CDM FEDERAL PROGRAMS CORPORATION

October 2, 1992

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Project: ARCS II Contract No. 68-W9-0024
Work Assignment 046-2LC3

Document Control No.: 7720-046-EP-BPTF

Subject: Final RI/FS Work Plan
Chemsol, Inc., Site
Piscataway, New Jersey

Dear Mr. Kollar and Mr. Haklar:

CDM FEDERAL PROGRAMS CORPORATION (CDM Federal) is pleased to submit this Final Work Plan (Volume I) for the Remedial Investigation/Feasibility Study (RI/FS) at the Chemsol Inc., Site, in Piscataway, New Jersey.

This Work Plan presents the scope of work for work assignment 046-2LC3.

CDM Federal will implement the work plan activities developed by EPA and NJDEPE with the following modifications/exceptions/changes. These changes were discussed with and agreed to by Ms. Janet Feldstein and Mr. James Haklar of EPA.

The scope modifications to Chapter 5 of the RI/FS work plan are as follows:

TASK 3A - Four subcontracts will be required to support field activities:

- A drilling subcontract for soil sampling, monitoring well installation, well development, well testing and well abandonment;
- A waste hauling subcontract to remove purged groundwater, drilling residuals and RI generated waste (personal protective gear);

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- A surveying subcontract to perform an aerial topographic survey, prepare a site map based on the fly over and to survey the locations and elevations for all monitoring wells and media sampling locations; and

- A subcontract to perform a Stage IA cultural resources survey.

Air sampling will be performed by CDM Federal through EPA's CLP program.

Borehole logging and weather monitoring will be performed by CDM Federal using rental equipment.

The on-site trailer will also be rented.

TASK 3D - In addition to the proposed drilling and monitoring well installation, CDM Federal will arrange for:

- The installation of three more overburden wells (5 to 15 feet approximate depth):

- Oriented rock coring in Wells IW-1 and IW-2 up to depths of 135 feet below ground surface;

- Oriented rock coring in Well DMW-9 from a depth of 135 feet to 250 feet below ground surface.

TASK 3F - In addition to the proposed soil sampling, the soil boring installation will include drilling to top of bedrock at 20 of the proposed 50 locations. One additional sample per borehole will be collected from the saturated zone for chemical analyses for TCL/TAL parameters (Level IV).

TASK 3G - Surface water samples will be collected from two additional locations (ponded area in south-east corner of Lot IB).

TASK 3H - Sediment samples will also be collected from the same two additional surface water sample locations described above.

Please note that the field investigations will be performed in the order described in the schedule attached to this letter. This is a modification of the schedule proposed in Figure 7-1. These changes are necessary to account for the effect of weather conditions on field activities, especially for the air sampling and wetlands survey tasks.

If you have any questions concerning this work plan, please contact me or the CDM Federal Work Assignment Manager, Dr. Maheyar R. Bilimoria at (212) 393-9634.

Very truly yours,

CDM FEDERAL PROGRAMS CORPORATION

Robert D. Goltz, P.E.
ARCS II Program Manager

RDG/nv

Enclosures

cc: E. Moriatry, EPA (w/attachments)
J. Feldstein, EPA (w/attachments)
C. Robinson, CDM Federal/NY (attachments)
M. Bilimoria, CDM Federal/NY (w/attachments)
S. Schofield, CDM Federal/NY (w/attachments)
Project File
Document Control (2)

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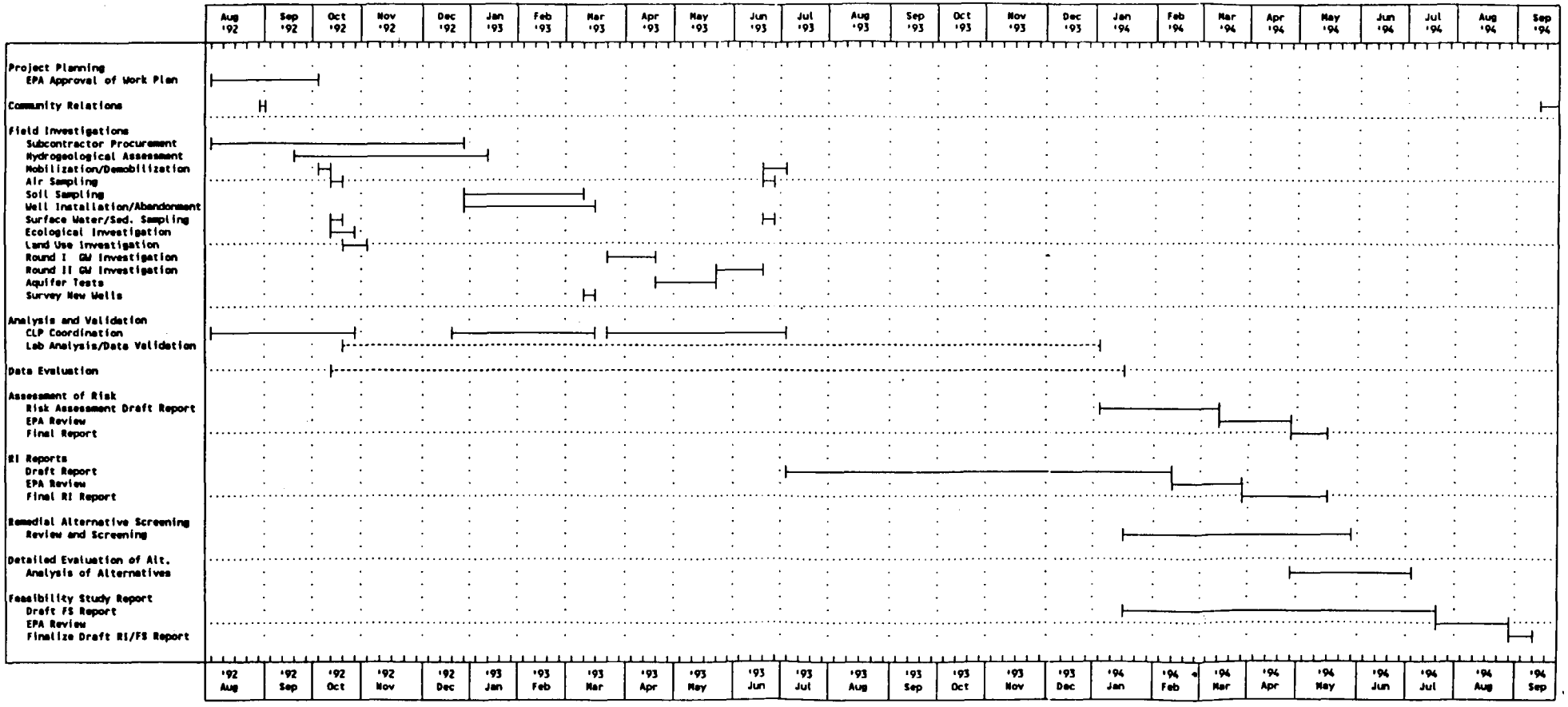
Revised 10/2/92

SCHEDULE
CHEMSOL, INC. SITE RI / FS



CHM 001 0598

Remedial Investigation and Feasibility Study Work Plan

Chemsol, Inc. Superfund Site

Piscataway
Middlesex County, New Jersey

Volume 1 of 2

EPA
Region 2

June 1992

EXECUTIVE SUMMARY

This work plan describes activities to be conducted during a Remedial Investigation/Feasibility Study (RI/FS) at the Chemsol, Inc. Site, located on Fleming Street in Piscataway, New Jersey. The scope of this work plan has been developed by the United States Environmental Protection Agency (EPA), in cooperation with the New Jersey Department of Environmental Protection and Energy (NJDEPE). This Work Plan describes tasks to be conducted to augment the existing data base, further evaluate the nature and extent of soil and ground water contamination, investigate potential sources of contamination, and evaluate remedial alternatives for remediation of contaminated soils and ground water.

During the 1950s and 1960s, the Chemsol Site was used as a solvent recovery and waste reprocessing facility. Activities at the site resulted in several fires and explosions during the period in which the facility was active. In the mid 1960s, Chemsol was ordered by Piscataway Township to cease operations. The production facility was razed after it was closed. Several mounded plastic refuse piles were left on the property. In 1975, one of the piles caught fire. Chemsol was ordered to remove the remaining plastic mounds from the site.

Soil and ground water investigations were conducted from 1980 to 1990 under the direction of the NJDEPE. In 1984, the NJDEPE ordered the owner, Tang Realty, to conduct soil and ground water investigations at Chemsol to evaluate the impact of former site activities. Soil samples were collected from on-site and ground water samples have been collected from on-site and off-site. Contaminants at Chemsol include an array of volatile organic compounds, semivolatile organic compounds, metals, and polychlorinated bi-phenyls (PCBs). In 1990, EPA and NJDEPE agreed that EPA should perform site investigations and federally fund the remainder of the investigatory work. EPA subsequently performed activities resulting in the development of a Focused Feasibility Study (FFS). The purpose of the FFS was to evaluate alternatives to restrict further migration of the most heavily contaminated ground water on-site (to 130 feet below grade). As part of the FFS, one round of ground water samples were collected. The FFS was finalized in July 1991 and a Record of Decision (ROD) was signed by EPA in September 1991. The ROD stipulates

that a ground water pump and treat remedy be implemented with treatment on-site and discharge to an on-site surface water body. During August and September, 1991, eight rounds of surface water samples were collected from the aforementioned surface water body. The analytical results will be used in the development of discharge limitations for the interim remedy.

The activities described in this RI/FS work plan will expand the existing data base to achieve the following objectives:

- Further delineate the horizontal and vertical nature and extent of soil and ground water contamination and mechanisms for transport and contaminant pathways;
- Identify the probable source(s) of contamination;
- Evaluate potential impacts to air;
- Evaluate potential environmental and public health risks;
- Evaluate Applicable or Relevant and Appropriate Requirements (ARARs) for cleanup standards;
- Evaluate methods for ground water remediation; and,
- Evaluate methods for soils remediation.

It is proposed that ten monitoring wells be installed to further investigate ground water quality and movement. The exact location and number of wells will be verified after development of a hydrogeologic stratigraphic framework for the site.

Field screening will be conducted to delineate the extent of PCBs. Biased and grid sampling will be conducted to investigate formerly active areas of the site and to evaluate the extent of soil contamination. A surface water and sediment sampling program is proposed to evaluate the extent to which the site has affected surface water quality. Samples will be collected from a drainage ditch and on-site streams at five locations. A wetland assessment will be conducted.

The nature and extent of air contamination will be evaluated through a sampling program. Samples will be collected at representative locations consistent with the site wind-rose pattern and analyzed for VOCs.

A risk assessment will be conducted to evaluate potential environmental public health risks. ARARS will be evaluated to determine ground water and soil cleanup standards which may impact remedy selection.

A draft Remedial Investigation report will be prepared upon receipt of analytical data and completion of the risk assessment. Remedial technologies for ground water and soils will be evaluated based on the results of the RI. A Feasibility Study will be conducted to screen and evaluate potential methods for soils and ground water remediation and a remedial alternative will be proposed.

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LIST OF ACRONYMS

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AOP	Advanced Oxidation Processes
ARARs	Applicable Relevant and Appropriate Requirements
ARCS	Alternative Remedial Contracting Strategy
ATSDR	Agency for Toxic Substances and Disease Registry
BAT	Best Available Technology
BNA	Base-Neutral/Acid Extractables
BOD_5	Biological Oxygen Demand (5 Day)
CDI	Chronic Daily Intake
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act
CLP	Contract Laboratory Program
CMA	Chemical Manufacturer's Association
COD	Chemical Oxygen Demand
CPF	Carcinogenic Potency Factor
CRP	Community Relations Plan
DOT	Department of Transportation
DQOs	Data Quality Objectives
EA	Endangerment Assessment
EPA (or USEPA)	U.S. Environmental Protection Agency
FFS	Focused Feasibility Study
FOL	Field Operations Leader
FOP	Field Operations Plan
FS	Feasibility Study
FSP	Field Sampling Plan
GPM	Gallon per minute
H_2O_2	Hydrogen Peroxide
HCl	Hydrogen Chloride
HEA	Health Effects Assessments
HLA	Harding Lawson Associates
HRS	Hazardous Ranking System
HSP	Health and Safety Plan
IRIS	Integrated Risk Information System
IRM	Interim Remedial Measure
MCLGs	Maximum Contaminant Level Goals
MCLs	Maximum Contaminant Levels
MCUA	Middlesex County Utilities Authority
MSL	Mean Sea Level
NAAQS	National Ambient Air Quality Standards
NAPLs	Non-Aqueous Phase Liquid
NCP	National Contingency Plan
ND	Not Detected

LIST OF ACRONYMS

NJDEPE	New Jersey Department of Environmental Protection
NPL	National Priorities List
OSC	On Scene Coordinator
PCBs	Polychlorinated biphenyls
PMO	Program Management Office
POTW	Publicly Owned Treatment Works
PRAP	Preferred Remedial Alternative Plan
QAPP	Quality Assurance Project Plan
QA/QC	Quality Assurance/Quality Control
RAS	Routine Analytical Services
RCRA	Resource Conservation and Recovery Act
RfD	Reference Dose
RI	Remedial Investigation
RI/FS	Remedial Investigation/Feasibility Study
RME	Reasonable Maximum Exposure
ROD	Record of Decision
RPM	Remedial Project Manager
RSCC	Regional Sample Control Center
SAP	Sampling and Analysis Plan
SARA	Superfund Amendments and Reauthorization Act of 1986
SAS	Special Analytical Service
SDWA	Safe Drinking Water Act
SHSP	Site Health and Safety Plan
SM	Site Manager
SMO	Sample Management Office
SMP	Site Management Plan
SVOCs	Semi-Volatile Organic Compounds
TBC	"To Be Considered" Material
TCL/TAL	Target Compound List/Target Analyte List
TCLP	Toxicity Characteristic Leaching Procedure
TDS	Total Dissolved Solids
TOC	Total Organic Carbon
TSCA	Toxic Substance Control Act
TSS	Total Suspended Solids
USEPA	United States Environmental Protection Agency
USGS	United States Geological Survey
UV	Ultra Violet
VOCs	Volatile Organic Compounds

1.0 INTRODUCTION AND PURPOSE

During the 1950s and 1960s, the Chemsol, Inc. (Chemsol) Site, in Piscataway, New Jersey, was used as a solvent recovery and waste reprocessing facility by a chemical firm known at various times as Chemsol Corporation and Chemsol, Inc. During the peak operating years of the site, several fires and explosions occurred at the site. Large mounds of plastic wastes, impoundment areas, ponded liquids, possible buried drums, and localized spills appear to have been located on-site (EPIC, 1991).

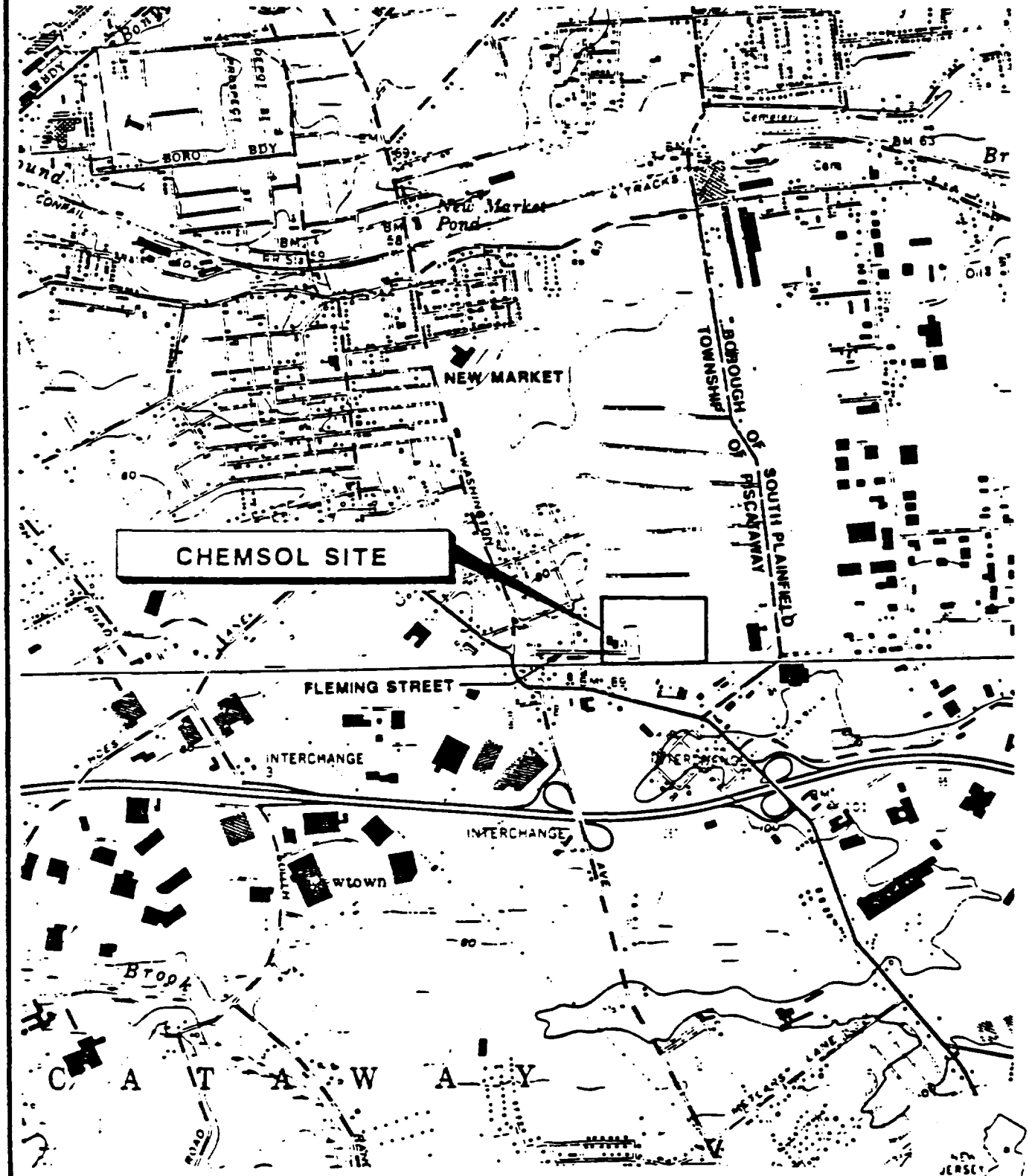
Since 1980, numerous site investigations have been conducted by consultants for the site owner. The findings of the site investigations are that site soils are contaminated in the areas where the bulk of site activities occurred and that a plume of contaminated ground water emanates laterally and vertically from the site. Insufficient data is available to determine the exact volume, extent, and character of the contaminated site soils or to estimate the volume, extent, and direction and speed of movement of the contaminated ground water plume. The site is of concern due to the potential for these compounds to migrate farther into drinking water aquifers or for future users of the site to be exposed via dermal contact with site soils.

The purpose of this document is to provide a detailed summary of data that have been collected on the site to date, to evaluate these data to estimate probable response actions, and to describe the additional data that is proposed for collection during the RI/FS.

1.1 SITE DESCRIPTION AND HISTORY

Chemsol is a 40-acre tract located on Fleming Street in the Township of Piscataway in Middlesex County, New Jersey (Figure 1-1). Interstate Route 287 is located approximately one-half mile south of the site. The Reading Railroad right-of-way is located adjacent to the southern property boundary. Single family residences are located immediately west and northwest of the site. Industrial and retail/wholesale businesses are located south and east of the site. An apartment complex is located north of the site.

As stated previously, operations at Chemsol included solvent recovery and waste reprocessing. The current owner of the site is Tang Realty, Inc. Historically, there have been several fires and explosions at Chemsol. In September 1958, a still exploded on the



SOURCE: USGS TOPOGRAPHIC MAP, PLAINFIELD, NEW JERSEY, 1981.

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SCALE IN FEET

CHEMSOL INCORPORATED (TANG REALTY) SITE
PISCATAWAY TOWNSHIP, MIDDLESEX COUNTY, NEW JERSEY

LOCATION MAP

FIGURE 1-1

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180381

site. In June 1961, a fire started when a 50 gallon drum of hexane exploded. In June 1962, a fire started when a pile of approximately 500,000 pounds of wax was ignited by a spark from a nearby tractor. In October 1964, a reaction of aluminum chloride and water generated hydrogen chloride gas, which resulted in the evacuation of the area in the vicinity of the site.

In 1964, the owner was ordered by the Township to cease operations. The plant was dismantled the following year and operations ceased. Several large mounds of plastic wastes were left behind. In 1976, a grass fire ignited one of the mounds. The Piscataway Fire Inspector subsequently signed a complaint against Tang Realty for failure to clear the waste mounds. In 1978, the site was rezoned from industrial to residential.

1.2 PREVIOUS REMEDIAL ACTIVITIES

Over the course of the past 10 years, numerous consultants have conducted soils and ground water investigations at the site under the direction of the site owner, Tang Realty, Inc. Numerous volatile and semi-volatile organic compounds have been found in the Chemsol soils and ground water. PCBs have also been detected in site soils.

From 1983 to 1984, NJDEPE issued an Administrative Order, an Amended Administrative Order, and an Administrative Consent Order to Tang Realty. These orders directed Tang to undertake a site investigation to evaluate contamination and develop a remedial action plan.

The original investigation by J.W. Patterson & Associates (Patterson) was conducted during 1980 and 1981. Eight shallow (20 feet to 80 feet in depth) monitoring wells were drilled and ground water sampled. The presence of volatile organic compounds was confirmed during the initial study. In addition to ground water samples, Patterson collected and analyzed 12 soil samples for PCB analysis. Nine of twelve samples contained PCBs in excess of 1 part per million (ppm). During this period, NJDEPE collected and analyzed water samples from domestic and industrial wells around the Chemsol site. Volatile organic compounds were found in many of these samples.

In August 1983, the Lancy Laboratories Division of Lancy International, Inc. (Lancy) was hired to continue the site investigation. Lancy conducted ground water and soil contamination studies at the site until October 1986. During that time, 3 monitor wells of various depths were installed and 33 soil samples were collected. Lancy partially

characterized the ground water flow systems at the site. The area that Lancy identified as having more than 1 ppm PCBs in the site soils was fenced in early 1985.

Applied Geotechnical and Environmental Services Corp. (AGES) began work at Chemsol in October 1986. AGES performed a pumping test in July 1987 at well C-1, a 315-foot deep well cored in November 1983 by Lancy. During the 71-hour pumping test, 12 shallow wells were monitored to determine the hydraulic characteristics of fractures in the bedrock aquifer. In addition to the pumping test, AGES continued PCB soil sampling initiated by Patterson and Lancy. Results were reported to NJDEPE in November 1987. During December 1987, AGES collected additional soil samples for PCB analysis. In early 1988, AGES completed eight deep wells; four drilled to 250 feet and four drilled to 325 feet.

Harding Lawson Associates (HLA) started work at the site in 1989. In early 1990, HLA installed four additional deep bedrock wells and sampled most site bedrock wells. Additional investigations were conducted during this time to characterize the hydraulic characteristics of the bedrock aquifer.

In general, past investigations indicate that the soils and ground water on the site have been contaminated with polychlorinated biphenyls (PCBs), volatile organic compounds (VOCs), semivolatile organic compounds (SVOCs) and metals. However, the vertical and horizontal extent of contamination had not been adequately delineated.

In December 1990, Malcolm Pirnie Inc. (MPI) started work at the site under contract to the EPA. During 1991, MPI conducted a Focused Feasibility Study (FFS) on the upper bedrock aquifer at Chemsol. Ground water samples were collected from the ground water to a depth of 130 feet. The results of the FFS and a detailed description of the proposed remedy are available in the "Focused Feasibility Study, Interim Action for Ground Water, Chemsol Inc.," July 12, 1991, prepared by MPI. The interim remedy selected to restrict off-site migration of the most highly contaminated ground water (to 130 feet below grade) includes:

- Installation of a ground water collection and extraction system for removal of contaminated groundwater;
- Installation of an on-site treatment plant to treat the ground water;
- Disposal of the treated ground water in an on-site surface water body; and

- Operation and maintenance of the components of the interim remedy and environmental monitoring to ensure continued achievement of the objectives of the interim remedy.

For purpose of site investigations, the site has been divided into Lots 1A and 1B. Lot 1A is approximately 27 acres in area, while Lot 1B covers approximately 13 acres (Figure 1-2). No above-ground man-made structures remain on site. The site is currently unoccupied.

1.3 RI/FS OBJECTIVES

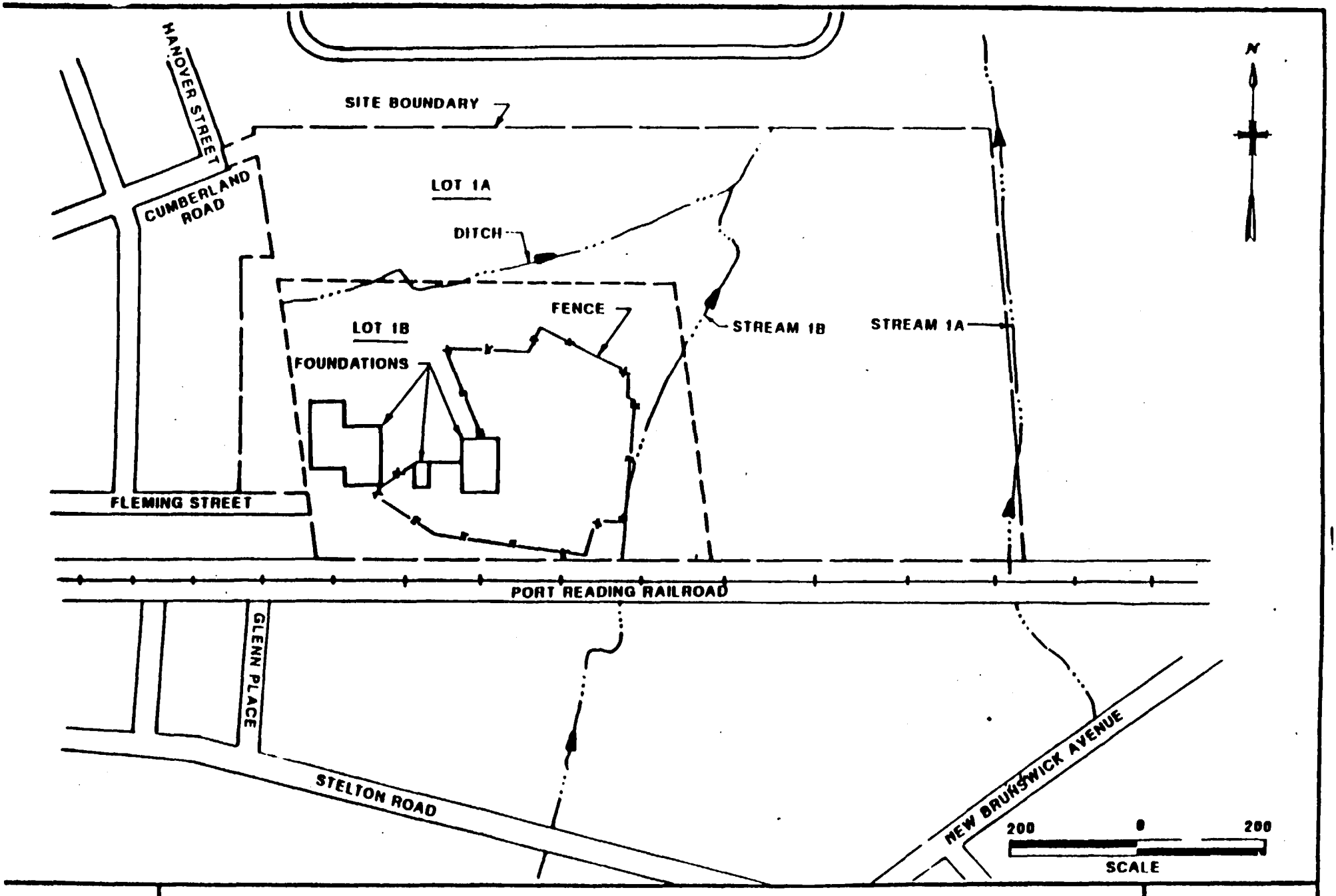
As previously presented in the Executive Summary, the objectives of the RI/FS are to:

- Further delineate the horizontal and vertical nature and extent of soil and ground water contamination and mechanisms for transport and contaminant pathways;
- Identify the probable source(s) of contamination;
- Evaluate potential impacts to air;
- Evaluate potential environmental and public health risks;
- Evaluate Applicable or Relevant and Appropriate Requirements (ARARs) for cleanup standards;
- Evaluate methods for ground water remediation; and
- Evaluate methods for soils remediation.

1.4 RI/FS APPROACH

This Work Plan presents the technical scope of work for the RI/FS as well as a detailed schedule for the performance of the work. This Work Plan has been prepared in accordance with EPA guidance relevant to preparation of RI/FS Work Plans.

The Work Plan contains 9 sections of which this introduction is Section 1. Section 2 describes a detailed summary of the site background, including the current understanding



CHEMSOL, INC.
PISCATAWAY, NEW JERSEY

SITE MAP

FIGURE 1-2

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of the location, history and existing condition of the site. Section 3 presents a preliminary understanding of the conceptual site model, probable risks, ARARs, and potential remedies. Section 4 presents the Work Plan rationale, including the Data Quality Objectives (DQOs) for RI sampling and analytical activities, and the RI/FS approach which illustrates how the tasks proposed in this document will satisfy data needs. Section 5 presents a discussion of each task of the RI/FS. Section 6, which is submitted under separate cover as Volume 2 of this Work Plan, presents costs and key assumptions. Section 7 presents the anticipated schedule for the RI/FS tasks. Section 8 presents project management considerations that define relationships and responsibilities for selected tasks and the project management team. Section 9 provides a list of references used to develop material presented in this Work Plan.

