0.0001	0.0002	0.05	0.0001	0.0002	0.0001
OW6	MW6	07/14/82	DER	AQ	NT	0.080	5.60	74.700	0.824	0.013	0.05	0.45	0.36	0.0001	0.0002	0.05	0.0001	0.0002	0.0001
	Well 6	07/14/82	Wastex	AQ	471.000	0.297	5.60	107.000	0.824	0.013	0.05	0.45	0.36	0.0001	0.0002	0.05	0.0001	0.0002	0.0001
	Well 6	08/09/82	RMC	AQ	0.205	0.016	4.15	86.700	0.173	0.013	0.05	0.45	0.36	0.0001	0.0002	0.05	0.0001	0.0002	0.0001
	Well 6	12/07/82	RMC	AQ	128.000	0.016	4.15	86.700	0.173	0.013	0.05	0.45	0.36	0.0001	0.0002	0.05	0.0001	0.0002	0.0001
	MW6	01/13/83	OXY-POTT	AQ	NT	0.080	5.60	74.700	0.824	0.013	0.05	0.45	0.36	0.0001	0.0002	0.05	0.0001	0.0002	0.0001
	MW6	04/14/83	OXY-POTT	AQ	471.000	0.297	5.60	107.000	0.824	0.013	0.05	0.45	0.36	0.0001	0.0002	0.05	0.0001	0.0002	0.0001
	MW6	07/21/83	OXY-POTT	AQ	0.205	0.016	4.15	86.700	0.173	0.013	0.05	0.45	0.36	0.0001	0.0002	0.05	0.0001	0.0002	0.0001
	MW6	10/27/83	OXY-POTT	AQ	128.000	0.016	4.15	86.700	0.173	0.013	0.05	0.45	0.36	0.0001	0.0002	0.05	0.0001	0.0002	0.0001
	MW6	02/02/84	OXY-POTT	AQ	NT	0.080	5.60	74.700	0.824	0.013	0.05	0.45	0.36	0.0001	0.0002	0.05	0.0001	0.0002	0.0001
	MW6	04/18/84	DER	AQ	200.000	0.016	4.15	86.700	0.173	0.013	0.05	0.45	0.36	0.0001	0.0002	0.05	0.0001	0.0002	0.0001
OW6	MW6	04/18/84	DER	AQ	1.700	0.016	4.15	86.700	0.173	0.013	0.05	0.45	0.36	0.0001	0.0002	0.05	0.0001	0.0002	0.0001
	MW6	04/19/84	Wastex	AQ	1.700	0.016	4.15	86.700	0.173	0.013	0.05	0.45	0.36	0.0001	0.0002	0.05	0.0001	0.0002	0.0001
	MW6	08/02/84	OXY-POTT	AQ	NT	0.080	5.60	74.700	0.824	0.013	0.05	0.45	0.36	0.0001	0.0002	0.05	0.0001	0.0002	0.0001
	MW6	11/08/84	OXY-POTT	AQ	NT	0.080	5.60	74.700	0.824	0.013	0.05	0.45	0.36	0.0001	0.0002	0.05	0.0001	0.0002	0.0001

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ble 1-8, cont.)

AMPLE CATION	SAMPLE NAME	SAMPLE DATE	LABORATORY	PHASE	Nickel (mg/L)	Potassium (mg/L)	Silver (mg/L)	Sodium (mg/L)	Selenium (mg/L)	Thallium (mg/L)	Tin (mg/L)	Vanadium (mg/L)	Zinc (mg/L)	REMARKS
2 LF	MW2	09/27/85	Nanco	AQ	5.65	5.870	0.002	122.00	--	--	--	--	171.00	Filtered
	MW2	09/27/85	Nanco	AQ	21.80	80.700	0.004	147.00	--	0.074	--	0.836	2.27	Unfiltered
	MW2	09/27/85	NUS	AQ	0.05	3.700	--	104.00	--	--	--	--	0.05	Filtered
	MW2	09/27/85	NUS	AQ	0.42	10.500	--	94.20	--	--	--	0.225	1.00	Unfiltered
OW5	MW5	07/14/82	DER	AQ	60.00	--	--	--	--	--	--	--	100.00	--
	Well 5	07/14/82	Wastex	AQ	--	--	--	10.50	--	--	--	--	--	--
	Well 5	08/09/82	RMC	AQ	--	--	--	16.00	--	--	--	--	0.03	--
	Well 5	12/07/82	RMC	AQ	0.02	--	--	4.90	0.002	--	--	--	--	--
	Well 5	01/13/83	OXY-POTT	AQ	--	--	--	--	--	--	--	--	--	--
	Well 5	04/14/83	OXY-POTT	AQ	--	--	--	--	--	--	--	--	--	--
	Well 5	07/21/83	OXY-POTT	AQ	--	--	--	--	--	--	--	--	--	--
	Well 5	10/27/83	OXY-POTT	AQ	--	--	--	--	--	--	--	--	--	--
	Well 5	02/02/84	OXY-POTT	AQ	--	--	--	--	--	--	--	--	--	--
	MW5	04/18/84	DER	AQ	--	--	--	--	--	--	--	--	200.00	--
	M5	04/19/84	Wastex	AQ	--	--	--	--	--	--	--	--	--	--
	Well 5	08/02/84	OXY-POTT	AQ	--	--	--	--	--	--	--	--	--	--
	Well 5	11/08/84	OXY-POTT	AQ	--	--	--	--	--	--	--	--	--	--
	SS	04/16/85	Wastex	AQ	--	--	--	7.20	0.011	--	--	--	0.02	--
	MW5	07/25/85	RMC	AQ	--	--	--	--	--	--	--	--	--	--
	MW5	10/24/85	OXY-POTT	AQ	--	--	--	--	--	--	--	--	--	--
	MW5	06/23/85	OXY-POTT	AQ	--	--	--	--	--	--	--	--	--	Filtered
	MW5	06/23/85	DER	AQ	--	--	--	--	--	--	--	--	--	Unfiltered
	MW5	03/14/86	OXY-POTT	AQ	--	--	--	10.60	--	--	--	--	0.07	--
	Well 5	06/04/86	RMC	AQ	NT	--	--	20.10	0.009	--	--	--	0.50	--
OW5A	MW5	06/04/86	DER	AQ	0.05	--	--	--	--	--	--	--	0.05	--
	MW5	06/02/87	RMC	AQ	--	1.100	--	20.00	0.002	--	--	--	--	--
	MW5	06/23/88	RMC	AQ	--	1.300	--	23.00	--	--	--	--	0.03	Filtered
	MW5	06/23/88	DER	AQ	--	1.000	--	19.10	--	--	--	--	--	Unfiltered
	MW5	06/23/88	DER	AQ	--	1.090	--	--	--	--	--	--	--	--
OW6	MW6	07/14/82	DER	AQ	40.00	--	--	--	--	--	--	--	70.00	--
	Well 6	07/14/82	Wastex	AQ	--	--	--	--	--	--	--	--	--	--
	Well 6	08/09/82	RMC	AQ	--	--	--	--	--	--	--	--	0.01	--
	Well 6	12/07/82	RMC	AQ	--	--	--	0.00	0.040	--	--	--	--	--
	MW6	01/13/83	OXY-POTT	AQ	--	--	--	--	--	--	--	--	--	--
	MW6	04/14/83	OXY-POTT	AQ	--	--	--	--	--	--	--	--	--	--
	MW6	07/21/83	OXY-POTT	AQ	--	--	--	--	--	--	--	--	--	--
	MW6	10/27/83	OXY-POTT	AQ	--	--	--	--	--	--	--	--	--	--
	MW6	02/02/84	OXY-POTT	AQ	--	--	--	--	--	--	--	--	--	--
	MW6	04/18/84	DER	AQ	--	--	--	--	--	--	--	--	90.00	--
	MW6	04/19/84	OXY-POTT	AQ	--	--	--	--	--	--	--	--	--	--
	M6	04/19/84	Wastex	AQ	--	--	--	--	--	--	--	--	--	--
	MW6	08/02/84	OXY-POTT	AQ	--	--	--	--	--	--	--	--	--	--
	MW6	11/08/84	OXY-POTT	AQ	--	--	--	--	--	--	--	--	--	--

ND : Not Detected
 NT : Not Tested
 -- : Currently not determined to be Not Detected (ND) or Not Tested (NT)
 LF : Landfill

AR304242

OVERBURDEN AQUIFER METALS ANALYTICAL RESULTS
OCCIDENTAL CHEMICAL CORPORATION, POTTSTOWN PENNSYLVANIA

ble 1-8, cont.)

HPLE ATION	SAMPLE NAME	SAMPLE DATE	LABORATORY	PHASE	Aluminum (mg/L)	Antimony (mg/L)	Arsenic (mg/L)	Barium (mg/L)	Beryllium (mg/L)	Cadmium (mg/L)	Calcium (mg/L)	Chromium (mg/L)	Cobalt (mg/L)	Copper (mg/L)	Iron (mg/L)	Lead (mg/L)	Magnesium (mg/L)	Manganese (mg/L)	Mercury (mg/L)
M6	M6	01/24/85	OXY-POTT	AQ	0.600	--	--	--	--	--	--	--	--	--	0.55	--	--	0.27	--
	M6	04/16/85	OXY-POTT	AQ	--	--	--	--	--	--	--	--	--	--	0.04	--	--	0.15	--
	M6	04/16/85	RMC	AQ	--	--	--	--	--	--	--	0.006	--	0.01	0.04	--	--	--	--
	6S	04/16/85	Wastex	AQ	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
	M6	06/23/85	DER	AQ	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
	M6	06/23/85	DER	AQ	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
	M6	07/25/85	OXY-POTT	AQ	--	--	--	--	--	--	--	--	--	--	14.50	--	--	--	--
	M6	09/27/85	Nanco	AQ	0.496	--	--	--	--	--	10.700	291.000	0.142	219.00	0.03	37.30	2.90	0.25	0.0004
	M6	09/27/85	Nanco	AQ	210.000	--	217.000	188.00	0.007	--	17.100	--	--	--	355.00	120.00	37.30	7.96	0.0006
	M6	09/27/85	NUS	AQ	0.205	--	10.400	--	--	--	10.400	--	--	--	0.05	--	3.55	0.20	--
	M6	09/27/85	NUS	AQ	89.600	--	--	1.46	--	--	17.800	0.138	--	0.14	14.20	0.02	28.30	8.17	--
ON6A	M6	03/14/86	OXY-POTT	AQ	--	--	--	--	--	--	--	--	--	--	4.67	--	--	0.28	--
	M6	06/04/86	OXY-POTT	AQ	--	--	0.002	--	--	0.001	NT	0.011	--	0.01	4.67	0.00	NT	0.28	--
	Well 6	06/04/86	RMC	AQ	0.220	--	--	--	--	--	NT	--	--	--	0.16	--	NT	0.04	--
	Well 6	06/04/86	DER	AQ	--	--	0.001	--	--	--	14.000	0.006	--	--	--	--	5.20	0.40	--
	M6	06/02/87	RMC	AQ	--	--	--	--	--	--	14.000	--	--	--	--	--	5.20	0.40	--
	M6	06/02/87	OXY-POTT	AQ	--	--	--	--	--	0.003	14.000	--	--	0.03	--	0.02	5.70	0.10	--
	M6	06/23/88	RMC	AQ	--	--	--	0.06	--	--	12.100	0.005	--	0.02	0.04	--	4.69	0.15	--
	M6	06/23/88	DER	AQ	--	--	--	0.07	--	--	12.900	--	--	0.02	0.40	--	4.88	0.17	--
	M6	06/23/88	DER	AQ	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
ON7	Well 7	07/14/82	Wastex	AQ	--	--	--	40.00	--	--	--	--	--	--	0.77	--	--	--	--
	M7	07/14/82	DER	AQ	NT	--	--	--	--	1.370	--	40.000	--	30.00	370.00	7.50	--	1520.00	--
	Well 7	08/09/82	RMC	AQ	--	--	--	--	--	--	--	--	--	--	0.21	--	--	1.90	--
	M7	04/14/83	OXY-POTT	AQ	0.400	--	--	--	--	--	--	--	--	--	5.20	--	--	--	--
	M7	07/21/83	OXY-POTT	AQ	--	--	--	--	--	--	--	--	--	--	4.30	--	--	--	--
	M7	02/02/84	OXY-POTT	AQ	--	--	--	--	--	--	--	--	--	--	4060.00	6.60	--	1110.00	--
	M7	04/18/84	DER	AQ	2140.000	--	--	--	--	1.100	--	--	--	--	2.80	--	--	1.10	--
	M7	04/19/84	OXY-POTT	AQ	2.100	--	--	--	--	--	--	--	--	--	2.30	--	--	1.10	--
	M7	04/19/84	Wastex	AQ	--	--	--	--	--	--	--	--	--	--	1.50	--	--	1.20	--
	M7	08/02/84	OXY-POTT	AQ	0.600	--	--	--	--	--	--	--	--	--	0.05	--	--	--	--
	M7	01/24/85	OXY-POTT	AQ	--	--	--	--	--	--	--	--	--	--	0.05	--	--	--	--
ON7A	M7	04/16/85	OXY-POTT	AQ	--	--	--	--	--	--	--	--	--	--	0.01	--	--	1.14	--
	M7	04/16/85	Wastex	AQ	--	--	--	--	--	--	--	0.005	--	--	--	--	--	--	--
	7S	04/16/85	RMC	AQ	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
	M7	06/23/85	DER	AQ	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
	M7	06/23/85	DER	AQ	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
	M7	03/14/86	OXY-POTT	AQ	--	--	--	--	--	--	--	--	--	0.03	0.30	--	--	1.30	0.0003
	M7	06/04/86	OXY-POTT	AQ	--	--	0.044	--	--	--	--	0.061	--	0.08	72.00	0.03	--	2.06	0.0003
	M7	06/04/86	RMC	AQ	0.390	--	0.048	0.70	--	--	NT	0.079	--	0.09	108.00	0.04	NT	2.16	0.0003
	Well 7	06/04/86	DER	AQ	--	--	--	--	--	--	NT	--	--	--	0.11	--	NT	0.05	--
	M7	06/04/86	DER	AQ	--	--	0.001	--	--	0.002	19.700	0.003	--	0.01	--	--	6.40	--	--
	M7	06/02/87	RMC	AQ	--	--	0.048	0.70	--	--	19.700	--	--	--	--	--	6.40	--	--
	M7	06/23/88	OXY-POTT	AQ	--	--	--	--	--	0.000	22.000	--	--	0.02	0.03	--	8.07	--	--
	M7	06/23/88	DER	AQ	--	--	--	0.07	--	0.000	22.600	--	--	0.01	0.06	--	8.30	--	--

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File 1-8, cont.)

HPLE ATION NAME	SAMPLE DATE	LABORATORY	PHASE	Nickel (mg/l)	Potassium (mg/l)	Silver (mg/l)	Sodium (mg/l)	Selenium (mg/l)	Thallium (mg/l)	Tin (mg/l)	Vanadium (mg/l)	Zinc (mg/l)	REMARKS
M6	01/24/85	OXY-POTT	AQ	--	--	--	--	--	--	--	--	--	--
M6	04/16/85	OXY-POTT	AQ	--	--	--	--	--	--	--	--	--	--
M6	04/16/85	RMC	AQ	--	--	--	--	--	--	--	--	0.01	--
6S	04/16/85	Wastex	AQ	--	--	--	--	--	--	--	--	--	--
M6	06/23/85	DER	AQ	--	--	--	--	--	--	--	--	0.04	Filtered
M6	06/23/85	DER	AQ	--	--	--	--	--	--	--	--	0.03	Unfiltered
M6	07/25/85	OXY-POTT	AQ	--	--	--	--	--	--	--	--	--	--
M6	09/27/85	Manco	AQ	3.40	42.700	--	4.20	--	0.011	--	0.377	0.83	Filtered
M6	09/27/85	NUS	AQ	21.20	--	--	12.50	--	--	--	0.225	1.00	Unfiltered
M6	09/27/85	NUS	AQ	--	3.940	--	7.43	--	--	--	0.152	0.55	Unfiltered
M6	09/27/85	OXY-POTT	AQ	0.18	--	--	4.50	--	--	--	--	0.02	--
M6	03/14/86	OXY-POTT	AQ	--	--	--	4.30	12.000	--	--	--	50.00	--
M6	06/04/86	OXY-POTT	AQ	--	--	--	4.30	0.012	--	--	--	0.05	--
Well 6	06/04/86	RMC	AQ	NT	--	--	4.30	--	--	--	--	0.04	--
M6	06/02/87	RMC	AQ	--	0.400	--	5.00	--	--	--	--	--	--
M6	06/02/87	OXY-POTT	AQ	--	0.600	--	6.00	--	--	--	--	0.04	--
M6	06/23/88	DER	AQ	--	0.330	--	4.05	--	--	--	--	--	Filtered
M6	06/23/88	DER	AQ	--	0.410	--	3.86	--	--	--	--	--	Unfiltered
OW7	Well 7	Wastex	AQ	50.00	--	--	--	--	--	--	--	120.00	--
M7	07/14/82	DER	AQ	--	--	--	--	--	--	--	--	--	--
Well 7	08/09/82	RMC	AQ	--	--	--	--	--	--	--	--	--	--
M7	04/14/83	OXY-POTT	AQ	--	--	--	--	--	--	--	--	--	--
M7	07/21/83	OXY-POTT	AQ	--	--	--	--	--	--	--	--	--	--
M7	02/02/84	OXY-POTT	AQ	--	--	--	--	--	--	--	--	50.00	--
M7	04/18/84	DER	AQ	--	--	--	--	--	--	--	--	--	--
M7	04/19/84	OXY-POTT	AQ	--	--	--	--	--	--	--	--	--	--
M7	04/19/84	Wastex	AQ	--	--	--	--	--	--	--	--	--	--
M7	08/02/84	OXY-POTT	AQ	--	--	--	--	--	--	--	--	--	--
M7	01/24/85	OXY-POTT	AQ	--	--	--	--	--	--	--	--	--	--
M7	04/16/85	OXY-POTT	AQ	--	--	--	--	--	--	--	--	--	--
M7	04/16/85	Wastex	AQ	--	--	--	--	--	--	--	--	--	--
7S	04/16/85	RMC	AQ	--	--	--	--	--	--	--	--	0.01	Filtered
M7	06/23/85	DER	AQ	--	--	--	--	--	--	--	--	--	Unfiltered
M7	06/23/85	DER	AQ	--	--	--	--	--	--	--	--	0.04	--
M7	03/14/86	OXY-POTT	AQ	--	--	--	10.90	0.006	--	--	--	0.18	--
M7	06/04/86	OXY-POTT	AQ	--	--	--	10.80	0.015	--	--	--	0.32	--
M7	06/04/86	RMC	AQ	NT	--	--	11.70	--	--	--	--	0.05	--
Well 7	06/04/86	DER	AQ	0.09	--	--	--	0.001	--	--	--	--	--
M7	06/02/87	RMC	AQ	--	0.700	--	15.30	--	--	--	--	--	--
M7	06/02/87	OXY-POTT	AQ	--	0.700	--	15.30	--	--	--	--	--	--
M7	06/23/88	RMC	AQ	--	0.800	--	15.00	--	--	--	--	--	Filtered
M7	06/23/88	DER	AQ	--	0.670	--	15.40	--	--	--	--	--	Unfiltered
M7	06/23/88	DER	AQ	--	0.670	--	13.30	--	--	--	--	--	--

ND : Not Detected
 NT : Not Tested
 -- : Currently not determined to be Not Detected (ND) or Not Tested (NT)
 LF : Blankfill

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OVERBURDEN AQUIFER METALS ANALYTICAL RESULTS
OCCIDENTAL CHEMICAL CORPORATION, POTTSTOWN PENNSYLVANIA

Table 1-8, cont.)