2.0 EXISTING CONDITIONS

Previous investigation reports have been reviewed relating to the site topography, geology, hydrogeology, ground water quality, soil, surface water, biota and environmental resources, air, and demographics and land use. These reports and data are summarized in the sections that follow. This information is then used to conduct a preliminary risk analysis and develop a conceptual site model in Section 3.0.

2.1 TOPOGRAPHY

The Chemsol site is fairly flat and generally slopes downward to the north and east. Local variations in topography occur along several streams and ditches on and adjacent to the site. Surface elevation ranges from 71 to 88 feet above mean sea level. Ponded water and probable wetlands exist at several locations adjacent to surface water bodies on the Chemsol site. These bodies include a drainage ditch which flows near the northern boundary of Lot 1B, a stream flowing north along the eastern edge of Lot 1B (referred to as Stream 1B), and a stream flowing north along the eastern edge of Lot 1A (referred to as Stream 1A) (Figure 1-2).

The drainage ditch discharges into Stream 1B prior to leaving the site. This stream then joins the Stream 1A to the northeast of the site. Stream 1A then meanders for approximately 1.5 miles northeast and empties into Bound Brook, located in Spring Lake County Park. From the park, the Bound Brook flows west for one mile and empties into the east end of New Market Lake. Water exits the west end of the lake and flows for approximately 2.25 miles west-northwest, emptying into Green Brook. Green Brook flows southerly for 2.5 miles, finally discharging into the Raritan River. The Raritan River discharges into Raritan Bay at the Atlantic Ocean.

Additional discussions of on-site surface water can be found in the following section.

2.2 SURFACE WATER

In May 1981, NJDEPE collected a surface water sample from the stream behind Pleasantview Gardens that runs along the site (on the northern boundary). Analysis for volatile organics was conducted and the following levels were reported (EPA, May 3, 1991):

TABLE 2-1

COMPOUNDS DETECTED IN SURFACE WATER

Compound	Results (ppb)
1,1,1 trichloroethane	2.2
tetrachloroethylene	110
chloroform	21.1
carbon tetrachloride	24.6
1,2 dichloroethylene	19.0
trichloroethylene	27.8

During August and September 1991, an eight week sampling program was conducted on the surface water and sediment of Stream 1A. This program was carried out to obtain data for the development of effluent discharge limitations for the interim remedy.

Previously collected analytical data of on-site soils and ground water samples indicate that various organic and inorganic compounds, metals and PCBs are present. As demonstrated during the FFS, some hydraulic communication exists between the shallow ground water on the site and the surface water (discussed in more detail in Section 2.4); therefore, it is probable that the on-site surface water bodies are impacted. At present, the existence and persistence of contaminants downstream of the site are unknown.

Additional testing will be conducted on both the site surface water and sediments during the RI/FS (Section 5.3).

2.3 GEOLOGY

The Chemsol site is located in the lowland Piedmont physiographic province. The site is underlain by the Passaic Formation of Triassic age, which is typically interbedded, reddish-brown to gray sandstone, siltstone and claystone (Figure 2-1). Bedrock drilling conducted at and in the vicinity of the site has encountered primarily red shale. The Passaic has been intruded by igneous rocks regionally. In the vicinity of Chemsol, no igneous intrusions or contact metamorphic effects or alterations have been observed. Boring logs from the site indicate bedrock is generally 3 to 14 feet below the ground surface. The reddish-brown soils overlying the bedrock are residual, derived from the weathering of the rock. They are composed of silt and clay with some sand.

The Passaic Formation regionally strikes northeast-southwest and dips approximately ten degrees northwest. Studies conducted in the Passaic (see References, Section 9.0) report that fractures occur primarily along bedding planes and at a near-vertical orientation. Bedrock does not outcrop in the vicinity of the site; however, in 1983, Lancy cored the bedrock at the site, which provided data on the subsurface conditions. Lancy described both near-horizontal and vertical fractures in the bedrock cores; however, the strike of the fractures was not described. Fractures occurred at a frequency generally between 20 and 30 per 5-inch core segment throughout the length of the 315-foot boring.

2.4 HYDROGEOLOGY

Information on the ground water has been gathered over the course of twelve years during the installation and monitoring of nearly 50 wells. At the Chemsol site, a perched ground zone water occurs in the overburden and the water table occurs in the bedrock (Figure 2-2). The perched zone is located at the interface of the soil and top of weathered bedrock. The perched zone may be hydraulically connected to the water table in the bedrock by low primary porosity and fractures through the weathered bedrock zone, which acts as a semi-confining unit. The perched zone is generally found at a depth of less than five feet in monitoring wells located near the center of the site. Available boring logs indicate the perched zone does not occur at the western portion of the site. The saturated thickness of the perched water zone measured on March 13, 1991 ranges from 5.29 feet in

Tb - BRUNSWICK FORMATION

SOURCE: NEW JERSEY STATE TOPOGRAPHIC MAP NO. 25 - 1974

CHEMSOL INCORPORATED (TANG REALTY) SITE
PISCATAWAY TOWNSHIP, MIDDLESEX COUNTY, NEW JERSEY
REGIONAL GEOLOGIC MAP

FIGURE 2-1

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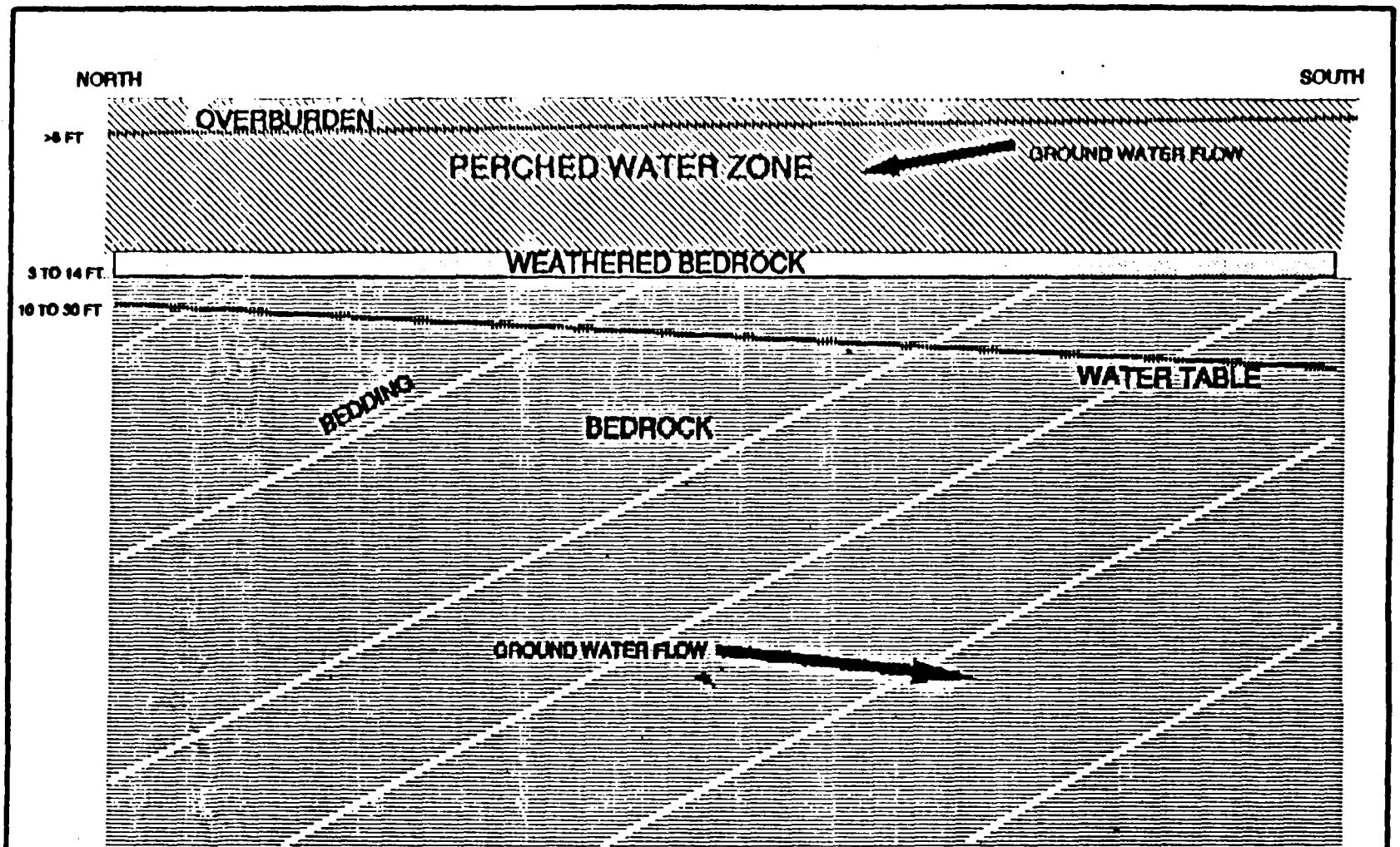


CONCEPTUAL SCHEMATIC GEOLOGIC CROSS SECTION

CHEMSOL, INC.

FIGURE 2-2

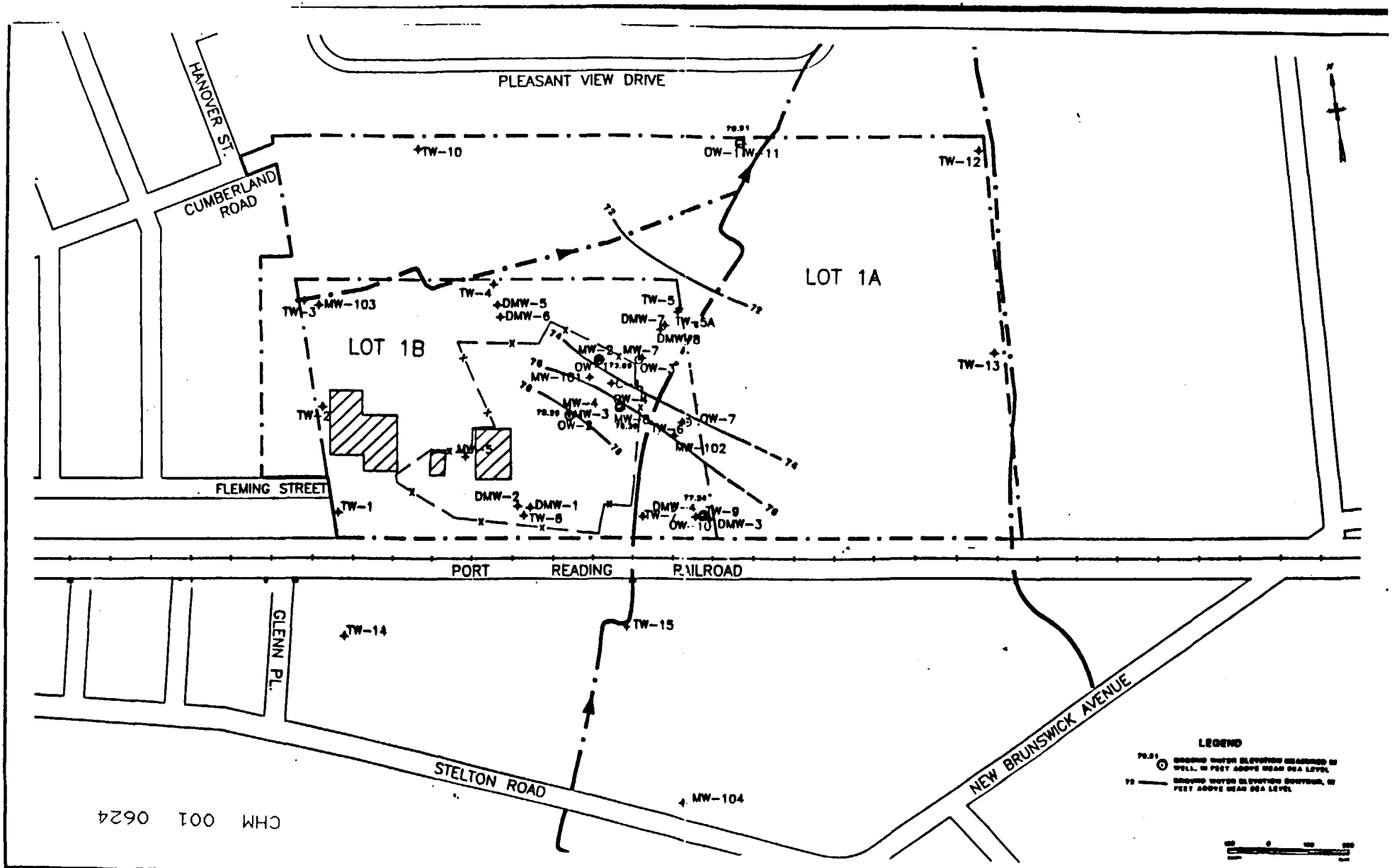
the center of the site (OW-1) to 13.07 feet in the southeast corner of Lot 1B (OW-10) (Figure 2-3). The depth below grade of the bottom of the perched water zone ranges from 8.14 feet (74.06 feet above mean sea level, MSL) in the center of the site (OW-2) to 14.41 feet (66.08 feet above MSL) in the southeast corner of Lot 1B (OW-10).

HLA previously reported that the perched zone flows to the northeast, generally following the slope of the bedrock surface. Water level contour maps for the perched zone were constructed with water level measurements collected on March 13, 1991 (Figure 2-3). Perched zone surface elevations ranged from 70.51 feet above MSL at northern boundary of Lot 1A (OW-11) up to 77.34 feet above MSL in the center of the site (OW-2). These data confirm HLA's earlier findings that the perched zone flows generally northeast. These elevations also correspond with elevations of on-site surface water bodies taken from the current topographic map of the site. This indicates that communication probably exists between the perched zone and surface water bodies. Therefore, water in the perched zone probably discharges to or recharges on-site surface water bodies.

In March 1991, slug tests were conducted on wells monitoring the perched zone. Hydraulic conductivities calculated from the test results (Table 2-2) are typical of low permeability material such as fine sand, or silt, clay, and sand mixtures. Insufficient water level response and exposure of well screen to unsaturated material affected the test results at some wells; therefore, the reported hydraulic conductivity values are considered approximate.

The water table occurs in interconnected fractures in the bedrock beneath Chemsol at depths ranging from 10 to 30 feet below grade. The fractures impart a secondary permeability to the rock and provide flow paths through which the water moves. The flow direction of the water table was reported by previous consultants to be to the southeast and was believed to be influenced by the pumping wells at neighboring Parkway Plastics (adjacent to and south of the site). The Parkway Plastics well reportedly ceased pumping in December 1990.

Water table elevations measured on March 13, 1991, ranged from 60.12 feet above MSL in monitoring well TW-3 in the northwest corner of the site up to 68.36 feet above MSL in the northern edge of Lot 1A (TW-11). As indicated by Figure 2-4, the potentiometric surface of the water table appears to flow toward a trough-like feature on the site and then to the southeast.



CHEMSOL, INC.
PISCATAWAY, NEW JERSEY

GROUND WATER ELEVATION CONTOURS - PERCHED ZONE - 3/13/91

FIGURE 2-3

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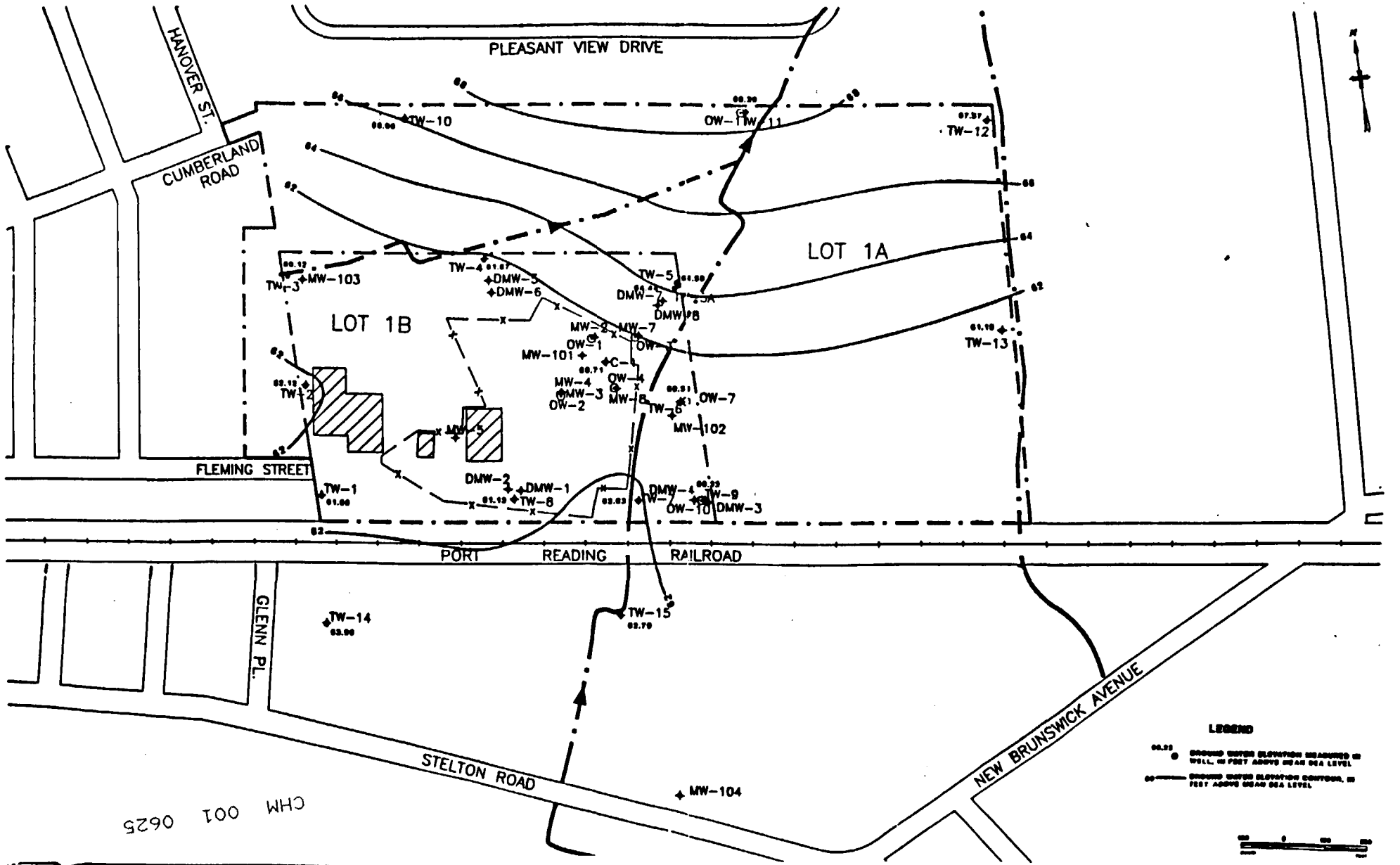

CHEMSOL INC.
PISCATAWAY, NEW JERSEY

GROUND WATER ELEVATION CONTOURS - WATER TABLE - 3/13/91

FIGURE 2-

CHM 001 0625

TABLE 2-2

OVERBURDEN HYDRAULIC PROPERTIES
CHEMSOL, INC.

Well	Open Interval (feet below grade)	Hydraulic Conductivity (feet per day)
OW-1	3-8	3.1E-02 (F)
OW-4	5-10	3.5E-04 (F)
OW-10	5-15	1.4E-02 (F)
OW-11	4-14	6.5E-02 (F) 9.5E-01 (R)

NOTE:

Data from "Focused Feasibility Study, Interim Action for Ground Water," July 1991, Malcolm Pirnie, Inc.

F = Falling head slug test analysis
R = Rising head slug test analysis

Additional information will be obtained during the RI/FS to enhance the current understanding of the direction of ground water movement. (Well elevations will be confirmed during the RI/FS as discussed in Section 5.0.)

Ground water occupying fractures in the Passaic Formation has historically been used regionally as a residential and industrial water supply. This aquifer is commonly referred to as the Passaic (formerly Brunswick) Formation. Well construction logs available for area wells indicate the Passaic yields from 10 to 190 gallons per minute (gpm) in the vicinity of the site. These yields are estimates of well drilling contractors and long term yields may vary.

AGES conducted a pumping test of the bedrock aquifer in July 1987 by pumping on-site well C-1 at 21 gpm for 71 hours. The aquifer response was typical of the fractured

zones of the Passaic Formation, with preferential drawdown along strike and shallow flow simulating that of porous media. AGES calculated transmissivity and storativity values from the pumping test data, which are presented in Table 2-3. Aquifer characteristics were also calculated by HLA by observing the aquifer response when the Parkway Plastics wells temporarily shut down in December 1989; these values are also presented in Table 2-3.

In addition, Lancy performed permeability testing of ten-foot zones of the C-1 boring after drilling. These data indicate the transmissivity of the bedrock generally ranges from 2 to 7 square feet per day to a depth of about 260 feet below grade. From this depth to the bottom of the tested portion of the borehole (305 feet), the transmissivity decreases to less than .08 square feet per day. These values are less than those obtained by HLA and AGES; this may be due to the fact that Lancy's results are from pressure testing whereas HLA's and AGES' results are from pump testing.

TABLE 2-3

WATER TABLE AQUIFER HYDRAULIC PROPERTIES

CHEMSOL, INC.

Well	Open Interval (feet below grade)	Transmissivity (ft^2/day)	Storativity
DMW-3[1]	225-250	200 (R) 157 (LA)	NA 5E-05
DMW-4[1]	300-325	380 (R) 248 (LA)	NA 2E-04
DM-3[1]	30-80	435 (R) 241 (LA)	NA 1E-04
TW-8[1]	16-60	200 (R) 205 (LA)	NA 4E-04
TW-9[1]	20-49	183 (R) 590 (LA)	NA 3E-04
C-1[2]	50-133	147 (S)	1E-03

NOTES:

1. Data from "Ground Water Characterization Report", September 1990, Harding Lawson Associates.

2. Data from "Phase I Ground Water Investigation," October 1987, AGES.

R = Recovery test analysis

LA = Leaky aquifer test analysis

S = Straight line approximation test analysis

NA = Not applicable

2.5 GROUND WATER QUALITY

The ground water quality at and in the vicinity of the Chemsol site has been investigated for almost twelve years. Available data from both the on-site and off-site wells have been tabulated (Appendix A). A synopsis of on-site and off-site ground water sampling events is provided in Table 2-4. The following paragraphs provide a summary of past ground water monitoring activities. Events are discussed chronologically for clarity. These data have then been used to assess trends in water quality with time and vertical and horizontal variations in water quality. Currently, there are 45 wells at the site. (See Figure 2-3 and Plate 1) Construction data on each well are provided in Table 2-5.

For the purposes of evaluating whether a trend may exist in lateral distribution of contaminants, nine compounds were selected for use in developing iso-contour maps. The nine compounds were selected due to their high concentrations, frequency of detection, frequency of analysis, and exceedence of cleanup standards. These nine include:

- Benzene
- Carbon Tetrachloride
- Chloroform
- 1,2-Dichloroethane
- 1,2-Dichloroethene (trans- and total)
- Methylene Chloride
- Toluene
- 1,1,1-Trichloroethane
- Trichloroethene

For the purposes of this Work Plan, the total of the individual concentrations of the nine parameters is referred to as the "Total Short List" of parameters (T_{SL}).

In June and July of 1980, NJDEPE sampled wells tapping the bedrock aquifer in the vicinity of the Chemsol site. This included private wells in the vicinity of the site, which are generally open from 50 to 150 feet below grade level, and the two Parkway Plastics industrial wells located immediately south of the site, which are open to more than 300 feet. Plate 2 provides the location of Residential Wells in the vicinity of Chemsol. All of the wells west of the site and most of the wells east of the site contained at least one contaminant at a concentration near the detection limit. These wells are not believed to be downgradient. The I and R Metals well on South Clinton Street (east of the site), contained 116 ug/l

TABLE 2-4

SUMMARY OF GROUND WATER SAMPLING EVENTS
(ON-SITE AND OFF-SITE)

Sampling Date	Location	Sampled By (Reported By)	Number of Samples	Analyses Conducted[1]
6 & 7/80	Private wells surrounding site	NJDEPE (Patterson, 1981)	17	Selected VOCs
6 & 7/80	MW 1 & C-2	Patterson, 1981	2	VOCs Pesticides/PCBs BNAs
11/80	C-2	NJDEPE (Patterson, 1981)	1	Selected VOCs
12/80	MWS 2-7	Patterson, 1981	6	VOCs Pesticides/PCBs BNAs[2]
12/80	Splits on samples MW 2-7 (above)	NJDEPE (Patterson, 1981)	6	VOCs[2]
8/83	MWs 2-4, 6 & 8	Lancy, 1983	5	Selected VOCs
8/83	MW-3	Baron (Lancy, 1983)	1	VOCs
10/83	MWs 2-8 & C-2	Lancy, 1983	8	Selected VOCs
10/83	MW-3	Baron (Lancy, 1983)	1	VOCs
11/83	C-1, Packer testing by 10-foot zone	Lancy, 1984	17	Selected VOCs
9/84	TWs 1-8	Lancy (Tang, 1984)	8	VOCs (EPA Method 624)
9/84	Splits on samples TWs 1-8 above	NJDEPE, 1984	8	VOCs
9/85	TWs 1-13	Lancy, 1986	13	VOCs
9/85	Splits on samples TWs 9-13 above	NJDEPE, 1985	5	VOCs[2]
12/85	TW-14 & TW-15 Private wells surrounding site	Lancy, 1986	5	VOCs
12/85	Splits on above samples	NJDEPE, 1985	5	VOCs[2]
12/86	Parkway Plastics effluent	NJDEPE, 1991	1	VOCs
7/87	C-1 (Time series from pumping test)	AGES, 1987	7	Selected VOCs
1/88	Parkway Plastics effluent	NJDEPE, 1991	1	VOCs
1/88	DMW 1-4	AGES, 1988	4	Selected VOCs
5/88	DMW 1-8	AGES, 1988	8	Selected VOCs
6/88	DMW 5-8	AGES, 1988	4	Selected VOCs
10/88	Parkway Plastics effluent	NJDEPE, 1991	1	VOCs
10/88	OWs 1-4 & 10	AGES (HLA, 3/1989)	5	VOCs (EPA Method 601 & 602)
12/88	TWs 1-4, 8 & 9	AGES (HLA, 10/1989)	6	VOCs (EPA Method 524)
8/89	Private wells surrounding site	NJDEPE, 1989	4	VOCs[2]
1/90	Parkway Plastics effluent	NJDEPE, 1991	1	VOCs

TABLE 2-4

SUMMARY OF GROUND WATER SAMPLING EVENTS
(ON-SITE AND OFF-SITE)

Sampling Date	Location	Sampled By (Reported By)	Number of Samples	Analyses Conducted[1]
1/90	Private wells surrounding site	HLA (NJDEP, 1990)	4	VOCs (EPA Method 524)
1/90	Private wells surrounding site	Middlesex Co. DOH, 1990	17	VOCs (EPA Method 524.2)
2/90	DMWs 1-8 (DMW-1, 3, 6, 7 also had time series)	HLA, 9/1990	8 8	VOCs (EPA Methods 601 & 602)
2 & 3/90	TWs 1-15	HLA, 9/1990	16	VOCs (EPA Methods 601 & 602)
3/90	MW-101, Packer testing by 10-foot zone	HLA, 9/1990	16	VOCs (EPA Methods 601 & 602)
4/90	Parkway Plastics effluent	NJDEPE, 1991	1	VOCs
7/90	Parkway Plastics effluent	NJDEPE, 1991	1	VOCs
7/90	MWs 102-104	HLA, 9/1990	4	VOCs (EPA Method 601/ 602)
7/90	TW-5, DMW-1 & 6, MW-101	HLA, 9/1990	4	Selected TCL/TAL (Pesticides & PCBs only on DMWs)
10/90	Parkway Plastics effluent	NJDEPE, 1991	1	VOCs
2/91	Private wells surrounding site	USEPA, 1991	3	VOCs
4/91	OWs 1, 2, 4, 10, 11 TWs 1-15, C-1	MPI, 1991	22	TCL/TAL, Conventional Water Quality Parameters and Parameters associated with Surface Water Sampling Program

NOTES:

1. Available analytical results for each sampling event are presented in Appendix A.
2. Data record analytical data, as presented, is incomplete (i.e., pages missing or original data sheets not provided)

TABLE 2-5

CONSTRUCTION INFORMATION FOR EXISTING WELLS

Well No.	Construction Date	Length of Casing (feet)	Length of Screen or Open Hole Interval (feet)	Depth of Monitoring Interval (feet below grade)	Well Casing Diameter and Type	Total Depth (feet below grade)	Drilling Method	Top of Casing Elevation (feet above MSL)[1]	Status	Inspecting Consultant
OW-1	1985	3	5	3-8	4" PVC	8	HSA	79.65	Active	Lancy
OW-2	1985	3	5	3-8	4" PVC	8	HSA	82.20	Active	Lancy
OW-3	1985	3	5	3-8	4" PVC	6	HSA	78.08	TBA	Lancy
OW-4	1985	5	5	5-10	4" PVC	10	HSA	80.54	Active	Lancy
OW-7	1985	4	10	4-14	4" PVC	14	HSA	79.12	TBA	Lancy
OW-10	1985	5	10	5-15	4" PVC	15	HSA	80.49	Active	Lancy
OW-11	1985	4	10	4-14	4" PVC	14	HSA	75.96	Active	Lancy
MW-1	1980	10	20	10-30	4" Steel	30	Unknown	ABND	ABND	Patterson
MW-2	1980	35	15	35-50	5" Steel	50	Unknown	76.43	TBA	Patterson
MW-3	1980	30	50	30-80	5" Steel	80	Unknown	81.09	TBA	Patterson
MW-4	1980	5	5	5-20	5" Steel	20	Unknown	80.81	TBA	Patterson
MW-5	1980	20	40	20-60	5" Steel	60	Unknown	85.72	TBA	Patterson
MW-6	1980	5	35	5-40	4" Steel	40	Unknown	Unknown	TBA[2]	Patterson
MW-7	1980	30	30	30-60	5" Steel	60	Unknown	77.99	TBA	Patterson
MW-8	1980	5	35	5-40	6" Steel	40	Unknown	77.15	TBA	Patterson
TW-1	1984	13	52	13-65	6" Steel	65	Air Hammer	90.33	Active	Lancy
TW-2	1984	12	48	12-60	6" Steel	60	Air Hammer	86.02	Active	Lancy
TW-3	1984	14	36	14-50	6" Steel	50	Air Hammer	81.82	Active	Lancy
TW-4	1984	18.5	30.5	18.5-49	6" Steel	49	Air Hammer	78.53	Active	Lancy
TW-5	1984	20	25	20-45	6" Steel	45	Air Hammer	76.20	Active	Lancy
TW-5A	Unknown	20	25	20-45	6" Steel	45	Air Hammer	76.44	Active	Lancy
TW-6	1984	19	26	19-45	6" Steel	45	Air Hammer	78.62	Active	Lancy
TW-7	1984	16.5	33.5	16.5-50	6" Steel	50	Air Hammer	80.31	Active	Lancy
TW-8	1984	16	44	16-60	6" Steel	60	Air Hammer	85.32	Active	Lancy
TW-9	1985	19.5	29.5	19.5-49	6" Steel	49	Air Hammer	80.48	Active	Lancy
TW-10	1985	19.5	44	19.5-60	6" Steel	60	Air Hammer	80.20	Active	Lancy
TW-11	1985	18.5	29.5	18.5-48	6" Steel	45	Air Hammer	75.95	Active	Lancy
TW-12	1985	19.5	29.5	19.5-49	6" Steel	45	Air Hammer	75.93	Active	Lancy
TW-13	1985	18.5	30.5	18.5-49	6" Steel	49	Air Hammer	78.37	Active	Lancy
TW-14	1985	19.5	39.5	19.5-59	6" Steel	59	Air Hammer	88.85	Active	Lancy
TW-15	1985	19.5	40.5	19.5-60	6" Steel	60	Air Hammer	82.54	Active	Lancy
C-1	1984	50	83	50-133	3.25"Steel	133	Cored[4]	79.99	Active	Lancy
C-2[3]	1963	50	255	50-305	6" Steel	305	Unknown	ABND	ABND	None
DMW-1	1988	225	25	225-250	6" Steel	250	Air Rotary	85.63	Active	AGES
DMW-2	1988	300	25	300-325	6" Steel	325	Air Rotary	85.27	Active	AGES
DMW-3	1988	225	25	225-250	6" Steel	250	Air Rotary	80.68	Active	AGES
DMW-4	1988	300	25	300-325	6" Steel	325	Air Rotary	80.63	Active	AGES
DMW-5	1988	225	25	225-250	6" Steel	250	Air Rotary	79.08	Active	AGES
DMW-6	1988	300	25	300-325	6" Steel	325	Air Rotary	79.45	Active	AGES
DMW-7	1988	225	25	225-250	6" Steel	250	Air Rotary	76.84	Active	AGES
DMW-8	1988	300	25	300-325	6" Steel	325	Air Rotary	77.97	Active	AGES
MW-101	1990	325	15	325-340	6" Steel	340	Air Rotary	79.52	Active	HLA
MW-102	1990	325	15	325-340	6" Steel	340	Air Rotary	77.91	Active	HLA
MW-103	1990	325	25	325-350	6" Steel	350	Air Rotary	81.32	Active	HLA
MW-104	1990	245	20	245-265	6" Steel	265	Air Rotary	88.63	Active	HLA

NOTE:

1. Elevation data provided to EPA by Tang Realty in 1990.
2. Believed to have been damaged and inactivated.
3. Former Chemsol production well.
4. Boring originally cored to 315 feet. Grouted to 133 feet prior to 10/87.

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TBA = to be abandoned due to compromised well integrity

HSA = Hollow stemmed augers

ABND = Reportedly abandoned

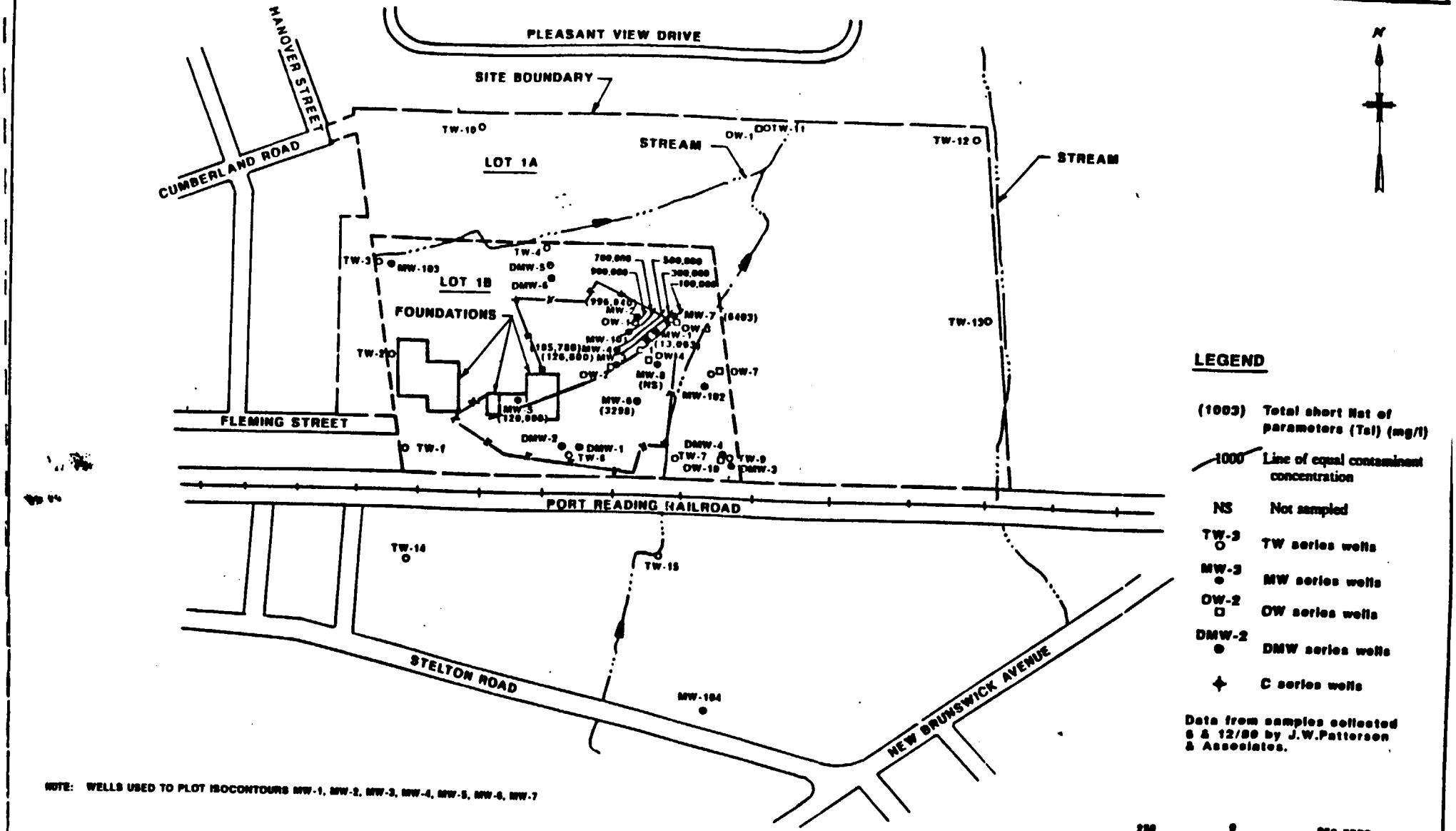
Summary based upon field inspection conducted 3/91 by MPI, review of original boring and monitoring well construction logs and summary prepared by HLA in "Groundwater Characterization Report," 9/90.

tetrachloroethene and 3160 ug/l trichloroethene. Three wells south of the site contained VOCs at concentrations near the detection limit. A Parkway Plastics well contained 2,751 ug/l methylene chloride and elevated levels of several other compounds. In addition, one of the wells, located at 10 Franklin Street in the Nova Ukraine area (located approximately 1000 feet south of the site), contained 44 ug/l tetrachloroethene.

In July 1980, Patterson sampled the former Chemsol production well (C-2), open to 305 feet in the bedrock. (This sampling was repeated by the NJDEPE in November 1980.) VOCs and SVOCs were detected at several orders of magnitude higher than in the private wells. Pesticides and PCBs were analyzed for but were not detected.

In 1980, Patterson installed the eight MW-series wells (MW-1 through MW-8) in the formerly active center of the site. The wells were open through both the perched zone and the water table aquifer (from 5-80 feet). Seven of the wells (MW-1 through MW-7) were sampled between June and December 1980. The ground water from all MW wells was contaminated with VOCs similar to those detected in C-2; however, the majority of the wells contained higher concentrations than found in C-2. It appears that most wells were contaminated with SVOCs. In general, contaminant levels are very high in the center of the site. Distribution of contaminants appears to decrease to the southeast. T_{SL} for each well in 1980 has been mapped on Figure 2-5 to indicate the lateral distribution of contaminants at the site. Two of the seven wells were contaminated with pesticides; PCBs were detected in only one well (MW-2), which contained 770 ug/l. The NJDEPE split those samples collected in December. Patterson prepared a comparison of the analytical data which indicated that the majority of analyses conducted by the NJDEPE had higher contaminant concentrations than the analyses by Patterson.

In August and October 1983, Lancy sampled selected MW-series wells for VOC analysis. The samples collected in August were of stagnant well water and were intended to be used for a treatability study. Well C-2 was re-sampled in November. Generally, the analytical results confirmed the suite of VOCs detected during December 1980. Concentrations of most individual parameters and T_{SL} in the wells varied by more than an order of magnitude from the earlier sampling; however, the variation was not consistently higher or lower and may be a result of differences in the sampling and analytical procedures. Although well C-2 was reportedly sealed at some time after October 1983, the sealing of this well will be confirmed as part of the RI.



CHEMSOL, INC.
PISCATAWAY, NEW JERSEY

ISOCONTOURS OF Tsl IN MW-WELLS (5-80') (1980)

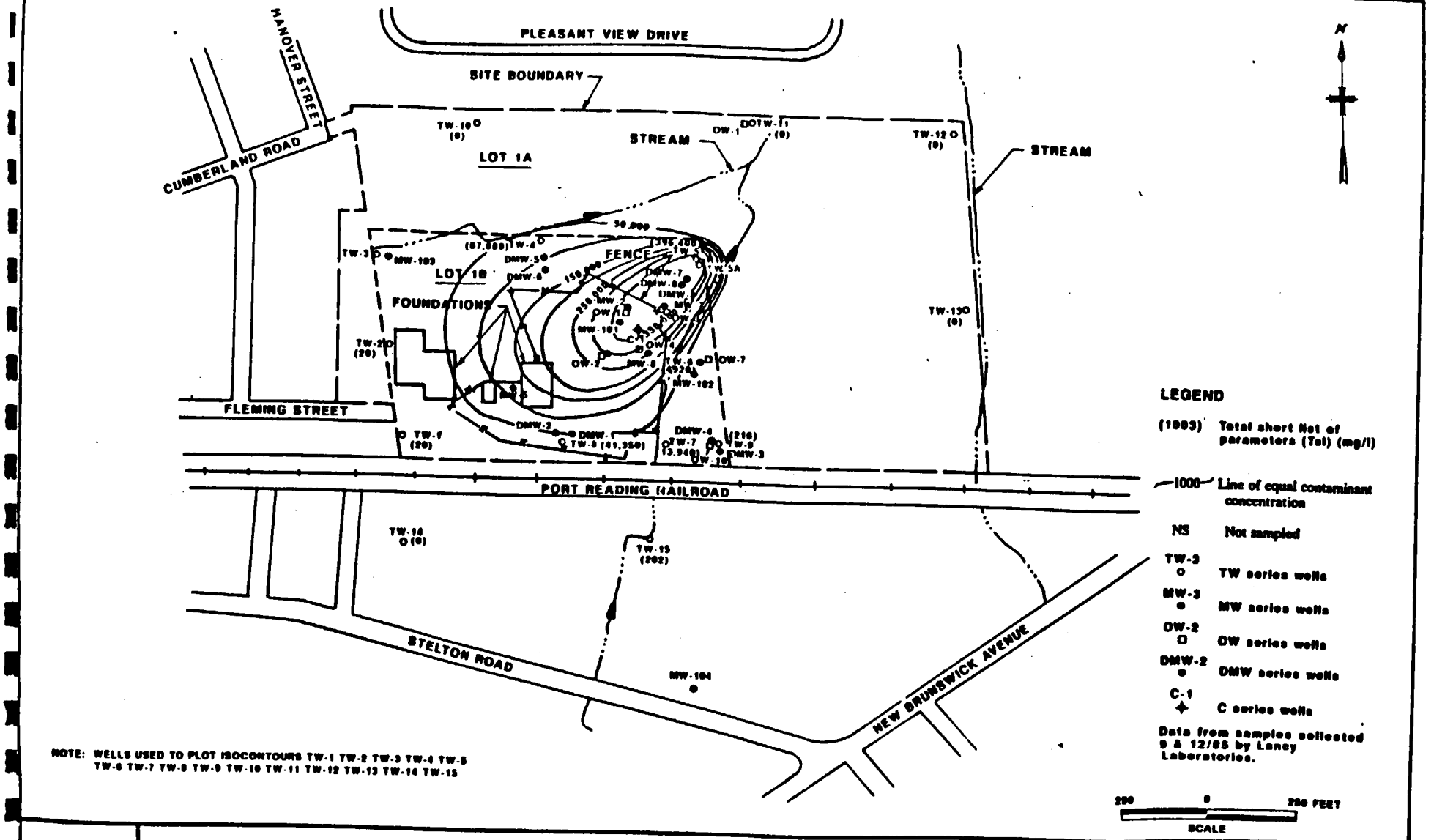
FIGURE 2-6

In November 1983, Lancy cored a test boring to 315 feet below grade in the location that is now well C-1. Using a dual packer assembly, they pressure tested 10-foot intervals to determine the variability in the permeability of the bedrock with depth. Each zone was then pumped and, if sufficient water was removed, a ground water sample was collected and analyzed for VOCs. T_{SL} remained fairly consistent (about 50,000 ug/l) to 270 feet below grade, although the concentration of individual parameters varied. If the packers did not completely seal the borehole, detected contaminants may have been pumped from other parts of the well. Below 270 feet, to the total tested depth of 300 feet, the total concentration of the indicator parameters was less than 10 ug/l. Contaminants were similar to those detected previously in the MW wells. Fifty feet of steel casing was reportedly added to complete the boring as a well (C-1). The depth of the casing in well C-1 will be confirmed during the RI.

In 1984 and 1985, 26 wells were installed at the site by Lancy. The new wells were designed to monitor the perched zone (the OW-series wells) and the water table (the TW-series wells). Eight TW-series wells were installed and sampled by Lancy in August 1984 (TW 1-8). Five additional TW-series (TW 9-13) wells were installed around the site perimeter; these and the other eight TW-series wells were sampled in August 1985.

In December 1985, two more TW-series wells were installed and sampled (TW-14 and -15). The NJDEPE split some or all of the samples collected in 1984 and 1985. All samples were analyzed for VOCs; the detected parameters were similar to those previously detected in the MW-series wells. Wells located near the center of the site (TW-5) were the most highly contaminated; individual compounds were frequently detected above 1,000 ug/l. T_{SL} ranged from 216 (TW-9 in the southeast corner of Lot 1B) to 396,400 (TW-5 in the center of the site) ug/l. At the upgradient northern and eastern site perimeters, no contaminants were detected above detection levels. Contaminants were detected in wells at the western and southern site perimeter, except at TW-14, which is off-site to the southwest. T_{SL} in perimeter wells was less than about 200 ug/l. The concentrations of individual and T_{SL} remained fairly consistent in wells that were sampled in both 1984 and 1985. T_{SL} distribution is mapped on Figure 2-6 using 1985 results.

As shown on Figure 2-6, very high concentrations of contaminants are observed in T_{SL} in the northeast corner of Lot 1B. The contaminant distribution may be a function of site operations (higher concentrations in areas where high concentrations of contaminants exist in the soils), or the ground water flow pattern.



NOTE: WELLS USED TO PLOT ISOCONTOURS TW-1 TW-2 TW-3 TW-4 TW-5 TW-6 TW-7 TW-8 TW-9 TW-10 TW-11 TW-12 TW-13 TW-14 TW-15

CHEMSOL, INC.
PISCATAWAY, NEW JERSEY

ISOCONTOURS OF Tsl IN TW - WELLS (12-60') (1985)

FIGURE 2-6

CHM 001 0636

In December 1985, the two wells at Parkway Plastics and a private well south of the site were sampled by Lancy (samples were again split with NJDEPE). Only the Parkway Plastics wells contained contaminants. T_{SL} concentrations were 1,054 and 1,603 ug/l. In addition, the wells contained up to 2,000 ug/l tetrachloroethene (PCE), which is similar to the concentration (2,751 ug/l) detected in 1980.

Well C-1 was permanently sealed below approximately 133 feet below grade in either late 1986 or early 1987. It is reported that in July 1987, AGES conducted a 72-hour pumping test on C-1 above 133 feet below grade. During the pumping test, water quality samples were obtained to investigate variability in the concentrations of VOCs with time. T_{SL} remained fairly consistent (about 30,000 ug/l) during the test duration although the concentration of individual parameters varied.

In 1988, AGES installed eight bedrock wells (DMW-series) to monitor ground water quality in two zones beneath the TW wells. The wells were installed in clusters with existing TW-wells around the center of the site and were open from either 225-250 feet or 300-325 feet below grade. (To date there are no wells open to the interval from 80-225 feet with the exception of C-1 which is open from 50-133 feet bgl.) Each DMW well was sampled twice between January and June 1988 and the ground water analyzed for VOCs. The detected parameters were similar to those detected in previously installed wells. However, T_{SL} generally decreased an order of magnitude in each successively deeper well, though this trend was not consistent in wells in clusters at TW-4 and TW-9.

In October 1988, samples were collected in five of seven OW wells (perched zone) by AGES for VOC analysis. These are the first reported water quality data for these wells. The suite of compounds identified was similar to that previously detected in other site wells. However, T_{SL} ranged from below detection levels to 460 ug/l, which is lower than in water table (TW) wells.

In December 1988, selected TW wells were resampled by AGES. In most, the parameters and concentrations detected were consistent with the results of the 1984 and 1985 sampling. However, T_{SL} in TW-3 was approximately 1700 ug/l, which is three orders of magnitude higher than previously detected. This well is located at the northwestern site edge. The results indicate that some of the selected parameters making up T_{SL} may be emanating from a (secondary) off-site source. Alternatively, the increase could be a function of release of contaminants from soils due to high activity (numerous excavations were

conducted during 1988 as will be discussed in the following section) or of variability in analytical precision and accuracy.

In August 1989, private wells in the site vicinity were sampled for VOCs by NJDEPE. HLA and the Middlesex Co. Health Department also sampled residential wells in January 1990. All but one of the wells were located in the Nova Ukraine area; however, only three of the wells had been sampled previously. Of these, only the sample from the well at 10 Franklin Street indicated concentrations significantly above detection levels. The concentration of PCE in this well increased an order of magnitude from 1980 to 1989/1990. The majority of the remaining wells contained no VOCs or contained PCE at concentrations near the detection levels (though at times exceeding the MCL). Well samples from three homes on Franklin Street (numbers 5, 9 and 15) and the home at 11 St. Michael Street contained up to 310 ug/l PCE.

Non-contact cooling water effluent fed by the Parkway Plastics wells was sampled by Parkway Plastics from 1986 through 1990. T_{SL} and PCE concentrations in these samples were fairly consistent, but slightly lower than in 1985.

Between March and June 1990, HLA installed four wells (MW-100 series) that monitor approximately the same two zones as the DMW-series wells (245-265 and 325-350 feet). During installation of MW-101, located less than 100 feet west of C-1, HLA used packers to isolate ten-foot sections of the borehole to a total depth of 220 feet below grade. Ground water samples were collected from each section for VOC analysis. Contaminant levels were fairly consistent throughout the sampled intervals. As with C-1, this may have been a result of ineffective packer sealing. The contaminants and concentrations were similar to those observed during the packer testing of C-1 (1983).

Between February and July 1990, all bedrock monitoring wells (except MWs 1 to 8) were sampled at least once by HLA. Ground water from all wells was analyzed for VOCs. T_{SL} in the TW-wells were similar to those previously detected. However, TW-1 contained 4,200 ug/l 1,2-dichlorobenzene (DCB), which had previously been detected at concentrations near the detection level. DCB is not on the short list of parameters. Also, TW-1 is not believed to be downgradient of the site. T_{SL} in TW-3 dropped three orders of magnitude to the concentrations detected prior to the increase detected in 1988, suggesting the 1988 results may have been anomalous. Contaminants were also detected for the first time in upgradient wells TW-10 and TW-13, though near the detection limits. A new TW-series well, TW-5A, was sampled for the first time in 1990. This well was installed sometime

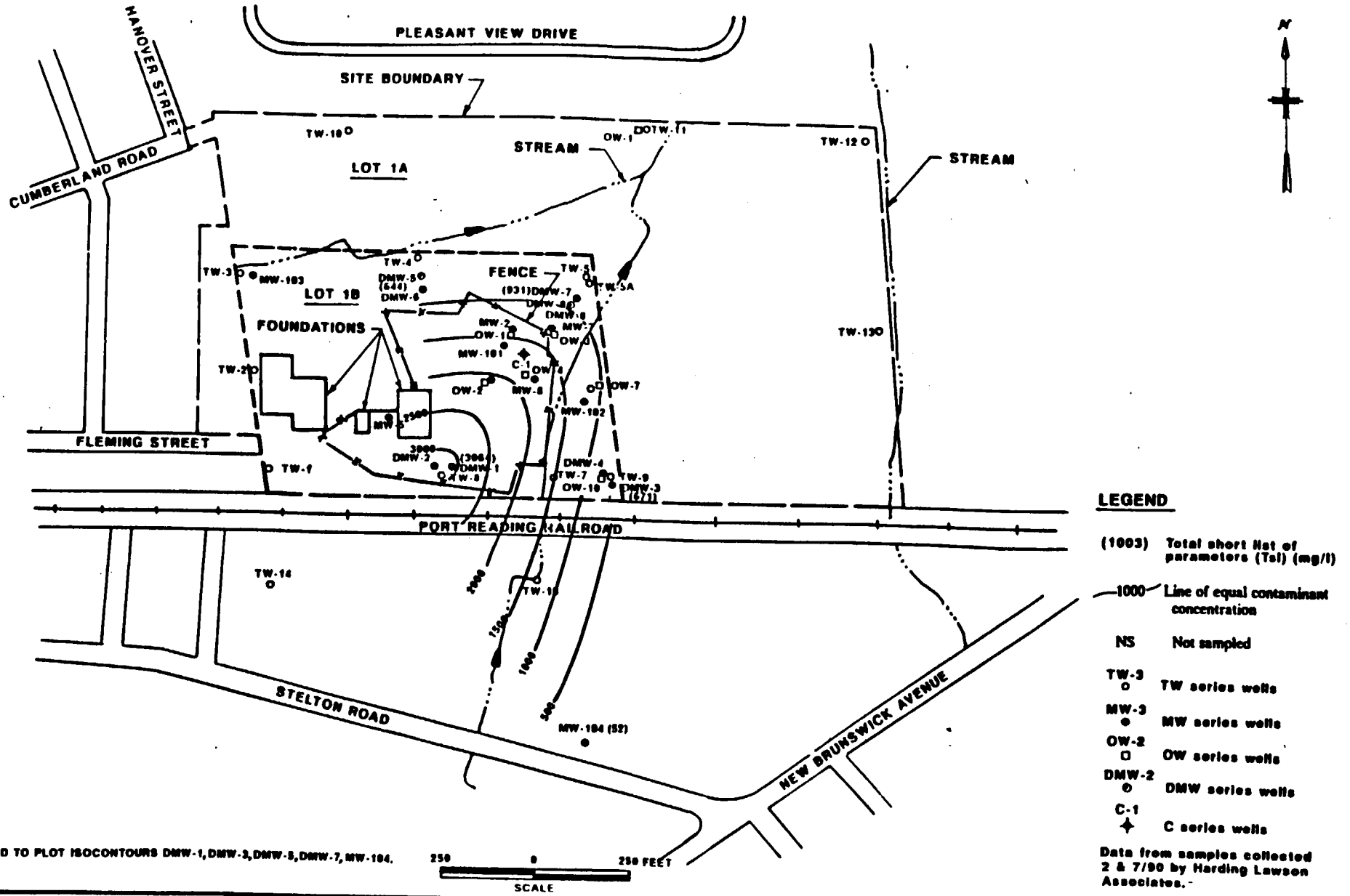
between 1986 and 1990 immediately adjacent to TW-5; though supporting documentation is unavailable, it is generally believed that TW-5A was intended to replace TW-5, which had been blocked. TW-5 was since rehabilitated and both wells were sampled in 1990. Though the contaminants were similar, T_{SL} in TW-5A was half that detected in TW-5.

During 1990, contamination in the DMW wells was similar to that detected in 1988. The drop in contaminant concentration with depth at TW/DMW-series well clusters was also relatively consistent with the 1988 results. T_{SL} in wells open from 225 to 265 feet below grade (DMW-1,3,5,7 and MW-104) are mapped on Figure 2-7. T_{SL} in wells open from 300 to 350 feet below grade (DMW-2,4,6,8 and MW-101,102,104) are mapped on Figure 2-8. Contaminant levels are highest around DMW-1, but are prominent throughout the eastern portion of Lot 1B. Two DMW-series wells were also sampled and analyzed for pesticides and PCBs. However, no pesticides or PCBs were detected. Only MWs 1-8 and C-2 had previously been sampled for these parameters, as discussed previously.

During 1990, the MW-100 series wells were sampled for the first time. Those installed at depths greater than 300 feet below grade generally contained the same contaminants and concentrations as found in the DMW-series wells open below 300 feet (Figure 2-8). The highest T_{SL} are again found in Lot 1B. MW-104 was installed south of the site on the Parkway Plastics property and is open between 245 and 265 feet below grade. This well contained 8700 ug/l PCE, which is not on the short list, but which has been consistently detected in the Parkway Plastics and in some residential wells. TCE was also detected in MW-104 at low levels (52 ug/l).

During 1990, samples from four wells (TW-5, DMW-1, DMW-6 and MW-101) were analyzed for inorganics. Ground water had not been previously analyzed for inorganic parameters as part of site investigations. Twelve inorganics were detected in at least one well at concentrations of 1 ug/l to 200,000 ug/l. However, only aluminum, iron and manganese exceeded existing or proposed secondary MCLs. The MCLs for these three metals were exceeded at all wells, except DMW-1, which did not contain aluminum.

By February 1991, all but three residences in the Nova Ukraine area south of the site were connected to public water supply. These three residences were sampled in February by the USEPA. VOCs occurred at concentrations near the detection limits. PCE exceeded the State MCL at one location (7 Carpathia Street).