SAMPLE LOCATION	SAMPLE NAME	SAMPLE DATE	LABORATORY	PHASE	Aluminum (mg/L)	Antimony (mg/L)	Arsenic (mg/L)	Barium (mg/L)	Beryllium (mg/L)	Cadmium (mg/L)	Calcium (mg/L)	Chromium (mg/L)	Cobalt (mg/L)	Copper (mg/L)	Iron (mg/L)	Lead (mg/L)	Magnesium (mg/L)	Manganese (mg/L)	Mercury (mg/L)
OW8	MW8	04/15/82	OXY-POTT	AQ	--	--	--	--	--	--	--	--	--	--	0.17	--	--	--	--
	MW8	07/14/82	OXY-POTT	AQ	--	--	--	--	--	--	--	--	--	0.02	0.23	--	--	--	--
	Well 8	07/14/82	Wastex	AQ	--	--	--	--	--	--	--	20.000	--	0.02	0.23	--	--	--	--
	MW8	07/14/82	DER	AQ	NT	--	--	70.00	--	0.240	--	--	--	20.00	340.00	--	--	20.00	--
	Well 8	08/09/82	RMC	AQ	--	--	--	--	--	--	--	--	--	--	0.18	--	--	--	--
	MW8	04/14/83	OXY-POTT	AQ	--	--	--	--	--	--	--	--	--	--	12.70	--	--	--	--
	MW8	02/02/84	OXY-POTT	AQ	--	--	--	--	--	--	--	--	--	--	800.00	17.30	--	--	--
	MW8	04/18/84	DER	AQ	480.000	--	--	--	--	3.250	--	--	--	--	0.28	--	--	--	--
	M8	04/19/84	Wastex	AQ	0.100	--	--	--	--	--	--	--	--	--	3.70	--	--	--	--
	MW8	11/08/84	OXY-POTT	AQ	--	--	--	--	--	--	--	--	--	--	6.40	--	--	0.01	--
	MW8	01/24/85	OXY-POTT	AQ	--	--	--	--	--	--	--	--	--	--	0.04	--	--	2.50	--
	MW8	04/16/85	Wastex	AQ	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
	8S	04/16/85	RMC	AQ	--	--	--	--	--	--	--	0.005	--	0.01	--	--	--	--	--
	MW8	06/23/85	DER	AQ	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
	MW8	06/23/85	DER	AQ	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
	MW8	10/24/85	OXY-POTT	AQ	--	--	--	--	--	--	--	--	--	--	3.79	--	--	--	--
	Well 8	06/04/86	RMC	AQ	NT	--	0.044	--	--	--	NT	0.061	--	0.08	72.00	0.03	NT	2.06	0.0003
OW8A	MW8	06/02/87	DER	AQ	--	--	0.005	--	--	--	32.000	0.003	--	--	--	--	10.60	--	--
	MW8	06/02/87	RMC	AQ	--	--	0.003	--	--	--	40.000	--	--	--	--	--	12.00	--	--
	MW8	06/23/88	DER	AQ	--	--	--	--	--	--	34.200	--	--	--	0.03	--	10.10	--	--
	MW8	06/23/88	DER	AQ	--	--	--	0.45	--	--	36.500	--	--	--	0.92	0.00	10.20	0.06	--
	MW8	06/23/88	DER	AQ	--	--	--	0.48	--	--	--	--	--	--	--	--	--	--	--
OW9	Well 9	08/09/82	RMC	AQ	--	--	--	--	--	--	--	0.003	--	--	--	--	--	0.64	0.0003
	MW9	12/07/82	RMC	AQ	--	--	--	--	--	--	--	0.001	--	--	0.05	--	--	0.62	0.0002
OW10	Well 10	08/09/82	RMC	AQ	--	--	--	--	0.002	--	--	0.003	--	--	0.05	--	--	0.12	0.0006
	MW10	12/07/82	RMC	AQ	--	--	--	--	--	--	--	0.001	--	--	0.23	--	--	0.13	0.0004
OW11	Well 11	08/09/82	RMC	AQ	--	--	--	--	--	--	--	0.005	--	--	--	--	--	--	0.0014
	MW11	12/07/82	RMC	AQ	--	--	0.001	--	--	--	--	0.004	--	--	0.19	--	--	0.05	0.0004
OW12	Well 12	08/09/82	RMC(dup)	AQ	--	--	0.001	--	--	--	--	--	--	--	0.32	--	--	7.77	0.0013
	MW12	12/07/82	RMC	AQ	--	--	--	--	--	--	--	--	--	--	0.50	--	--	2.42	0.0004
OW13	Well 13	08/09/82	RMC	AQ	--	--	0.011	--	--	--	--	0.002	--	--	50.00	--	--	7.68	0.0005
	MW13	12/07/82	RMC	AQ	--	--	0.016	--	--	--	--	0.002	--	--	68.31	--	--	13.99	0.0002
OW14A	Well 14	06/02/87	RMC	AQ	--	--	0.017	--	--	--	141.000	0.002	--	--	1.90	--	57.90	18.10	--
	Well 14	06/23/88	RMC	AQ	--	--	0.003	--	--	--	155.000	--	--	--	2.70	--	65.00	19.00	--
OW15	Well 15	08/09/82	RMC	AQ	--	--	--	--	0.001	--	--	0.018	--	--	0.12	--	--	0.16	0.0014
OW19	Well 19	12/07/82	RMC	AQ	--	--	0.001	--	--	--	--	0.008	--	--	37.54	--	--	49.37	0.0010

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le 1-8, cont.)

IMPLE ATION NAME	SAMPLE DATE	LABORATORY	PHASE	Nickel (mg/L)	Potassium (mg/L)	Silver (mg/L)	Sodium (mg/L)	Selenium (mg/L)	Thallium (mg/L)	Tin (mg/L)	Vanadium (mg/L)	Zinc (mg/L)	REMARKS
MW8	04/15/82	OXY-POTT	AQ	--	--	--	--	--	--	--	--	--	--
MW8	07/14/82	OXY-POTT	AQ	--	--	--	--	--	--	--	--	--	--
Well 8	07/14/82	Wastex	AQ	--	--	--	--	--	--	--	--	70.00	--
MW8	07/14/82	DER	AQ	50.00	--	--	--	--	--	--	--	--	--
Well 8	08/09/82	RMC	AQ	--	--	--	--	--	--	--	--	--	--
MW8	04/14/83	OXY-POTT	AQ	--	--	--	--	--	--	--	--	--	--
MW8	02/02/84	OXY-POTT	AQ	--	--	--	--	--	--	--	--	140.00	--
MW8	04/18/84	DER	AQ	--	--	--	--	--	--	--	--	--	--
MW8	04/19/84	Wastex	AQ	--	--	--	--	--	--	--	--	--	--
MW8	11/08/84	OXY-POTT	AQ	--	--	--	--	--	--	--	--	--	--
MW8	01/24/85	OXY-POTT	AQ	--	--	--	--	--	--	--	--	--	--
MW8	04/16/85	Wastex	AQ	--	--	--	--	--	--	--	--	--	--
BS	04/16/85	RMC	AQ	--	--	--	--	--	--	--	--	0.02	Filtered
MW8	06/23/85	DER	AQ	--	--	--	--	--	--	--	--	--	Unfiltered
MW8	06/23/85	DER	AQ	--	--	--	--	--	--	--	--	--	--
MW8	10/24/85	OXY-POTT	AQ	NT	--	--	--	0.006	--	--	--	0.18	--
Well 8	06/04/86	RMC	AQ	--	--	--	10.80	--	--	--	--	0.02	--
MW8	06/04/86	DER	AQ	--	--	--	--	--	--	--	--	--	--
MW8	06/02/87	RMC	AQ	--	0.600	--	5.60	--	--	--	--	--	--
MW8	06/23/88	RMC	AQ	--	0.800	--	7.50	--	--	--	--	0.03	--
MW8	06/23/88	DER	AQ	--	0.660	--	5.34	--	--	--	--	--	Filtered
MW8	06/23/88	DER	AQ	--	0.840	--	5.35	--	--	--	--	--	Unfiltered
MW9	08/09/82	RMC	AQ	0.01	--	--	--	--	--	--	--	--	--
MW9	12/07/82	RMC	AQ	0.01	--	--	--	0.020	--	--	--	--	--
Well 10	08/09/82	RMC	AQ	0.01	--	--	--	--	--	--	--	--	--
MW10	12/07/82	RMC	AQ	0.01	--	--	--	0.050	--	--	--	--	--
Well 11	08/09/82	RMC	AQ	--	--	--	--	--	--	--	--	--	--
MW11	12/07/82	RMC	AQ	0.02	--	--	0.00	0.030	--	--	--	--	--
Well 12	08/09/82	RMC(dup)	AQ	--	--	--	--	--	--	--	--	--	--
MW12	12/07/82	RMC	AQ	--	--	--	0.00	0.030	--	--	--	--	--
Well 13	08/09/82	RMC	AQ	--	--	--	--	--	--	--	--	--	--
MW13	12/07/82	RMC	AQ	0.01	--	--	--	0.040	--	--	--	--	--
MW 14	06/02/87	RMC	AQ	--	51.200	--	70.50	0.004	--	--	--	0.03	--
Well 14	06/23/88	RMC	AQ	--	450.000	--	55.00	--	--	--	--	--	--
Well 15	08/09/82	RMC	AQ	--	--	--	--	--	--	--	--	--	--
Well 19	12/07/82	RMC	AQ	0.09	--	--	--	0.380	--	--	--	--	--

D : Not Detected
 T : Not Tested
 - : Currently not determined to be Not Detected (ND) or Not Tested (NT)
 F : Labfill

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OVERBURDEN AQUIFER METALS ANALYTICAL RESULTS
OCCIDENTAL CHEMICAL CORPORATION, POTTSSTOWN PENNSYLVANIA

Table 1-8, cont.)

ANPLE CATION	SAMPLE NAME	SAMPLE DATE	LABORATORY	PHASE	Aluminum (mg/L)	Antimony (mg/L)	Arsenic-Barium (mg/L)	Beryllium (mg/L)	Cadmium (mg/L)	Calcium (mg/L)	Chromium (mg/L)	Cobalt (mg/L)	Copper (mg/L)	Iron (mg/L)	Lead (mg/L)	Magnesium (mg/L)	Manganese (mg/L)	Mercury (mg/L)
M24A	MW24	06/02/87	RMC	AQ	--	--	0.003	--	--	29.200	0.002	--	0.00	--	--	10.10	--	--
	Well 24	06/23/88	RMC	AQ	--	--	--	--	--	23.000	--	--	--	--	--	12.00	0.10	--
O25	Well 25	08/09/82	RMC	AQ	--	--	--	--	--	--	0.005	--	--	0.05	--	--	0.09	0.0011
	MW25	12/07/82	RMC	AQ	--	--	--	--	--	--	--	--	--	--	--	--	--	0.0006
	MW25	10/03/85	Nanco	AQ	--	--	--	--	0.056	15.000	--	--	101.00	130.00	--	9.10	18.00	--
	MW25	10/03/85	Nanco	AQ	454.000	0.153	0.368	3.13	--	36.600	0.721	--	0.51	674.00	--	70.10	35.10	--
	MW25	10/03/85	NUS	AQ	3.100	--	--	--	--	--	0.013	--	3.22	--	0.15	10.50	0.19	--
	MW25	10/03/85	NUS	AQ	--	--	0.080	--	--	--	0.575	--	0.47	--	--	--	31.50	--
O27A	MW27	06/02/87	RMC	AQ	--	--	0.005	--	--	70.900	0.008	--	--	--	--	--	17.50	--
	Well 27	06/23/88	RMC	AQ	--	--	--	--	--	70.000	--	--	--	--	--	16.00	--	--
	MW27	06/23/88	DER	AQ	--	--	--	0.29	--	63.300	--	--	0.01	--	--	16.00	0.02	--
O27	MW27	06/23/88	DER	AQ	--	--	--	0.29	--	61.900	--	--	0.01	0.05	--	15.60	0.02	--
	MW27	06/23/85	DER	AQ	--	--	--	--	--	--	--	--	--	--	--	--	--	--
	field Blank2	08/09/82	RMC	AQ	--	--	--	--	--	--	0.007	--	--	0.10	--	--	--	0.0002
	field Blank	12/07/82	RMC	AQ	--	--	--	--	--	--	0.003	--	--	--	--	--	--	--
	field Blank	04/16/85	RMC	AQ	--	--	--	--	--	--	0.004	--	0.00	--	--	--	--	--
	field Blank	06/04/86	RMC	AQ	NT	--	--	--	--	NT	0.003	--	0.00	--	--	NT	--	--
	field Blank	06/04/86	DER	AQ	--	--	--	--	--	NT	--	--	0.06	--	--	NT	--	--

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Table 1-8, cont.)

SAMPLE CATION	SAMPLE NAME	SAMPLE DATE	LABORATORY	PHASE	Nickel (mg/L)	Potassium (mg/L)	Silver (mg/L)	Sodium (mg/L)	Selenium (mg/L)	Thallium (mg/L)	Tin (mg/L)	Vanadium (mg/L)	Zinc (mg/L)	REMARKS
OW24A	Well 24	06/02/87	RMC	AQ	--	2.800	--	25.20	0.002	--	--	--	0.01	--
		06/23/88	RMC	AQ	--	1.600	--	13.00	--	--	--	--	0.03	--
OW25	Well 25	08/09/82	RMC	AQ	0.07	--	--	--	0.040	--	--	--	--	--
		12/07/82	RMC	AQ	0.02	--	--	0.00	--	--	--	--	0.12	Filtered
		10/03/85	Nanco	AQ	3.39	1.170	--	9.50	--	--	--	0.812	2.40	Unfiltered
		10/03/85	Nanco	AQ	24.70	62.700	0.005	26.50	--	0.028	--	--	--	Filtered
		10/03/85	NUS	AQ	0.03	0.953	--	15.10	--	--	--	0.712	--	Unfiltered
		10/03/85	NUS	AQ	0.91	31.100	0.057	--	--	--	0.540	--	--	--
OW27A	Well 27	06/02/87	RMC	AQ	--	1.300	--	19.10	0.002	--	--	--	0.03	--
		06/23/88	RMC	AQ	--	1.300	--	24.00	--	--	--	--	--	Filtered
		06/23/88	DER	AQ	--	1.410	--	24.30	--	--	--	--	--	Unfiltered
		06/23/88	DER	AQ	--	1.320	--	22.50	--	--	--	--	--	Filtered
OW27	Well 27	06/23/85	DER	AQ	--	--	--	--	--	--	--	--	--	Unfiltered
		06/23/85	DER	AQ	--	--	--	--	--	--	--	--	--	--
field Blank2		08/09/82	RMC	AQ	--	--	--	--	--	--	--	--	--	--
field Blank		12/07/82	RMC	AQ	--	--	--	--	0.040	--	--	--	0.01	--
field Blank		04/16/85	RMC	AQ	NT	--	--	--	--	--	--	--	0.01	--
field Blank		06/04/86	RMC	AQ	--	--	--	--	0.016	--	--	--	0.05	--
field Blank		06/04/86	DER	AQ	--	--	--	--	--	--	--	--	--	--

ND : Not Detected
 NT : Not Tested
 -- : Currently not determined to be Not Detected (ND) or Not Tested (N)
 LF : Landfill

Note: OW8A and OW27A have been reclassified as bedrock wells in the RI.
 OW24A has been reclassified as an overburden/bedrock well.

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TABLE 1-9
OVERBURDEN AQUIFER EXISTING SEMIVOLATILE ORGANIC ANALYTICAL RESULTS
OCCIDENTAL CHEMICAL CORPORATION, POTTSTOWN, PENNSYLVANIA

SAMPLE LOCATION	SAMPLE NAME	SAMPLE DATE	LABORATORY	PHASE	Bis- phthalate (2-ethylhexyl) (mg/l)	Di-N- Octyl phthalate (mg/l)	Benzo (K) Fluor- anthene (mg/l)	Benzoic Acids (mg/l)	Butyl Benzyl phthalate (mg/l)
MW2	MW2	09/27/85	NUS	AQ	ND	ND	ND	ND	ND
	MW2	09/27/85	Nanco	AQ	0.063	0.001	ND	ND	ND
OW6	MW6	09/27/85	NUS	AQ	ND	ND	ND	ND	ND
	MW6	09/27/85	Nanco	AQ	ND	ND	ND	ND	ND
OW25	MW25	10/03/85	NUS	AQ	ND	ND	ND	ND	ND
	MW25	10/03/85	Nanco	AQ	0.038	ND	ND	ND	ND

ND : Not Detected

Note: OW8A and OW27A have been reclassified as bedrock wells in the RI.
OW24A has been reclassified as an overburden/bedrock well.

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TABLE 1-10

1983 BCM TCE STUDY SOIL SAMPLE ANALYTICAL RESULTS
 OCCIDENTAL CHEMICAL, POTTSTOWN, PENNSYLVANIA

Sample Location I.D.	Trichloroethylene (TCE) (mg/kg)	Perchloroethylene (PCE) (mg/kg)
B-7-2	ND*	ND
B-8-2	ND	ND
B-9-0	72.7	ND
B-10-0	27.3	ND
B-11-0	7.8	ND
B-12-0	3.5	ND
B-13-4	0.66	ND
B-14-2	ND	ND
B-14-4	ND	ND
B-15-2	ND	ND
B-15-4	ND	ND
B-16-2	ND	ND
B-16-4	ND	ND
B-17-2	ND	ND
B-17-4	ND	ND
B-18-2	0.51	ND
B-18-4	0.077	ND
B-19-2	ND	ND
B-19-4	ND	ND
B-19-8	ND	ND
B-20-4	ND	ND
B-21-2	ND	ND
B-21-4	ND	ND
B-21-8	ND	ND
B-22-2	ND	ND
B-22-4	ND	ND
B-23-2	ND	ND
B-23-4	ND	ND
B-24-2	ND	ND
B-24-4	ND	ND
B-25-2	1.19	2.59
B-25-4	ND	ND
B-26-2	ND	ND
B-26-4	ND	0.07
B-27-2	19.7	ND ⁶
B-27-4	4.56	ND
B-28-2	ND	ND
B-28-4	ND	ND
B-29-2	ND	ND
B-29-4	ND	ND
B-30-2	ND	ND
B-30-4	ND	ND
B-31-2	ND	ND
B-31-4	ND	ND
B-32-2	0.47	0.7
B-32-4	ND	ND
B-33-2	0.30	ND
B-33-4	0.47	ND
B-34-2	ND	ND
B-35-2	0.88	ND
B-35-4	ND	ND

ND = Not detectable at concentrations less than 0.01 mg/kg.

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TABLE 1-11

SEDIMENTATION POND EXISTING VOLATILE ANALYTICAL RESULTS
OCCIDENTAL CHEMICAL CORPORATION, POTTSTOWN, PENNSYLVANIA

SAMPLE NAME	SAMPLE DATE	LABORATORY	PHASE	Trans- 1,2-DCE (mg/kg)	TCE (mg/kg)	Benzene (mg/kg)	Methylene Chloride (mg/kg)		Acetone (mg/kg)
							Toluene		
SEDPOND	09/27/85	NUS	SOIL	0.52	0.98	ND	0.07	0.11	0.22
	09/27/85	NUS	SOIL	1.10	4.00	0.17	0.18	0.14	ND
	09/27/85	Nanco	SOIL	1.90	3.70	0.22	1.10	2100.00	3.90

ND : Not Detected
B : Found in Method Blank

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TABLE 1-12

SEDIMENTATION POND EXISTING SEMIVOLATILE ANALYTICAL RESULTS
OCCIDENTAL CHEMICAL CORPORATION, POTTSTOWN, PENNSYLVANIA

SAMPLE LOCATION	SAMPLE NAME	SAMPLE DATE	LABORATORY	PHASE	Bis- (2-ethylhexyl) phthalate (mg/kg)	Di-N- Octyl phthalate (mg/kg)	Benzo (K) Fluor- anthene (mg/kg)	Benzoic Acids (mg/kg)	Butyl Benzyl phthalate (mg/kg)
Sediment Pond	SED	09/27/85	NUS	SOIL	93.00	ND	ND	24.00	27.00
	SED-DUP	09/27/85	NUS	SOIL	84.00	12.00	ND	ND	72.00
	SED	09/27/85	Nanco	SOIL			ND	ND	

ND : Not Detected

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TABLE 1-13

SEDIMENTATION POND EXISTING METALS ANALYTICAL RESULTS
OCCIDENTAL CHEMICAL CORPORATION, POTTSVILLE, PENNSYLVANIA

SAMPLE LOCATION	SAMPLE LABORATORY	PHASE	Aluminum (mg/kg)	Arsenic (mg/kg)	Barium (mg/kg)	Beryllium (mg/kg)	Calcium (mg/kg)	Chromium (mg/kg)	Copper (mg/kg)	Cyanide (mg/kg)	Iron (mg/kg)	Lead (mg/kg)	Magnesium (mg/kg)	Manganese (mg/kg)	Nickel (mg/kg)	Mercury (mg/kg)	Potassium (mg/kg)	Sodium (mg/kg)	Thallium (mg/kg)	Vanadium (mg/kg)	Zinc (mg/kg)
SED POND	09/27/85	NUS	6.200	0.024	0.176	0.002	6.93	0.019	0.020	ND	6.58	0.017	1.100	0.249	ND	0.001	1.760	8.620	ND	0.040	0.061
SED dup	09/27/85	NUS	7.160	0.023	0.184	0.002	4.03	0.023	0.025	ND	9.27	0.062	0.968	0.237	ND	0.001	1.760	9.190	ND	0.046	0.072
SED POND	09/27/85	Manco	5.690	0.035	0.170	ND	3.60	ND	0.027	0.050	13.50	0.031	0.585	0.229	0.090	ND	5.690	ND	0.004	0.045	0.063

ND : Not Detected

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TABLE 1-14
FORMER EARTHEN LAGOONS EXISTING VOLATILE ANALYTICAL RESULTS
OCCIDENTAL CHEMICAL CORPORATION, POTTSTOWN, PENNSYLVANIA

SAMPLE NAME	SAMPLE DATE	LABORATORY	PHASE	TCE (mg/kg)	Trans- 1,2-DCE (mg/kg)	1,2-				1,1,1-				Tetra- chloro- ethene (mg/kg)	Xylenes (mg/kg)	
						Vinyl Chloride (mg/kg)	Dichloro ethene (mg/kg)	Toluene (mg/kg)	Ethyl Benzene (mg/kg)	Styrene (mg/kg)	Methylene Chloride (mg/kg)	Acetone (mg/kg)	Carbon Disulfide (mg/kg)			Trichloro- ethene (mg/kg)
1 (LAGOON)	9-27-85	NUS	SOIL	16.00	550.00	420.00	3.60	13.00	100.00	66.00	18.00	24.00	ND	ND	ND	ND
	9-27-85	Nanco	SOIL	12.80	480.00	18.00	ND	7.80	112.00	40.00	1.50	4.80	0.28	0.34	0.60	0.54
2 (LAGOON)	9-27-85	NUS	SOIL	18.00	100.00	3.40	ND	1.60	0.95	ND	5.40	11.00	ND	ND	ND	ND
	9-27-85	Nanco	SOIL	22.00	180.00	0.89	ND	1.10	1.40	1.40	0.94	4.20	ND	ND	ND	0.22

ND : Not Detected

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Source: USGS Quadrangle, Phoenixville, PA