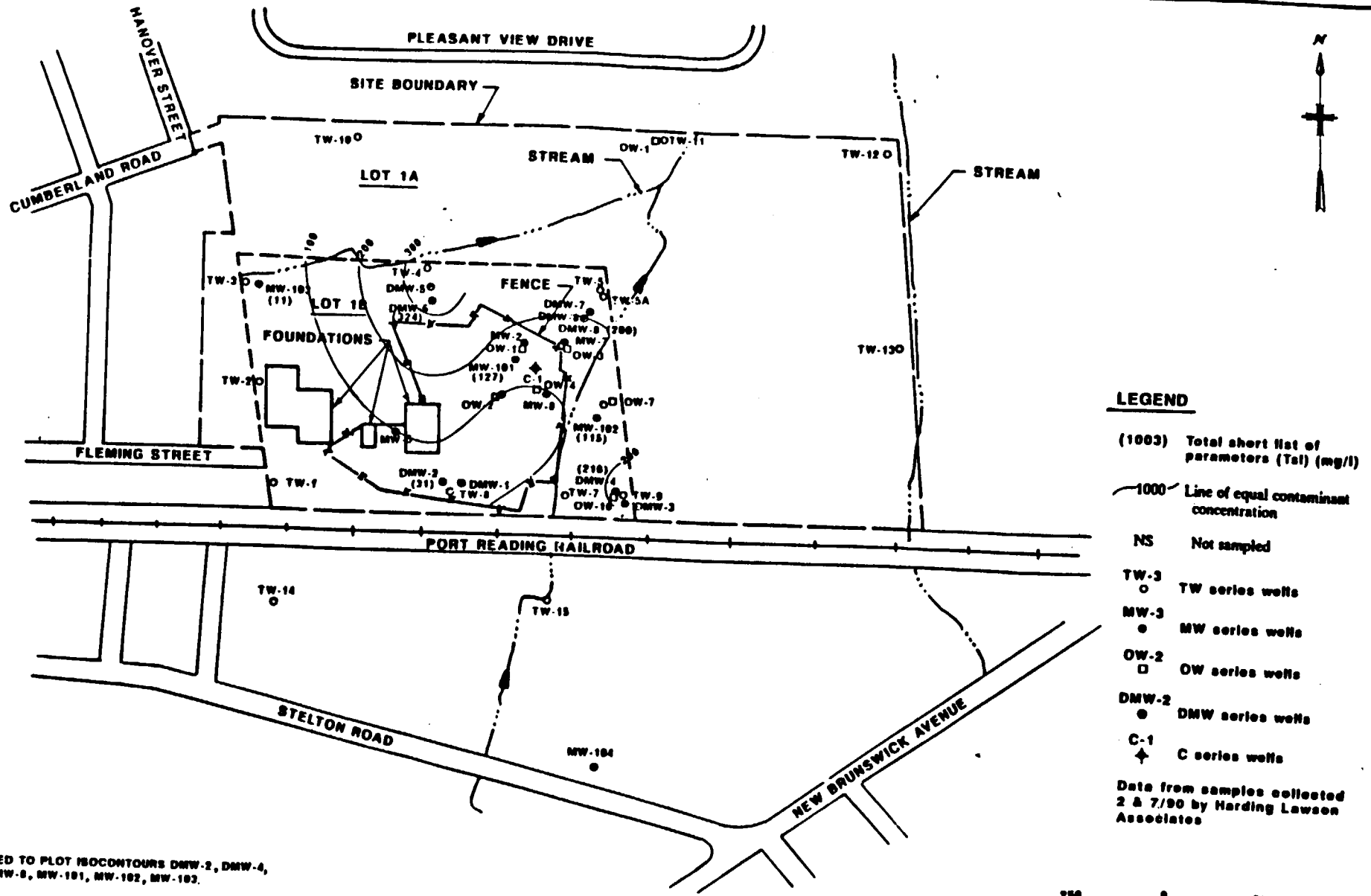


CHEMSOL, INC.
PISCATAWAY, NEW JERSEY

ISOCONTOURS OF Tsl IN MODERATELY DEEP WELLS (225 - 265') (1990)

FIGURE 2-7

CHM 001 0640



NOTE: WELLS USED TO PLOT ISOCONTOURS DMW-2, DMW-4, DMW-5, DMW-6, MW-101, MW-102, MW-103.

CHEMSOL, INC.
PISCATAWAY, NEW JERSEY

ISOCONTOURS OF Tsl IN MODERATELY DEEP WELLS (300 - 350')

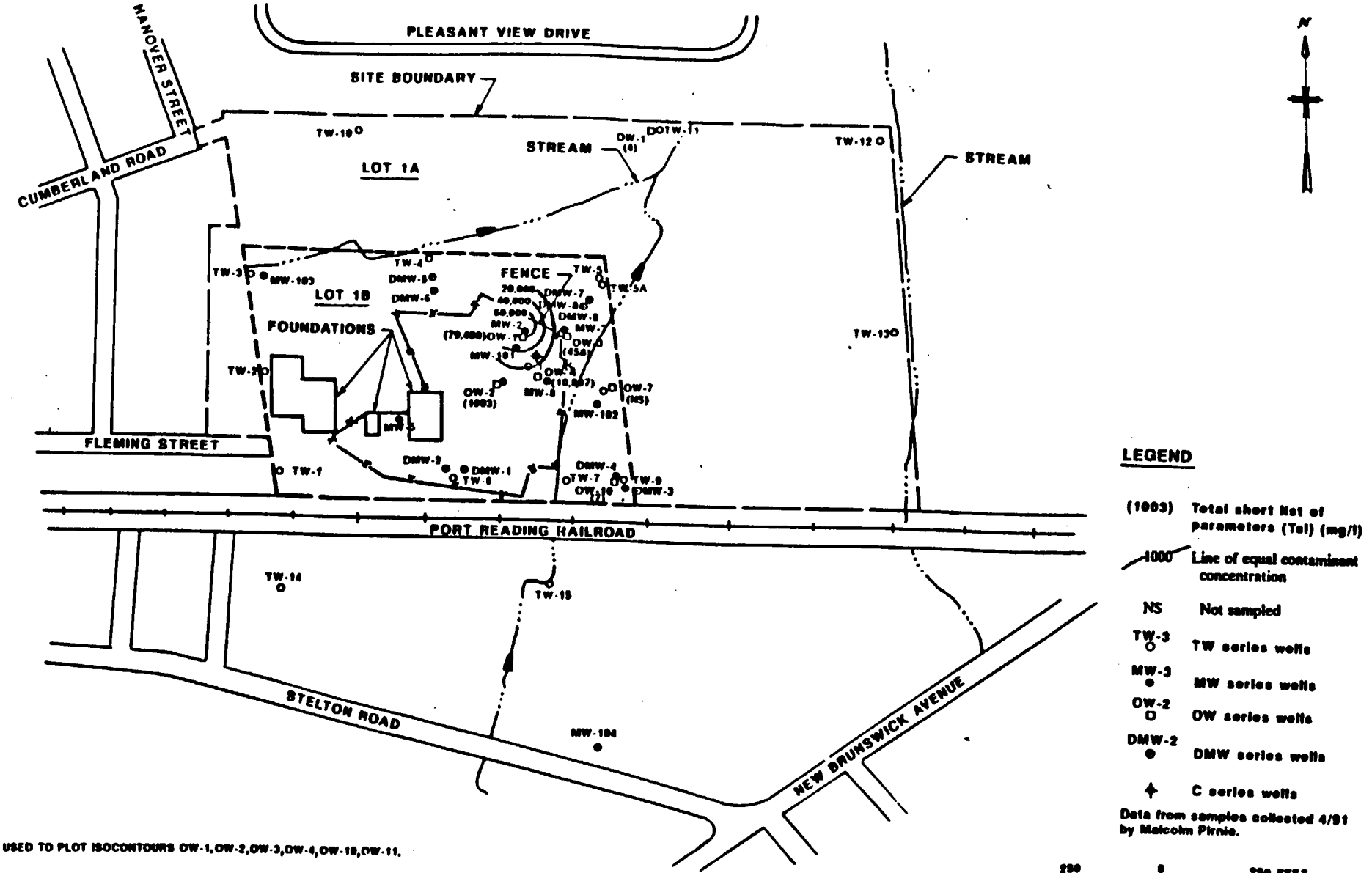
FIGURE 2-8

CHM 001 0641

In April 1991, Malcolm Pirnie sampled five OW-series wells, C-1 and all sixteen TW-series wells as part of the Focused Feasibility Study. Ground water from all wells was analyzed for TCL/TAL parameters and selected additional parameters. VOC concentrations in three OW-wells in the center of the site (OW-1, OW-2 and OW-4) were greater by several orders of magnitude over 1988 results. Concentrations continued to be lower than in water table (TW-series) wells. The downgradient well (OW-11), which had not previously been sampled, contained several contaminants near the detection limit. T_{SL} in the OW wells from April 1991 is shown on Figure 2-9. SVOCs in OW-wells were generally higher than in other site wells. Total concentrations ranged from 2 ug/l in OW-11 to 11,394 ug/l in OW-1. Pesticides were also detected in the most highly contaminated OW-wells, but concentrations did not exceed MCLs. PCBs and dioxin were not detected in the ground water. Inorganics were detected in all OW-series wells except OW-1, which was not analyzed for metals. MCLs for metals were exceeded for lead (in OW-2 and OW-4), iron (in all wells) and manganese (all wells except OW-10).

T_{SL} in C-1 increased from 1987 to 1991 by an order of magnitude. This well currently contains the highest concentrations of VOCs at the site. Pesticides were also detected in C-1, but concentrations did not exceed MCLs. PCBs and dioxin were not detected. Inorganic parameters were detected, with exceedance of the ground water standards for iron and manganese.

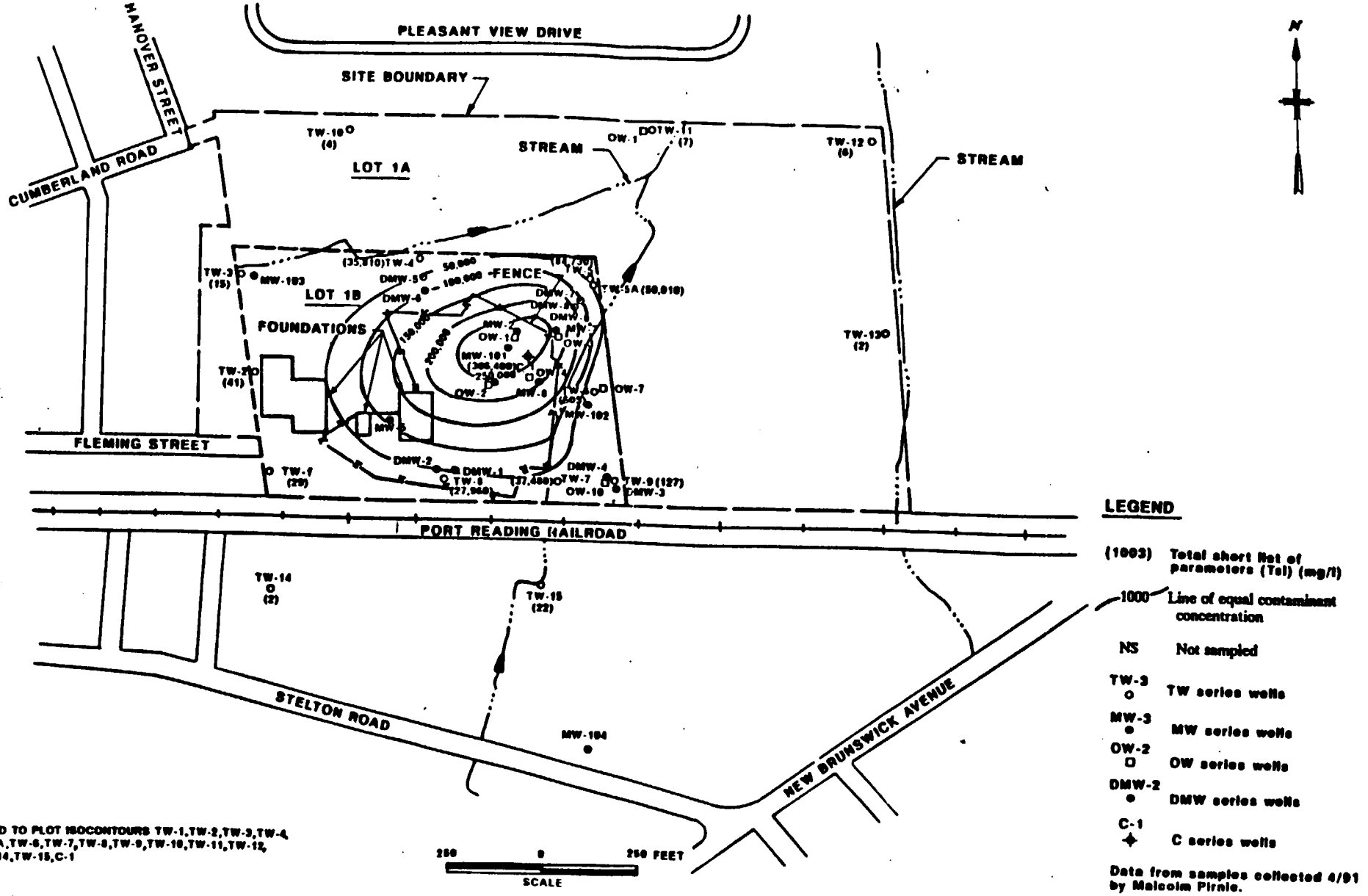
Contamination in TW-series wells remained similar to that detected in 1990. Less DCB was detected in TW-1, but the concentration remained high. T_{SL} in all perimeter wells was generally at concentrations near detection levels. Isocontours of T_{SL} in the TW-wells and well C-1 are shown on Figure 2-10. SVOCs in TW-series wells were generally lower than in the perched zone (OW-series) wells. Total concentrations ranged from undetected in TW-9, TW-11, TW-12, TW-13 and TW-15 to 1,573 ug/l in TW-1. Pesticides, PCBs and dioxin were not detected. Inorganics were detected in all TW-wells. MCLs were exceeded for barium (in TW-2, TW-4 and TW-7), lead (in TW-1 and TW-14), iron (in all wells) and manganese (in all wells). Inorganics in TW-5, which is the only well previously analyzed for inorganics, were relatively consistent with those detected in 1990. A summary of the existing wells and the zones they monitor is provided in Table 2-6.



CHEMSOL, INC.
PISCATAWAY, NEW JERSEY

ISOCONTOURS OF Tsl IN OW - WELLS (3-15') (1991)

FIGURE 2-9



LEGEND

(1993)	Total short list of parameters (Tsl) (mg/l)
1000	Line of equal contaminant concentration
NS	Not sampled
TW-3 ○	TW series wells
MW-3 ●	MW series wells
OW-2 □	OW series wells
DMW-2 ●	DMW series wells
C-1 ✦	C series wells

Data from samples collected 4/91 by Malcolm Pirnie.

NOTE: WELLS USED TO PLOT ISOCONTOURS TW-1,TW-2,TW-3,TW-4, TW-5,TW-5A,TW-6,TW-7,TW-8,TW-9,TW-10,TW-11,TW-12, TW-13,TW-14,TW-15,C-1

CHEMSOL, INC.
PISCATAWAY, NEW JERSEY

ISOCONTOURS OF Tsl IN TW-WELLS (12-60') (1991)

FIGURE 2-10

CHM 001 0644

TABLE 2-6

SUMMARY OF EXISTING WELLS
CHEMSOL, INC.

Well Series	Number of Wells	Type of Well	Monitored Interval (Feet Below) Ground Surface	Zone Monitored
OW	7	Overburden	3-15	Perched Zone
MW	7	Overbur-den/Bedrock	5-80	Perched Zone and Water Table
TW	16	Bedrock	12-65	Water Table
DMW-1,3,5,7 MW-104	5	Bedrock	225-265	Moderately Deep
DMW-2,4,6,8 MW-101,102,103	7	Bedrock	300-350	Moderately Deep
C-1	1	Bedrock	50-133	Water Table and Upper Bedrock

NOTE:

MW-6 is believed to have been inactivated and is not included in this total. This will be confirmed during the RI/FS.

C-2 (former Chemsol production well) not included.

In summary, VOCs are the most pervasive ground water contaminants at the site and occur at the highest concentrations. Similar compounds occur in all contaminated wells. Water in the perched zone is less contaminated with VOCs and more contaminated with SVOCs than the water table wells. The bedrock aquifer becomes less contaminated with depth. Furthermore, all the deepest wells at the site contain contaminants.

The highest levels of ground water contamination occur in the center of the site. Contaminant concentrations have not changed significantly in this area between 1985 and 1991 except in C-1, where contaminant concentrations have apparently increased (C-1 is currently the most highly contaminated on-site well). Wells monitoring the water table at the site perimeter contain much lower levels of contamination. MW-104, located on the Parkway Plastics property (south of the site and south of the Parkway Plastics well) and

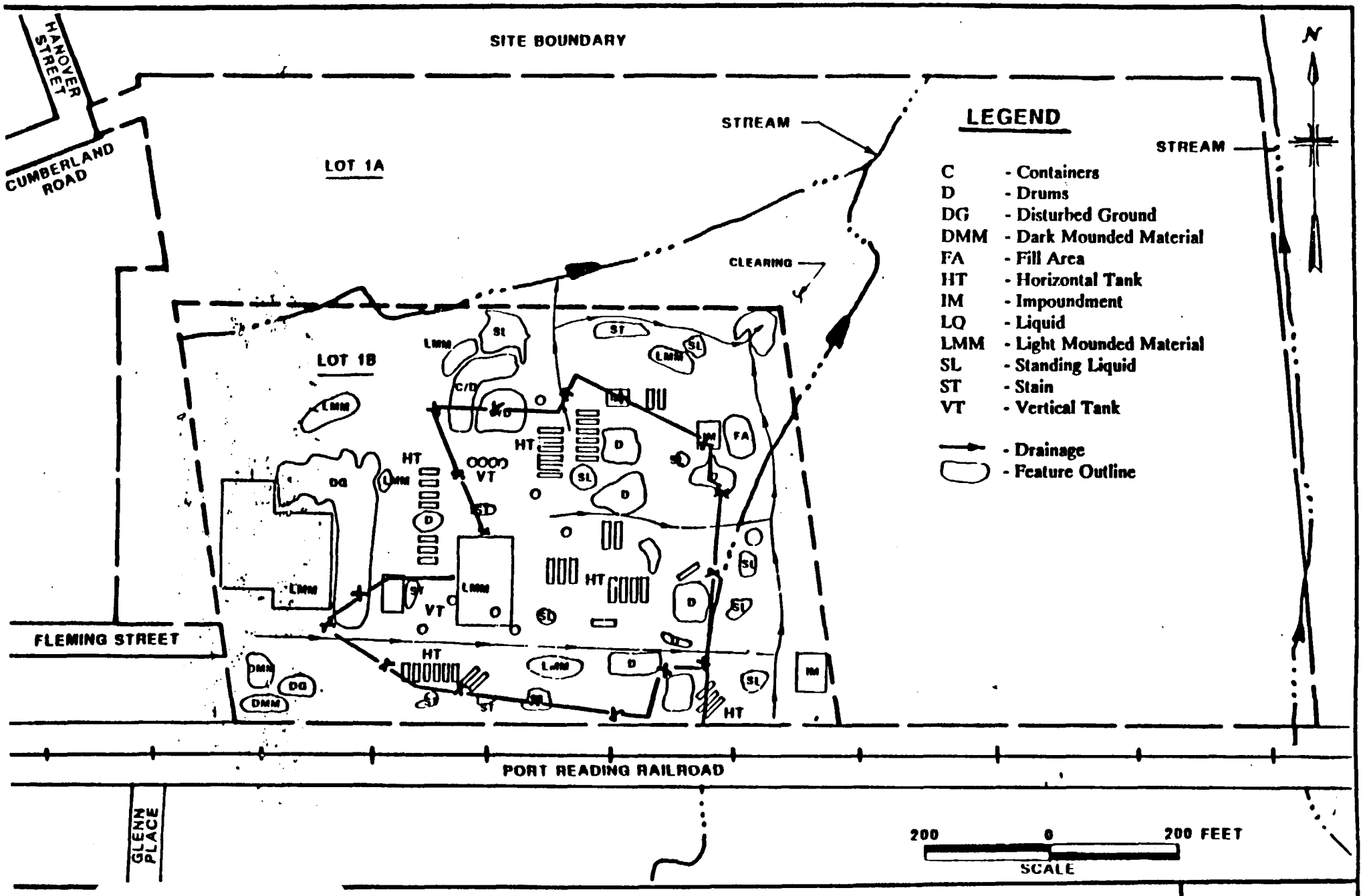
monitoring a deeper zone of the bedrock aquifer, contains high concentrations of PCE. PCE is detected on-site, but does not occur with great frequency nor at high concentrations. This contaminant, however, is the most frequently detected in off-site wells, including the Parkway Plastics wells.

2.6 SOIL CONTAMINATION

An unknown quantity of organic and inorganic chemicals were processed at the Chemsol site during the 1950's and 1960's. Spills of unidentified fluids were documented on the site during the period that the site was active. In addition, several fires and explosions at the site have been documented. The site appears to have reached its peak activity during the years 1961-1963. In all available aerial photographs, Lot 1A outside of Lot 1B appears undisturbed with wooded and shrub vegetation. However, Lot 1B is nearly completely cleared and heavily used west of Stream 1B. Figure 2-11 is a schematic representation of the past activities at the site based on historic aerial photographs. A small clearing is seen in a circular pattern at the northeast corner within Lot 1B and an apparent impoundment is seen at the southeast corner of Lot 1B. Additional areas of standing liquid and mounded materials are found to the east and north of the fenced area. The areas of standing liquid may have been low points topographically and may have been a point for recharge to the overburden. Additionally, several areas of mounded material are found in the southwest corner of Lot 1B and west of the fence. The remainder of Lot 1B is nearly 80 percent covered with drums, tanks, and mounded materials. Based on the EPIC photos, it has been determined that the eastern 2/3 portion of Lot 1B should be considered a probable source of contaminants, via residuals that remain in the site soils due to past activities at the site.

Data from previous investigations indicate that PCBs, VOCs, SVOCs and metals are present in the soil. Based on the analysis of the EPIC photographs, it is probable that the compounds in the site soil are residual contaminants remaining from the former chemical reprocessing operations. The areas where the highest levels of contaminants are found correlate to those areas where past activities most frequently occurred. A detailed discussion of past sampling is provided in the following paragraphs.

Patterson initiated soil sampling activities in 1980. Thirteen soil samples were collected from within Lot 1B and analyzed for PCBs. NJDEPE collected split samples of



CHM 001 0647

CHEMSOL, INC.
PISCATAWAY, NEW JERSEY

SCHEMATIC DIAGRAM OF SITE ACTIVITIES BASED ON EPIC 1991 REPORT

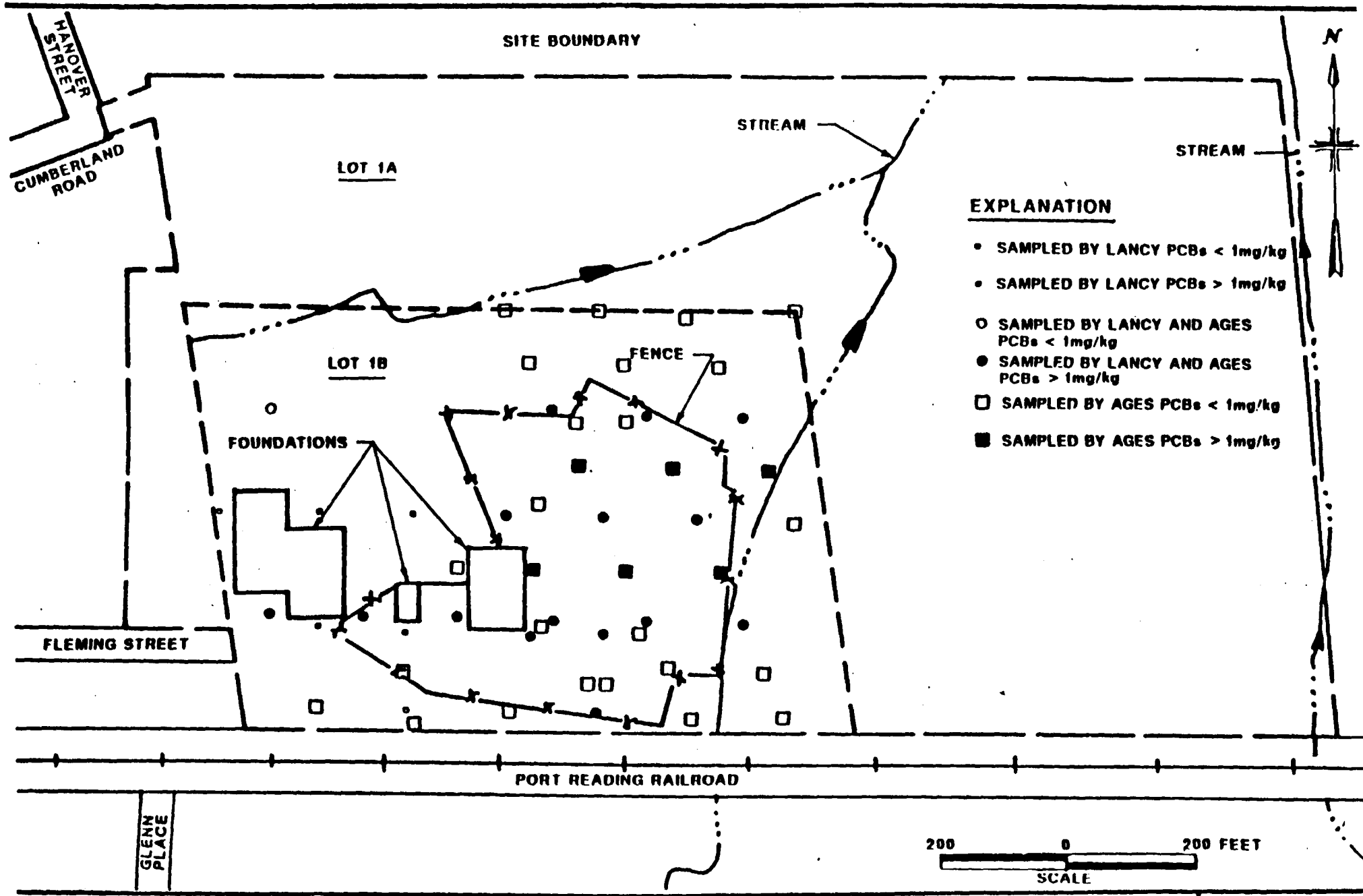
FIGURE 2-11

the soil for PCB analysis. Patterson detected PCBs in 10 out of the 13 samples collected. Patterson's data ranged from non-detect to 16 mg/kg. The samples collected by the NJDEPE had concentrations ranging from non-detect to 50 mg/kg. PCB contamination was found in the deepest samples collected (30 inches). PCBs above 1 ppm were found consistently in which is now the fenced portion (center) of the site.

Lancy describes a more extensive sampling program in 1985 (on Figure 2-12). Eighteen of the twenty four locations sampled indicated PCB concentrations greater than 1 mg/kg. PCB concentrations were found as high as 300 mg/kg in the eastern half of Lot 1B.

AGES collected additional soil sampling for PCB analysis in 1987. Samples were collected from four intervals: 0-6 inches, 6-12 inches, 12-18 inches and 18-24 inches (Figure 2-12). PCB concentrations ranged from non-detect to 351 mg/kg. In 1987, a fence was erected around the area in Lot 1B believed to be the most highly contaminated. Based on their 1987 sampling results, AGES began removing soils which were determined to have PCB concentrations greater than 1 mg/kg (locations shown on Figure 2-13). During the soil removal activities in the summer of 1988, buried waste was found and was also excavated and removed by BES Environmental Specialists. The buried waste was described as drums, bottles, jars, cans and wood. In total, approximately 7,900 cubic yards of soil and buried waste were removed from the site. A summary of the removal activities is in HLA's document titled Third Revision to the Work Plan for the Characterization of the Unsaturated Zone and Confirmation of Removal of Buried Wastes and Contaminated Soils, July 1990. Exact depths and locations of soil removal were not provided in the HLA document. A bucket loader was used to scrape surface soils to "pre-determined" depths from 6 to 24 inches below grade. A second phase of sampling indicated that contaminated areas remained. These areas were excavated an additional 6 inches. In the areas where buried wastes were found, excavations generally terminated at the bedrock surface (HLA 1990). The berms on the northern and eastern portions of the site were also sampled. Soils with PCB concentrations greater than 1 mg/kg were reported to have been excavated, presumably to bedrock, although the depth was not described.