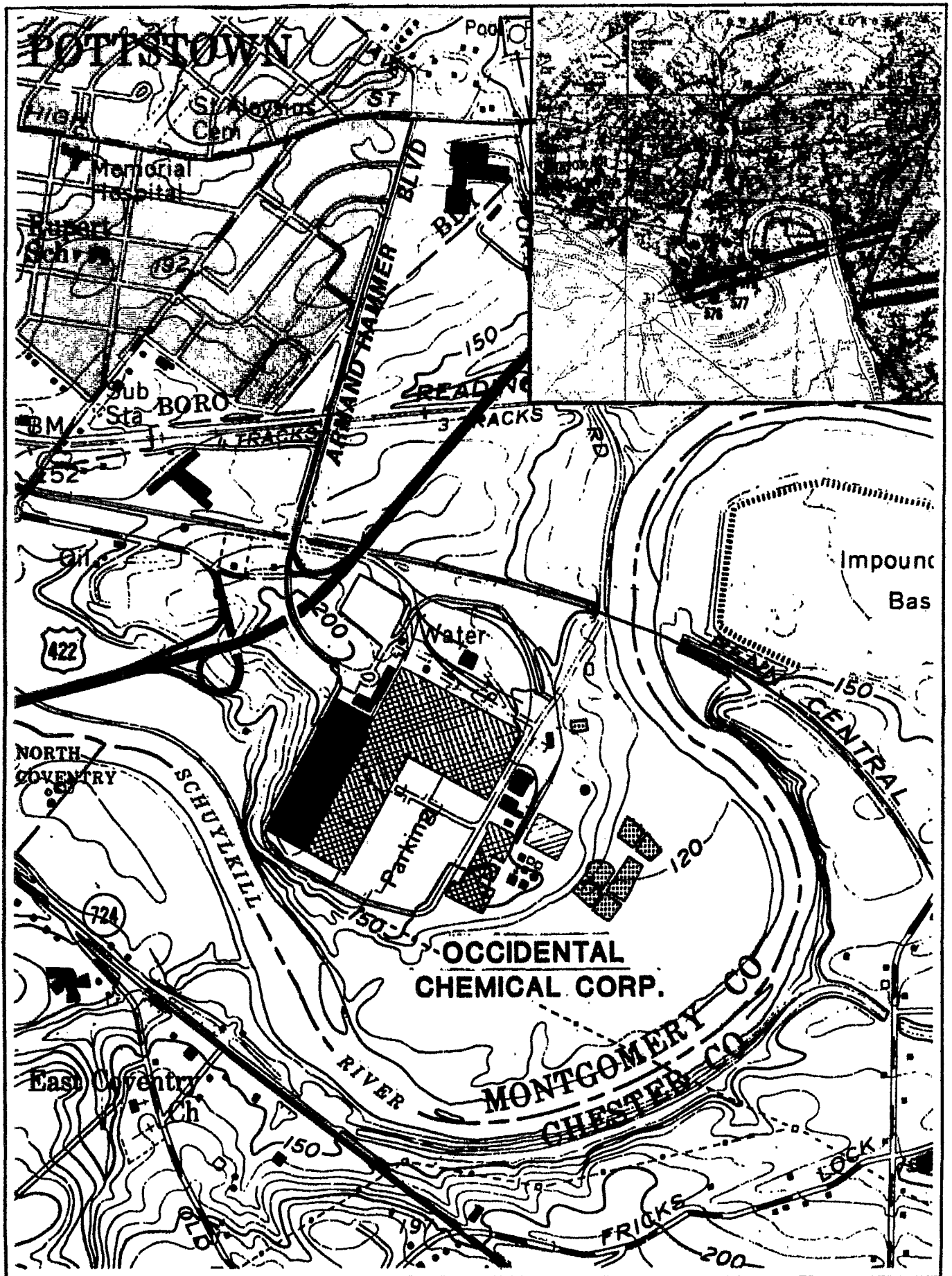
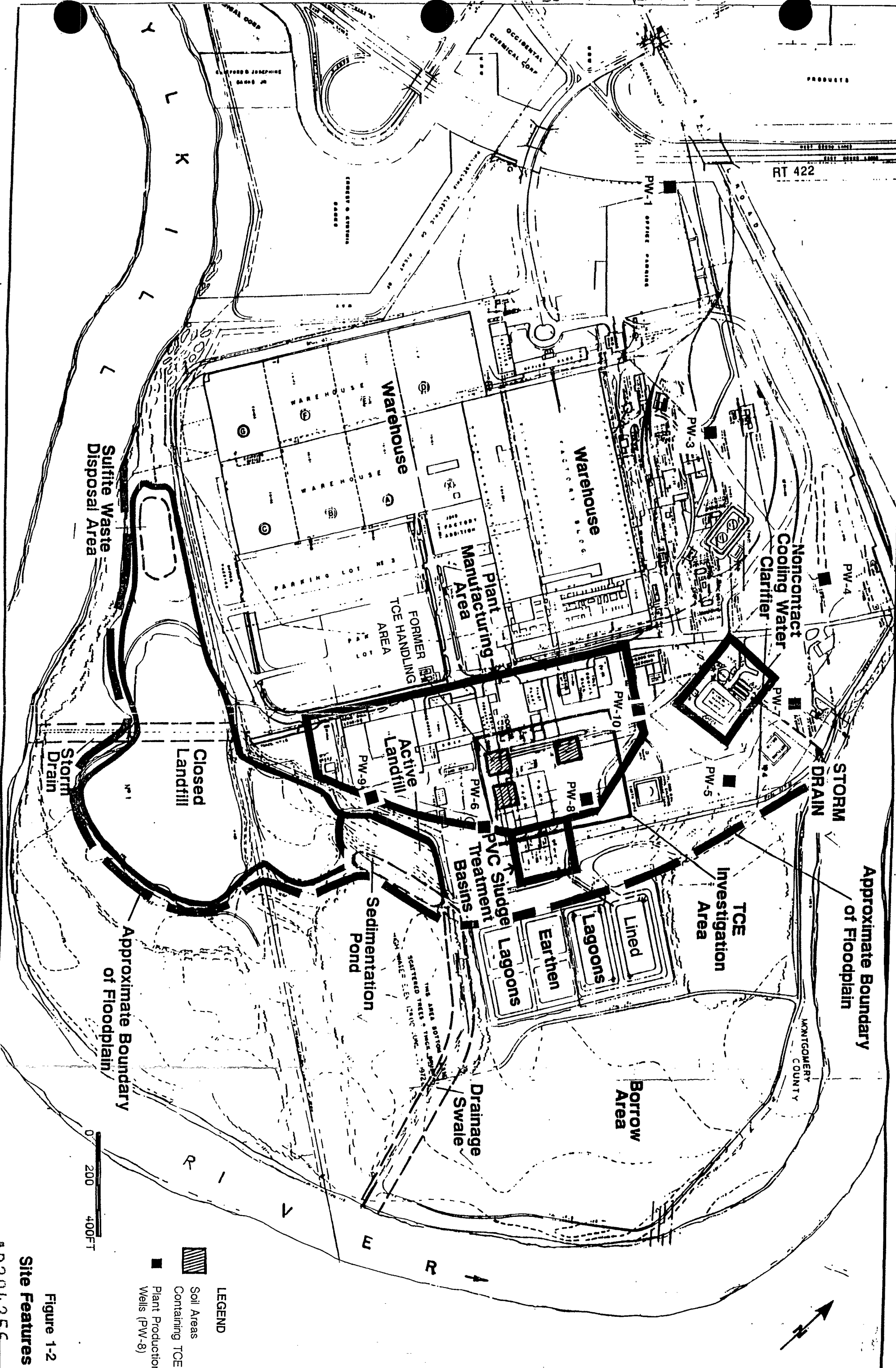


Figure 1-1
Site Location and Geologic Map

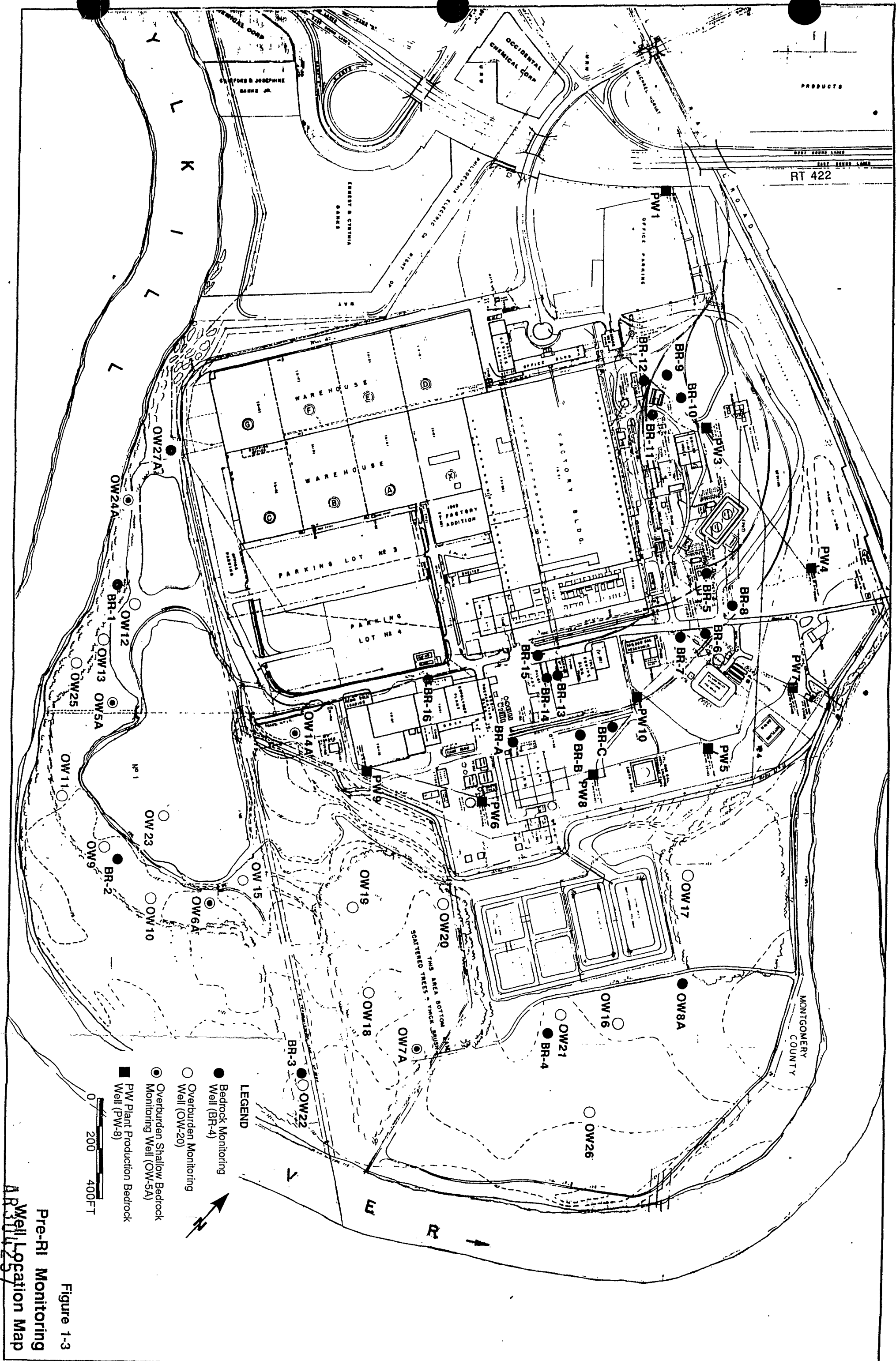


0 200 400 FT

- LEGEND**
- Soil Areas Containing TCE
 - Plant Production Wells (PW-8)

Figure 1-2
Site Features

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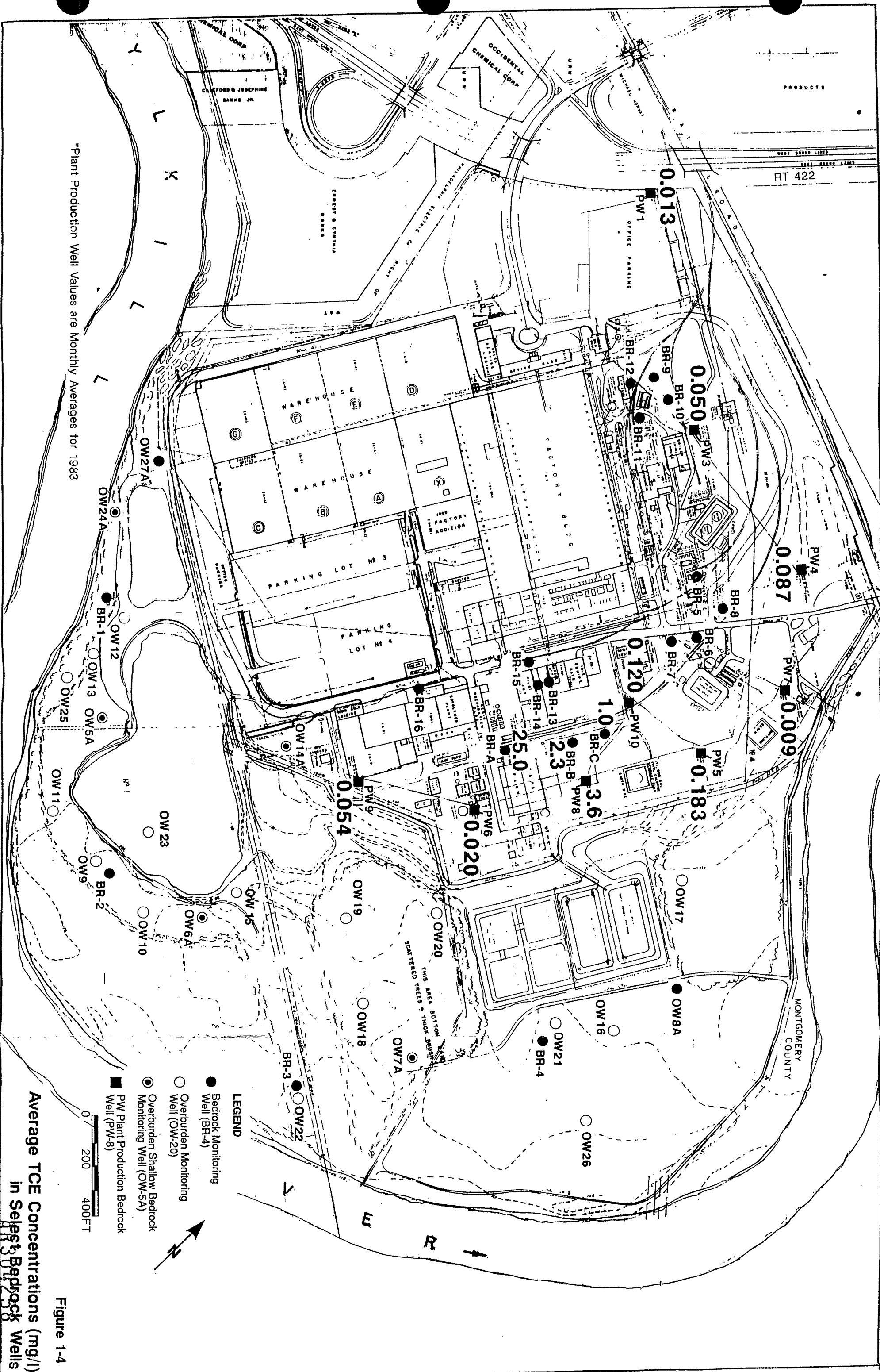
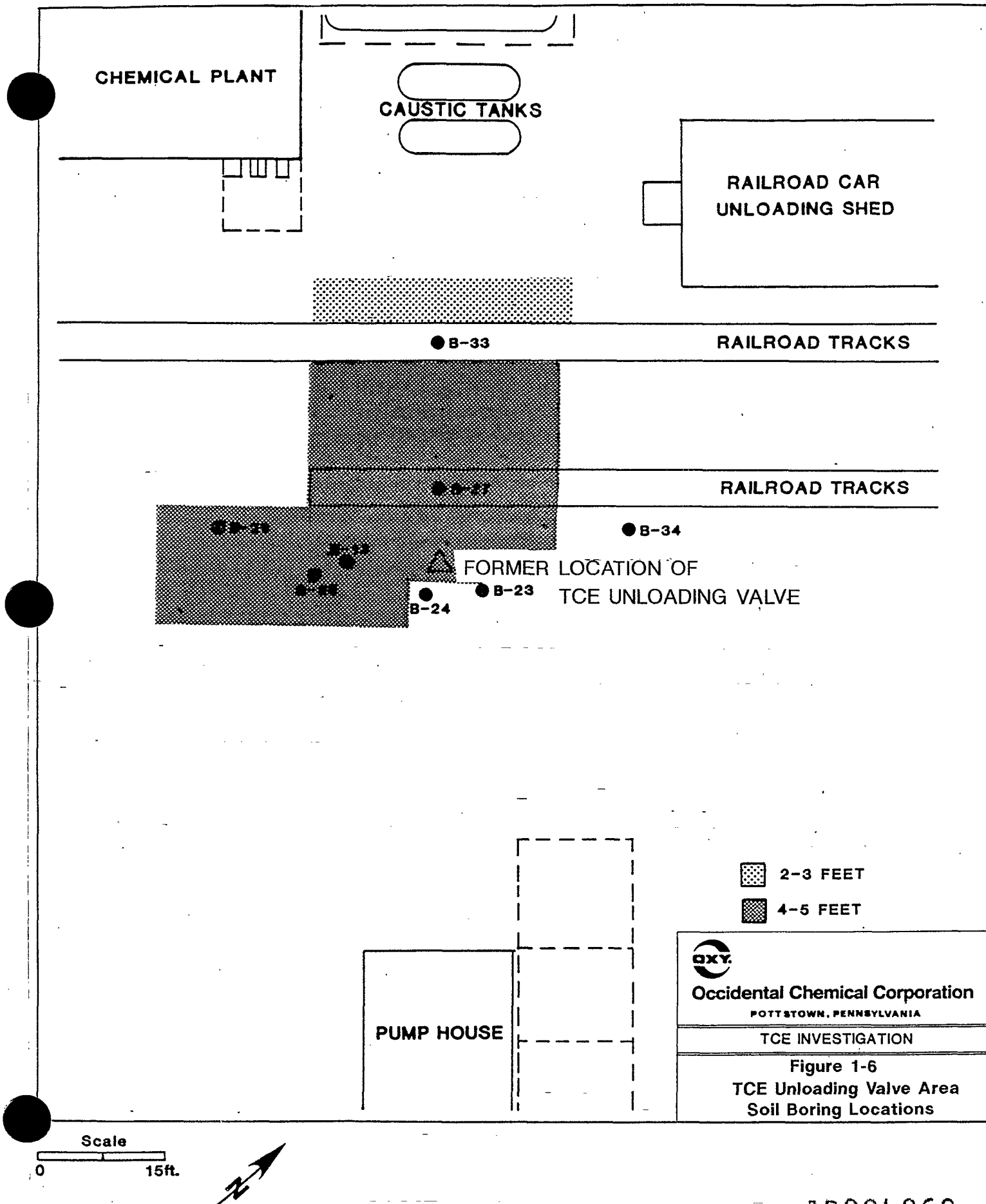


Figure 1-4



AR304260

2.0 METHODOLOGY AND OVERVIEW OF FIELD INVESTIGATIONS

2.1 BEDROCK AQUIFER INVESTIGATION

2.1.1 Overview

The first phase of investigation of the bedrock aquifer involved the drilling of 12 reconnaissance boreholes. This detailed investigation included geophysical logging, borehole camera, packer testing, and depth-discrete sampling of the reconnaissance boreholes. These results were presented in the May 1991 Interim Report.

Based on the findings from the 12 reconnaissance boreholes, 5 additional borings were drilled and 14 monitoring wells were installed to complete the bedrock characterization. Following the installation of the new wells, 2 rounds of sampling for CLP analyses were performed.

2.1.2 Reconnaissance Borehole Program

2.1.2.1 Drilling Procedures

Twelve bedrock aquifer reconnaissance boreholes were drilled at the Site between December 1990 and April 1991. Figure 2-1 shows the borehole locations. Table 2-1 lists the borehole completion depths, cased intervals, and completion dates; and, Table 2-4 presents additional well completion specifications. Appendix A contains the drilling lithologic logs. The boreholes were drilled to allow packer testing of discrete zones to determine groundwater hydraulic and chemical characteristics within the bedrock aquifer.

All boreholes were drilled using the compressed air percussion rotary drilling method. Reconnaissance boreholes TB-4 through TB-9 and existing water production Well PW-7 were drilled or redeveloped as outlined in the Work Plan. The drilling or completion of boreholes TB-1, TB-2, TB-3, TB-10, and PW-1 deviated slightly from the Work Plan because of Site conditions encountered during drilling.

Borehole TB-1 was re-drilled at a location about 20 feet from the original location. The original borehole became misaligned when the previously drilled core hole was reamed to accommodate the 100 feet of steel casing. Borehole TB-1 was initially completed to a depth of 500 feet. Based on water quality results of packer testing, the borehole was drilled deeper to a final completion depth of 585 feet.

Borehole TB-2 was completed at a depth of 450 feet instead of the anticipated depth of 500 feet. Borehole water yield in excess of 250 gpm encountered during drilling exceeded the capacity of the onsite treatment basins. Completion of TB-2 at the 450 depth met the Work Plan objective of affording investigation of bedrock water quality below the production well pump intake levels.

Borehole TB-3 was drilled, tested, and cased to a depth of 100 feet during the 1990 plant maintenance period. This borehole was completed to a depth of 553 feet.

Borehole TB-10 was drilled to a depth of 350 feet instead of the proposed completion depth of 300 feet. The borehole was completed deeper than anticipated because no significant water bearing zone was encountered between 200 to 300 feet bgs. The next significant water bearing was encountered between 330 and 350 feet bgs and the borehole was completed at this depth.

Existing water production Well PW-1 was not drilled deeper because of overhead electric powerline interference. A new borehole, designated PW-1R, was advanced to a depth of 550 feet at a location approximately 40 feet from PW-1.