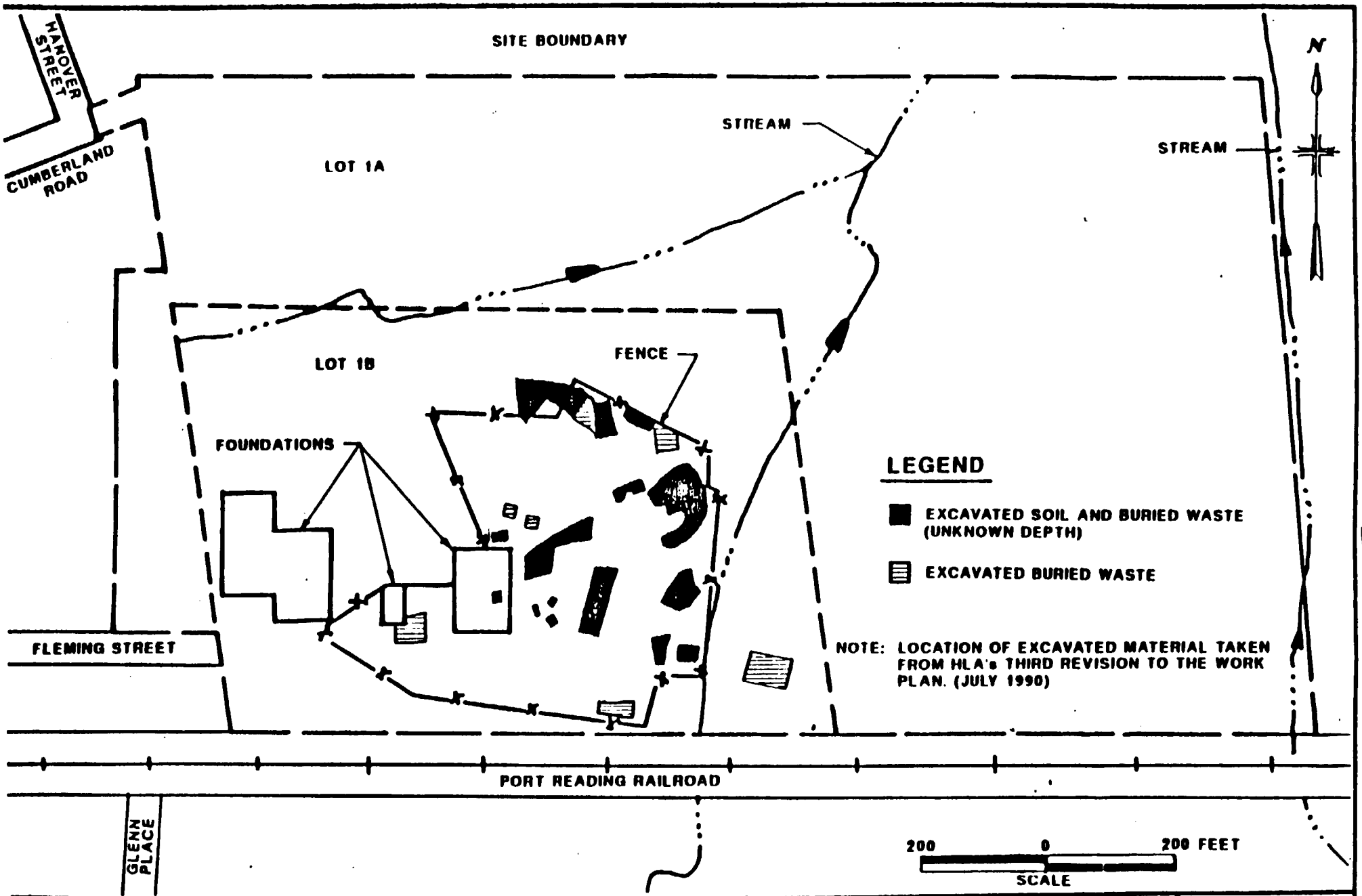
Post-excavation sampling conducted by AGES, consisting of test pits, grab samples and composite soil scrapings from areas as large as 100 square feet, demonstrated that contaminated soil remained on-site. The intent of post-excavation sampling was to determine residual PCB levels in the soils. The post-excavation data presented in Appendix



CHEMSOL, INC.
PISCATAWAY, NEW JERSEY

PCB SOIL SAMPLE LOCATIONS - LANCY (85), AGES (87)

FIGURE 2-12



CHEMSOL, INC.
PISCATAWAY, NEW JERSEY

APPROXIMATE LOCATIONS OF SOIL AND BURIED WASTE EXCAVATION (AGES, 1989)

FIGURE 2-13

C of HLA's document, however, include samples taken from stockpiled soils as well as samples from newly exposed, un-excavated soils. Many post-excavation samples from unexcavated soils showed PCB concentrations in excess of 1 mg/kg. HLA does not indicate that any additional soil removal was conducted in the areas where post-excavation samples revealed PCB concentrations greater than one mg/kg.

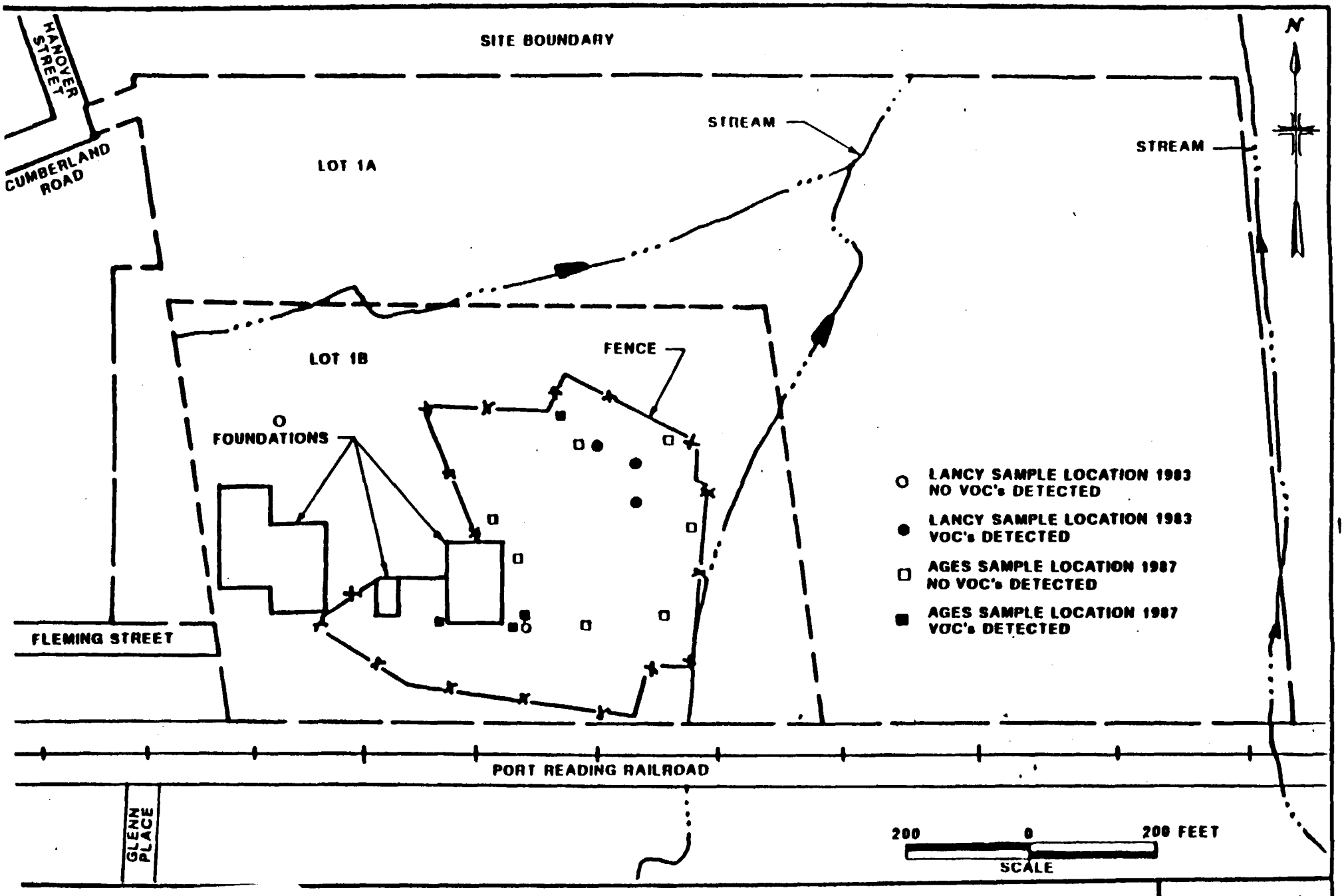
Significantly less data has been collected by previous consultants regarding soil contamination by VOCs. VOCs were detected in three out of five samples collected from Lot 1B by Lancy in 1983. Compounds detected included benzene, ethylbenzene, toluene, xylene, trichloroethene, tetrachloroethene and chlorobenzene. The contaminated soils were found in the vicinity of well C-1 (Figure 2-14). Additional VOC data were collected by AGES during pre-excavation sampling. Volatile compounds were detected in five of the 14 samples collected from 11 locations. All samples containing VOCs were from locations within the fenced area and were typically collected from a depth of six to twelve inches. Contaminants included benzene, tetrachloroethene, ethyl benzene, chlorobenzene, 1,1-dichlorobenzene and 1,4-dichlorobenzene. The samples which contained the highest concentration of volatiles were found in locations shown to have PCB concentrations exceeding 1 mg/kg. Sixteen samples were also collected for VOC analysis during the second phase of AGES sampling. No VOCs were detected. The results of VOCs analysis are provided in Appendix B.

The only metals data available are the EP Toxicity results performed on excavated soils. Seven composite samples were collected from the stockpiled soils. Lead concentrations as high as 1126 mg/kg, barium concentrations as high as 127 mg/kg and arsenic concentrations as high as 726 mg/kg were detected.

An electromagnetic survey was conducted by HLA in November 1989 to determine potential locations of buried metal at the site. Ten anomalies were discovered. Their locations are shown in Figure 2-15. Test pits in these areas revealed sections of iron pipe and resinous material in some areas. No underground storage tanks were found.

2.7 BIOTA AND ENVIRONMENTAL RESOURCES

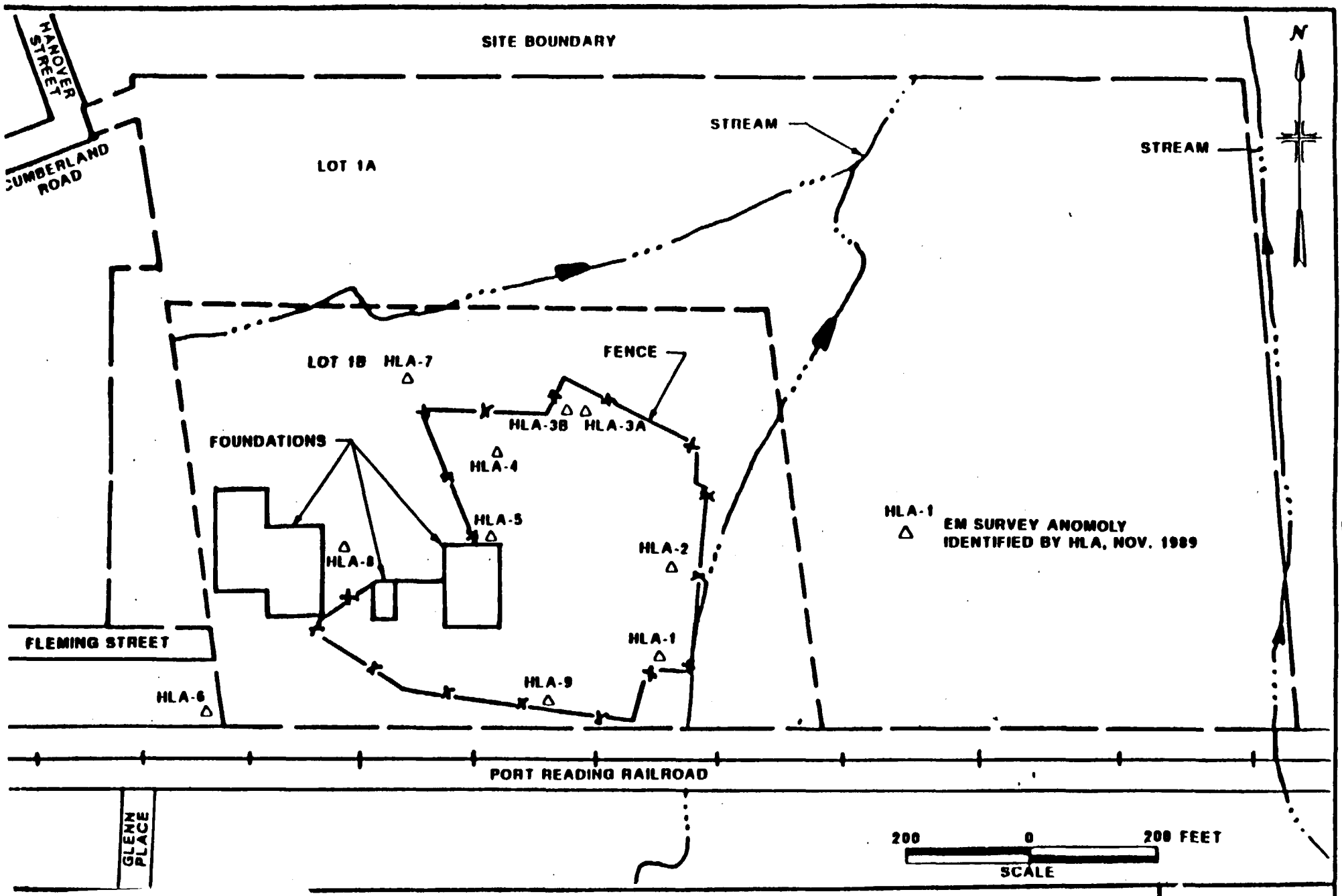
The Chemsol site has been described as heavily vegetated with areas of hydrophytic plants. National Wetlands Inventory (NWI) mapping for the Plainfield, N.J. quadrangle indicates a Palustrine, Forested, Broad-leaved Deciduous (PFO1) wetland is present in the



CHEMSOL, INC.
PISCATAWAY, NEW JERSEY

VOC SAMPLE LOCATIONS FROM LANCY ('83) - AGES ('87)

FIGURE 2-14



CHEMSOL, INC.
PISCATAWAY, NEW JERSEY

GROUND CONDUCTIVITY SURVEY ANOMOLIES FOUND BY HLA, NOVEMBER 1989

FIGURE 2-15

northwest portion of the Chemsol site. This environment is likely to provide habitat for wetland mammals, birds, reptiles and amphibians.

Ambrose-Dotty's Park, a County-owned park, is located along either side of Ambrose Brook approximately 4,000 feet south and southeast of the Chemsol site. Lake Nelson is situated along Ambrose Brook, approximately 1.5 miles south of the Chemsol site. The New Jersey Surface Water Quality Standards for the entire length of Ambrose Brook and Lake Nelson is FW2-NT (non trout). Currently, the designated uses of Ambrose Brook and Lake Nelson includes:

- maintenance, migration, and propagation of native biota;
- primary and secondary recreation;
- industrial and agricultural water supply;
- public water supply after treatment as required by law; and,
- any other reasonable use.

Haines Avenue Park, a relatively small municipal park, is situated at the intersection of Haines Avenue and Stelton Road, approximately 1.0 miles southeast of the Chemsol site. A second municipal park, Shadyside Park, is located about 1.9 miles to the southeast of the site, between New Durham Road and I-287. Ambrose-Dotty park is undeveloped and does not currently have a water supply (Middlesex Co. Parks Department, personal communication, 1992). Nor are there water supplies at Haines Avenue Park (Piscataway Township, personal communication, 1992) or Shadyside Park (Borough of South Plainfield, personal communication, 1992). Water facilities at Spring Lake are supplied by the Middlesex County Water company (Middlesex Co., personal communication, 1992). Spring Lake County Park is located approximately 2.5 miles northeast of the site.

Data on the chemical characteristics of on-site biota have not been collected by previous consultants. Section 5.3 contains a description of the Ecological Investigation work proposed as part of this Work Plan for the purpose of documenting existing conditions.

2.8 AIR QUALITY

Odors at the site were noted during field activities for the FFS (April 1991). Odors have been reported to emanate from the southeast corner of the fenced portion of Lot 1B. During EPA's site visit in December 1990, the ambient air quality was monitored with a

particulate meter and a photoionization detector with an 11.7 eV probe. No readings above background were measured.

The climate of the area surrounding Piscataway is classified as continental with only minor influences from the Atlantic Ocean. Summer temperatures rarely exceed 100°F but frequently reach the low 90's. The average daily maximum temperature of 86°F occurs during the month of July. Winter readings below O°F are infrequent. The average daily minimum temperature is 20°F during January.

Precipitation in the area averages about 45 inches per year. The heaviest rains normally occur during the summer growing season of July and August. Snowfall averages approximately 27 inches per year, but this number can vary significantly from year to year.

Winds are generally out of the southwest. During winter, winds from the west-northwest predominate. .

2.9 DEMOGRAPHICS AND LAND USE

The Township of Piscataway is located in Middlesex County in central New Jersey. The Township experienced growth in population and in residential units during the period from 1980 to 1990. In 1980, the resident population of Piscataway was 42,223 persons (U.S. Bureau of the Census, 1980). The unofficial 1990 U.S. Census population for Piscataway is 46,298 persons for an increase over the 1980 population of 4,075 residents (i.e., a 9.7 percent increase). Population projections for Piscataway anticipate an increase of 650 persons by the year 1993 and 750 by the year 2000 (Middlesex County Data, 1986).

Tract and block group data from the 1990 U.S. Census have been requested from the U.S. Census Bureau but have not been received as of the date of this work plan. These data will be required for Task 6, Public Health Evaluation, of the RI/FS in order to identify the number of persons currently residing or expected to reside within a one-half to three-mile radius of the site.

In 1978, the site was rezoned from industrial to residential use. Land use in the vicinity of the site is commercial and residential. Single family residences are located immediately west and northwest of the site. Industrial and retail/wholesale businesses are located south and east of the site. An apartment complex is located north of the site.

3.0 INITIAL EVALUATION

In this section, a preliminary assessment is made of the types and volumes of waste present, the potential migration pathways, and risks, so that probable response action can be determined. Federal and state environmental and public health requirements which are applicable or relevant and appropriate to the site are identified. Remedial actions which could mitigate risks and meet regulatory requirements are identified.

3.1 TYPES AND VOLUMES OF WASTE PRESENT

The available data on Chemsol suggest that the following conclusions can be made regarding the types and volumes of waste present at Chemsol:

- The most highly contaminated ground water is located on-site to 130 feet below grade and is being addressed by the interim remedy. Ground water to 350 feet has been observed to be contaminated.

- Soils throughout the eastern two-thirds of Lot 1B including two small areas east of the stream, are presumed to be contaminated. The depth of contamination is unknown. PCBs have been detected throughout this area at levels from non-detect to 351 mg/kg. Several soil parcels in the fenced area have been previously excavated. However, data do not indicate that all contaminated soils have been removed. VOCs, lead, and barium have also been detected on-site.

- Surface water and wetlands are located on-site. The nature and extent of contamination in the surface water, wetlands, and sediments is unknown.

Presently, the volumes of contaminated soils and ground water cannot be estimated.

3.2 POTENTIAL PATHWAYS OF CONTAMINANT MIGRATION

Potential migration pathways exist via the soil, ground water, surface water, and air. Contaminants released from the overburden may be carried to surface water bodies as runoff, may be volatilized or carried into the air on dust particles, or may infiltrate to the perched zone. Workers or visitors to the site could come into direct contact with the soil and could be exposed to contaminants through dermal contact, ingestion, or inhalation. Contaminants following the ground water pathway could migrate through the perched zone

to the water table and eventually to water supply wells. Nearby homeowner wells in the Nova Ukraine area of Piscataway are contaminated. Although a municipal water supply has been provided to the Nova Ukraine area, the potential remains for off-site contact with the contaminated groundwater since residents may continue to use these or other wells in the vicinity of the site. Finally, site biota may be exposed to contaminants released into the food chain via contaminated soil, surface water, and sediment.

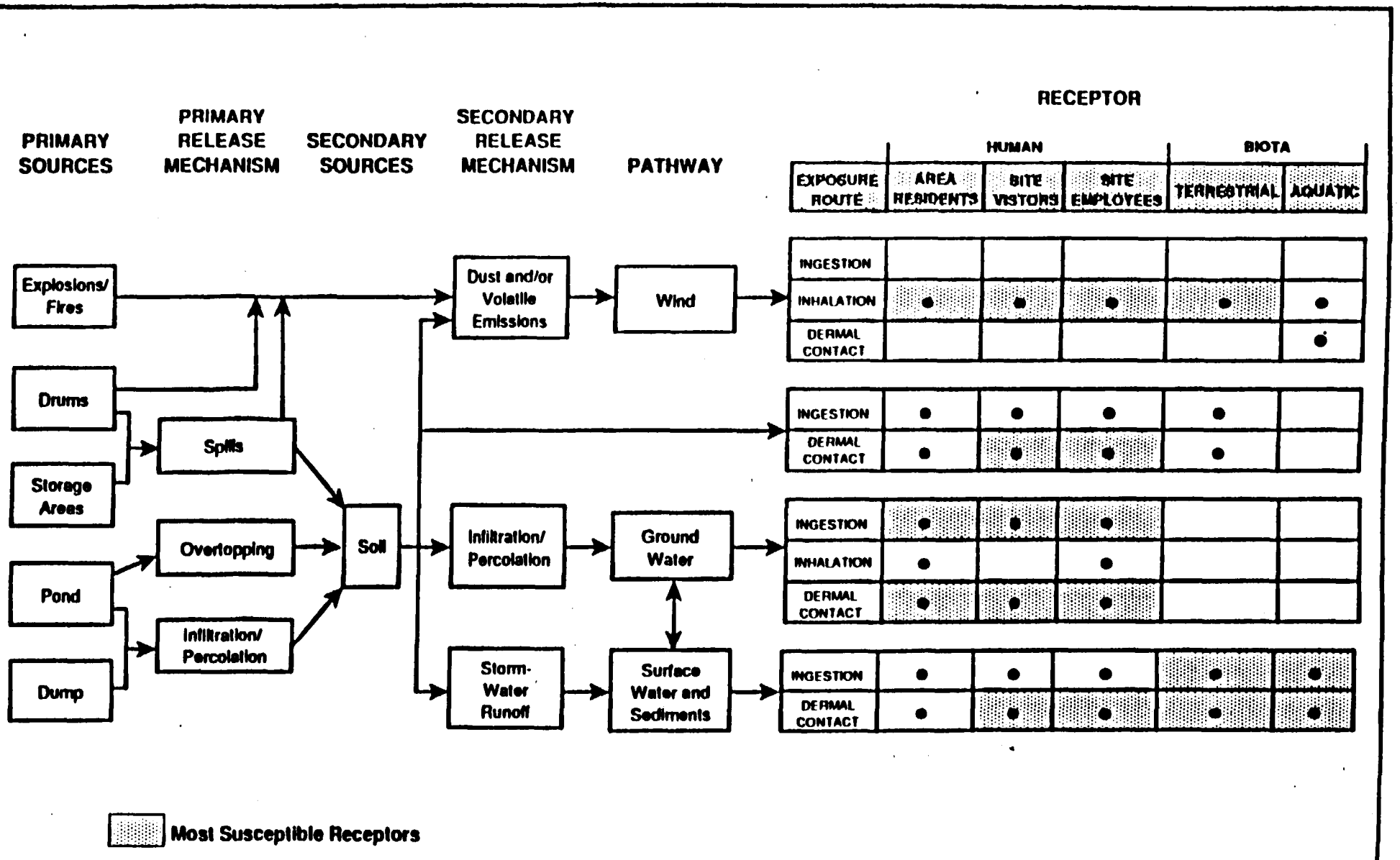
A conceptual site model is presented in Figure 3-1. The model is based on the existing data, site hydrogeology and current site uses. The site model depicts the suspected sources, release mechanisms, pathways and receptors. While many receptors are conceptually possible, the most significant receptors are highlighted by shading on the diagram.

3.3 PRELIMINARY IDENTIFICATION OF PUBLIC HEALTH AND ENVIRONMENTAL IMPACTS

This section presents a summary of the public health and environmental risks associated with the site. This summary is based upon the distribution and concentrations of contaminants, site history, land use, demography, hydrogeology and other data presented in this Work Plan. The baseline risk assessment will be prepared according to the methodologies outlined by the Risk Assessment Guidance for Superfund, Part A, Volumes 1 and 2.

During the FFS, EPA conducted a qualitative risk assessment of the shallow water table aquifer (to 130 feet below grade). The conclusion of that risk assessment was that the Chemsol site is highly contaminated with a wide variety of compounds at levels which far exceed applicable standards. If uncontrolled, such contaminants will continue to migrate from the site via ground water and surface water, potentially affecting receptors through ingestion, inhalation and dermal contact.

Although a complete investigation of the Chemsol site has not been conducted to date, the available data suggest likely, or suspected, source areas. Historical information and available site data indicate that the entire eastern two-thirds of Lot 1B is a primary concern and a probable remaining source. The primary release mechanism is via direct drainage or seepage into the underlying soils and perched zone. The underlying soils and perched zone then become a secondary source for environmental releases. The potential



CHEMSOL, INC.
PISCATAWAY TOWNSHIP, NEW JERSEY

RISK ASSESSMENT - CONCEPTUAL MODEL

FIGURE 3-1

mechanisms for releases from the soil as a secondary source include discharge to ground water, surface water or the air.

A preliminary list of compounds has been compiled from those contaminants identified at the site due to their potential to pose a risk to human health. These compounds are listed in Table 3-1 according to their site matrices. These compounds were selected based upon the following criteria:

- Frequency of detection
- Measured concentration relative to background levels and/or relevant ground water and drinking water standards
- Toxicity
- Availability of toxicological criteria
- Quality of analytical data

Only the currently available sample and analytical data were evaluated to select potential chemicals of concern. Further sampling and analysis to be performed in the RI as described in Section 5.3 will refine the selection of chemicals of concern. In addition, actual exposure to these chemicals via migration pathways will be evaluated in the RI.

TABLE 3-1

PRELIMINARY INDICATOR COMPOUNDS
CHEMSOL, INC.

Chemical	Matrices in Which Detected
ORGANICS:	
Benzene	GW, SD, S
Carbon Tetrachloride	GW, SD, S
Chloroform	GW, SD
1,2-Dichloroethane	GW, S
1,1-Dichloroethene	GW
Trans-1,2-Dichloroethene	GW, SD
Methylene Chloride	GW
Methyl Isobutyl Ketone	GW
Phenol	GW
Tetrachloroethene	GW, SD, S
Toluene	GW, SD, S
Trichloroethene	GW, SD
Xylene	GW, S
INORGANICS:	
Arsenic	GW, S
Lead	GW, S
Zinc	GW
POLYCHLORINATED BIPHENYLS	GW, SD, S

GW = Ground Water
SD = Sediment
S = Soil

3.4 PRELIMINARY IDENTIFICATION OF APPLICABLE OR RELEVANT AND APPROPRIATE REQUIREMENTS (ARARs)

This section provides a preliminary determination of the federal and state environmental and public health requirements that are potentially applicable or relevant and appropriate to the selection of a remedial action for the site. In addition, this section presents an identification of other federal and state criteria, advisories and guidance (i.e., to be considered) that could be used for evaluating remedial alternatives to be developed during the FS.

3.4.1 Definition of ARARs

ARARs are classified as either applicable, or relevant and appropriate. Other guidance and regulations may be classified as TBCs.

Applicable Requirements

Applicable requirements refer to those Federal or State requirements that would be legally enforceable. An example of an applicable requirement would be the Safe Drinking Water Act's Maximum Contaminant Levels (MCLs) for a site that causes contamination of a public water supply.

Relevant and Appropriate Requirements

Relevant and appropriate requirements are Federal or State standards, criteria or guidelines that are not legally enforceable at the site, but which address problems so similar to those on-site that their application is appropriate. During the FFS process, relevant and appropriate requirements are intended to have the same weight and consideration as applicable requirements.

To Be Considered

Other Federal and State guidance documents or criteria that are not generally enforceable but are advisory are "to be considered" during the FFS process. For example, where no specific ARARs exist for a chemical or situation, or where such ARARs are not sufficient to be protective, guidance documents or advisories may be considered in determining the necessary level of cleanup for protection of public health and the environment.

ARARs and TBCs are further categorized as either chemical-specific, location-specific or action-specific.

Chemical Specific

Chemical-specific requirements define acceptable exposure levels for specific hazardous substances and therefore may be used as a basis for establishing preliminary remediation goals and cleanup levels for chemicals of concern in the designated media. Chemical-specific ARARs and TBCs are also used to determine treatment and disposal

requirements that may occur in a remedial activity. In the event a chemical has more than one requirement, the more stringent of the two requirements will govern.

Location Specific

Location specific requirements set restrictions on the types of remedial activities that can be performed based on site-specific characteristics or location. Alternative remedial actions may be restricted or precluded based on Federal and State site laws for hazardous waste facilities, proximity to wetlands or floodplains, or to man-made features such as existing landfills, disposal areas and local historic landmarks or buildings.

Action Specific

Action specific requirements set controls or restrictions on the design, implementation and performance of remedial actions. They are triggered by the particular types of treatment or remedial actions that are selected to accomplish the cleanup. After remedial alternatives are developed, action-specific ARARs and TBCs that specify performance levels, as well as specific levels for discharges or residual chemicals, provide a basis for assessing the feasibility and effectiveness of the remedial action.

The requirements identified below have been identified as being potentially ARAR and TBC material, based upon the EPA's post-SARA (Superfund Amendments and Reauthorization Act) interim guidance and the National Contingency Plan (NCP) that addresses the development and utilization of ARARs. ARARs and TBCs are used primarily during the FS to conduct a detailed evaluation of the remedial alternatives. The Statute requires that any remedial action shall attain:

- Any standard, requirement, criterion, or limitation under any federal environmental law; or
- Any promulgated standard, requirement, criterion, or limitation under a state environmental or facility siting law that is more stringent than any equivalent federal standard, requirement, criterion, or limitation, which is legally applicable to the contaminant or relevant and appropriate under the particular circumstances.

The purpose of this requirement is to ensure that selected remedies are consistent with both federal and state environmental requirements.

3.4.2 Consideration of ARARs During the RI/FS

ARARs will be considered at the following intervals during the RI/FS:

1. **Scoping of the RI/FS:** Identify chemical-specific and location-specific ARARs on a preliminary basis to plan the site characterization sampling locations and analytical Data Quality Objectives (DQOs) (including any required Special Analytical Services (SAS)).

2. **Site characterization and risk assessment phases of the Remedial Investigation:** Identify the chemical-specific ARARs and "to be considered" (TBC) material and location-specific ARARs more comprehensively and use them to help determine cleanup goals.

3. **Development of remedial alternatives in the FS Report:** Identify action-specific ARARs for each of the proposed alternatives and consider them along with other ARARs and "to be considered" material.

4. **Detailed evaluation of alternatives:** Examine all the ARARs and "to be considered" material for each alternative as a package to determine what is needed to comply with laws and regulations and whether or not compliance is expected.

5. **Selection of remedy:** Select an alternative able to attain all ARARs, unless one of the six statutory waivers is invoked.

6. **Remedial design:** Ensure that the technical specifications of remedy construction attain ARARs.

As the RI/FS process continues, the list of ARARs will be updated as guidance is issued by the State. ARARs will be used as a guide to establish the sampling strategy and the appropriate extent of site cleanup; to aid in scoping, formulating and selecting proposed treatment technologies; and to govern the implementation/operation of the selected action. Primary consideration should be given to remedial alternatives that attain or exceed the requirements found in ARAR regulations. At each interval, ARARs are identified and utilized by taking into account the following:

- Contaminants suspected to be at the site.
- Chemical analyses to be performed.
- Types of media to be sampled.

- Geology and other site characteristics.
- Use of the resource/medium.
- Level of exposure and risk.
- Potential transport mechanism ARARs.
- Purpose and application of the potential ARARs.
- Remedial alternatives that will be considered for the site.
- Future use of the site.

3.4.3 Potentially Applicable or Relevant and Appropriate Requirements

The NCP defines applicable requirements as the federal and state requirements for hazardous substances that would be legally binding at the site if site response were to be undertaken, regardless of CERCLA (Comprehensive Environmental Response, Compensation, and Liability Act) Section 104. Relevant and appropriate requirements are defined as those federal and state requirements that, while not directly applicable, apply to facilities or problems similar to those encountered at this site, so that their use is well suited. In other words, requirements may be relevant and appropriate if they would be applicable except for jurisdictional restrictions associated with the requirements. With respect to the selection of remedial alternatives, relevant and appropriate requirements are to be afforded the same weight and consideration as applicable requirements.

The following federal and state regulatory requirements are potentially applicable or relevant and appropriate to the site:

CONTAMINANT-SPECIFIC

Federal

- Resource Conservation and Recovery Act (RCRA) Ground Water Protection Standards and Maximum Concentration Limits (40 CFR 264, Subpart F).
- Clean Water Act, Water Quality Criteria (Section 304) (May 1,1987 -Gold Book)
- National Ambient Air Quality Standards (NAAQS) (40 CFR 50)
- Safe Drinking Water Act, Maximum Contaminant Levels (MCLs) (40 CFR 141.11-.16)

- RCRA TCLP and Land Ban Requirements for Landfilling (40 CFR 261)

New Jersey

- New Jersey Ground Water Quality Standards (NJAC 7:9-6)
- New Jersey Safe Drinking Water Act Maximum Contaminant Levels (MCLs) for Metals and A-280 chemicals (NJAC 7:10-16)
- New Jersey Surface Water Standards (NJAC 7:9-4)
- New Jersey RCRA Ground Water Protection Standards (NJAC 7:26-1)
- New Jersey Ambient Air Quality Standards (NJAC 7:27-13)

LOCATION-SPECIFIC

Federal

- Executive Order on Wetlands Protection (CERCLA Wetlands Assessments) No. 11990.
- National Historic Preservation Act (16 USC 470) Section 106 *et seq.* (36 CFR 800)
- RCRA Location Requirements for 100-year Floodplains (40 CFR 264.18(b)).
- Fish and Wildlife Coordination Act (16 USC 661 *et seq.*)
- Clean Water Act Section 404 and Rivers and Harbor Act Section 10 Requirements for Dredge and Fill Activities (40 CFR 230)
- Army Corps of Engineers Regulations for Construction and Discharge of Dredged or Fill Materials in Navigable Waterways (33 CFR 320-330).
- Wetlands Construction and Management Procedures (40 CFR 6, Appendix A)

New Jersey

- New Jersey Freshwater Wetlands Act and Requirements (NJSA 13:98-1)
- Flood Hazard Control Act Requirements (Stream Encroachment) (NJAC 7:8-3.15 and NJSA 58:16A-15 *et seq.*)
- New Jersey Water Pollution Control Act Water Quality Certification Requirements (NJSA 58: 10A1 to 13)

ACTION-SPECIFIC

Federal

- RCRA Subtitle C Hazardous Waste Treatment Facility Design and Operating Standards for Treatment and Disposal Systems, (i.e., landfill, incinerators, tanks, containers, etc.)(40 CFR 264 and 265) (Minimum Technology Requirements)
- RCRA Subtitle C Closure and Post-Closure Standards (40 CFR 264, Subpart G)
- RCRA Ground Water Monitoring and Protection Standards (40 CFR 264, Subpart F)
- RCRA Manifesting, Transport and Recordkeeping Requirements (40 CFR 262)
- RCRA Wastewater Treatment System Standards (40 CFR 264, Subpart X)
- RCRA Corrective Action (40 CFR 264.101)
- RCRA Storage Requirements (40 CFR 264; 40 CFR 265, Subparts I and J)
- RCRA Subtitle D Nonhazardous Waste Management Standards (40 CFR 257)
- Off-Site transport of Hazardous Waste (EPA OSWER Directive 9834.11)
- Reinjection Requirements (EPA OSWER Directive 9234.1-06
- RCRA Excavation and Fugitive Dust Requirements (40 CFR 264.251 and 264.254)
- Safe Drinking Water Act, Underground Injection Control Requirements (40 CFR 144 and 146)
- RCRA Land Disposal Restrictions (40 CFR 268) (On- and off-site disposal of excavated soil)
- Clean Water Act - NPDES Permitting Requirements for Discharge of Treatment System Effluent (40 CFR 122-125)
- Effluent Guidelines for Organic Chemicals, Plastics and Resins (Discharge limits) (40 CFR 414)
- Clean Water Act Discharge to Publicly Owned Treatment Works (POTW) (40 CFR 403)

- National Emission Standards for Hazardous Air Pollutants (NESHAPs) (40 CFR 61)
- DOT Rules for Hazardous Materials Transport (49 CFR 107,171.1-171.500)
- Occupational Safety and Health Standards for Hazardous Responses and General Construction Activities (29 CFR 1904,1910,1926)

New Jersey

- New Jersey RCRA Standards for the Design and Operation of Hazardous Waste Treatment Facilities (i.e., landfills, incinerators, tanks, containers, etc.) Minimum Technology Requirements (NJAC 7:26-1 *et seq.*)
- New Jersey RCRA Closure and Post-Closure Standards (Clean Closure and Waste-In-Place Closure) (NJAC 7:26-1 *et seq.*)
- New Jersey Ground Water Protection and Monitoring Standards (NJAC 7:26-1 *et seq.*)
- New Jersey Volatile Organic Substances Air Emissions Control Requirements (NJAC 7:27-16)
- New Jersey Incineration Standards (NJAC 7:27-11)
- New Jersey Nonhazardous Waste Management Requirements
- New Jersey Pollution Discharge Elimination System (NJPDES) and Effluent Limitations (NJAC 7:14A Appendix F)
- New Jersey Toxic Substances Air Pollution Control Requirements (NJAC 7:27-17)
- New Jersey Pretreatment Requirements for Sanitary Sewer Discharges
- New Jersey Air Pollution Definitions and General Provisions (NJAC 7:27-5)
- New Jersey Soil Erosion and Sediment Control Act Requirements (NJSA 4:24-42 and NJAC 2:90-1.1 *et seq.*)
- Middlesex County Utilities Authority (MCUA) local laws, applicable to pretreatment and discharge to the sewer system.

3.4.4 Potential "To Be Considered" Material

When ARARs do not exist for a particular chemical or remedial activity or when the existing ARARs are not protective of human health or the environment, other criteria,

advisories and guidance may be useful in designing and selecting a remedial alternative. The following criteria, advisories and guidance were developed by the EPA and other federal and state agencies.

Federal

- Safe Drinking Water Act National Primary Drinking Water Regulations, Maximum Contaminant Level Goals (MCLGs)
- Maximum Contaminant Levels Goals (56 CFR 3256, January 30, 1991, 50 Federal Register 46936-47022, November 13, 1985)
- Proposed Federal Air Emission Standards for Volatile Organic Control Equipment (52 Federal Register 3748) (air stripper controls)
- Proposed Requirements for Hybrid Closures (combined waste-in-place and clean closures) (52 Federal Register 8711)
- USEPA Drinking Water Health Advisories
- USEPA Health Effects Assessment (HEAs)
- TSCA Health Data
- Toxicological Profiles, Agency for Toxic Substances and Disease Registry, U.S. Public Health Service
- Policy for the Development of Water-Quality-Based Permit Limitations for Toxic Pollutants (49 Federal Register 9016)
- Cancer Assessment Group (National Academy of Science) Guidance
- Ground Water Classification Guidelines
- Ground Water Protection Strategy
- Waste Load Allocation Procedures
- Fish and Wildlife Coordination Act Advisories
- Federal Guidelines for Specification of Disposal Site for Dredged or Fill Material
- Proposed RCRA Corrective Action Regulations (July 27,1991)

New Jersey

- New Jersey Soil Cleanup Level Standards

3.4.5 Potential Contaminant-Specific ARAR Levels for Ground Water and Soil

Table 3-2 provides a numerical listing of potential contaminant-specific ARARs and TBCs for the site ground water compared to analytical levels observed at the site during April 1991.

3.4.6 Preliminary Scoping of ARAR Impacts

The following are the ARARs that may significantly impact the selection of a remedial alternative at the Chemsol site.

CONTAMINANT-SPECIFIC

Federal

- Safe Drinking Water Act (SDWA) Maximum Contaminant Levels (40 CFR 141.11-141.16)
- Clean Water Act (CWA) Water Quality Criteria (Sec. 304 CWA)
- Resource Conservation and Recovery Act (RCRA) Maximum Concentration Limits and Ground Water Protection Standards (40 CFR 264.94)

New Jersey

- Safe Drinking Water Act (NJSDWA) Maximum Contaminant Levels for Hazardous Contaminants (NJAC 7:10-16)
- Water Pollution Control Act and Water Quality Planning Act Ground Water Quality Criteria (NJAC 7:9-6)
- Pollutant Discharge Elimination System (NJPDES) Discharges to Ground Water (DWG) Maximum Concentration of Constituents for Ground Water Protection (NJAC 7:14A)

ACTION-SPECIFIC

Federal

- CWA Pollutant Discharge Elimination System (NPDES) Requirements
- RCRA Land Disposal Restrictions (40 CFR 268)
- DOT Rules for Hazardous Materials Transport (49 CFR 107,171)
- Clean Air Act National Emissions Standards for Hazardous Air Pollutants (NESHAPs) (40 CFR 61)

TABLE 3-2
Comparison of Ground Water Quality Data to ARAR's and Other Criteria
Chemsol, Inc., Piscataway, New Jersey

Chemical	FFS DATA April, 1991 Frequency of Detection	Highest Concentration (ug/l)	Well Location	FEDERAL SDWA Value (ug/l)	Criterion	NJ SDWA MCL (ug/l)	USEPA Health Advisory (ug/l)
VOLATILE ORGANICS							
Acetone	2/22	81,000 D	C-1				
Benzene	14/22	17,000 D	C-1	5	MCL	1	
2-Butanone	5/22	20,000 D	C-1				
Carbon Disulfide	4/22	310 J	C-1				
Carbon Tetrachloride	12/22	33,000 J	TW-7	5	MCL	2	
Chlorobenzene	8/22	5,500	C-1	100	MCL	4	100
Chloroethane	0/22	—	—				
Chloroform	16/22	56,000	C-1	100 a	MCL	100 a	
1,1-Dichloroethane	10/22	980	C-1				
1,2-Dichloroethane	11/22	21,000	C-1	5	MCL	2	
1,1-Dichloroethene	8/22	2,300 J	C-1	7	MCL	2	7
trans-1,2-Dichloroethene	NA	—	—	100	MCL	10 b	100
1,2-Dichloroethene (total)	14/22	20,000 D	TW-05	70 c	MCL	10	70 c
1,2-Dichloropropane	2/22	300 J	C-1	5	MCL	5	
Ethylbenzene	7/22	1800	C-1	700	MCL		700
2-Hexanone	2/22	190 J	C-1				
4-Methyl-2-Pentanone	5/22	10,000	C-1				
Methylene Chloride	2/22	3,200 BJ	TW-04	5	pMCL	2	
1,1,2,2-Tetrachloroethane	5/22	1,400	C-1				
Tetrachloroethene	12/22	1,300	C-1	5	MCL	1	
Toluene	9/22	26,000 D	C-1	1,000	MCL		1,000
1,1,1-Trichloroethane	7/22	8,600 DJ	C-1	200	MCL	26	200
1,1,2-Trichloroethane	3/22	150 J	C-1	5	pMCL		3
Trichloroethene	17/22	220,000 D	C-1	5	MCL	1	
Trichlorofluoromethane	NA	—	—				
Vinyl Chloride	5/22	450 J	C-1	2	MCL	2	
Xylenes (total)	8/22	6,600 J	C-1	10,000	MCL	44	10,000
SEMIVOLATILE ORGANICS							
Acenaphthene	0/21	—	—				
Acrolein	0/21	—	—				
Benzoic Acid	0/21	—	—				
Butylbenzylphthalate	6/21	73	TW-14	100	pMCL		
2-Chlorophenol	2/21	3 J	TW-05				40
Dibenzofuran	0/21	—	—				
1,2-Dichlorobenzene	8/21	1400	TW-01	600	MCL	600	600
1,3-Dichlorobenzene	5/21	42	OW-04	600	MCL	600	
1,4-Dichlorobenzene	9/21	110	OW-04	75	MCL		75
2,4-Dichlorophenol	2/21	980	C-1				20
Diethylphthalate	6/21	530	C-1				5,000
Dimethyl Phthalate	3/21	63 J	C-1				
2,4-Dimethylphenol	3/21	38 J	C-1				
Di-n-Butylphthalate	3/21	180 J	C-1				
Di-n-Octylphthalate	0/21	—	—				
1,2-Diphenylhydrazine	NA	—	—				
bis (2-Chloroethyl) Ether	7/21	3,100 D	C-1				
Hexachloroethane	4/21	79	TW-07				1
Isophorone	8/21	230	C-1				100
2-Methylnaphthalene	3/21	11	OW-04				
2-Methylphenol	8/21	580	C-1				
4-Methylphenol	5/21	450	C-1				
Methyl Isobutyl Ketone	NA	—	—				

TABLE 3-2
Comparison of Ground Water Quality Data to ARAR's and Other Criteria
Chemsol, Inc., Piscataway, New Jersey

Chemical	FFS DATA April, 1991			FEDERAL SDWA		NJ SDWA	USEPA Health Advisory
	Frequency of Detection	Highest Concentration (ug/l)	Well Location	Present Value (ug/l)	Criterion	MCL (ug/l)	(ug/l)
SEMIVOLATILE ORGANICS							
Naphthalene	6/21	110 J	C-1				20
Nitrobenzene	3/21	580	C-1				
2-Nitrophenol	2/21	220	C-1				
4-Nitrophenol	1/21	14 J	OW-02				
Phenol	6/21	1600	C-1				4,000
bis (2-Ethylhexyl) Phthalate	6/21	33 J	OW-01	4	pMCL		
1,2,3-Trichlorobenzene	NA	—	—			9 d	
1,2,4-Trichlorobenzene	8/21	120 J	C-1	9	pMCL	8	9
2,4,6-Trichlorophenol	0/18	—	—				
PESTICIDES AND PCBs							
a-BHC	5/21	0.43 N	C-1				
b-BHC	1/21	0.034 J	OW-02				
d-BHC	4/21	0.094 N	C-1				
g-BHC	8/21	0.025 JP	TW-04	0.2	MCL	0.2	0.2
4,4'-DDD	1/21	0.0062 JN	TW-03				
4,4'-DDE	1/21	0.0086 JN	TW-05				
Endosulfan I	1/21	0.0087 JN	TW-05				
Heptachlor epoxide	3/21	0.011 JN	OW-01	0.2	MCL	0.2	
PCB-1248	0/21	—	—	0.5	MCL	0.5	
INORGANICS							
Aluminum	21/21	21,100	OW-04	50	psMCL		
Antimony	1/21	47.5 J	C-1	10/5	pMCL	10/5	3
Arsenic	12/21	18.3	OW-02	50	MCL	50	
Barium	21/21	2830	TW-04	1,000	MCL	1,000	2,000
Calcium	21/21	250,000	C-1				
Chromium	18/21	46.5	OW-04	100	MCL	50	100
Cobalt	7/21	42.9	OW-04				
Copper	5/21	864	TW-14	1,300	AL	1,000	
Cyanide	6/21	76 NJ	TW-05A	200	pMCL		200
Iron	21/21	84,900 J	TW-11	300	sMCL	300	
Lead	21/21	33.4	OW-02	15	AL	50	
Magnesium	21/21	24,800	W-04, C-1				
Manganese	21/21	7,270	OW-04	50	sMCL	50	
Mercury	2/21	0.4	TW-11	2	MCL	2	2
Nickel	18/21	709 J	TW-04	100	pMCL		100
Potassium	21/21	8010	OW-04				
Selenium	0/21			50	MCL	10	
Sodium	21/21	34,200 J	C-1			50,000	
Vanadium	20/21	80.2	OW-04				20
Zinc	20/21	183	OW-04	5,000	sMCL	5,000	2,000

Notes:

(a) as total Trihalomethanes
(b) as 1,2-Dichloroethene (cis + trans)
(c) as cis-1,2-Dichloroethene
(d) as Trichlorobenzenes (1,2,4-Trichlorobenzene)

J - estimated value
P - estimated value for pesticides
NA - not analyzed
N - presumptive evidence
B - compound also detected in the blank
D - a secondary dilution factor was used

MCL - Maximum Contaminant Level
pMCL - Proposed Maximum Contaminant Level
sMCL - Secondary Maximum Contaminant Level
psMCL - Proposed Secondary Maximum Contaminant Level
AL - Action Level

New Jersey

- New Jersey Pollution Discharge Elimination System (NJPDES) Requirements
- Volatile Organic Substances Air Emissions Control Requirements (NJAC 7:27-16)
- Toxic Substances Air Pollution Control Requirements (NJAC 7:27-17)

TO BE CONSIDERED

Federal

- SDWA Maximum Contaminant Level Goals (MCLGs)
- USEPA Drinking Water Health Advisories
- USEPA Health Effects Assessment (HEAs)

New Jersey

- Soil Cleanup Level Objectives

3.5 PRELIMINARY IDENTIFICATION OF RESPONSE OBJECTIVE

In general, the objective of the selected remedial alternative is to permanently and significantly reduce the volume, toxicity or mobility of the contaminants. The specific remedial action objectives at Chemsol are as follows:

- Ground Water - Contain further migration of contaminants and remediate ground water contamination such that available ARARs and/or risk-based levels are attained at the end of the remedy.
- Soils - Prevent exposures to contaminated soil that exceed risk-based levels developed in the risk assessment. Reduce or eliminate the potential for releases from the soil to air and ground water.
- Surface Water/Sediment - Prevent exposure to contaminated surface water or sediment, such that biota and wetlands resources are protected.

3.6 PRELIMINARY IDENTIFICATION OF REMEDIAL ALTERNATIVES

To meet the above preliminary remedial response objectives, a set of general response actions were identified. These general response actions identify the areas to be investigated to meet objectives and fall into the following categories:

- No action
- Source control
- Migration control
- Remediation of contaminated media

The no-action alternative will be evaluated during the FS as a baseline of comparison for the other alternatives (as mandated by the NCP). Each of the following subsections discusses preliminary response actions for specific media, remedial alternatives for each response action category, and data requirements to evaluate the alternatives. This preliminary list of alternatives is intended to provide a wide range of alternatives as a starting point for the FS, which involves the development, screening and detailed analysis of alternatives (discussed in Section 5.9). Further investigations into alternatives will utilize references including "Technology Screening Guide for Treatment of CERCLA Soils and Sludges" (USEPA, September 1988).

3.6.1 Soil Treatment and Disposal

The contaminated soil at the site can be remediated via excavation with on-site or off-site treatment and disposal, or via treatment. Table 3-3 is a summary of the remedial alternatives appropriate to the specific response actions as discussed below. These alternatives entail the treatment of contaminated soils to reduce or eliminate their potential risk to public health and the environment. Table 3-4 presents a breakdown of treatment technologies and the type of contaminant against which each technology is most effective.

On-site/off-site treatment technologies may include vapor extraction, soil washing, incineration, mechanical or thermal aeration, or biological treatment. Treated soil would be disposed of either by landfilling off-site or by use as backfill on-site (assuming ARARs for on-site backfill were met).

In situ treatment technologies may include soil flushing, vitrification, solidification/fixation or bioreclamation.

TABLE 3-3

PRELIMINARY IDENTIFICATION OF TYPICAL REMEDIAL TECHNOLOGIES/ALTERNATIVES FOR CONTAMINATED SOIL

RESPONSE ACTION	REMEDIAL ALTERNATIVE
No Action	• Fences/Warning Signs • Ground Water Monitoring • Surface Water Monitoring
Containment	• Capping • Impermeable Barrier
Treatment	**Excavation/On-Site Treatment** • Mechanical/Thermal Aeration • Vapor Extraction • Soil Washing • Incineration • Biological Treatment **Excavation/Off-Site Treatment** • Off-Site Contract Treatment • Same Technologies for On-Site Treatment **In-Situ Treatment** • Soil Flushing/Washing • Vitrification • Solidification/Fixation • Bioreclamation
Disposal	• On-Site Disposal • Off-Site Disposal

TABLE 3-4

CHEMSOL, INC. WORK PLAN
TREATMENT FOR CONTAMINATED SOIL/CONTAMINANTS AFFECTED

Physical Treatment	Affected Contaminant
• Solids Separation • Mechanical Aeration	Organics (Volatile)
Chemical Treatment	
• Soil Washing	Metals; organics
• Solidification/Fixation	Metals; limited organics
• Solvent or Acid Extraction	Metals; organics
• Alkali Metal Dechlorination	PCB's
Thermal Treatment	
• Incineration	Organics
• Enhanced Volatilization	Organics (Volatile)
• Thermoplastic Solidification	Metals
Biological Treatment	
• Land farming	Organics
In Situ Physical Treatment	
• In situ Vacuum Extraction	Organics (Volatile)
In Situ Chemical Treatment	
• In situ Soil Flushing	Metals, organics
• In situ Solidification	Metals, limited organics
In Situ Thermal Treatment	
• In situ Vitrification	Metals, organics
• In situ Volatilization	Organics (Volatile)
In Situ Biological Treatment	
• In situ Biodegradation	Organics

On-Site or Off-Site Treatment/Disposal

Vapor extraction is a method by which volatile organics can be extracted from the soil via a vacuum system. Recovered organics are then treated above ground via conventional air pollutant control methods. Vapor extraction can be enhanced in silty soils with pneumatic fracturing.

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Soil washing involves chemical and physical processes. The chemical process applies solvent extraction methodologies to remove contaminants (metals and organics) from the soil. Physical processes may include classification of the contaminated soil prior to extraction, removal of excess moisture from treated soil after extraction, and recovery of the spent solvent. The waste water generated from soil washing would be treated in an on-site water treatment system.

Soil incineration is a process in which one of a number of thermal technologies is utilized to accomplish different phases of thermal reactions leading progressively to the complete oxidation of organic substances.

Mechanical (thermal) aeration involves the contact of clean air with the heated contaminated soils to transfer the volatile organics from the soil into the air system. Depending upon the concentrations of contaminants, the air stream could be combusted in an afterburner or passed through activated carbon for air pollution control.

The biological treatment technology considered for the contaminated soil is the "land farming" technology, which involves spreading contaminated soil over a prepared treatment area. Depending on the characteristics of the contaminated soil, it could be mixed with nutrient-enriched soil. The moisture, carbon/nitrogen ratio, pH and nutrient content of the soil are monitored and maintained to enhance the microbial metabolism. The hazardous organics would thus be degraded and transformed to nonhazardous substances.

In Situ Treatment

Technologies capable of treating contaminated soil in-place have been considered. These technologies include soil flushing, vitrification, solidification/fixation, and bioreclamation.

Soil flushing is the in-place washing of contaminants from the soil with a suitable solvent such as steam, water or a surfactant solution to remove organic compounds. The contaminated elutriate is pumped to the surface for removal, resource recovery and recirculation, or on-site treatment and reinjection.

The in-situ soil vitrification technology immobilizes metals by using an electric current passed between electrodes placed in the ground to convert soil and contaminants into a stable glass material. Heat from the electric current decomposes organic matter, and solubilizes and encapsulates metallic and other inorganic materials in the vitrified mass. When the electric current ceases, the molten mass cools and solidifies. The gases generated

from vitrification can be further combusted in an afterburner for air pollution control. Any wastewater generated from scrubbing gaseous emissions can be treated in an on-site water treatment system.

In situ solidification uses a mechanical mixer/injector to introduce and mix fixation materials directly into the contaminated subsurface materials. The soil is eventually solidified.

In-situ bioreclamation is a technique for treating zones of organic contamination by microbial degradation. The basic concept involves altering environmental conditions to enhance the microbial catabolism or metabolism of organic contaminants, resulting in the breakdown and detoxification of those contaminants.

3.6.2 Ground Water Treatment and Disposal

The contaminated ground water at the site can be pumped and treated on-site or treated in-situ as summarized in Table 3-5 and discussed below. The USEPA Guidance on Remedial Action for Contaminated Ground Water at Superfund Sites (December 1988) provides further information on ground water remediation strategies and technologies.

TABLE 3-5

REMEDIAL TECHNOLOGIES/ALTERNATIVES FOR GROUND WATER

Response Action	Remedial Alternative	Data Requirements
No Action	• Ground Water Monitoring • Institutional Controls	Risk Assessment
Treatment	Volatiles • Air Stripping • Chemical Oxidation • Carbon Adsorption Non-Volatile Organics • Carbon Adsorption • Chemical Oxidation • Biological Treatment Metals • Chemical Softening/Precipitation	Treatability Studies (results available from FFS)
Disposal	• Recharge to Ground Water • Sanitary Sewer • Discharge to Surface Water	Regulatory Requirements

The following technologies have been identified as being potentially applicable to treating contaminated groundwater at Chemsol. The technologies described in this Section are based on the results of the treatability study performed during May 1991, the results of which are presented as Appendix A of the Focused Feasibility Study Report. Technologies are described in general terms only in this section.

Air Stripping

Air-stripping is a commonly used technique for removing volatile compounds from ground water. It is generally effective for the removal of compounds for which the Henry's law constant is greater than 0.003. Air-stripping is particularly effective for removal of low-molecular weight chlorinated hydrocarbons such as vinyl chloride, TCE and dichloroethyl-

ene. During the air stripping process, extracted groundwater is introduced at the top of a tower filled with high surface area packing material. Influent groundwater is sprayed downward over the packing material while air is blown upward through the column. Volatiles are transferred into the vapor phase and vented through the top of the column.

Air stripping efficiency depends on temperature, types of contaminants, the chemical and physical characteristics of the contaminants, and the process design criteria for the air stripper. Such process design criteria include packing height, liquid loading, air-to-water ratio, and type of packing material.

Various air stripping equipment configurations are available; however, the countercurrent packed tower has been used most frequently at hazardous waste sites. The contaminated water in an air stripper unit is exposed to large volumes of air. In the countercurrent packed tower configuration, the contaminated groundwater is fed through the packing, air is forced through the packing from the base of the tower, and VOCs are transferred from the water to the air. High air-to-water volume ratios can be obtained, and the system can be easily connected to air pollution control equipment.

Air stripping is a well-established process that effectively removes VOCs from aqueous waste streams. The equipment is relatively simple and start-up and shutdown can be accomplished fairly quickly, making air stripping highly implementable. The capital and O&M costs for this process are moderate compared to some other physical and chemical treatment process options. As indicated by the results of the treatability study conducted for the FFS, air stripping has been demonstrated to be effective in removing VOCs and SVOCs from contaminated groundwater from the Chemsol Site. However, depending on the discharge criteria, air stripping alone may not be sufficient. Therefore, it may require augmentation with other treatment processes, described below. Air pollution devices may be required to remove VOCs from the off-gas before it is discharged to the atmosphere in order to meet New Jersey Ambient Air Quality standards. A post-treatment scrubber using a granular carbon packed adsorber is typically used.

Carbon Adsorption

In carbon adsorption, contaminated groundwater is passed through reactors packed with granulated activated carbon. Upon contact with the solid, contaminants are adsorbed onto the solid phase. The extent to which a particular compound is adsorbed by the carbon

can be estimated using experimentally determined partition coefficients. This treatment is particularly effective in the removal of volatile and semi-volatile compounds.

It is necessary to monitor the effluent for breakthrough to determine when the carbon has been saturated. Regeneration of spent carbon can either be carried out on-site or off-site. On-site regeneration of the sorbent increases capital investment as well as operating and maintenance costs. If off-site regeneration is selected, the vendor is responsible for collecting and disposing of the spent carbon and for providing reactivated carbon.

Continuous treatment can be performed if two adsorbers are connected in series. Groundwater is passed only through the first adsorber until breakthrough is observed. The groundwater is then diverted to the second adsorber until the carbon in the first reactor is regenerated. As indicated by the results of the treatability study conducted for this FFS, carbon adsorption has been demonstrated to be effective in removing VOCs and SVOCs from contaminated groundwater from the Chemsol Site. However, depending on the discharge criteria, activated carbon alone may not be sufficient. Therefore, it may require augmentation with other treatment processes. Carbon adsorption has been demonstrated to be effective and implementable at hazardous waste sites.