2.1.2.2 Camera Surveys

Reconnaissance boreholes TB-1 through TB-10, PW-1R and existing boreholes PW-7 and BR-2 were surveyed with a downhole television maintenance period. Table 2-2 lists the completion dates and total depth logged per reconnaissance borehole. Appendix B contains downhole camera log observations compiled during review of the video tapes.

The boreholes were surveyed with a forward viewing color television camera. Copies of camera video tapes were submitted to the EPA following completion of a borehole.

2.1.2.3 Geophysical Surveys

Reconnaissance boreholes TB-1 through TB-10, PW-1R, and existing boreholes PW-7 and BR-2 were geophysically logged. The following suite of geophysical logs were performed in each borehole: natural gamma, resistivity, specific conductance, caliper and temperature. Copies of all geophysical logs were forwarded to the EPA following completion of each borehole.

Table 2-2 lists the completion dates and total depth logged per borehole. Appendix C contains a copy of each geophysical log generated.

2.1.2.4 Borehole Packer Testing

Reconnaissance boreholes TB-1 through TB-10, PW-1R, and existing borehole PW-7 were packer tested. Table 2-3 lists the completion dates of the packer tests, the depth intervals tested, and the rationale for testing the intervals.

Borehole TB-1 was originally completed at 500 feet. Based on water quality results of initial packer testing of TB-1, additional packer testing was performed using a single packer system to obtain groundwater samples at specific intervals as the borehole was deepened. Two zones were packer tested as the borehole was deepened (507 to 535 feet, 540 to 585 feet).

Packer intervals were selected on the basis of the geophysical logs, drilling logs, and camera surveys. Natural gamma logs, together with rock core examination and borehole drilling logs, were used primarily for describing lithology. Caliper logs and camera survey tapes provided specific information on fracture occurrence and orientation and assisted in selecting smooth-wall zones for packer inflation. Inflections noted on the temperature logs were considered as potential groundwater flow zone indicators.

Both single and double (straddle) packer test configurations were utilized. Packer spreads for straddle packer configurations ranged from 19 to 65 feet, depending on fracture occurrence. Water elevations were measured before and after packer inflation. These levels were obtained with pressure transducers on the packer testing assemblage at locations above, between, and below the inflatable packers.

Prior to pumping a selected interval, a one gallon slug of deionized water was instantaneously introduced into the interval, with recovery of the water level recorded until the original water elevation was reestablished. This allowed an order-of-magnitude estimate of the permeability and yield of the isolated zone, and helped assess the quality of the seal between the packer(s) and the borehole wall.

Following the slug test, the pump was started and allowed to pump approximately one hour while drawdown data were recorded. The selected pumping rates per interval, determined from the slug tests, were in the range of 1 to 30 gpm. For those intervals with a slow slug test recovery time, increasing stepped-flowrate drawdown tests were performed to determine a sustainable flow rate for the final test. Water level recovery was monitored following the end of pumping each interval.

2.1.2.5 Reconnaissance Borehole Groundwater Quality Screening

Water quality samples for volatiles analysis (Method 601 and modified Method 602) were collected from each packer test zone following the removal of at least five volumes of water within the tested zone. Samples for CLP TAL metals analysis were collected from the basal test interval of each borehole in the same manner indicated above.

A separate water quality sample was obtained at the time that the laboratory samples were collected. These samples were analyzed in the field for temperature, dissolved oxygen (DO), specific conductance (EC), oxidation reduction potential (Eh), and pH.

2.1.3 Additional Borehole Drilling

Five additional boreholes (TB-1A, TB-1B, TB-2A, TB-5A, and TB-7A) were drilled at the Site following the reconnaissance borehole program. Figure 2-1 shows the borehole locations. Table 2-1 lists the borehole completion depths, cased intervals, and completion dates; and, Table 2-4 presents additional completion specifications. Appendix A contains the drilling lithologic logs. The completion depths, number, and locations of the additional wells were based on the hydraulic conductivity and water quality data from the reconnaissance borehole testing program results presented in the Interim Report. These additional boreholes were installed to enhance the delineation of VOC distribution within the bedrock.

Boreholes TB-1A, TB-1B, TB-2A, and TB-5A were drilled to completion depths specified in the Interim Report. Additional Well TB-7A was located and drilled to the completion depth agreed to by the EPA representative on May 30, 1991. All boreholes were cased and drilled in accordance with the Work Plan using the compressed air percussion rotary drilling method.

2.1.4 RI Bedrock Well Completion

The bedrock wells were constructed in accordance with the Work Plan. Each well was cased through the overburden to competent bedrock. Four-inch I.D. schedule 40 PVC riser and screen were used to construct the wells. The monitoring well completion specifications and completion dates are summarized on Table 2-4. The location of the reconnaissance monitoring wells and additional wells are shown on Figure 2-1. The following describes the completion of the boreholes drilled for the RI program.

Borehole PW-1R was left open for plant use. It is an upgradient well under both plant production well pumping conditions and non-pumping conditions. No chemicals were detected in the groundwater at this location.

Production Well PW-7 was completed as a monitoring well screened between 175 to 210 feet bgs. The original borehole was 347 feet deep and was grouted to a depth of 210 feet. The selection of the monitoring interval was based on the relatively high yield and presence of TCE at a concentration close to the MCL. Under the induced gradient resulting from plant production well pumping, PW-7 is upgradient of the center of the Site.

Borehole TB-1 was determined to be in a location requiring further characterization and remediation. A monitoring well screen was placed 541 to 585 feet bgs. The screened interval coincides with a sandstone unit of significant yield and is intended to monitor the lowest zone of detected chemical migration.

Borehole TB-1A was completed as a monitoring well screened between 291 and 322 feet bgs. The screened interval coincides with a sandstone unit with significant yield and was selected on the basis of packer testing results which indicated levels of TCE in excess of the MCL.

Borehole TB-1B was completed as a monitoring well screened between 102 to 132 feet bgs. This additional well was completed in a sandstone unit with significant yield and TCE levels above the MCL.

Borehole TB-2 was completed as a monitoring well screened between 350 to 365 feet bgs. The borehole was first grouted to 370 feet from the original completion depth of 450 feet. The screened zone was selected to define the lateral extent of VCM migration.

Borehole TB-2A was completed as a monitoring well screened between 100 to 130 feet bgs. This zone was selected to confirm water quality in the shallow bedrock in the center of the site.

Borehole TB-3 was completed as a monitoring well screened between 385 to 410 feet bgs. The borehole was grouted from an original depth of 553 feet to 410 feet bgs.

Borehole TB-4 will be left open and the completion of this well will be determined in the feasibility study. Depth-specific groundwater quality screened indicated that chemicals were present only in the upper zone of the well. This zone can be monitored by existing shallow bedrock Well BR-4.

Borehole TB-5 was completed as a monitoring well screened between 95 and 135 feet bgs, after first being grouted from the original completion depth of 450 feet. This zone was selected for monitoring a sandstone unit which has shown the presence of TCE and other VOCs.

Borehole TB-5A was completed as a monitoring well screened between 40 to 85 feet bgs. This screened interval was selected on the basis of the screening analysis which detected elevated TCE concentrations within this zone.

Borehole TB-6 was completed as a monitoring well screened between 349 and 384 feet bgs. This screened interval was selected since the result of packer testing indicated that this was the one interval within the borehole which showed TCE slightly above the MCL.

Borehole TB-7 was completed as a monitoring well screened between 120 to 148 feet bgs. It was first grouted from the original completion depth of 350 feet before well installation in the borehole.

Borehole TB-7A was completed as a monitoring well screened between 70 and 105 feet bgs. The selection of this screened interval was based on the presence of TCE at this zone.

Borehole TB-8 was completed as a monitoring well screened between 85 and 105 feet bgs. The purpose of this well was to monitor styrene which was identified as the principal chemical present at this location during the packer testing program.

Borehole TB-9 will be left open until completion of the RI/FS study. This well was determined by the packer testing and groundwater sampling program to be free of the chemicals of concern at the Site. This well serves as a background well.

Borehole TB-10 was completed as a monitoring well screened between 86 and 113 feet bgs. During the packer testing program, TCE was detected in this zone at levels slightly above the MCL.

2.1.5 CLP Analyses of Groundwater Samples

2.1.5.1 Round No. 1 CLP Program

The first round of groundwater sampling for CLP analyses was initiated on July 29, 1991. A total of 22 bedrock wells, 6 overburden wells in the alluvial aquifer, and 1 well (OW-24A) whose screen bridges the overburden and shallow bedrock, were sampled. Table 2-5 presents a summary of the sampling date and methods for each well and the analyses performed. Figure 2-2 shows the locations of the wells sampled. Four wells (TB-1, TB-1A, TB-1B, and TB-3) were proposed for sampling but were not sampled because these wells were either under construction or had not adequately equilibrated at the time of sampling. These wells were sampled on September 24, 1991. Wells OW-10, OW-16, OW-17, and OW-19 were proposed for sampling but were dry. Well TB-1A was not sampled due to a blockage in the well at 60 feet below ground surface.

The locations for the first round of groundwater sampling were selected on the basis of the results of the packer testing program. The purpose of the sampling was to complete characterization of the bedrock aquifer. The results of packer testing indicated that the bedrock aquifer contained chemicals in the center of the Site. Wells BR-B, TB-1B, and TB-2A were sampled to evaluate the shallow bedrock in the center of the Site, and Wells TB-1, TB-2, and TB-3 were sampled to evaluate deeper bedrock in the center of the Site.

Wells OW-8A and BR-4 were sampled to evaluate water quality in the shallow bedrock adjacent to the lagoons. The closed landfill was investigated by sampling Wells OW-24A and OW-29A which are screened across the alluvium/shallow bedrock and by sampling Wells BR-1, BR-2, TB-5, and TB-10 completed in the shallow bedrock.

The farthest areal extent of chemical presence in the bedrock aquifer indicated by depth-discrete water quality screening were evaluated by sampling Wells TB-6, TB-7, TB-7A, TB-8, and PW-7. Wells TB-9 and PW-1R were sampled as background wells by virtue of their upgradient location under pumping conditions.

2.1.5.2 Round No. 2 CLP Program

The second round of CLP groundwater sampling of 11 bedrock wells was conducted during the weeks of January 13 and January 20, 1992. Table 2-6 presents a summary of the dates and sampling method for each well and the analyses performed. Figure 2-2 shows the locations of the wells sampled.

The locations for the second round of CLP groundwater sampling focused on the center of the Site and outer edges of chemical presence in the bedrock aquifer. The wells sampled in the center of the Site included Wells TB-1B, TB-2A, and BR-B completed in the shallow bedrock, and Well TB-2 completed in the deeper bedrock. Wells sampled at the outer edge of the plume included TB-5, TB-5A, TB-7, TB-7A, and PW-7. Well BR-1, located adjacent to the closed landfill and background Well TB-9 were sampled to enhance characterization of the bedrock aquifer in these areas.

2.1.5.3 Sampling Protocol

Wells were sampled in accordance with procedures detailed in the Work Plan and Field Sampling Plan with the exception of Round No. 1 groundwater samples collected from Wells TB-1 and TB-3. The height of the standing water columns (i.e., the distance from the top of the standing water in the well to the bottom of the well) were approximately 490 feet and 330 feet in wells TB-1 and TB-3, respectively. It was considered at the time of sampling that complete dewatering of these deep wells could potentially cause screen collapse or damage as the formation, the backfill, and recharge groundwater pressure acted against the PVC screen. Samples from TB-1 and TB-3 were collected after purging less than the standard 3 well volumes because of the great volume of standing water and the slow recharge conditions. To sample these wells, a pump was lowered to a depth of 170 feet below ground surface, which was approximately 87 and 92 feet into the standing water column of TB-1 and TB-3, respectively. The wells were then purged to the depth of the pump, and samples were collected at the end of the day when recharge occurred.

The bedrock wells were purged using either a submersible or centrifugal pump. The wells were sampled using 2-inch OD dedicated teflon bailers. Tables 2-5 and 2-6 provides a list of the purging and sampling methods utilized at each well.

All samples for analyses of volatile organic compounds, except trip blanks, were preserved with hydrochloric acid in the field. Inorganic analyses were performed on both unfiltered and filtered samples for the first round of CLP analyses. The samples were filtered using a nitrogen pressure filtering unit with a 0.45-micron filter. Inorganic analyses were performed on filtered samples only for the second round of CLP analyses.

Equipment blanks, trip blanks, and field duplicate samples were retained and submitted for chemical analysis in accordance with the procedures detailed in Section 9.2 of the QAPP. Field duplicate samples were collected from Wells TB-7 and TB-9 for the first round of CLP analyses. Field duplicate sample was collected from Well TB-9 for the second round of CLP analyses. EPA split samples were collected during Round No. 1 at Well TB-3 on September 24, 1991, and for Round No. 2 at Well TB-2A on January 22, 1992.

2.2 ALLUVIAL AQUIFER GROUNDWATER INVESTIGATION

2.2.1 Sampling Locations

A 1976 hydrogeological study revealed that alluvium ranging from 9 to 20 feet thick overlies bedrock in the underdeveloped floodplain area of the Site. The saturated portion of the alluvium varies from less than a foot thick to nine feet and fluctuates seasonally. The packer testing observations, as reported in the May 1991 Interim Report, provides evidence that the alluvial flow system is a perched groundwater layer which primarily drains local infiltration to the Schuylkill River. Because of the prior extent of characterization and historical database from alluvial well sample analyses, no additional wells were required in the alluvial aquifer as part of the RI.

Groundwater samples from 6 alluvial aquifer wells (OW-9, OW-11, OW-12, OW-19, OW-21, and OW-25) were obtained in July 1991, during the first CLP round of groundwater sampling. (See Table 2-5.) The locations of the sampled wells are shown on Figure 2-2. Wells OW-10, OW-16, and OW-17 were dry and could not be sampled. Well OW-19 had a very low recharge and insufficient volume was available to obtain the filtered sample; therefore, only an unfiltered sample was obtained.

The sampling locations of the alluvial aquifer were selected to evaluate potential impact from four Site features located in the floodplain. Wells OW-9, OW-11, OW-12, and OW-25 were sampled to evaluate the alluvial aquifer water quality in the vicinity of the closed landfill. Well OW-19 was sampled to evaluate water quality adjacent to the active landfill and Well OW-21 was sampled to evaluate water quality adjacent to the lined and unlined lagoons.

2.2.2 Sampling Protocol

The wells were purged using either a peristaltic, centrifugal, or submersible pump. Wells were sampled using 2-inch OD dedicated teflon bailers. Table 2-5 provides a list of the purging and sampling methods utilized at each well.

Inorganic analyses were performed on both unfiltered and filtered samples with exception of the sample from Well OW-19. Insufficient volume was available after purging Well OW-19 for the collection of a filtered groundwater sample for metal analyses.

Equipment blanks, trip blanks, and field duplicates were retained and submitted for analysis in accordance with procedures detailed in Section 9.2 of the QAPP. Field duplicates were obtained from bedrock Wells TB-7 and TB-9 at the time that the alluvial aquifer sampling was conducted.

2.3 SURFACE WATER INVESTIGATION

2.3.1 Sampling Areas and Protocol

The surface water investigation at the Site focused on three potential pathways for chemical migration: (1) The Schuylkill River, (2) storm water sewer outfalls, and (3) the sediment pond discharge swale. The samples were collected at each location by submerging the sample containers just below the water surface.

Where flowing water conditions were encountered, the sample containers were positioned with the open end facing upstream. All samples for analyses of volatile organic compounds, except trip blanks, were preserved with hydrochloric acid in the field. Trip blanks and field duplicates samples were retained and submitted for chemical analyses. No equipment blanks were required for the surface water sampling program, since bottles were filled directly and no sampling equipment was utilized.

Table 2-7 presents a summary of the surface water analytical program, sampling dates, and locations of field duplicate and EPA split samples. A separate aliquot of surface water was also collected at each location for field analysis of temperature, dissolved oxygen, specific conductance, and pH. Field Eh measurements were also collected at several collections.

2.3.2 Schuylkill River

Twelve surface water grab samples were collected from the Schuylkill River. The location of the surface water samples and transect are shown on Figure 2-3. Samples were collected at the shoreline, midpoint, and between the shoreline and midpoint along four transects at separate locations. The locations of the transects were approved by the onsite EPA representative and were as follows:

- Transect No. 1 was located approximately 600 feet upstream of the southwestern OxyChem property boundary
- Transect No. 2 was located approximately 180 feet downstream of the closed landfill drainage swale
- Transect No. 3 was located approximately 100 feet downstream of the sediment pond discharge swale, and

- Transect No. 4 was located approximately 250 feet upstream of the northeastern OxyChem property boundary

2.3.3 Storm Water Sewer Outfalls

One surface water grab sample was collected from the northern storm water sewer outfall on and one surface water grab sample was collected from the southern storm water sewer outfall. The samples were collected to investigate the storm water sewer line as a potential pathway for chemical migration. Surface water sample NSO-1-SW and field duplicates NSO-1A-SW were collected from inside the concrete pipe approximately 1 foot beyond the metal grate. Sample SSO-1-SW was collected from approximately 2 feet within the culvert. Approximately 8-inches of water were present in the culvert but there was no noticeable flow from the culvert. The sample locations are shown on Figure 2-4.

2.3.4 Sediment Pond Discharge Swale Sampling

Three surface water grab samples were collected from the sediment pond discharge. The sample locations are shown on Figure 2-5.

At the time of sampling, the outfall from the sediment pond was discharging approximately 1 to 3 gallons per minute. The sample locations were selected in accordance with the Work Plan. Sample SW-1 was collected approximately 5 feet from the sediment pond discharge. Sample SW-2 and a field duplicate at this location were collected at the midpoint of the swale approximately 600 feet downstream of the discharge pipe. Sample SW-3 was collected adjacent to the Schuylkill River approximately 1,300 feet downstream of the discharge pipe and approximately 20 feet upstream of the Schuylkill River.

2.4 SOILS AND SEDIMENT INVESTIGATIONS

2.4.1 Overview of the Program

Soil and sediment samples were collected from a diversity of areas. The program involved sampling locations at several specific features in the floodplain, which included: the earthen lagoons; the lined lagoons; the swale and sediment pond area; the borrow area; and the storm water sewer outfalls. The sampling procedures and protocol varied between floodplain areas due to the variable nature of the material sampled. Sampling procedures were in accordance with the relevant sections of the Work Plan and Field Sampling Plan. Dedicated sample trowels, mixing pans, and spatulas were utilized at each sampling location. Hand augers not dedicated were decontaminated between sample locations in accordance with Section 7.3 of the Field Sampling Plan. Split samples were obtained at various soil and sediment locations selected by EPA for their analyses. Equipment blanks and trip blanks were retained and submitted for analysis in accordance with the procedures outlined in Section 9.2 of the QAPP. Grain-size analyses were performed using ASTM D422 procedure, in accordance with Table 2 of the QAPP.

At most of the soil and sediment sampling locations, a representative sample was taken and slurried with deionized water in the field, upon which measurements of pH/Eh, specific conductance, temperature, and dissolved oxygen were made. Color and other visual characteristics of the samples were also recorded in the field.

Figures 2-4 through 2-8 show the locations of the samples within the floodplain area. Tables 2-8 through 2-9 present summaries of the soil and sediment analytical programs, sampling dates, and locations of field duplicates and EPA split samples.

Sediment samples from the Schuylkill River were collected from the river bottom at locations coinciding with the Schuylkill River surface water samples. These sampling locations are shown on Figure 2-3.

The Schuylkill River sediment sampling included 3 samples at locations upstream of the OxyChem plant for background samples. Background soil samples were collected at 5 locations. The background soil samples are discussed in Section 2.4.5 of this chapter.

The soil and sediment investigation also included the plant area outside of the floodplain. This involved a Phase I and Phase II Soil Vapor Survey (SVS), and soil collected and analyses from 7 soil borings, whose locations were based on the results of the SVS. The investigation protocol in the plant area is discussed in detail in Section 2.4.4.2 of this chapter.

2.4.2 Floodplain Area

2.4.2.1 Earthen Lagoon

Five test borings were conducted in each of the four earthen lagoons. Samples were obtained of both the lagoon material and the underlying soils. The boring locations are shown in Figure 2-6. The boring logs are provided in Appendix D, along with a detailed discussion of the sampling and field quality assurance protocol. Appendix D is a section of the report previously submitted to EPA on this project, "Results of the Earthen Lagoon Investigation and Identification of Potential Remediation Technologies" (March, 1990). The central boring from each lagoon was sampled for analysis of the chemicals in the lagoon material and underlying soil. These central borings were sampled on a continuous basis (i.e., samples collected at 2-foot intervals). Most of the borings were advanced utilizing hollow-stem augers and split-barrel sampling equipment. Two of the borings in the corners of Lagoon No. 1 (TB-2 and TB-5) were completed with hand augers.

2.4.2.2 Lined Lagoon

Ten soil samples were collected from 5 borings located around the lined lagoons. The boring locations and sample designations are shown on Figure 2-7. The boring logs are presented in Appendix E.

Each boring was advanced to either refusal or the water table, whichever was encountered first. Two samples were collected per boring, one from the 2- to 4-foot depth interval and one from the 2-foot interval immediately above groundwater. Only one sample was collected from the 2- to 4-foot depth interval at boring LL-2 since bedrock was encountered at approximately 4 feet below ground surface. Samples were collected from the intervals with the highest HNu response. Table 2-10 presents a summary of the HNu responses, and identifies the sample depth intervals which were selected for analyses.

The downhole boring equipment was decontaminated between borings at the designated area onsite. At the end of sampling, each boring was grouted to the surface via gravity emplacement or tremie pipe, using a 10-percent bentonite slurry.

The lined lagoon soil samples were analyzed for TCL volatiles, TCL semivolatiles, TAL metals, TOC, and grain size. In addition, 2 samples from boring LL-4 were analyzed for TCL PCBs and pesticides; these locations were selected in the field with the concurrence of the onsite EPA representative. One field duplicate (LL3S-4A) was collected for this sampling event.