Biological Treatment

In the conventional activated sludge biological treatment process, aqueous waste flows into an aeration basin where it is aerated for several hours. During this time, a suspended microbial population aerobically degrades organic matter in the stream and generates new cells. In the post-treatment clarifier, sludge is settled out of the effluent and can be recycled back into the reactor to maintain the microbial population. Clarified water flows to disposal or further processing such as carbon polishing.

A modification of this aerobic biodegradation are fixed-film systems that could include trickling filters or bio-disk systems in which the biomass is attached to an inert medium such as PVC. Contaminated water is sprayed over the medium and organics are degraded after contacting the biological "slime" layer on the surfaces. Air is supplied countercurrent to the water flow to maintain sufficient aerobic conditions. Biological treatment was not evaluated during the treatability study. However, it has been applied successfully at other hazardous waste sites and is assumed to be applicable here (Bourguin,

et.al). The necessity for bio-treatment depends on the average concentrations of organic compounds received from the stripper.

UV/H_2O_2 Oxidation

Advanced oxidation processes (AOPs) such as ultra violet (UV) light and hydrogen peroxide, UV light and ozone, and ozone and hydrogen peroxide (H_2O_2), involve the generation of hydroxyl radicals to destroy organic compounds. AOPs have been evaluated over the past several years for their effectiveness in destroying concentrated aqueous wastes containing toxic solvents, fuels, and pesticides. During the UV/H_2O_2 oxidation process, volatile organic chemicals are converted to carbon dioxide, water and chlorine (for chlorinated VOCs). Although UV light alone can oxidize some organics, it is generally used in conjunction with H_2O_2 and/or ozone to facilitate oxidation. When H_2O_2 is catalyzed by UV light, hydroxyl radicals react with the organic compounds to form carbon dioxide, chlorine and water. This process can be used successfully to remove a variety of petroleum and chlorinated hydrocarbons such as benzene, toluene, TCE and chloroform. As indicated by the results of the treatability study conducted for this FFS, UV/H_2O_2 oxidation was not found to be effective in removing VOCs and SVOCs from contaminated groundwater from the Chemsol Site. UV oxidation may be considered as a disinfectant for certain alternatives.

Chemical Softening/Precipitation

If analytical results indicate the presence of high levels of suspended solids, chemical softening (or precipitation) prior to or subsequent to further treatment may be necessary. This is a process in which acid or base is added to a solution to reach a desired pH where the constituents have their lowest solubility. Metals can be precipitated from solutions in the forms of hydroxides, sulfides, carbonates or other insoluble salts. Hydroxide precipitation with lime is most common; however, sodium sulfide is sometimes used to achieve lower concentrations of metals in the treatment effluent. The residuals from this process are metal-containing sludge and the treatment effluent, which have an elevated or lowered pH and (in the case of sulfide precipitation) excess sulfides. Based on analytical results at Chemsol during the FFS, it is probable that some type of precipitation process may be required. The final determination of its necessity would be made during a treatment pilot program.

4.0 WORK PLAN RATIONALE

4.1 DATA QUALITY OBJECTIVES (DQOs)

The objectives of the Chemsol RI/FS were developed after an extensive review of data available in EPA and NJDEPE files. Additional data will be required to identify present and future risks from the site and to evaluate whether or not remedial alternatives can meet the objectives. If the data generated during the RI/FS are to support the decision-making process for determining site remediation, a clear definition of the RI/FS objectives and procedures for collecting data is required. This goal is achieved through the development of data quality objectives (DQOs). DQOs relate the end use of the data to the extent and quality of the data to be gathered in the RI. DQOs are based on the concept that different data uses may require different levels of data quality. DQOs are set such that the level of uncertainty associated with data measurement is compatible with the level of uncertainty that can be acceptable in the decisions or conclusions derived from data interpretation.

Data quality objectives are qualitative and quantitative goals for precision, accuracy, reproducibility, comparability, and completeness and are specified for each data set. DQOs are defined with respect to the types, numbers, and locations of samples that will be collected, and the QA levels associated with the analysis. The guidance, Data Quality Objectives: Remedial Guidance for the Uncontrolled Hazardous Waste Site, For Remedial Response Activities (EPA, 1987a), will be used in determining the analytical levels needed to obtain the confidence levels for the intended data use. The analytical levels required for specific data uses and the types of analyses needed to achieve an analytical level are presented in Table 4-1. Where data have multiple uses, the uses will be prioritized and assigned the highest analytical level for a particular use.

Levels I through V for analytical data will be used during the Chemsol RI/FS. Level I data are typically not suitable to support the risk assessment and alternatives evaluation. Levels II and III analytical data will be used to aid in site characterization and may be used in the alternatives evaluation when accompanied with appropriate QA/QC procedures. The Level IV and V analytical data will ensure detection limits that will allow comparison with ARARs for soils and ground water and support the risk assessment and alternatives

TABLE 4-1
SUMMARY OF ANALYTICAL LEVELS APPROPRIATE TO DATA USES

DATA USES	ANALYTICAL LEVEL	TYPE OF ANALYSIS	LIMITATIONS	DATA QUALITY
SITE CHARACTERIZATION MONITORING DURING IMPLEMENTATION	LEVEL I	- TOTAL ORGANIC/INORGANIC VAPOR DETECTION USING PORTABLE INSTRUMENTS - FIELD TEST KITS	- INSTRUMENTS RESPOND TO NATURALLY-OCCURING COMPOUNDS	- IF INSTRUMENTS CALIBRATED AND DATA INTERPRETED CORRECTLY, CAN PROVIDE INDICATION OF CONTAMINATION
SITE CHARATERIZATION EVALUATION OF ALTERNATIVES ENGINEERING DESIGN MONITORING DURING IMPLEMENTATION	LEVEL II	- VARIETY OF ORGANICS BY GC; INORGANICS BY AA; XRF - TENTATIVE ID; ANALYTE-SPECIFIC - DETECTION LIMITS VARY FROM LOW ppm TO LOW ppb	- TENTATIVE ID - TECHNIQUES/INSTRUMENTS LIMITED MOSTLY TO VOLATILES, METALS	- DEPENDENT ON QA/QC STEPS EMPLOYED - DATA TYPICALLY REPORTED IN CONCENTRATION RANGES
RISK ASSESSMENT PRP DETERMINATION SITE CHARACTERIZATION EVALUATION OF ALTERNATIVES ENGINEERING DESIGN MONITORING DURING IMPLEMENTATION	LEVEL III	- ORGANICS/INORGANICS USING EPA PROCEDURES OTHER THAN CLP CAN BE ANALYTE-SPECIFIC - RCRA CHARACTERISTIC TESTS	- TENTATIVE ID IN SOME CASES - CAN PROVIDE DATA OF SAME QUALITY AS LEVELS IV, NS	- SIMILAR DETECTION LIMITS TO CLP - LESS RIGOROUS QA/QC
RISK ASSESSMENT PRP DETERMINATION EVALUATION OF ALTERNATIVES ENGINEERING DESIGN	LEVEL IV	- HSL ORGANICS/INORGANICS BY GC/MS; AA; ICP - LOW ppb DETECTION LIMIT	- TENTATIVE IDENTIFICATON OF NON-HSL PARAMETERS - SOME TIME MAY BE REQUIRED FOR VALIDATION OF PACKAGES	- GOAL IS DATA OF KNOWN QUALITY - RIGOROUS QA/QC
RISK ASSESSMENT PRP DETERMINATION	LEVEL V	- NON-CONVENTIAL PARAMETERS - METHOD-SPECIFIC DETECTION LIMITS - MODIFICATION OF EXISTING METHODS - APPENDIX B PARAMETERS	- MAY REQUIRE METHOD DEVELOPMENT/MODIFICATION - MECHANISM TO OBTAIN SERVICES REQUIRES SPECIAL LEAD TIME	- METHOD-SPECIFIC

Source: USEPA, Data Quality Objectives for Remedial Response Objectives, March, 1987

evaluation. The DQOs for the sampling activities at the Chemsol site will be detailed in the Sampling and Analysis Plan (SAP).

The Level I data to be generated include OVA, HNu or other readings gathered during field activities. Field measurements of parameters such as pH, temperature, and specific conductance of water samples are also examples of Level I data. These types of data will be used to monitor the health and safety of field personnel and assist in evaluating the adequacy of well development and purging procedures.

Level II data will be used in screening soil samples for PCBs. A field analytical method will be selected and used with a grid approach. The accuracy of Level II analyses will be verified via comparison with laboratory data. A detailed description of PCB screening locations, rationale, and methods appears in Section 5.

Previously collected analytical data are generally Level III. These data have been used to develop the scope and approach to the RI/FS described in this document. This will be used to supplement data collected during the RI for site characterization. Air sampling performed for the RI will also be considered Level III. These data will be used primarily for site characterization.

Laboratory analyses of ground water, surface water, soil and sediment samples from Chemsol will be performed to obtain Level IV data. These analyses will include the routine analytical services (RAS) provided by the Contract Laboratory Program (CLP). Level IV data have standard detection limits and documentation suitable for the risk assessment and alternatives evaluation and to support cost recovery. The contract required quantitation and detection limits for Target Analyte Compound List and Target Analyte List parameters are presented in Tables 4-2 and 4-2A, respectively.

Level V data include all analysis performed using the CLP special analytical services (SAS). Level V data will include analyses for VOCs in water samples to obtain detection limits for comparison to ARARs, if necessary. A list of those parameters for which MCLs are lower than CRQLs and CRDLs appears in Table 4-3.

TABLE 4-2

TARGET COMPOUND LIST (TCL) AND CONTRACT REQUIRED QUANTITATION LIMITS (CRQL)

Volatiles	CAS Number	Quantitation Limits* Water ug/L	Low Soil ug/Kg	Med. Soil ug/Kg	On Column (ng)
1. Chloromethane	74-87-3	10	10	1200	(50)
2. Bromomethane	74-83-9	10	10	1200	(50)
3. Vinyl Chloride	75-01-4	10	10	1200	(50)
4. Chloroethane	75-00-3	10	10	1200	(50)
5. Methylene Chloride	75-09-2	10	10	1200	(50)
6. Acetone	67-64-1	10	10	1200	(50)
7. Carbon Disulfide	75-15-0	10	10	1200	(50)
8. 1,1-Dichloroethene	75-35-4	10	10	1200	(50)
9. 1,1-Dichloroethane	75-34-3	10	10	1200	(50)
10. 1,2-Dichloroethene (total)	540-59-0	10	10	1200	(50)
11. Chloroform	67-66-3	10	10	1200	(50)
12. 1,2-Dichloroethane	107-06-2	10	10	1200	(50)
13. 2-Butanone	78-93-3	10	10	1200	(50)
14. 1,1,1-Trichloroethane	71-55-6	10	10	1200	(50)
15. Carbon Tetrachloride	56-23-5	10	10	1200	(50)
16. Bromodichloromethane	75-27-4	10	10	1200	(50)
17. 1,2-Dichloropropane	78-87-5	10	10	1200	(50)
18. cis-1,3-Dichloropropene	10061-01-5	10	10	1200	(50)
19. Trichloroethene	79-01-6	10	10	1200	(50)
20. Dibromochloromethane	124-48-1	10	10	1200	(50)
21. 1,1,2-Trichloroethane	79-00-5	10	10	1200	(50)
22. Benzene	71-43-2	10	10	1200	(50)
23. trans-1,3-Dichloropropene	10061-02-6	10	10	1200	(50)
24. Bromoform	75-25-2	10	10	1200	(50)
25. 4-Methyl-2-pentanone	108-10-1	10	10	1200	(50)
26. 2-Hexanone	591-78-6	10	10	1200	(50)
27. Tetrachloroethene	127-18-4	10	10	1200	(50)
28. Toluene	108-88-3	10	10	1200	(50)
29. 1,1,2,2-Tetrachloroethane	79-34-5	10	10	1200	(50)
30. Chlorobenzene	108-90-7	10	10	1200	(50)
31. Ethyl Benzene	100-41-4	10	10	1200	(50)
32. Styrene	100-42-5	10	10	1200	(50)
33. Xylenes (Total)	1330-20-7	10	10	1200	(50)

* Quantitation limits listed for soil/sediment are based on wet weight. The quantitation limits calculated by the laboratory for soil/sediment, calculated on dry weight basis as required by the contract, will be higher.

TABLE 4-2 (Continued)

TARGET COMPOUND LIST (TCL) AND CONTRACT REQUIRED QUANTITATION LIMITS (CRQL)

Semivolatiles	CAS Number	Quantitation Limits* Water ug/L	Low Soil ug/Kg	Med. Soil ug/Kg	On Column (ng)
34. Phenol	108-95-2	10	330	10000	(20)
35. bis(2-Chloroethyl) ether	111-44-4	10	330	10000	(20)
36. 2-Chlorophenol	95-57-8	10	330	10000	(20)
37. 1,3-Dichlorobenzene	541-73-1	10	330	10000	(20)
38. 1,4-Dichlorobenzene	106-46-7	10	330	10000	(20)
39. 1,2-Dichlorobenzene	95-50-1	10	330	10000	(20)
40. 2-Methylphenol	95-48-7	10	330	10000	(20)
41. 2,2'-oxybis (1-Chloropropane)#	108-60-1	10	330	10000	(20)
42. 4-Methylphenol	106-44-5	10	330	10000	(20)
43. N-Nitroso-di-n-propylamine	621-64-7	10	330	10000	(20)
44. Hexachloroethane	67-72-1	10	330	10000	(20)
45. Nitrobenzene	98-95-3	10	330	10000	(20)
46. Isophorone	78-59-1	10	330	10000	(20)
47. 2-Nitrophenol	88-75-5	10	330	10000	(20)
48. 2,4-Dimethylphenol	105-67-9	10	330	10000	(20)
49. bis(2-Chloroethoxy) methane	111-91-1	10	330	10000	(20)
50 2,4-Dichlorophenol	120-83-2	10	330	10000	(20)
51. 1,2,4-Trichlorobenzene	120-82-1	10	330	10000	(20)
52. Naphthalene	91-20-3	10	330	10000	(20)
53. 4-Chloroaniline	106-47-8	10	330	10000	(20)
54. Hexachlorobutadiene	87-68-3	10	330	10000	(20)
55. 4-Chloro-3-methylphenol	59-50-7	10	330	10000	(20)
56. 2-Methylnaphthalene	91-57-6	10	330	10000	(20)
57. Hexachlorocyclopentadiene	77-47-4	10	330	10000	(20)
58. 2,4,6-Trichlorophenol	88-06-2	10	330	10000	(20)
59. 2,4,5-Trichlorophenol	95-95-4	25	800	25000	(50)
60. 2-Chloronaphthalene	91-58-7	10	330	10000	(20)
61. 2-Nitroaniline	88-74-4	25	800	25000	(50)
62. Dimethylphthalate	131-11-3	10	330	10000	(20)
63. Acenaphthylene	208-96-8	10	330	10000	(20)
64. 2,6-Dinitrotoluene	606-20-2	10	330	10000	(20)
65. 3-Nitroaniline	99-09-2	25	800	25000	(50)
66. Acenaphthene	83-32-9	10	330	10000	(20)
67. 2,4-Dinitrophenol	51-28-5	25	800	25000	(50)
68. 4-Nitrophenol	100-02-7	25	800	25000	(50)

Previously known by the name bis(2-Chloroisopropyl) ether

TABLE 4-2 (Continued)

Semivolatiles	CAS Number	Quantitation Limits* Water ug/L	Low Soil ug/Kg	Med. Soil ug/Kg	On Column (ng)
69. Dibenzofuran	132-64-9	10	330	10000	(20)
70. 2,4-Dinitrotoluene	121-14-2	10	330	10000	(20)
71. Diethylphthalate	84-66-2	10	330	10000	(20)
72. 4-Chlorophenyl-phenyl ether	7005-72-3	10	330	10000	(20)
73. Fluorene	86-73-7	10	330	10000	(20)
74. 4-Nitroaniline	100-01-6	25	800	25000	(50)
75. 4,6-Dinitro-2-methylphenol	534-52-1	25	800	25000	(50)
76. N-nitrosodiphenylamine	86-30-6	10	330	10000	(20)
77. 4-Bromophenyl-phenylether	101-55-3	10	330	10000	(20)
78. Hexachlorobenzene	118-74-1	10	330	10000	(20)
79. Pentachlorophenol	87-86-5	25	800	25000	(50)
80. Phenanthrene	85-01-8	10	330	10000	(20)
81. Anthracene	120-12-7	10	330	10000	(20)
82. Carbazole	86-74-8	10	330	10000	(20)
83. Di-n-butylphthalate	84-74-2	10	330	10000	(20)
84. Fluoranthene	206-44-0	10	330	10000	(20)
85. Pyrene	129-00-0	10	330	10000	(20)
86. Butylbenzylphthalate	85-68-7	10	330	10000	(20)
87. 3,3'-Dichlorobenzidine	91-94-1	10	330	10000	(20)
88. Benzo(a)anthracene	56-55-3	10	330	10000	(20)
89. Chrysene	218-01-9	10	330	10000	(20)
90. bis(2-Ethylhexyl)phthalate	117-81-7	10	330	10000	(20)
91. Di-n-octylphthalate	117-84-0	10	330	10000	(20)
92. Benzo(b)fluoranthene	205-99-2	10	330	10000	(20)
93. Benzo(k)fluoranthene	207-08-9	10	330	10000	(20)
94. Benzo(a)pyrene	50-32-8	10	330	10000	(20)
95. Indeno(1,2,3-cd)pyrene	193-39-5	10	330	10000	(20)
96. Dibenz(a,h)anthracene	53-70-3	10	330	10000	(20)
97. Benzo(g,h,i)perylene	191-24-2	10	330	10000	(20)

* Quantitation limits listed for soil/sediment are based on wet weight. The quantitation limits calculated by the laboratory for soil/sediment, calculated on dry weight basis as required by the contract, will be higher.

TABLE 4-2 (Continued)

TARGET COMPOUND LIST (TCL) AND CONTRACT REQUIRED QUANTITATION LIMITS (CRQL)

Pesticides/Aroclors	CAS Number	Quantitation Limits* Water ug/L	Soil ug/Kg	On Column (pg)
98. alpha-BHC	319-84-6	0.05	1.7	5
99. beta-BHC	319-85-7	0.05	1.7	5
100. delta-BHC	319-86-8	0.05	1.7	5
101. gamma-BHC (Lindane)	58-89-9	0.05	1.7	5
102. Heptachlor	76-44-8	0.05	1.7	5
103. Aldrin	309-00-2	0.05	1.7	5
104. Heptachlor epoxide	1024-57-3	0.05	1.7	5
105. Endosulfan I	959-98-8	0.05	1.7	5
106. Dieldrin	60-57-1	0.10	3.3	10
107. 4,4'-DDE	72-55-9	0.10	3.3	10
108. Endrin	72-20-8	0.10	3.3	10
109. Endosulfan II	33213-65-9	0.10	3.3	10
110. 4,4'-DDD	72-54-8	0.10	3.3	10
111. Endosulfan sulfate	1031-07-8	0.10	3.3	10
112. 4,4'-DDT	50-29-3	0.10	3.3	10
113. Methoxychlor	72-43-5	0.50	17.0	50
114. Endrin ketone	53494-70-5	0.10	3.3	10
115. Endrin aldehyde	7421-36-3	0.10	3.3	10
116. alpha-Chlordane	5103-71-9	0.05	1.7	5
117. gamma-Chlordane	5103-74-2	0.05	1.7	5
118. Toxaphene	8001-35-2	5.0	170.0	500
119. Aroclor-1016	12674-11-2	1.0	33.0	100
120. Aroclor-1221	11104-28-2	2.0	67.0	200
121. Aroclor-1232	11141-16-5	1.0	33.0	100
122. Aroclor-1242	53469-21-9	1.0	33.0	100
123. Aroclor-1248	12672-29-6	1.0	33.0	100
124. Aroclor-1254	11097-69-1	1.0	33.0	100
125. Aroclor-1260	11096-82-5	1.0	33.0	100

* Quantitation limits listed for soil/sediment are based on wet weight. The quantitation limits calculated by the laboratory for soil/sediment, calculated on dry weight basis as required by the contract, will be higher.

There is no differentiation between the preparation of low and medium soil samples in this method for the analysis of Pesticides/Aroclors.

TABLE 4-2A

INORGANIC TARGET ANALYTE LIST (TAL)

Analyte	Contract Required Detection Limit (ug/L)
Aluminum	200
Antimony	60
Arsenic	10
Barium	200
Beryllium	5
Cadmium	5
Calcium	5000
Chromium	10
Cobalt	50
Copper	25
Iron	100
Lead	3
Magnesium	5000
Manganese	15
Mercury	0.2
Nickel	40
Potassium	5000
Selenium	5
Silver	10
Sodium	5000
Thallium	10
Vanadium	50
Zinc	20
Cyanide	10

TABLE 4-3 COMPOUNDS FOR WHICH CRQLs AND CRDLs GREATER THAN MCLS
Vinyl Chloride
Methylene Chloride
1,2-Dichloroethane
1,1-Dichloroethene
Carbon Tetrachloride
Trichloroethene
Chlorobenzene
Benzene
Tetrachloroethene
Pentachlorophenol
1,2-Dichloropropane
PCBs
1,2,4-Trichlorobenzene
Thallium
Antimony
Toxaphene

4.2 WORK PLAN APPROACH

The objectives of the Chemsol RI/FS have been developed based on the data available in EPA and NJDEPE files. Additional information was compiled from published reports on regional and local geology and hydrogeology. Historical aerial photographs of the site were reviewed and a site visit was conducted. Additional information was obtained during the Focused Feasibility Study.

The primary concern at the Chemsol site is the severe bedrock aquifer contamination. A Focused Feasibility Study was prepared which was used to select an interim remedy to contain shallow contaminated ground water on-site. The interim remedy will restrict further off-site migration of the most highly contaminated ground water. However,

additional ground water controls will be necessary for the contaminated bedrock below 130 feet below grade and the off-site shallow bedrock aquifer.

The Chemsol RI/FS will focus on characterizing the sources and defining the extent of contamination, establishing background soils and ground water quality and evaluating the possible connection between the site and area residences. RI/FS tasks include data collection, validation, and evaluation, assessment of public health and environmental risks, screening of potential remedial alternatives and the preparation of the RI report. These activities will be followed by a detailed evaluation of remedial alternatives and the preparation of the FS report. The FS is planned to be prepared concurrently with the latter portions of the RI. Should the results of the field investigations show that the nature and extent of contamination are not sufficiently defined to support the risk assessment and FS, additional investigations may then be necessary.

To achieve the objectives of the RI/FS, several investigation efforts are proposed as follows:

Hydrogeologic Investigation - a hydrogeologic stratigraphic framework for the site will be developed, ten new monitoring wells are proposed, ground water samples will be collected and analyzed, water levels will be measured and a pumping test will be conducted to characterize aquifer conditions and hydraulic connection between the Chemsol site and area residences.

Soils Investigation - surface as well as shallow subsurface samples will be collected to delineate the extent of contamination. Field screening will be conducted (Level II) for PCB analysis.

Surface Water and Sediment - samples will be collected from the onsite surface water bodies to obtain data on surface water and sediment quality.

Air Monitoring - real time air monitoring for organic vapors will be conducted during the field investigation using portable field equipment, and a particulate monitor will be used to assess the presence of other airborne contaminants. Air samples will be collected to identify site-related odors.

Environmental Risk Assessment including Wetlands Assessment - an initial environmental assessment will be conducted to characterize and inventory potentially sensitive receptors, as well as surface water resources, including the mapping of wetlands.

Public Health Risk Assessment - The objectives of this task are to provide an analysis of baseline risks and determine the need for action at the site, determine levels of contaminants that can remain on-site and still adequately protect public health, provide a basis for comparing health impacts of remedial alternatives, and provide a consistent process for evaluating and documenting public health threats at the site.

Table 4-4 present a summary of the proposed RI sampling program including the media to be sampled, the types of data to be collected, the analytical level to be achieved and the analytical parameters.

Section 5 describes the scope for each of the planned field activities including the sampling programs. The Sampling and Analysis Plan (SAP) will include the Field Sampling Plan (FSP) and the Quality Assurance Project Plan (QAPjP) and will outline the detailed sampling and analytical procedures for each medium to be sampled, the number and type of each sample and the QA/QC sample requirements for each medium. The site-specific health and safety requirements and measures will be discussed in the Site Health and Safety Plan (SHSP). The DQO for each sample type will be identified in the SAP based on the highest analytical level for the intended use of the data. The SAP will identify precision, accuracy and completeness goals used in selecting the sampling and analysis methods. The SAP will also contain details of non-laboratory data collection, such as SOPs for well installation, collection of soil and water samples and for conducting the pumping tests.

TABLE 4-4

SUMMARY OF PROPOSED RI SAMPLING PROGRAM

Media	Type of Investigation	Location of Investigation	Data Uses	Analytical Level	Proposed Analysis	Proposed No. of Samples*
Soil	Subsurface Soil Sampling	- Lot 1A and 1B	- Site Characterization		TCLP	8
		- PCB Screening	- Risk Assessment	II	PCBs	166
		- Soil Sampling	- Alternatives Evaluation	IV	TCL/TAL	85
Ground Water	Ground Water Well Sampling	- On-Site Monitoring Wells (44x2 rounds)	- Site Characterization	IV, V	TCL/TAL, pH, Specific Conductance, Temperature	88
		- Pumping Test	- Risk Assessment			
	Aquifer Testing		- Alternatives Evaluation			1
Surface Water	Surface Water Sampling	- On-Site Surface Waters (5x2 rounds)	Same as Above	IV	TCL/TAL	10
Sediment	Sediment Sampling	- On-Site Surface Waters (6x2 rounds)	Same as Above	IV	TCL/TAL	12
				V	TOC , Grain Size	
Air	Air Sampling	- Southeast Corner of Fenced Area (7 x 2 rounds)	Same as Above	III	VOCS,Method T014	14
	Health & Safety Monitoring	- During all site activities	Real-time Monitoring	I	VOCs, particulates	NA

TCL - Target Compound List
TAL - Target Analyte List
TCLP - Toxicity Characteristic Leaching Procedure
VOCs - Volatile Organic Compounds
PCBs - Polychlorinated Biphenyls

* Does not include QA/QC samples

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5.0 RI/FS TASKS

The tasks for the RI/FS presented below are derived from the "Guidance for Conducting Remedial Investigations and Feasibility Studies under CERCLA; Interim Final," October 1988. The order in which these tasks are presented is the general order in which the tasks will be performed. Some tasks, such as community relations support, will be implemented throughout the duration of the RI/FS.

5.1 TASK 1 - PROJECT PLANNING/REVIEW OF BACKGROUND DOCUMENTS

The project planning task involves several subtasks that must be performed in order to develop the plans and corresponding schedule to execute the RI/FS. These subtasks include conducting a detailed analysis of existing data, developing a preliminary risk assessment, identifying preliminary remedial alternatives, identifying Data Quality Objectives, determining ARARs, and conducting Work Plan review meetings with EPA and other interested agencies. All of these activities culminate in the preparation of the final project plans.

5.1.1 Review Background Documents (Task 1a)

Extensive ground water and soils data have been collected at the Chemsol site. The most recent data were collected by MPI during the Focused Feasibility Study (ground water sampling of April 1991). Additional surface water sampling was conducted in Stream 1A during August and September 1991.

Tables summarizing 12 years of ground water and soils data have been prepared and are included in Appendices A and B of this document (surface water sampling results are included as Appendix C). Ground water data have been plotted to develop iso-contour maps. The findings of the data review are summarized in Section 2 of this document.

5.1.2 Preparation of Work Plan (Task 1b)

The Work Plan consists of two volumes:

Volume 1: Technical Document including description of Tasks to be conducted, management, structure, staffing and scheduling.

Volume 2: Estimate of Costs to conduct activities described in Volume 1.

5.1.3 Preparation of Sampling and Analysis Plan (Task 1c)

The Sampling and Analysis Plan (SAP) consists of two subplans: the Field Sampling Plan (FSP) and the Quality Assurance Project Plan (QAPjP). A brief description of each subplan of the SAP is included below.

The FSP provides detailed procedures for each field activity and includes the following:

- Site Background
- Sampling Objectives
- Sample Location and Frequency
- Sample Designation
- Sample Equipment and Procedures
- Sample Handling and Analysis
- Site control procedures,
- Field investigation activities and responsibilities (site operations)
- The corresponding field operations schedule

The site control section describes how approval to enter the areas of investigation will be obtained, along with the site security control measures and the field office/command post for the field investigation. The logistics of all field investigation activities are also described. The site operations section delineates the responsibilities of key field and office team members. The last section includes a field operations schedule, showing the proposed scheduling of each major field activity.

The QAPjP will be prepared in accordance with EPA Region II procedures and Section 10 of the EPA publication entitled Test Methods for Evaluating Solid Waste (SW846). The QAPjP will include:

- Project Description
- Project Organization and Responsibilities
- QA Objectives for Measurement
- Sampling Procedures
- Sample Custody
- Calibration Procedures
- Analytical Procedures
- Data Reduction, Validation, and Reporting
- Internal Quality Control
- Performance and Systems Audits
- Preventative Maintenance
- Data Assessment Procedures

- Corrective Actions
- Quality Assurance Reports

5.1.4 Preparation of Site Health and Safety Plan (Task 1d)

The Site Health and Safety Plan (SHSP) includes the following site-specific information:

- Hazard assessment
- Training requirements
- Monitoring procedures for site operations
- Safety procedures
- Disposal and decontamination procedures

The SHSP will also include a contingency plan that addresses site-specific conditions that may be encountered. The combined SHSP and SAP is referred to as the Field Operations Plan (FOP).