2.4.2.3 Swale and Sediment Pond

The locations of the sediment samples collected in the swale and sediment pond area are shown on Figure 2-5. Six sediment samples were collected from the discharge swale at approximately 200-foot intervals from the sediment pond discharge pipe, with the exception of the sample from SW-10, which was collected approximately 1,300 feet downstream of the discharge pipe and 20 feet upstream of the Schuylkill River. Three sediment samples were collected from the low lying area below the sediment pond. One sediment sample was collected from the middle of the sediment pond approximately 3 feet from the upper discharge pipe.

The sediment samples were analyzed for the following parameters; TCL volatiles, TCL semivolatiles, TAL metals, TOC, and grain size. In addition, 1 pond sediment sample (SW-1-SED) and 1 swale sample (SW-10-SED) were analyzed for TCL pesticides and PCBs. One field duplicate (SW6A-SED) was collected for this sampling event.

2.4.2.4 Borrow Area

Three soil samples were collected from the borrow area to characterize soils in that portion of the floodplain. The sample locations are shown on Figure 2-8. The borrow area was ponded and frozen at the time of sampling. The samples were collected from the interval between the top of the sediment and a depth of 6 inches below the top of the sediment. The samples were collected in accordance with the Field Sampling Plan with the exception that the samples were collected with stainless steel augers, since it was not possible to collect the samples directly with trowels due to the ponded water.

The borrow area sediment samples were analyzed for the following parameters; TCL volatiles, TCL semivolatiles, TAL metals, TOC, and grain size. In addition, 1 sample location (B-1) was selected for TCL pesticides and PCBs analyses.

One field duplicate was collected at sediment sampling location B-3. The duplicate sample for volatile organic compound analysis was collected from the auger bucket by alternatively filling the VOA vials. The remainder of the material was homogenized in accordance with the procedure outlined in Section 9.2 of the QAPP. Equipment blanks and trip blanks were retained and submitted for analysis.

2.4.2.5 Storm Water Sewer Outfalls

One sediment sample was collected from the northern storm water sewer outfall and one from the southern storm water sewer outfall. The sampling locations are shown on Figure 2-4. The Field Sampling Plan specified that samples should be collected inside the outfall pipes, pending the availability of sediment. Since no sediments were present inside the pipe, the samples were collected from low energy environments below the discharge pipes where sediment had accumulated. The sample at the northern outfall (NS0-1) was collected approximately 5 feet below the discharge pipe. The sample at the southern storm water outfall (SS0-1), was collected in the discharge swale, approximately 10 feet from the edge of the Schuylkill River. Both locations were selected in accordance with the Work Plan and with approval of the onsite EPA representative.

Since the samples were collected from below the discharge outfall pipes in areas under water, the sampling procedures were modified from those in the Field Sampling Plan. A hand auger was necessary to obtain a sample from the upper 6 inches of sediment substrate beneath several feet of water at each location.

After removing the auger from the sediment, samples VOC analyses were removed from the auger bucket with a stainless steel spatula and placed into the VOA vials. The remaining sample was transferred into a stainless steel mixing pan, homogenized, and placed to the appropriate sample containers.

The storm water sewer outfall sediment samples were analyzed for the following parameters; TCL volatiles, TCL semivolatiles, TAL metals, TOC, and grain size. In addition, 1 sample location, SS0-1 was selected for TCL pesticides and PCBs analyses.

One field duplicate was collected at the northern storm water outfall sediment sampling location (NS0-1) for this sampling event. The duplicate sample for VOC analysis was collected from the auger bucket by alternatively filling the VOA vials. The remainder of the material was homogenized prior to placement in the appropriate sample containers.

2.4.3 Schuylkill River Sediment

Ten sediment samples were collected from the Schuylkill River. The sampling locations are shown on Figure 2-3, and coincide with Schuylkill River surface water sampling locations discussed in Section 2.3.2.

River sediment samples were obtained from a boat. The sampling locations were approached from downstream. The boat was anchored at two points to maintain a fixed sampling location. All samples were obtained with a hand auger. Attempts were made initially to obtain the sediment samples with an Eckman dredge, but river currents and a cobbly river bottom resulted in no sample recovery by this technique.

Sediment samples could not be collected at two midstream locations: SR-3-3 and SR-4-3. No sediment was present on the river bottom at these locations. Several attempts were made to relocate the sampling locations at 5- to 10-foot increments away from the proposed location, but a cobbly river bottom was encountered and no sediment could be obtained with either the Eckman dredge or hand auger. Further attempts to collect samples at these two locations were abandoned with the concurrence of the EPA onsite representative. One field duplicate was collected at location SR-3.

The Schuylkill River sediment samples were analyzed for TCL volatiles, TCL semivolatiles, TAL metals, TOC, and grain size. In addition, samples from locations SR-1-3, SR-3-2, and SR-4-2 were analyzed for PCBs and pesticides.

2.4.4 Plant Area Overburden Soils

2.4.4.1 Soil Vapor Surveys

Two soil vapor surveys (SVS) were conducted within the main production areas of the plant as a reconnaissance technique for identifying potential source areas of TCE.

A detailed discussion of the Phase I SVS sampling procedures and field quality assurance is presented in Appendix F. Appendix F was previously submitted to EPA during the RI (January, 1991). The Phase I SVS sampling points were established at locations in former and present plant production areas, based on a grid with approximate 150-foot centers. A denser 100-foot separation between sampling points was used around the former TCE railroad tank car siding and the present PVC sludge clarifier. Figure 2-9 shows the location of the Phase I sampling points.

A total of 59 soil vapor samples were collected during the Phase I SVS. Sampling depths ranged from 3.5 to 4.75 feet below ground surface.

The Phase II SVS was conducted to investigate four areas of the plant where the Phase I SVS detected soil vapor concentrations of TCE above 5.0 parts per million (ppm). This threshold level was established in the Work Plan to identify areas for the Phase II SVS

investigation. The Phase II SVS was conducted to delineate the extent of TCE are these four areas. The locations of the Phase II SVS are shown on Figure 2-10. The sampling procedures, results, and quality assurance procedures for the Phase II SVS were submitted to EPA previously (June 1991) and are included in Appendix F to this RI report.

Thirty-seven vapor samples were collected and analyzed at 26 locations during the Phase II SVS (Figure 2-10). All samples were analyzed for TCE and trans-1,2-DCE in the field, using a portable gas chromatograph (GC).

2.4.4.2 Contingent Soil Boring Program

Seven test boring were performed to further investigate the presence of TCE in the soil at 4 areas delineated by the Phase II SVS (see Appendix F). The borings were drilled to bedrock. The boring locations are shown on Figure 2-10.

Four soil borings were located in Area 1 because of the lateral extent of elevated vapor concentrations of TCE in this area. One boring was located in each of Area 2, 3, and 4, where minimal lateral migration of TCE was detected by the SVS. The boring logs are presented in Appendix G.

Soil samples were collected on a continuous basis (i.e., 2-foot intervals) and each sample was screened with a HNu. Two intervals for laboratory analyses of soil samples were distributed over the depth of the boring. The sample intervals were as follows:

1. The sample from each boring with the highest HNu response was selected for laboratory analyses.
2. The second of two samples for chemical analyses from each borehole was obtained from the interval just above bedrock.

When the highest HNu response corresponded to the interval above bedrock, a second sample was obtained at the interval of 2 to 4 feet below grade. Table 2-11 presents a summary of the selected sample intervals and HNu responses. The samples were collected in accordance with the Field Sampling Plan.

All soil samples were analyzed for TCL VOCs and grain size. A duplicate sample of soil was collected from the 6- to 8-foot intervals of boring SB-6. VOC duplicates were collected directly from the soil sampling device by alternately filling the VOA vials. Equipment blanks and trip blanks were retained and submitted in accordance with the Field Sampling Plan.

2.4.5 Background Soil

The background soil sampling program involved sample collection at 5 locations. These locations are shown on Figure 2-11.

Two background soil samples were collected at the Site because floodplain soils are different in origin than the upland plant area soils. One of the samples was collected from the floodplain and the other sample was collected on the plant grounds. Three offsite background soil samples were collected from the floodplain upstream of the Site.

The background soil samples were analyzed for the following parameters; TCL volatiles, TCL semivolatiles, TAL metals, TOC, and grain size. Four sample locations (OS-2, OS-3, PBG-1, PBG01) were analyzed for TCL pesticides and PCBs. One field duplicate was collected at the onsite soil sampling location PBG-1.

2.5 ECOLOGICAL INVESTIGATIONS

The ecological investigations involved wetlands delineation, plant community delineation, wildlife and habitat surveys, and a receptor evaluation. These involved field investigations and review of published data. The methodology and results of the ecological investigations are presented in Chapter 5 of this RI report.

Table 2-1
Reconnaissance and Additional Borehole
Completion Depths

Occidental Chemical Corporation
Pottstown, Pennsylvania

Borehole/ Well ID	Cased Interval	Borehole Completion Depth	Borehole Completion Date	Borehole Completion Notes
TB-1	97.5	585	7/16/91	Originally completed to a depth of 500ft. on 4/10/91.
TB-1A	PC	322	7/22/91	
TB-1B	PC	132	7/29/91	
TB-2	99	450	3/14/91	
TB-2A	96	130	7/3/91	Open-rock 96 - 130ft.
TB-3	100	410	6/28/91	Originally completed to a depth of 100ft. on 7/6/90.
TB-4	39	300	12/19/90	
TB-5	37	450	1/31/91	To be left open; completion to be determined during the FS.
TB-5A	PC	85	6/17/91	
TB-6	40	450	1/31/91	
TB-7	64	350	1/24/91	
TB-7A	PC	105	6/17/91	
TB-8	29	350	1/18/91	
TB-9	39	300	1/25/91	Remains as an open borehole.
TB-10	28	350	1/7/91	
PW-1R	37	550	1/23/91	Remains as an open borehole.
PW-7	37	350	4/30/91*	Well redeveloped on 2/25/91, reported depth - 351 feet.

PC Protective casing

* Production well original completion date.

Table 2-2
Reconnaissance Borehole Camera
And Geophysical Surveys

Occidental Chemical Corporation
Pottstown, Pennsylvania

Borehole ID	Camera Survey Completion	Geophysical Survey Completion	Survey Depth
PW-1R	1/29/91	1/28/91	550 ft
PW-7	2/13/91	2/6/91	350 ft
TB-1	2/13/91 & /3/12/91	2/13/91 & 3/12/91	100 ft/500 ft
TB-2	2/13/91 & /3/15/91	2/14/91 & 3/15/91	100 ft/450 ft
TB-3	7/7/90	7/7/90 & 7/28/91	100 ft/ 553 ft
TB-4	1/28/91	1/29/91	300 ft
TB-5	2/2/91	2/5/91	450 ft
TB-6	2/1/91	2/5/91	450 ft
TB-7	1/31/91	2/4/91	350 ft
TB-8	1/31/91	2/5/91	350 ft
TB-9	2/1/91	2/13/91	300 ft
TB-10	1/28/91	2/6/91	350 ft
BR-2	2/2/91	2/6/91	120 ft

TABLE 2-3

RECONNAISSANCE BOREHOLE PACKER INTERVALS
OCCIDENTIAL CHEMICAL CORPORATION
POTTSTOWN, PENNSYLVANIA

Borehole	Completion Date	Zone	Depth Interval (Feet)	Testing Rationale
TB-1	2/20/91	1	Surface to 101	Isolate upper fracture zone in which dense suspended material was encountered
TB-1	2/20/91	2	72 to 101	Isolate lower fracture zone and evaluate area in which change noted on temperature log
TB-1	4/26/91	3	102.0 - 132.0	Observed flow at 160 feet open horizontal and vertical fractures
TB-1	4/27/91	4	158.0 - 180.0	Horizontal and vertical fractures
TB-1	4/27/91	5	218.0 - 302.0	Observed flow at 219 feet horizontal and vertical fractures
TB-1	4/26/91	6	292.0 - 302.0	Heavily fractured zone at 295-305 feet, 305-320 feet
TB-1	4/27/91	7	354.0 - 376.0	Heavily fractured at 370-375 feet
TB-1	4/26/91	8	390.0 - 420.0	Fractured zone at 395-400 feet 412-418 feet
TB-1	4/25/91	9	450.0 - 500.0	Heavily fractured at 450-462 feet
TB-1	7/11/91	10	507.0 - 535.0	Determine vertical extent of TCE
TB-1	7/18/91	11	540.0 - 582.0	Determine vertical extent of TCE

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TABLE 2-3

RECONNAISSANCE BOREHOLE PACKER INTERVALS
OCCIDENTIAL CHEMICAL CORPORATION
POTTSTOWN, PENNSYLVANIA

Borehole	Completion Date	Zone	Depth Interval (Feet)	Testing Rationale
TB-2	2/25/91	1	80.0 and Above	Isolate upper fracture zone
TB-2	3/27/91	2	80.0 - 100.0	Evaluate visually tight zone below upper fracture zone for difference in hydraulic characteristics and groundwater quality
TB-2	3/17/91	3	100.4 to 130.1	Evaluate fracture zones observed at 105 feet, 110 feet, 114 feet-115 feet and 120 feet to 125 feet, provide depth profile of possible styrene presence; assess significance of temperature change at 125 feet
TB-2	3/26/91	4	190.4 to 210.1	Evaluate hydraulic characteristics and groundwater quality associated with fractures observed at 200 feet,-203 feet, 205 feet-207 feet
TB-2	3/26/91	5	215.4 to 235.1	Evaluate first zone where increased water production was noted during drilling; fractures observed at 218 feet, and 220 feet-222 feet
TB-2	3/25/91	6	248.4 to 268.1	Evaluate second zone where increased water production was noted during drilling fractures observed at 263 feet

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TABLE 2-3

RECONNAISSANCE BOREHOLE PACKER INTERVALS
OCCIDENTIAL CHEMICAL CORPORATION
POTTSTOWN, PENNSYLVANIA

Borehole	Completion Date	Zone	Depth Interval (Feet)	Testing Rationale
TB-1	2/20/91	1	Surface to 101	Isolate upper fracture zone in which dense suspended material was encountered
TB-1	2/20/91	2	72 to 101	Isolate lower fracture zone and evaluate area in which change noted on temperature log
TB-1	4/26/91	3	102.0 - 132.0	Observed flow at 160 feet open horizontal and vertical fractures
TB-1	4/27/91	4	158.0 - 180.0	Horizontal and vertical fractures
TB-1	4/27/91	5	218.0 - 302.0	Observed flow at 219 feet horizontal and vertical fractures
TB-1	4/26/91	6	292.0 - 302.0	Heavily fractured zone at 295-305 feet, 305-320 feet
TB-1	4/27/91	7	354.0 - 376.0	Heavily fractured at 370-375 feet
TB-1	4/26/91	8	390.0 - 420.0	Fractured zone at 395-400 feet 412-418 feet
TB-1	4/25/91	9	450.0 - 500.0	Heavily fractured at 450-462 feet
TB-1	7/11/91	10	507.0 - 535.0	Determine vertical extent of TCE
TB-1	7/18/91	11	540.0 - 582.0	Determine vertical extent of TCE

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TABLE 2-3

RECONNAISSANCE BOREHOLE PACKER INTERVALS
OCCIDENTIAL CHEMICAL CORPORATION
POTTSTOWN, PENNSYLVANIA

Borehole	Completion Date	Zone	Depth Interval (Feet)	Testing Rationale
TB-2	2/25/91	1	80.0 and Above	Isolate upper fracture zone
TB-2	3/27/91	2	80.0 - 100.0	Evaluate visually tight zone below upper fracture zone for difference in hydraulic characteristics and groundwater quality
TB-2	3/17/91	3	100.4 to 130.1	Evaluate fracture zones observed at 105 feet, 110 feet, 114 feet-115 feet and 120 feet to 125 feet, provide depth profile of possible styrene presence; assess significance of temperature change at 125 feet
TB-2	3/26/91	4	190.4 to 210.1	Evaluate hydraulic characteristics and groundwater quality associated with fractures observed at 200 feet, 203 feet, 205 feet-207 feet
TB-2	3/26/91	5	215.4 to 235.1	Evaluate first zone where increased water production was noted during drilling; fractures observed at 218 feet, and 220 feet-222 feet
TB-2	3/25/91	6	248.4 to 268.1	Evaluate second zone where increased water production was noted during drilling fractures observed at 263 feet

TABLE 2-3

RECONNAISSANCE BOREHOLE PACKER INTERVALS
OCCIDENTIAL CHEMICAL CORPORATION
POTTSTOWN, PENNSYLVANIA

Borehole	Completion Date	Zone	Depth Interval (Feet)	Testing Rationale
TB-2	3/22/91	7	350.9 to 370.9	Evaluate fracture zone where slight temperature change and increase in water production were noted
TB-2	3/21/91	8	405.4 to 450.0	Evaluate groundwater quality and hydraulic properties in deep portion of boring relatively free of fractures

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TABLE 2-3

RECONNAISSANCE BOREHOLE PACKER INTERVALS
OCCIDENTIAL CHEMICAL CORPORATION
POTTSTOWN, PENNSYLVANIA

Borehole	Completion Date	Zone	Depth Interval (Feet)	Testing Rationale
TB-3	6/29/90	1	75.3 to 95.00	Isolate bottom of borehole with upper packer set in smooth and round portion of bore
TB-3	6/30/90	2	Above 48.45	Evaluate yield from upper portion of borehole
TB-3	6/30/90	3	51.20 to 66.50	Isolate fracture zone observed at 51-66 feet
TB-3	7/2/90	4	Above 65.55	Evaluate combined yield from middle and upper fracture zones
TB-3	7/2/90	5	62.20 to 77.55	Isolate smooth and round portion of borehole to evaluate yield of this zone
TB-3	7/3/91	6	110.0 to 135.0	Evaluate sandstone member with significant fractures observed at 115 -125 feet
TB-3	7/3/91	7	140.0 to 165.0	Evaluate zone with intersecting horizontal and vertical fractures at 140-145 feet
TB-3	7/2/91	8	226.0 to 251.0	Evaluate significant fracture zone on sandstone/siltstone unit at 230-250 feet
TB-3	7/2/91	9	350.0 to 375.0	Isolate sandstone unit which overlies shale at 350-360 feet
TB-3	7/2/91	10	420.0 to 445.0	Evaluate fractured sandstone units at 430-445 feet

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TABLE 2-3

RECONNAISSANCE BOREHOLE PACKER INTERVALS
OCCIDENTIAL CHEMICAL CORPORATION
POTTSTOWN, PENNSYLVANIA

Borehole	Completion Date	Zone	Depth Interval (Feet)	Testing Rationale
TB-3	7/1/91	11	505.0 to 550.0	Acquire chemical sample from lowest portion of the borehole

TABLE 2-3

RECONNAISSANCE BOREHOLE PACKER INTERVALS
OCCIDENTIAL CHEMICAL CORPORATION
POTTSTOWN, PENNSYLVANIA

Borehole	Completion Date	Zone	Depth Interval (Feet)	Testing Rationale
TB-4	2/6/91	1	65 and above	Assess upper fracture zone
TB-4	2/6/91	2	65.0 to 85	Isolate fracture zones at 72 feet and 79 feet above sandstone member
TB-4	2/6/91	3	85.0 to 105.0	Evaluate sandstone member with significant fractures
TB-4	2/8/91	4	110.0 to 145.0	Evaluate significantly fractured siltstone zone between sandstone and shale members; assess with observed temperature change at 135 feet
TB-4	2/11/91	5	150.0 to 212.0	Evaluate zone which is visually relatively tight for hydraulic and groundwater quality characteristics
TB-4	2/7/91	6	240.0 to 300.0	Assess abrupt temperature change observed below 245 feet

TABLE 2-3

RECONNAISSANCE BOREHOLE PACKER INTERVALS
OCCIDENTIAL CHEMICAL CORPORATION
POTTSTOWN, PENNSYLVANIA

Borehole	Completion Date	Zone	Depth Interval (Feet)	Testing Rationale
TB-5	2/15/91	1	85.0 and Above	Assess upper fractured zone
TB-5	2/15/91	2	100.0 to 140.0	Isolate and assess zone with moderate fracturing
TB-5	2/14/91	3	185.0 to 225.0	Assess zone showing possible inflow at 189' and fractures at 220'
TB-5	2/14/91	4	260.0 to 300.0	Assess sandstone with potential inflow
TB-5	2/13/91	5	340.0 to 380.0	Assess relatively tight zone with few fractures
TB-5	2/13/91	6	410.0 to 450.0	Assess lower sandstone with potential inflow

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TABLE 2-3

RECONNAISSANCE BOREHOLE PACKER INTERVALS
OCCIDENTIAL CHEMICAL CORPORATION
POTTSTOWN, PENNSYLVANIA

Borehole	Completion Date	Zone	Depth Interval (Feet)	Testing Rationale
TB-6	3/5/91	1	121.1 and Above	Access upper fractured zone for groundwater and hydraulic characteristics
TB-6	3/5/91	2	160.0 - 179.0	Isolate zone in which significant change in temperature was noted, and in which very large crevices were observed (162 feet to 166 feet,, and 172 feet to 178 feet)
TB-6	3/4/91	3	197.0 - 216.0	Isolate fracture zone from visually tight zones above and below noted temperature change was observed within this zone
TB-6	3/1/91	4	246.0 - 265.0	Evaluate hydraulic properties of zone which appear relatively tight by visual observations; assess this zone as a barrier to vertical migration. Also, temperature change observed in this zone.
TB-6	2/28/91	5	280.0 - 315.0	Assess deeper fractured zone for groundwater and hydraulic characteristics
TB-6	2/28/91	6	349.0 - 384.0	Assess zone which appears relatively tight by visual observation, with minor fractures noted
TB-6	2/27/91	7	406.0 or Below	Isolate bottom portion of borehole and evaluate for groundwater and hydraulic characteristics

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TABLE 2-3

RECONNAISSANCE BOREHOLE PACKER INTERVALS
OCCIDENTIAL CHEMICAL CORPORATION
POTTSTOWN, PENNSYLVANIA

Borehole	Completion Date	Zone	Depth Interval (Feet)	Testing Rationale
TB-7	2/28/91	1	107.0 and Above	Assess upper fractured zone above shale layer
TB-7	2/27/91	2	115.0 to 155.0	Assess zone with few fractures
TB-7	2/27/91	3	190.4 to 231.2	Assess sandstone zone with moderate fractures
TB-7	2/26/91	4	265.4 to 306.2	Isolate and assess relatively tight zone above pronounced shale zone
TB-7	2/26/91	5	302.4 and Below	Evaluate zone below change observed on temperature log

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TABLE 2-3

RECONNAISSANCE BOREHOLE PACKER INTERVALS
OCCIDENTIAL CHEMICAL CORPORATION
POTTSTOWN, PENNSYLVANIA

Borehole	Completion Date	Zone	Depth Interval (Feet)	Testing Rationale
TB-8	2/22/91	1	80.0 and Above	Evaluate upper fracture zone with observed inflow at 62' and temperature variation relative to lower zones
TB-8	2/20/91	2	85.4 to 105.4	Isolate zone of vertical and horizontal fracturing
TB-8	2/20/91	3	120.4 to 140.4	Isolate zone of vertical and horizontal fracturing
TB-8	2/22/91	4	195.0 to 235.0	Isolate zone of minor horizontal fracturing
TB-8	2/21/91	5	245.4 to 285.2	Isolate zone of minor fracturing
TB-8	2/21/91	6	295.4 and Below	Evaluate water quality and hydraulic characteristics in sandstone member with minor fracturing

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TABLE 2-3

RECONNAISSANCE BOREHOLE PACKER INTERVALS
OCCIDENTIAL CHEMICAL CORPORATION
POTTSTOWN, PENNSYLVANIA

Borehole	Completion Date	Zone	Depth Interval (Feet)	Testing Rationale
TB-9	3/19/91	1	77.0 and Above	Assess upper fracture zone for groundwater and hydraulic characteristics
TB-9	3/19/91	2	155.0 to 180.0	Isolate moderately fractured zone for groundwater and hydraulic characteristics
TB-9	3/18/91	3	225.0 to 260.0	Isolate highly fractured zone for groundwater and hydraulic characteristics; evaluate zone where slight temperature change was noted

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TABLE 2-3

RECONNAISSANCE BOREHOLE PACKER INTERVALS
OCCIDENTIAL CHEMICAL CORPORATION
POTTSTOWN, PENNSYLVANIA

Borehole	Completion Date	Zone	Depth Interval (Feet)	Testing Rationale
TB-10	3/15/91	1	38.0 and Above	Assess upper fracture zones for groundwater quality and hydraulic characteristics
TB-10	3/15/91	2	46.4 to 77.1	Assess fracture zones at 55-57 feet and 67-68 feet. Increase in water yield noted on drilling log
TB-10	3/13/91	3	86.4 to 117.1	Assess fractures at 90-95, 105 and 110-112 feet. Increase in water yield indicated on drilling log.
TB-10	3/13/91	4	166.4 to 197.1	Assess fractures at 168, 180-185 and 188-193 feet. Increase in water yield noted on drilling log. Temperature change noted over this interval
TB-10	3/12/91	5	246.4 to 290.7	Assess fractures at 255, 260-262, 268 and 275-280 feet. Temperature changes noted at 280 and 285 feet
TB-10	3/12/91	6	296.4 and Below	Assess fractures at 317-319, 323-326 and 330 feet. Temperature change noted on log. Increase in water yield noted on drilling log.

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TABLE 2-3

RECONNAISSANCE BOREHOLE PACKER INTERVALS
OCCIDENTIAL CHEMICAL CORPORATION
POTTSTOWN, PENNSYLVANIA

Borehole	Completion Date	Zone	Depth Interval (Feet)	Testing Rationale
PW-1R	3/14/91	1	125.0 and Above	Evaluate upper zone with significant fractures observed at 72-83 feet, 92-94 feet, 83 feet., 92-94 feet., 98 feet to 100 feet 112 feett. and 122 feet
PW-1R	3/13/91	2	200.0 to 220.0	Isolate fracture zone at 204 to 215
PW-1R	3/12/91	3	261.0 to 291.0	Isolate zone with significant fractures at 260 to 261 feet, 273 to 281 feet, and 285 feet
PW-1R	3/12/91	4	359.0 to 389.0	Evaluate shale as a potential confining layer and isolate fractures observed at 365 feet, and 307 to 380 feet
PW-1R	3/11/91	5	441.0 to 471.2	Isolate fracture zone between 445 and 462 ft.
PW-1R	3/8/91	6	491.6 or Below	Evaluate hydraulic characteristics and groundwater quality in argillite with minor fractures

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TABLE 2-3

RECONNAISSANCE BOREHOLE PACKER INTERVALS
OCCIDENTIAL CHEMICAL CORPORATION
POTTSTOWN, PENNSYLVANIA

Borehole	Completion Date	Zone	Depth Interval (Feet)	Testing Rationale
PW-7	3/4/91	1	65.0 and Above	Assess water quality and permeability on fractures at 35-59 feet. Temperature change noted on log
PW-7	3/5/91	2	100.1 and Above	Assess fractures at 66-80 and 85-90 feet. Evaluate confining effects of shale layer
PW-7	3/5/91	3	105.0 to 140.0	Assess fractures at 133-138 feet. Evaluate confining effects of shale layers. Temperature change noted on log
PW-7	3/8/91	4	177.1 to 212.1	Assess fractures at 190 and 203 feet. Temperature change noted on log
PW-7	3/6/91	5	216.0 to 251.0	Assess fractures at 223, 230 and 247 feet. Temperature change noted on log
PW-7	3/7/91	6	310.0 and Below	Assess fractures at 315, 320, 325, and 340 feet. Temperature change noted on log

TABLE 2-4
Remedial Investigation Monitoring Well
Completion Information

Occidental Chemical Corporation
Pottstown, Pennsylvania

WELL	COMPLETION DATE	CASED INTERVAL (ft bgs)	COMPLETION DEPTH (ft. bgs)	TOP OF SCREEN (ft bgs)	OPEN/ SCREENED INTERVAL (ft)	SCREENED LITHOLOGY	SCREEN SLOT SIZE (inches)	SAND PACK INTERVAL (ft)	WELL DIAMETER (inches)
TB-1	8/5/91	97.5	585	541	44	FRAC. SANDST	0.04	50	4
TB-1A	6/22/91	*	322	291	31	FRAC. SANDST	0.04	35	4
TB-1B	7/31/91	*	132	102	30	SANDST/SILTST	0.04	36	4
TB-2	6/20/91	99	365	350	15	FRAC. SANDST	0.04	20	4
TB-2A	7/3/91	96	130	-	34	FRAC. SANDST	OPEN ROCK	-	8
TB-3	9/5/91	100	410	385	25	SILTST	0.04	34	4
TB-4	12/19/90	39	300	-	261	SANDST/SILTST/SHALE	OPEN ROCK	-	8
TB-5	6/17/91	37	135	95	40	FRAC. SANDST	0.02	45	4
TB-5A	6/19/91	*	85	40	45	SILTST	0.04	50	4
TB-6	6/17/91	40	384	349	35	SILTST	0.02	52*	4
TB-7	6/11/91	64	148	120	28	SILTST	0.04	34	4
TB-7A	6/21/91	*	105	70	35	SILTST	0.04	40	4
TB-8	6/14/91	29	105	85	20	SILTST	0.02	25	4
TB-9	1/23/91	42	300	-	258	SANDST/SILTST/SHALE	OPEN ROCK	-	8
TB-10	6/21/91	28	113	86	27	FRAC. SANDST	0.02	33	4
PW-1R	1/23/91	37	550	-	513	SANDST/SILTST/SHALE	OPEN ROCK	-	8
PW-7	6/27/91	37	210	175	35	SANDST/SILTST/SHALE	0.04	40	4

* : Protective casing extends from surface to 3-5 feet bgs.

- : Not Applicable

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Table 2-5
Round 1 CLP Groundwater Sampling Program

Occidental Chemical Corporation
Pottstown, Pennsylvania

Well Sampled		Purge Method	Sample Method	Date Sampled	Analytical Parameters***
OxyChem	EPA*				
<u>Overburden Monitoring Wells</u>					
OW-9	--	Peristaltic pump	Teflon bailer	7/29/91	TCL VOAs
OW-10	--	Dry	--	--	--
OW-11	--	Peristaltic pump	Teflon bailer	8/1/91	TCL VOAs Semi-VOAs and TAL Metals
OW-12	--	Teflon bailer	Teflon bailer	8/1/91	TCL VOAs Semi-VOAs and TAL Metals
OW-16	--	Dry	--	--	--
OW-17	--	Dry	--	--	--
OW-19	--	Peristaltic pump	Teflon bailer	7/31/91	TCL VOAs and Semi-VOAs
OW-21	--	Peristaltic pump	Teflon bailer	7/29/91	TCL and TAL (Full)
(OW-24A)	--	Bladder pump	Bladder pump	8/5/91	TCL VOAs Semi-VOAs and TAL Metals
OW-25	--	Peristaltic pump	Teflon bailer	7/29/91	TCL VOAs
<u>Bedrock Monitoring Wells</u>					
BR-B	--	Submersible pump	Teflon bailer	7/30/91	TCL and TAL (Full)
BR-1	--	Submersible pump	Teflon bailer	8/1/91	TCL VOAs and TAL Metals
BR-2	--	Centrifugal pump	Teflon bailer	8/2/91	TCL VOAs and TAL Metals
BR-3	--	Submersible pump	Teflon bailer	7/31/91	TCL VOAs and TAL Metals
BR-4	--	Submersible pump	Teflon bailer	7/29/91	TCL and TAL (Full)
OW-8A	--	Bladder pump	Bladder pump	8/5/91	TCL VOAs Semi-VOAs and TAL Metals
OW-27A	--	Bladder pump	Bladder pump	8/5/91	TCL VOAs
TB-1	--	Submersible pump	Teflon bailer	9/24/91	TCL and TAL (Full)
TB-1A	--	Blocked	--	--	--
TB-1B	--	Submersible pump	Teflon bailer	9/24/91	TCL VOAs Semi-VOAs and TAL Metals
TB-2	--	Submersible pump	Teflon bailer	7/30/91	TCL and TAL (Full)
TB-2A	--	Submersible pump	Teflon bailer	7/30/91	TCL and TAL (Full)
TB-3	TB-3	Submersible pump	Teflon bailer	9/24/91	TCL VOAs
TB-5	--	Submersible pump	Teflon bailer	7/31/91	TCL VOAs Semi-VOAs and TAL Metals
TB-5A	--	Submersible pump	Teflon bailer	7/31/91	TCL VOAs
TB-6	--	Submersible pump	Teflon bailer	8/1/91	TCL VOAs Semi-VOAs and TAL Metals
TB-7**	--	Submersible pump	Teflon bailer	8/1/91	TCL VOAs Semi-VOAs and TAL Metals
TB-7A	--	Submersible pump	Teflon bailer	8/1/91	TCL VOAs
TB-8	--	Submersible pump	Teflon bailer	7/30/91	TCL VOAs Semi-VOAs and TAL Metals
TB-9**	--	Centrifugal pump	Teflon bailer	7/31/91	TCL and TAL (Full)
TB-10	--	Centrifugal pump	Teflon bailer	7/31/91	TCL VOAs and Semi-VOAs
PW-1R	--	Submersible pump	Teflon bailer	8/2/91	TCL and TAL (Full)
PW-7	--	Submersible pump	Teflon bailer	8/2/91	TCL VOAs Semi-VOAs and TAL Metals

() Well screened across overburden and shallow bedrock aquifers

* Split sample

** Field duplicate sample obtained at these locations

*** pH, Eh, specific conductance, temperature and dissolved oxygen measured in field prior to sample collection.

-- Not sampled

TCL Target Compound List

TAL Target Analyte List

Table 2-6
Round 2 CLP Groundwater Sampling Program

Occidental Chemical Corporation
Pottstown, Pennsylvania

Well Sampled		Purge Method	Sample Method	Date Sampled	Analytical Parameters***
OxyChem	EPA*				
<u>Bedrock Monitoring Wells</u>					
TB-1B	--	Submersible pump	Teflon bailer	1/23/92	TCL VOAs and Semi-VOAs
TB-2	--	Submersible pump	Teflon bailer	1/22/92	TCL VOAs
TB-2A	TB-2A	Submersible pump	Teflon bailer	1/22/92	TCL VOAs and TAL Metals
TB-5	--	Submersible pump	Teflon bailer	1/22/92	TCL VOAs
TB-5A	--	Submersible pump	Teflon bailer	1/22/92	TCL VOAs
TB-7	--	Submersible pump	Teflon bailer	1/21/92	TCL VOAs
TB-7A	--	Submersible pump	Teflon bailer	1/21/92	TCL VOAs
TB-9**	--	Centrifugal pump	Teflon bailer	1/21/92	TCL VOAs Semi-VOAs and TAL Metals
BR-B	--	Submersible pump	Teflon bailer	1/13/92	TCL VOAs
BR-1	--	Submersible pump	Teflon bailer	1/21/92	TCL VOAs
PW-7	--	Submersible pump	Teflon bailer	1/23/92	TCL VOAs

* Split sample

** Field duplicate sample obtained at this location

*** pH, Eh, specific conductance, temperature and dissolved oxygen measured in field prior to sample collection.

-- Not sampled

TCL Target Compound List

TAL Target Analyte List (filtered samples only)

Table 2-7
Surface Water Sampling and Analysis Program

Occidental Chemical Corporation
Pottstown, Pennsylvania

Sample Location	Collection Date	Analytical Parameters***			TOC
		TCL Semi-Volatiles	TAL Metals	TCL Volatiles	
<u>Schuylkill River</u>					
SR-1 (background)	12/19/90	X	X	X	X
SR-1-2 (background)	1/18/91	X	X	X	X
SR-1-3 (background)	1/18/91	X	X	X	X
SR-2**	12/19/90	X	X	X	X
SR-2-2	1/17/91	X	X	X	X
SR-2-3**	1/17/91	X	X	X	X
SR-3	12/18/90	X	X	X	X
SR-3A*	12/18/90	X	X	X	X
SR-3-2	12/27/90	X	X	X	X
SR-3-3	12/27/90	X	X	X	X
SR-4	12/19/90	X	X	X	X
SR-4-2	1/18/91	X	X	X	X
SR-4-3	1/18/91	X	X	X	X
<u>Storm Water Sewer Outfalls</u>					
CLSO-1**	1/17/91	X	X	X	X
NSO-1	1/14/91	X	X	X	X
NSO-1A*	1/14/91	X	X	X	X
<u>Sediment Pond Drainage Swale</u>					
SW-1	1/9/91	X	X	X	X
SW-2	1/9/91	X	X	X	X
SW-2A*	1/9/91	X	X	X	X
SW-3	1/9/91	X	X	X	X

* Field Duplicate Sample

** EPA Split Sample.

*** Field measurements for pH, specific conductance, and dissolved oxygen taken at time of sampling

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Table 2-8
Soil Sampling and Analysis Program

Occidental Chemical Corporation
Pottstown, Pennsylvania

Sample Location	Collection Date	TCL Semi-Volatiles	Analytical Parameters***			Pesticides PCBs
			TAL Metals	TCL Volatiles	TOC	
<u>Background</u>						
OS-1-S**	1/18/91	X	X	X	X	
OS-2-S	4/11/91	X	X	X	X	X
OS-3-S	4/11/91	X	X	X	X	X
PGB-1-S	1/28/91	X	X	X	X	X
PGB-1A-S*	1/28/91	X	X	X	X	X
FBG-1-S	1/28/91	X	X	X	X	X
<u>Lined Lagoon</u>						
LL1S-4	3/4/91	X	X	X	X	
LL1S-6	3/4/91	X	X	X	X	
LL2S-4	3/4/91	X	X	X	X	
LL3S-4	3/4/91	X	X	X	X	
LL3S-4A*	3/4/91	X	X	X	X	
LL3S-10	3/4/91	X	X	X	X	
LL4S-4**	3/5/91	X	X	X	X	X
LL4S-9	3/5/91	X	X	X	X	X
LL5S-4	3/5/91	X	X	X	X	
LL5S-10	3/5/91	X	X	X	X	
<u>Contingent Borings</u>						
SB-1 D2-4	8/1/91			X	X	
SB-1 D10-12	8/1/91			X	X	
SB-2 D8-10	8/1/91			X	X	
SB-2 D10-12	8/1/91			X	X	
SB-3 D8-10	8/1/91			X	X	
SB-3 D10-12	8/1/91			X	X	

* Field Duplicate Sample

** EPA Split Sample.

*** Field measurements for pH, specific conductance, and dissolved oxygen taken at time of sampling

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Table 2-8
Soil Sampling and Analysis Program

Occidental Chemical Corporation
Pottstown, Pennsylvania

Sample Location		Collection Date	TCL Semi-Volatiles	Analytical Parameters***			Pesticides PCBs
				TAL Metals	TCL Volatiles	TOC	
SB-4	D6-8	8/2/91			X	X	
SB-4	D8-10	8/2/91			X	X	
SB-5	D4-6	8/2/91			X	X	
SB-5	D10-12	8/2/91			X	X	
SB-6	D6-8	8/2/91			X	X	
SB-6A**	D6-8	8/2/91			X	X	
SB-6	D8-10	8/2/91			X	X	
SB-7	D8-10	8/2/91			X	X	
SB-7	D8-10	8/2/91			X	X	

* Field Duplicate Sample

** EPA Split Sample.

*** Field measurements for pH, specific conductance, and dissolved oxygen taken at time of sampling

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AR304300

Table 2-9
Sediment Sampling and Analysis Program

Occidental Chemical Corporation
Pottstown, Pennsylvania

Sample Location	Collection Date	TCL Semi-Volatiles	Analytical Parameters***			Pesticides PCBs
			TAL Metals	TCL Volatiles	TOC	
<u>Schuylkill River</u>						
SR-1	12/19/90	X	X	X	X	
SR-1-2	1/18/91	X	X	X	X	
SR-1-3	1/18/91	X	X	X	X	X
SR-2**	12/19/90	X	X	X	X	
SR-2-2	1/17/91	X	X	X	X	
SR-2-3**	1/17/91	X	X	X	X	
SR-3	12/18/90	X	X	X	X	
SR-3A*	12/18/90	X	X	X	X	
SR-3-2	12/17/90	X	X	X	X	X
SR-4	12/19/90	X	X	X	X	
SR-4-2	1/18/91	X	X	X	X	X
<u>Storm Water Sewer Outfalls</u>						
CLSO-1	1/15/91	X	X	X	X	X
NSO-1	1/15/91	X	X	X	X	
NSO-1A*	1/15/91	X	X	X	X	
<u>Sediment Pond Drainage Swale</u>						
SW-1	1/9/91	X	X	X	X	X
SW-2	1/9/91	X	X	X	X	
SW-3	1/9/91	X	X	X	X	
SW-4	1/9/91	X	X	X	X	
SW-5	1/9/91	X	X	X	X	
SW-6	1/9/91	X	X	X	X	
SW-6A	1/9/91	X	X	X	X	
SW-7	1/9/91	X	X	X	X	

* Field Duplicate Sample

** EPA Split Sample.

*** Field measurements for pH, specific conductance, and dissolved oxygen taken at time of sampling

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AR304301

Table 2-9
Sediment Sampling and Analysis Program

Occidental Chemical Corporation
Pottstown, Pennsylvania

Sample Location	Collection Date	TCL Semi-Volatiles	Analytical Parameters***			Pesticides PCBs
			TAL Metals	TCL Volatiles	TOC	
SW-8	1/9/91	X	X	X	X	
SW-9	1/9/91	X	X	X	X	
SW-10	1/10/91	X	X	X	X	X
<u>Borrow Area</u>						
B-1	1/15/91	X	X	X	X	X
B-2	1/16/91	X	X	X	X	
B-3	1/16/91	X	X	X	X	
B-3A*	1/16/91	X	X	X	X	

* Field Duplicate Sample

** EPA Split Sample.

*** Field measurements for pH, specific conductance, and dissolved oxygen taken at time of sampling

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AR304302

Table 2-10
Lined Lagoon Soil Boring Program
HNu Response and
Depth for Laboratory Analysis

Occidental Chemical Corporation
Pottstown, Pennsylvania

Boring Location	Sample Depth (ft)	HNu Readings (ppm)	Collection Date	TCL Semi-Volatiles	Analytical Parameters			
					TAL Metals	TCL Volatiles	TOC	Pesticides PCBs
LL-1	0-2	--						
	2-4	--	3/4/91	X	X	X	X	
	4-6	1.0	3/4/91	X	X	X	X	
	6-8	--						
	8-10	NIR						
LL-2	0-2	--						
	2-3.5	--	3/4/91	X	X	X	X	
LL-3	0-2	--						
	2-4	--	3/4/91	X	X	X	X	
	4-6	4.5						
	6-8	3.6						
	8-10	8.0	3/4/91	X	X	X	X	
	10-12	4.0						
LL-4	0-2	NIR						
	2-4 **	NIR	3/5/91	X	X	X	X	X
	4-6	NIR						
	6-8	NIR						
	8-10 **	NIR	3/5/91	X	X	X	X	X
LL-5	0-2	NS						
	2-4	NS	3/5/91	X	X	X	X	
	4-6	NIR						
	6-8	NIR						
	8-10	NIR	3/5/91	X	X	X	X	
	10-12	NIR						

Notes :

-- : No Information Available

NS : Interval Not Sampled with HNu

NIR : No Instrument Response

** : EPA Split Sample

Oxychem\report\sec2\tbl27ll.xls

AR304303

Table 2-11
Contingent Soil Boring Program
HNu Response

Occidental Chemical Corporation
Pottstown, Pennsylvania

Boring Location	Sample Depth (ft)	HNu Readings (ppm)	Collection Date	Analytical Parameters	
				TCL Volatiles	TOC
SB-1	0.5-2	0.6			
	2-4	2-3	8/1/91	X	X
	4-6	0.6-15			
	6-8	5-13			
	8-10	19-20			
	10-12	2-19	8/1/91	X	X
	12-14	2-5			
SB-2	1-2	0.2			
	2-4	1.0			
	4-6	2.0			
	6-8	1-8			
	8-10	3-15	8/1/91	X	X
	10-12	1-19	8/1/91	X	X
SB-3	1-2	1-2			
	2-4	2-10			
	4-6	1-2			
	6-8	2-4			
	8-10	4-18	8/1/91	X	X
	10-12	5-30	8/1/91	X	X
SB-4	1-2	0.7			
	2-4	1.0			
	4-6	2-9			
	6-8	20-30	8/2/91	X	X
	8-10	9-40	8/2/91	X	X
	10-12	5.0			
SB-5	0-2	0.2			
	2-4	NIR			
	4-6	2.8	8/2/91	X	X
	6-8	2.0			
	8-10	0.6			

AR304304

Table 2-11
Contingent Soil Boring Program
HNu Response

Occidental Chemical Corporation
Pottstown, Pennsylvania

Boring Location	Sample Depth (ft)	HNu Readings (ppm)	Collection Date	Analytical Parameters	
				TCL Volatiles	TOC
	10-12	1-5	8/2/91	X	X
SB-6	0-2	NIR			
	2-4	0.4			
	4-6	2.0			
	6-8	15.0	8/2/91	X	X
	8-10	2.0	8/2/91	X	X
SB-7	0-2	0-13	8/2/91	X	X
	2-4	0-3			
	4-6	0-2			
	6-8	0-2			
	8-10	NIR	8/2/91	X	X

Notes :

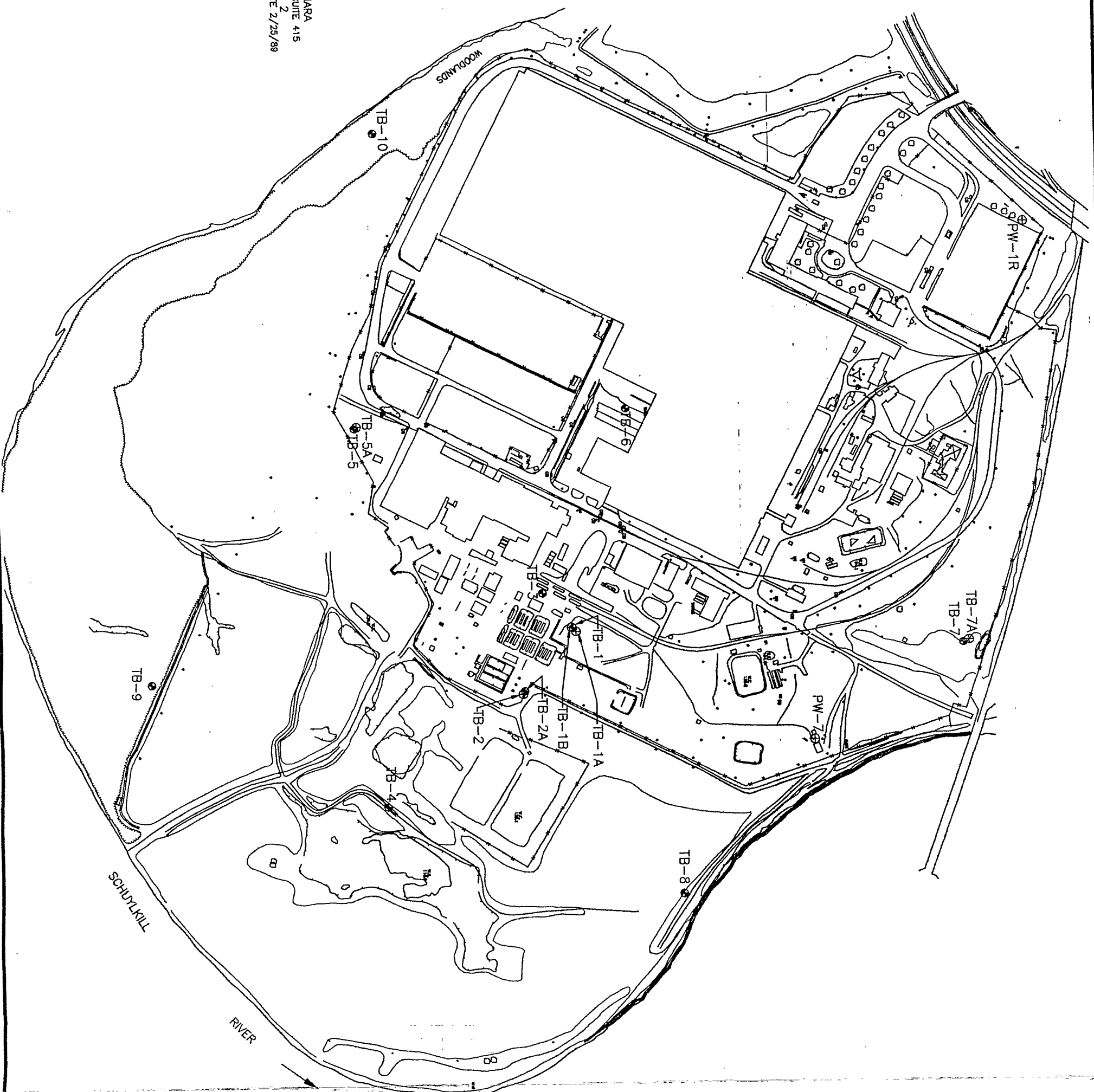
NIR : No Instrument Response

Oxychem\report\sec2\oxytb28.xls

AR304305



BASE MAP:
GREENHORNE & O'MARA
3075 BRECKENRIDGE BLVD, SUITE 415
POTTSTOWN PLANT 2
JOB NO. 0089-076 PHOTO DATE 2/25/89



- LEGEND**
- TB-10 RECONNAISSANCE BOREHOLE WELL LOCATION
 - ⊕ TB-7A ADDITIONAL BOREHOLE/WELL LOCATION



Figure 2-1

Occidental Chemical Corporation

RECONNAISSANCE AND ADDITIONAL
BOREHOLE/WELL LOCATIONS

REMEDIAL INVESTIGATION REPORT

AR304306



Figure 2-2

Occidental Chemical Corporation

WELL LOCATIONS

REMEDIAL INVESTIGATION REPORT

AR 30430

⊕	TB-4	RECONNAISSANCE BEDROCK WELL
●	BR-5	BEDROCK MONITORING WELL
○	OW-7	OVERBURDEN MONITORING WELL
⊙	OW-5A	OVERBURDEN/SALLOW BEDROCK WELL
⊕	SBMW-3	RCRA MONITORING SHALLOW BEDROCK WELL
⊕	PW-8	PLANT PRODUCTION BEDROCK WELL

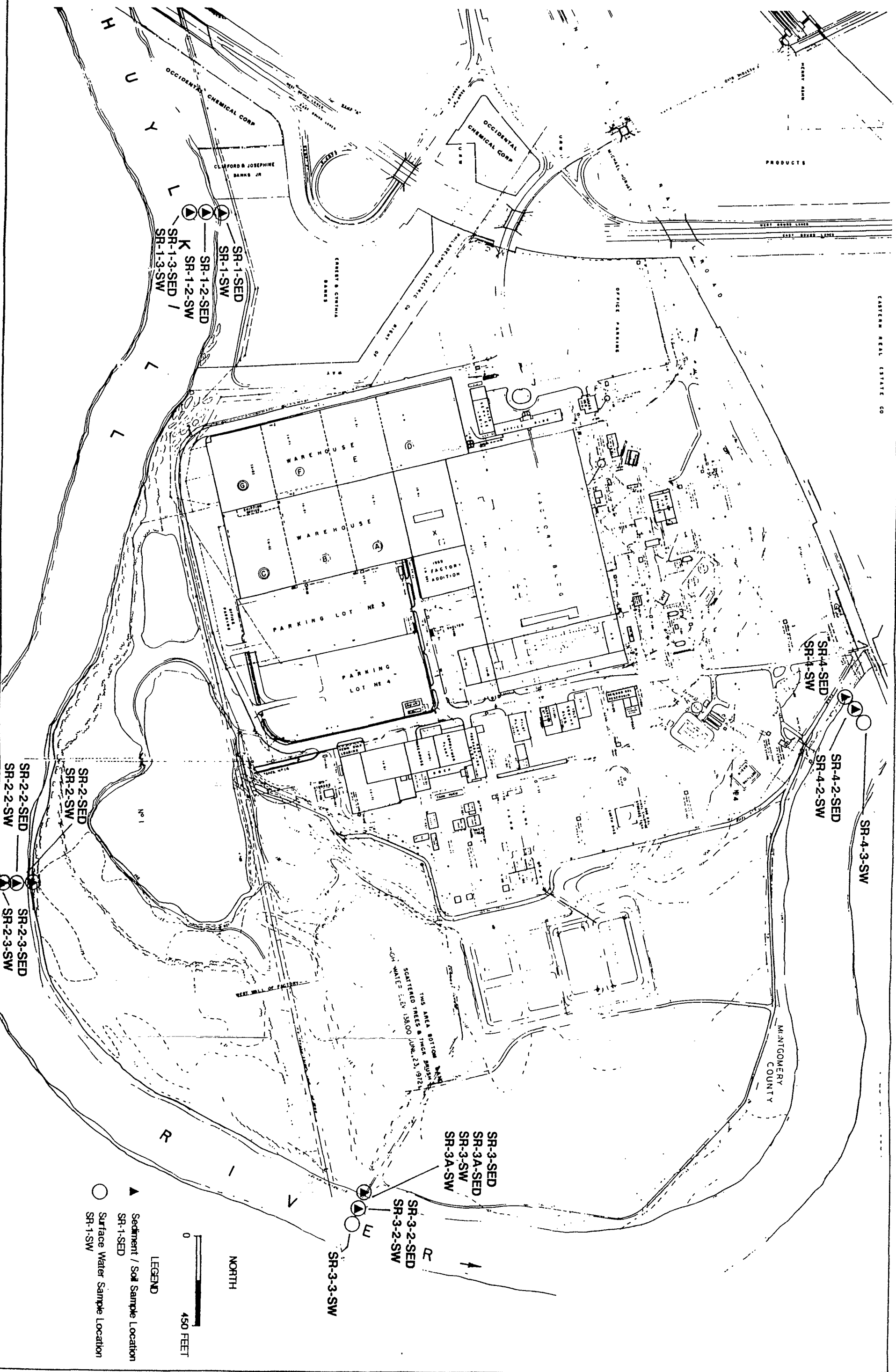


Figure 2-3
Schuylkill River Sediment and Surface Water Sampling Locations
AR 304308

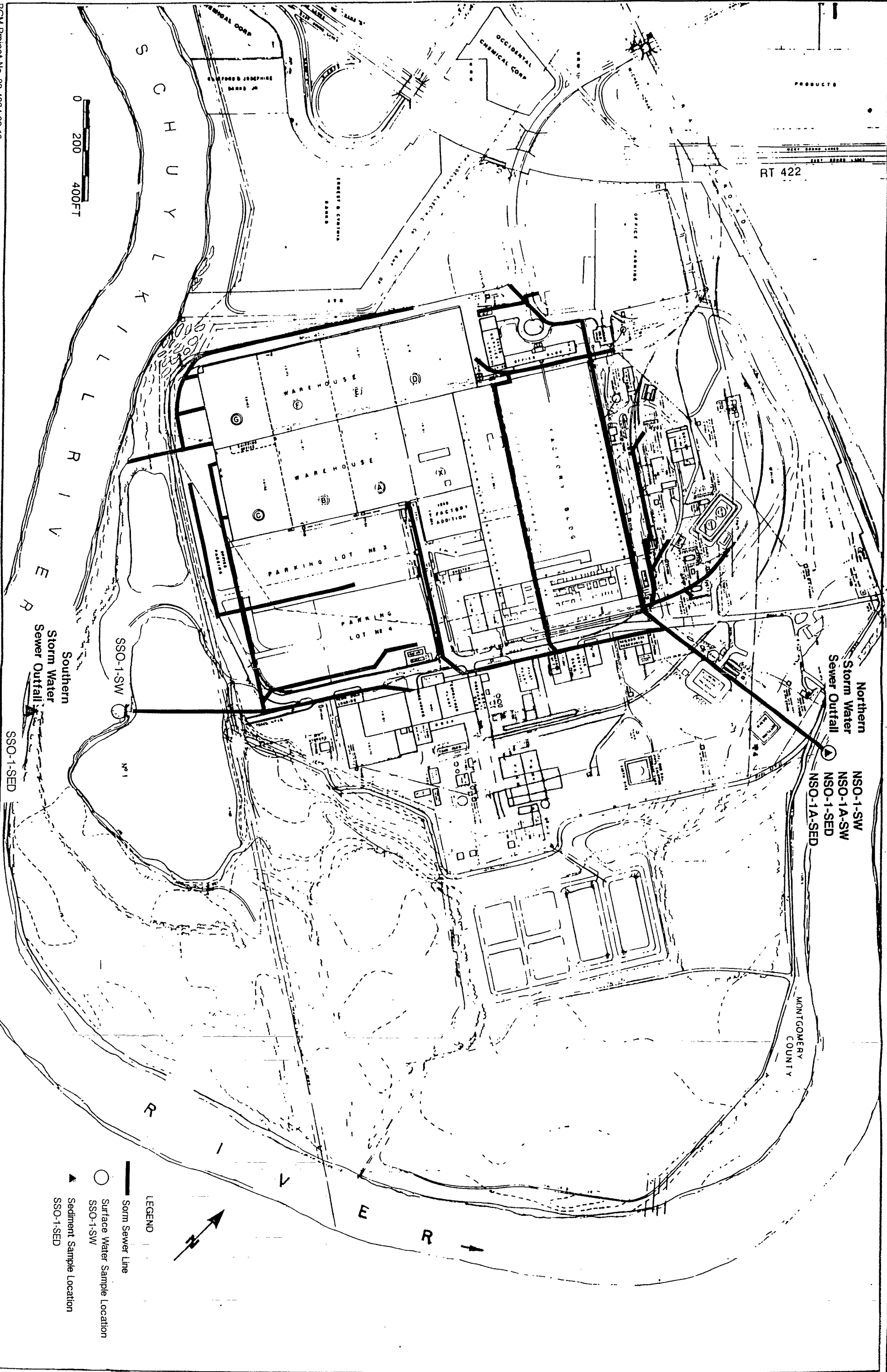
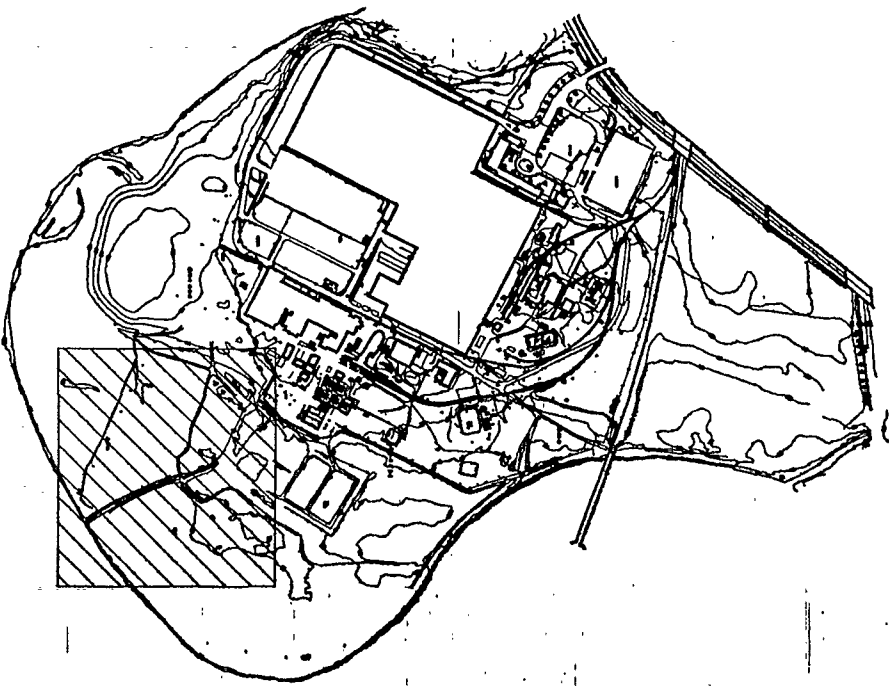
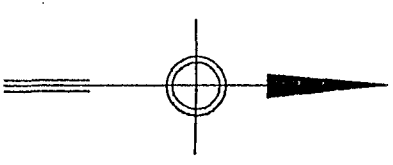
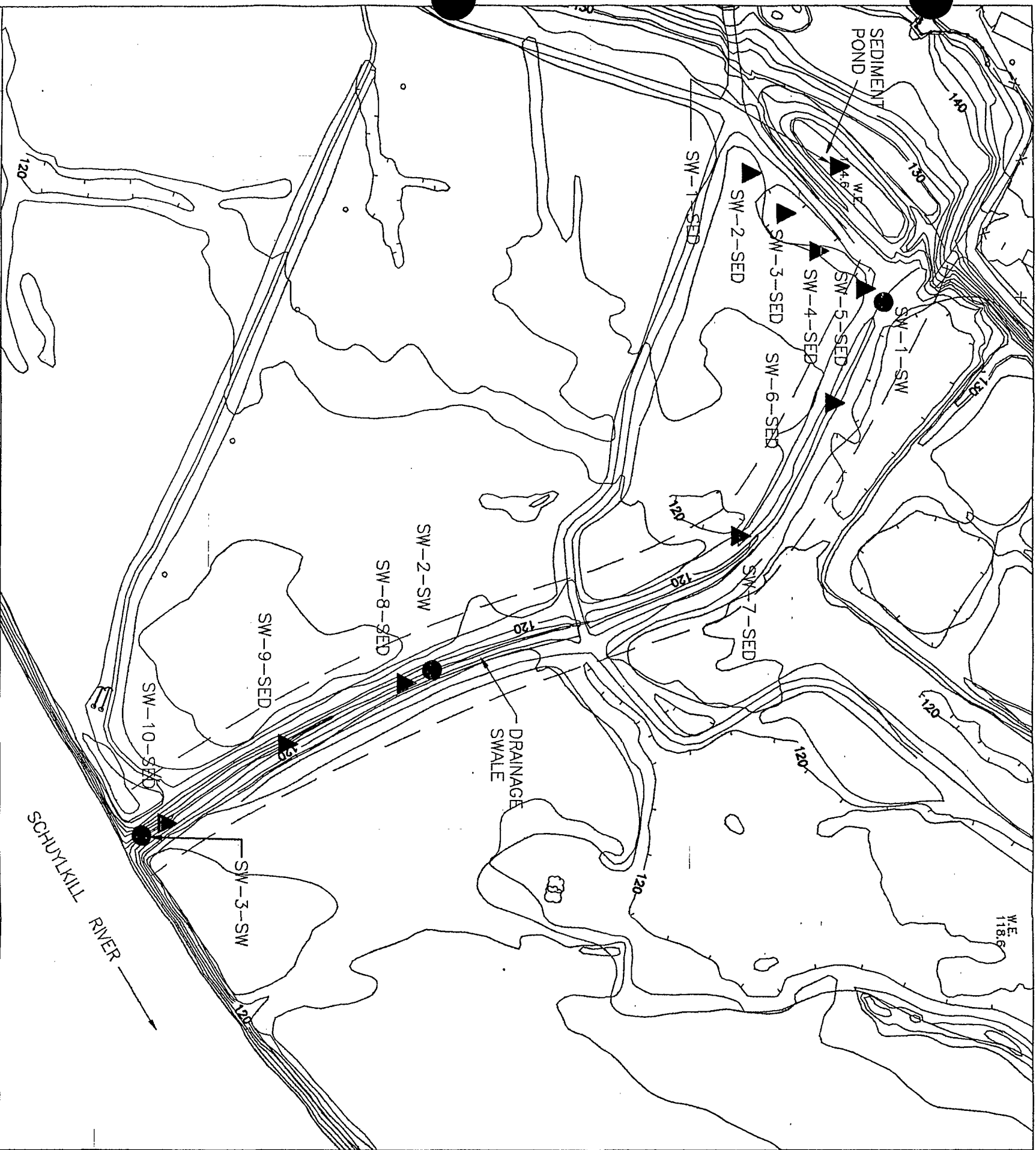


Figure 2-19
Storm Sewer Sampling and
Surface Water Sampling Locations



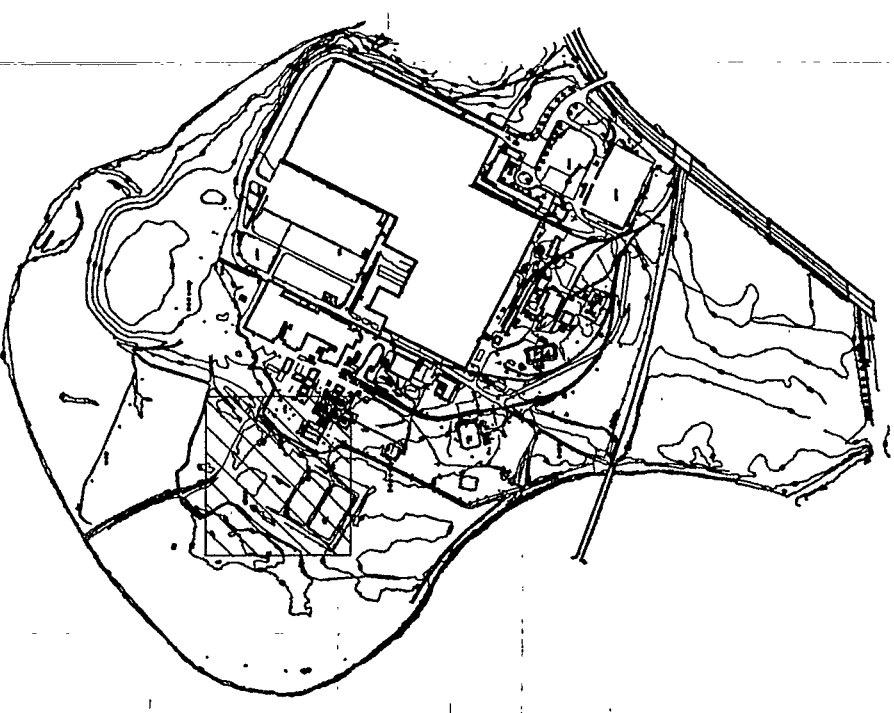
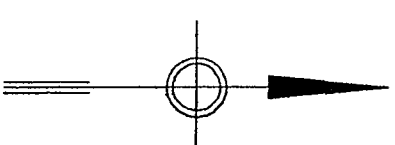
SITE PLAN
NTS

- LEGEND**
- ▲ SEDIMENT / SOIL SAMPLE LOCATION
 - SURFACE WATER SAMPLE LOCATION

Figure 2-5

OCCIDENTAL CHEMICAL CORPORATION

SEDIMENT POND & DRAINAGE SWALE
SAMPLING LOCATIONS



SITE PLAN
NTS

LEGEND

- TEST BORING LOCATION
- ▲ TEST BORING / SAMPLING LOCATION

Figure 2-6

OCCIDENTAL CHEMICAL CORPORATION

INACTIVE EARTHEN LAGOONS
SAMPLING LOCATIONS

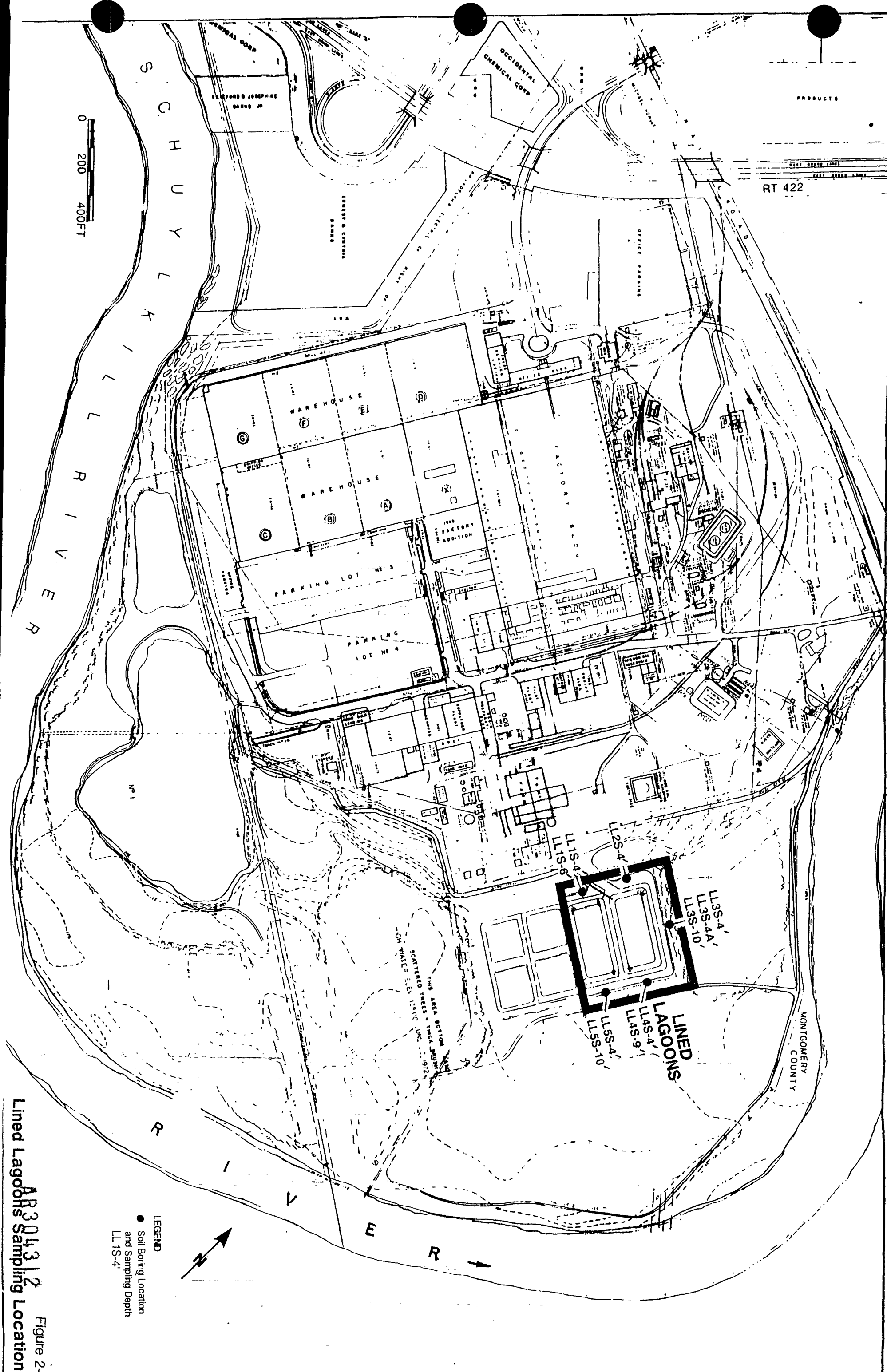
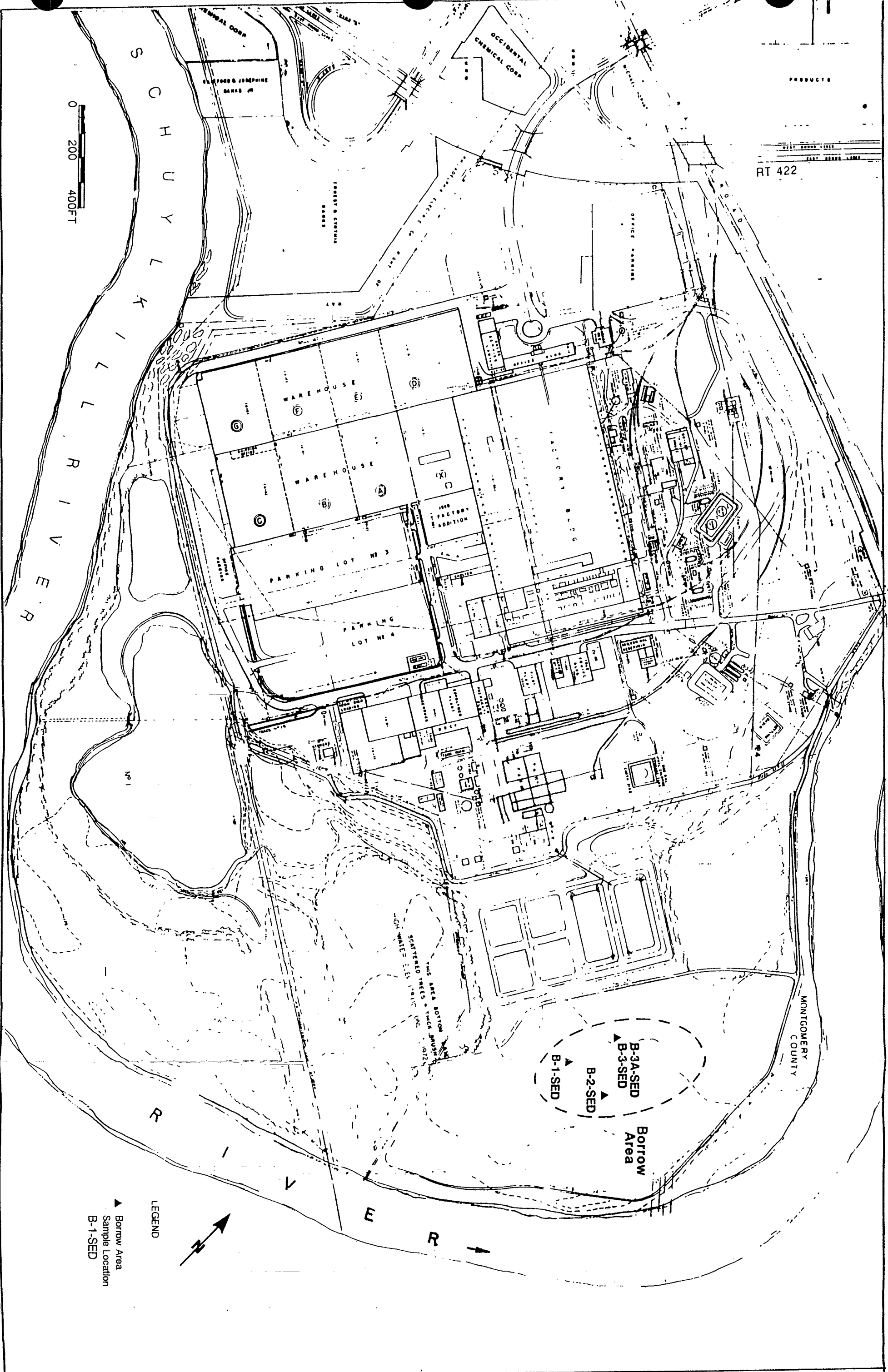


Figure 2-8
Borrow Area Sampling Locations



RT 422

PRODUCT 8

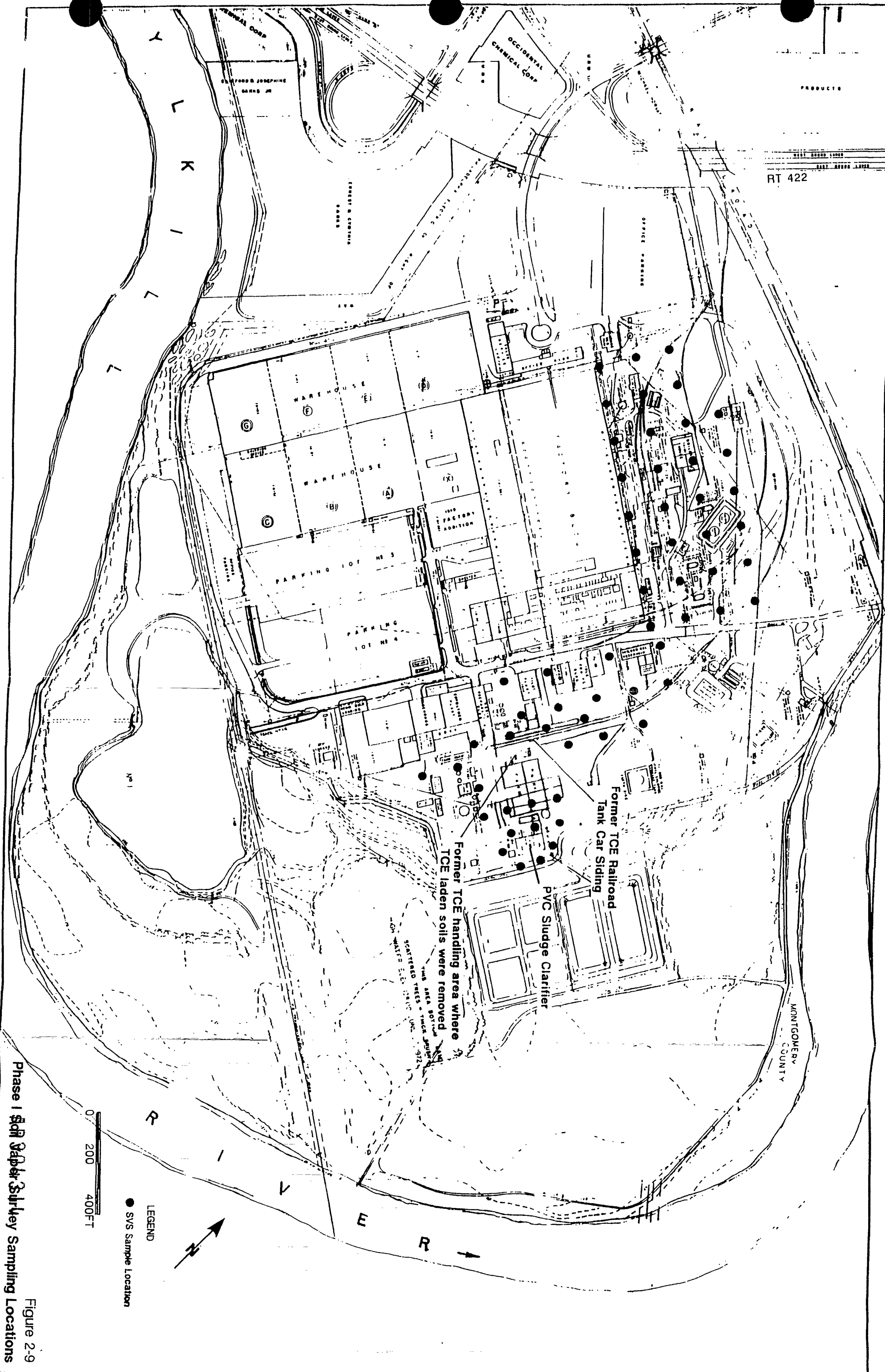
WEST ARROW, LONG
EAST ARROW, SHORT

0 200 400 FT

LEGEND
● SVS Sample Location



Figure 2-9
Phase I SVS Sampler Survey Sampling Locations



- Legend
- Phase II SVS Sample Point
 - ⊕ Soil Boring/Sampling Location
 - ⊕ Phase I SVS Sampling Point

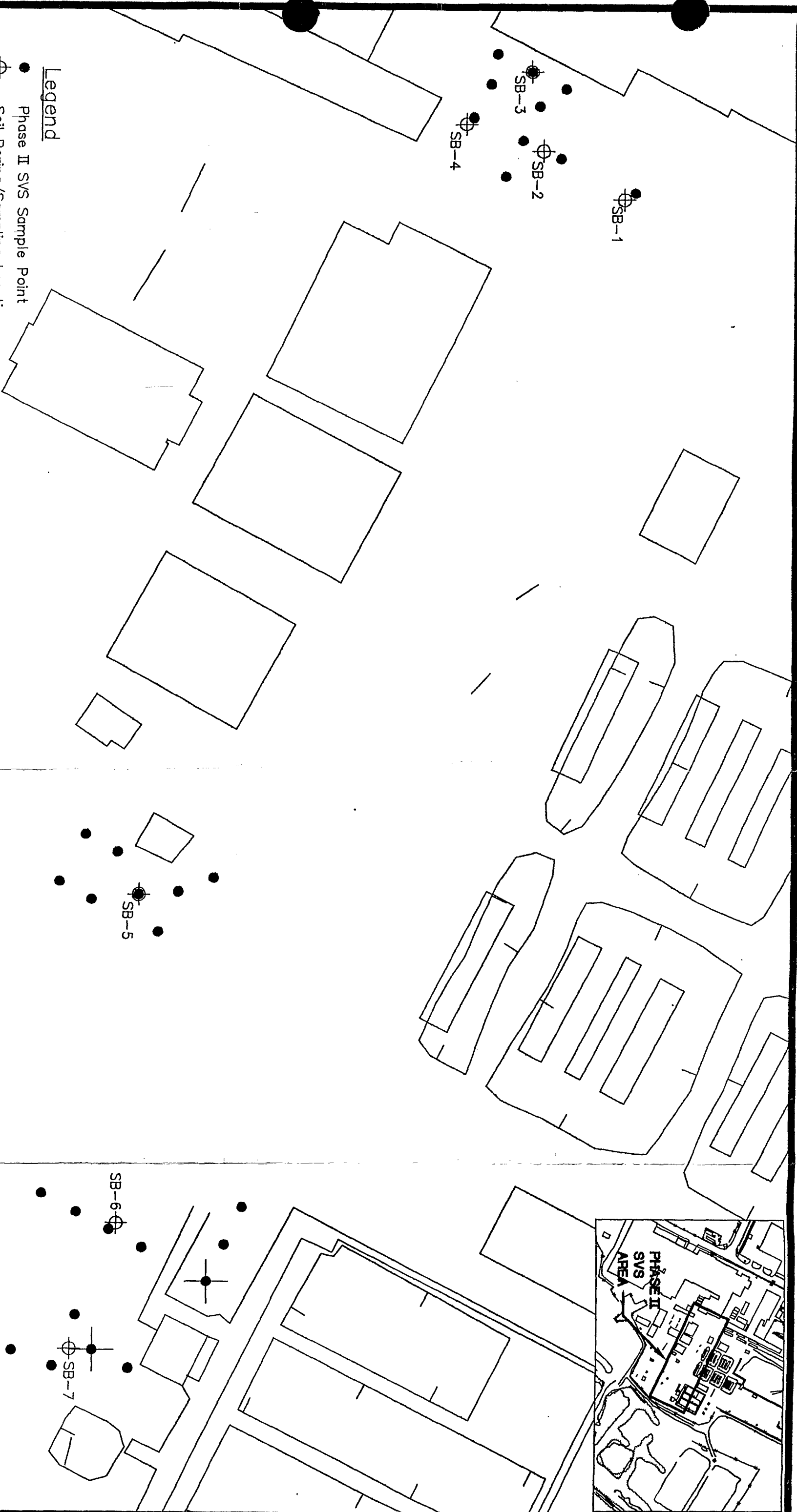


Figure 2-10

Occidental Chemical Corporation
 Phase II Soil Vapor Survey
 And Contingent Soil Boring
 Location Map
 Remedial Investigation Report

DWG. No.C4064SVS

AK004013

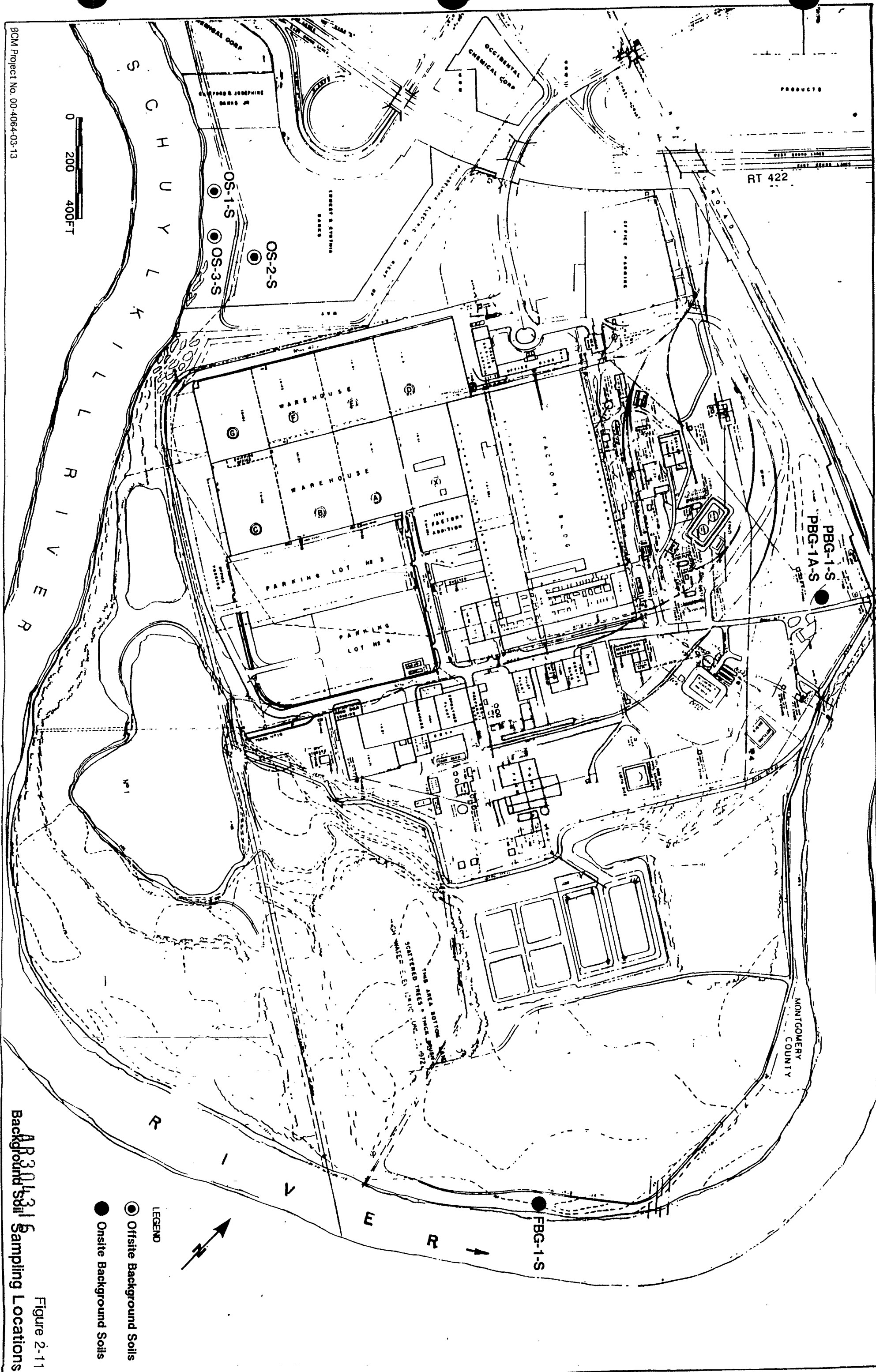


Figure 2-11
Background Soil Sampling Locations