5.2 TASK 2 - COMMUNITY RELATIONS SUPPORT

Community relations support will be provided as requested and may include the following:

Provide public meeting support (Task 2a). Technical support of the RI/FS work plan will be provided for a public meeting.

Other Technical Support (Task 2b). As requested by EPA, technical support for other community relations activities will be provided.

5.3 TASK 3 - FIELD INVESTIGATIONS

The field investigation is conducted to obtain data which will augment and expand upon the data base acquired during previous investigations at Chemsol. The additional data will be used to assess migration and exposure pathways from the sources and evaluate the potential connection between the contamination at the Chemsol site and the ground water contamination in area residential wells.

The data generated during the field investigation will be used to assess what risks, if any, the contamination resulting from the operations of Chemsol present to public health and to the environment. EPA has determined that the contaminants are of sufficient concentration to warrant a ground water interim remedy. Data generated during the RI will be used to evaluate the need for remediation of other contaminated media (soil, air, sediment, surface water and ground water below 130 feet) and identify appropriate remedial response alternatives.

5.3.1 Subcontracting (Task 3a)

To support the proposed field activities, the following subcontracts will be required:

- A drilling subcontract for soil sampling, monitoring well installation, well development and well testing;
- A waste hauling subcontract to remove purged ground water and drilling residuals from the site;
- A subcontract for an on-site trailer, including the appropriate utilities;
- A subcontract for surveying monitoring well and staff gauge locations and elevations, and surface water, sediment, and soil sample locations;
- An air laboratory to analyze air samples;
- A weather service to provide forecasting information during air sampling events;
- A geophysical services subcontract for borehole logging; and
- A certified archaeologist to conduct the archaeological search.

Subcontracts will be awarded based on competitive procurement and a minimum of three bids will be required. Subcontracts in excess of $10,000 will be submitted to EPA for review and approval. In the event that three bids are not received, available records will be reviewed to determine price reasonableness based on similar procurements and an independent cost analysis may be conducted. These activities would be closely coordinated with the EPA contracting officer. Subcontracting for the ARCS program will follow ARCS procurement guidelines.

5.3.2 Mobilization and Demobilization (Task 3b)

This subtask includes orienting field personnel, mobilizing equipment, staking sampling locations and demobilizing. Each field team member will attend an on-site orientation meeting to become familiar with the history of the site, health and safety requirements, and field procedures.

Equipment mobilization entails ordering, purchasing, and if necessary, fabricating all sampling equipment needed for the field investigation. An inventory of available equipment will be conducted prior to initiating field activities. Any additional equipment required will be secured. A field office trailer will be set up and necessary utility hookups will be made as part of the mobilization effort (telephone and electricity).

Locations for the soil samples, sediment and surface water samples, and existing ground water monitoring wells will be staked at the start of the site operations. These locations will be measured from existing landmarks. A utilities stakeout will be performed at the location of all subsurface investigations.

Equipment will be decontaminated and demobilized at the completion of each phase of field activities as necessary. Equipment may include field measurement instruments, sampling equipment, drilling subcontractor equipment, health and safety monitoring and decontamination equipment and field office trailer and utility hookups.

5.3.3 Topographic Survey (Task 3c)

Topographic surveys will be conducted in two phases at Chemsol. Inconsistencies in survey data for the existing wells have raised some questions regarding the accuracy of the groundwater level measurements that have been collected to date. Existing groundwater level measurements will be re-evaluated after the correct monitor well measurement point elevations have been established.

A permanently marked reference point on the inner casing of each well will be surveyed for vertical and horizontal control and the nearest U.S.G.S benchmark will be used to tie into mean sea level datum. Wells will be surveyed to 0.01 ft. MSL. During the second phase of topographic surveys, new monitoring wells and sampling locations will be surveyed and incorporated onto an updated map. The base map will be used to display information on contaminant distribution and characterize hydraulic gradient, among other information.

5.3.4 Inspection/Rehabilitation/Abandonment/Installation of Monitoring Wells (Task 3d)

The hydrogeologic investigation is proposed to further delineate the vertical and lateral extent of on-site and off-site contamination, refine understanding of the ground water flow patterns, and estimate aquifer parameters. Data on well construction details including well number, construction date, casing length, monitoring interval, total depth and top of casing (TOC) elevation are presented in Table 2-5. A summary of the existing wells is presented on Table 2-6.

Inspection/Rehabilitation

The existing monitoring wells will be inspected for integrity. The construction of each well will be compared to the specifications presented in Table 2-5. The depth of the casing in well C-1 will be confirmed with a magnetic casing locator. The cement collar around each casing will be checked for degradation. If the cement collar has degraded, surface waters may be able to enter the well and compromise the ability of the well to yield a representative sample. The wells will also be sounded to determine if sediment has accumulated in the bottom. If sufficient sediment has accumulated to block ten percent or more of the open interval of a well, the ability of that well to yield a representative water level or sample may be compromised. If it is determined that a well requires rehabilitation during inspection, this will be conducted prior to sampling. Each well will be permanently marked on the outer casing with the identification and permit numbers. If a well does not have a permit number, the NJDEPE Bureau of Water Allocation will be requested to assign one.

Abandonment

Review of the construction logs indicates the earlier MW-series wells may provide a pathway for the migration of ground water from the perched zone to the water table. Contamination identified in these wells cannot be associated with a particular zone. Therefore, the MW-series wells will be abandoned unless it is determined that they can be rehabilitated and/or that they provide some form of useful information. Monitor wells should not be abandoned until after a planned geophysical well logging effort has been completed and the resulting data analyzed. Geophysical logging of wells that are to be

abandoned could provide useful information in evaluating the site hydrogeologic framework. The MW-100 series wells will be left intact. During a recent inspection, wells OW-3 and OW-7 were found structurally unsound and unusable; they will also be abandoned. Wells MW-1, MW-6 and C-2 have reportedly been decommissioned or abandoned. An attempt will be made to locate these wells. If necessary, the mapped well location will be surveyed with a magnetometer, which should detect the metal well casing. When found, the upper five feet of the cement well plug will be drilled to confirm the integrity of the seal. If the wells are not properly sealed, these wells will also be abandoned. The casing will be removed from all wells cased to bedrock, prior to grouting. If the casing cannot be removed, the casing will be pierced throughout its entire length to ensure proper sealing of the borehole, including the annular space. All wells will be abandoned by a licensed and certified well driller in accordance with NJDEPE protocols (NJSA 58:4A-4.1 and 58:4A-4.3 and NJAC 7:9-7 and 7:9-9).

Installation

Ground water samples collected during previous investigations indicate that contamination exists in the perched zone, the shallow portion of the bedrock aquifer, and the deep portion of the bedrock aquifer. Additional monitoring wells are proposed for the Chemsol site to determine the vertical and lateral extent of contaminant migration and to understand the ground water flow patterns controlling contaminant migration.

All wells previously installed at the site have been grouped by their depth below grade without regard for elevation, and are summarized in Table 2-6. This type of grouping does not consider the structural hydrogeologic framework of the site and does not consider that groundwater flow in the bedrock is controlled primarily by the orientation of stratigraphic units and fractures. As discussed in Section 2.3, fractures in the Passaic Formation occur primarily along bedding planes, which dip approximately 10° northwest, and at a near-vertical orientation. Additionally, variations in lithology may cause come stratigraphic units to be less fractured than others. These factors may influence ground water flow patterns sufficiently that wells open to the same elevation relative to mean sea level may not actually intercept the same water-bearing zones. Therefore, one major objective of this investigation is to reclassify the existing monitor wells based on their relationship to the hydrogeologic framework of the site.

Prior to installing any additional bedrock ground water monitoring wells at the site, an accurate understanding of stratigraphic controls on ground water flow patterns will be developed. The following hydrogeologic investigation will be conducted:

1. A large, accurate map will be developed showing the location of all monitoring wells, residential wells and industrial wells. A one-mile well search and location radius will be obtained from the NJDEPE. The identified wells will be located on the 1:1200 scale topographic maps available from the Township of Piscataway.

2. Data from the well logs obtained during the well search will be tabulated, including well depth, casing depth, lithologic information and packer or pumping test results. All data will be correlated to mean sea level elevation.

3. Selected site wells will be geophysically logged to characterize subsurface characteristics at the site. To provide data for a geologic cross-section in the direction of dip, eight wells will be logged roughly along a northwest-southeast trending line. These wells are TW-10, DMW-6, MW-101, C-1, MW-102, DMW-4, TW-15 and MW-104. To determine if stratigraphy varies significantly along strike, four wells to the east and west will also be geophysically logged. These wells are TW-12, DMW-8, DMW-2 and TW-14. Since these wells (except C-1) are cased through almost their entire drilled depth, they will be logged using natural gamma radiation, which can penetrate steel casing. Additional wells will be logged based on the results of the geophysical logging of these twelve wells if additional data is required to provide a good representation of the subsurface conditions laterally and vertically. At least three off-site wells will also be geophysically logged, in the manner described above, if access can be obtained by the EPA. The Parkway Plastics well and some of the residential wells in the Nova Ukraine and other areas could be logged, if possible.

Natural gamma measures the naturally-occurring radioactivity of the formations adjacent to the borehole and is generally used to detect shale or clay. This method has been used successfully to detect lithologic changes and fractures in the Passaic Formation. The uncased portions of the borehole will also be logged using spontaneous potential, resistance and caliper methods. These methods measure changes in the characteristics of the material nearest the geophysical probe and can only be used in uncased boreholes. Spontaneous potential measures naturally occurring electrical potentials that result from chemical and physical changes at contacts between different types of geologic materials. Resistance measures the resistance of the material near the probe and is generally used to correlate beds. Caliper logging is a mechanical means of obtaining a profile of the borehole shape and can be used to identify changes in borehole diameter that may be related to fracture zones.

4. A site hydrogeologic framework will be developed using all available data from monitoring, residential and industrial wells. Geophysical data from these wells will be correlated to existing geologic well logs to identify key stratigraphic units and fracture zones that may control groundwater flow patterns. Existing pump test and packer test results will be re-evaluated considering the potential impact of the structural dip of the Passaic formation on groundwater flow patterns and geophysical results. Correlated geologic data will be presented on large-scale geologic cross-sections and stratigraphic structure contour maps of key stratigraphic horizons. The geologic cross-sections should show information on zones of relatively higher and lower permeability as well as groundwater contaminant levels.

5. All monitor wells, residential wells, and industrial wells will be reclassified according to where their screened/open hole intervals are located relative to the hydrogeologic framework that has been developed during this investigation.

6. Stratigraphic interpretations regarding the location of high and low permeability stratigraphic units will be tested in the field by packer testing the boreholes of selected wells. These wells will be geophysically logged as described above prior to packer testing. After logging, discrete zones of the borehole suspected to correlate to low and high permeability units will be isolated for testing using a dual-packer system. The results of the packer testing will be used to test the hydrogeologic framework which has been developed for the site at this point. The packer system will consist of a submersible pump positioned between two inflatable packers. By inflating the packers with compressed air, a discrete section of the borehole will be isolated. The isolated zone will then be pumped at a constant rate (to be selected in the field) for sufficient time to determine the relative permeability of that zone. When an isolated section of the borehole is pumped, only fractures open to that interval will supply groundwater.

   Pressure transducers will be used to monitor water level changes in the packed zone and the borehole above and below the packers. The data collected during pumping will permit determination of whether or not the packers successfully isolated a portion of the borehole. It will also be used to determine the permeability of the pumped zone, and the degree of interconnection between fractures supplying the pumped zone and other portions of the borehole.

7. Groundwater levels will be collected from existing wells and contoured to determine groundwater flow patterns. The location of proposed monitor wells will be re-evaluated after a new groundwater flow map has been developed to ensure that these new wells will be installed in appropriate locations. Water levels in all existing and new wells will also be measured a minimum of two times after all proposed wells have been constructed and developed, preferably during two different seasons. Water level measurements will be collected synoptically to provide comparable data for mapping. NJDEPE will be notified four weeks prior to the collection of any water level measurement such that they may obtain water level measurements at industrial sites under investiga-

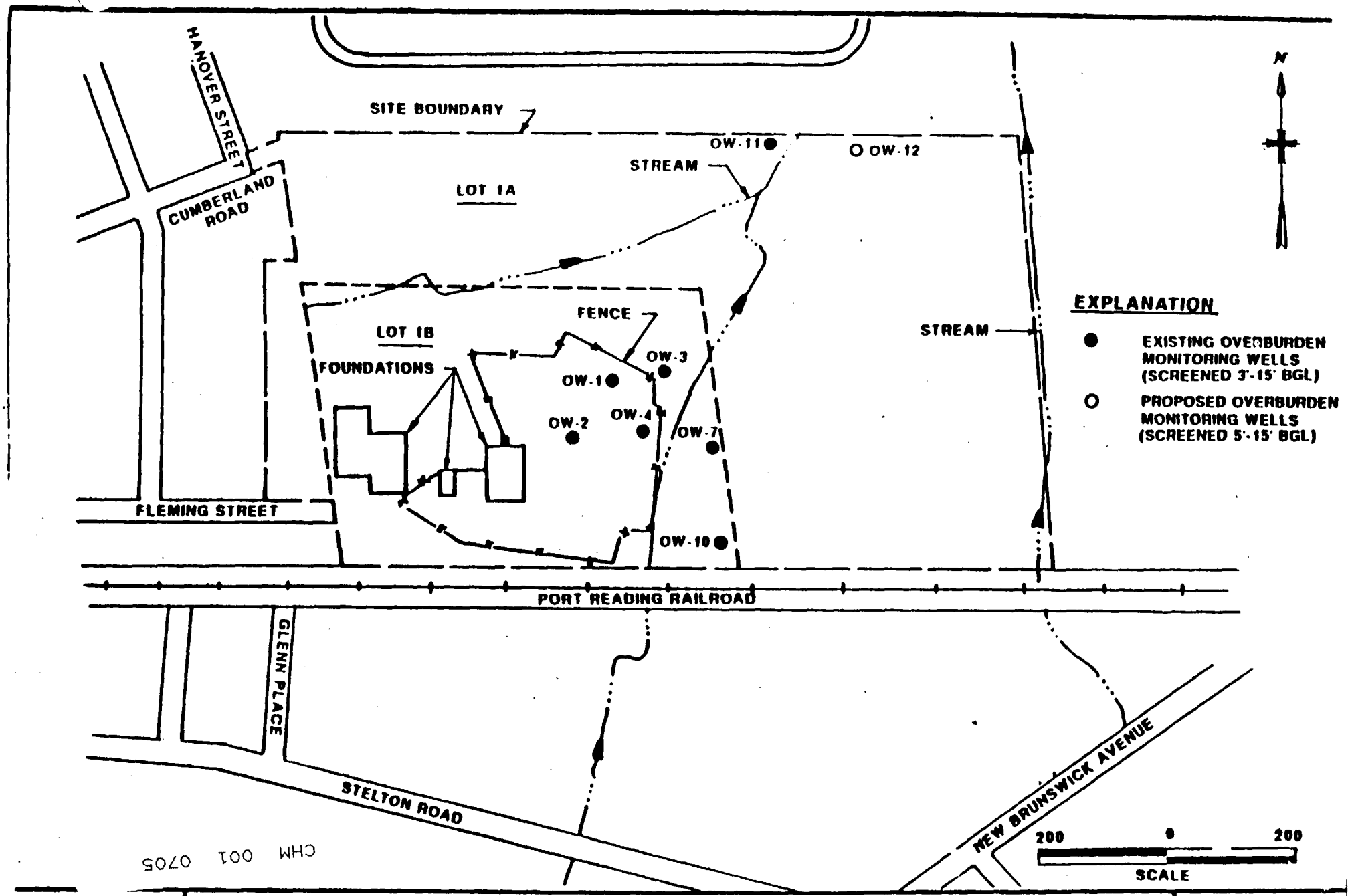
tion in the area. Synoptic regional data could improve the current understanding of the regional groundwater flow patterns.

Water levels in selected overburden and bedrock wells will be continuously monitored using an automatic data logger for one week to determine if groundwater levels are fluctuating in response to any natural and/or artificial influences on groundwater levels. Water levels in these wells will be monitored continuously for one week as the first round of synoptic water levels measurements are obtained so that any variability in groundwater flow at the site is understood prior to the collection of groundwater level measurements. The collection of groundwater level measurements will be timed to occur when water levels are relatively stable if it is found that significant water level fluctuations do occur in response to natural and/or artificial influences.

8. Existing groundwater level and quality data, as well as existing pumping test data, will be reexamined in light of the stratigraphic framework developed during the tasks outlined above. The effect of current and historical off-site pumping on the current distribution of contaminants will be examined. New groundwater flow maps and groundwater quality maps, possibly based on key stratigraphic units will be developed if appropriate.

Based upon this assessment, a preliminary determination will be made regarding the likely locations and depths of current contaminant migration. Monitoring well locations will be proposed that will aid in defining the vertical and horizontal extent of groundwater contamination. Based upon the current understanding of the site hydrogeology, however, and for the purposes of this Work Plan, the installation of ten wells is proposed (see Table 5-1 and Figures 5-1 through 5-5).

The shallow monitoring well will be installed in the overburden using hollow stem auger drilling methods. The deep wells will be installed in the bedrock using rotary methods using potable water or mud as a drilling fluid. Proposed casing depths are listed in Table 5-2. Well construction methods are discussed in detail in the following sections and are based upon wells being constructed as detailed above. Construction may vary based upon the results of the stratigraphic assessment conducted prior to finalizing the well locations.

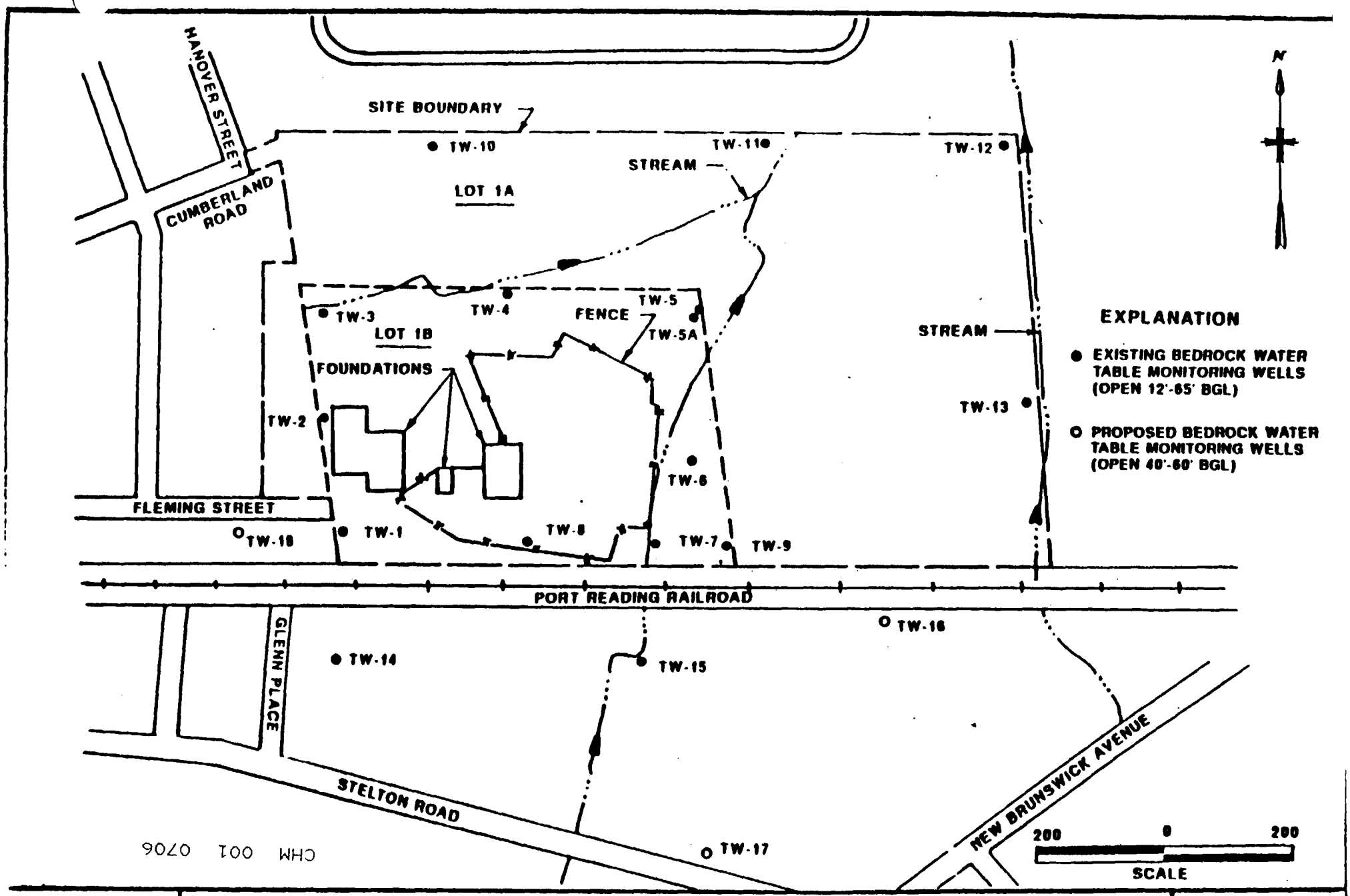


CHEMSOL, INC.
PISCATAWAY, NEW JERSEY

PERCHED AQUIFER **WELLS (5'-15' BGL)**

FIGURE 5-1

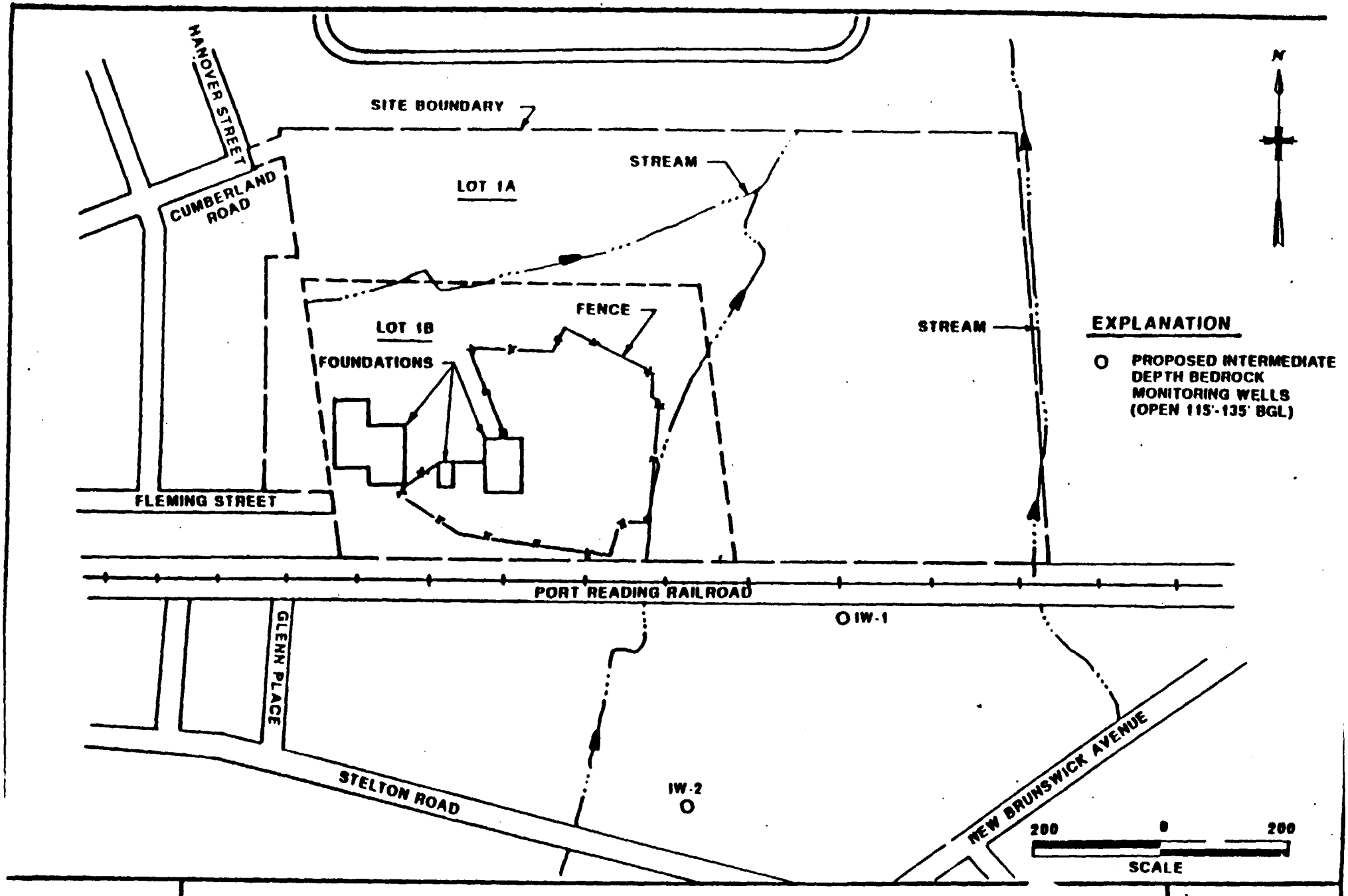
CHM 001 0705



CHM 001 0706

CHEMSOL, INC.
PISCATAWAY, NEW JERSEY
BEDROCK AQUIFER WELLS (40'-60' BGL)

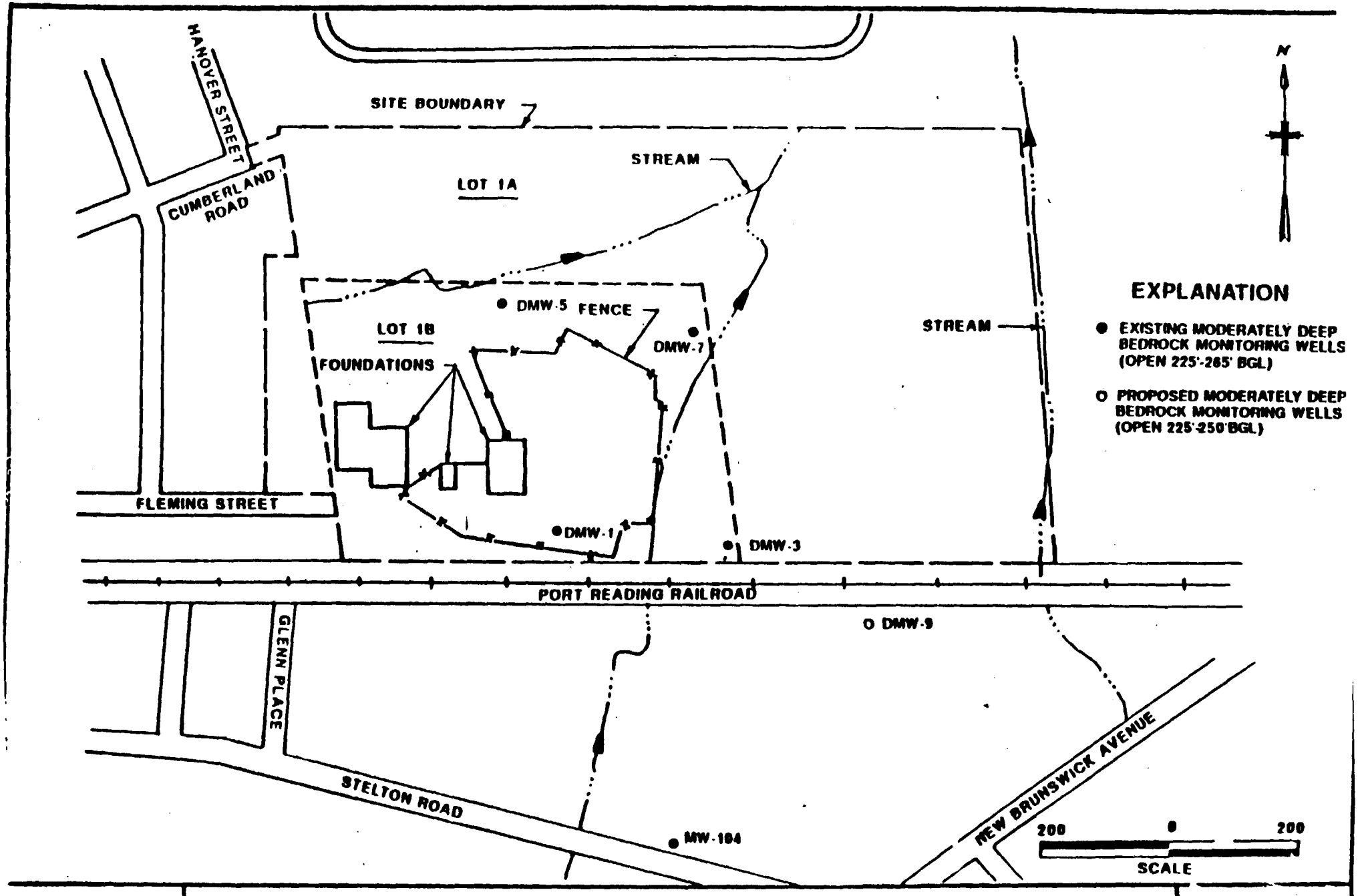
FIGURE 5-2



CHEMSOL, INC.
PISCATAWAY, NEW JERSEY
BEDROCK AQUIFER **WELLS (115'-135' BGL)**

FIGURE 5-3

CHM 001 0707



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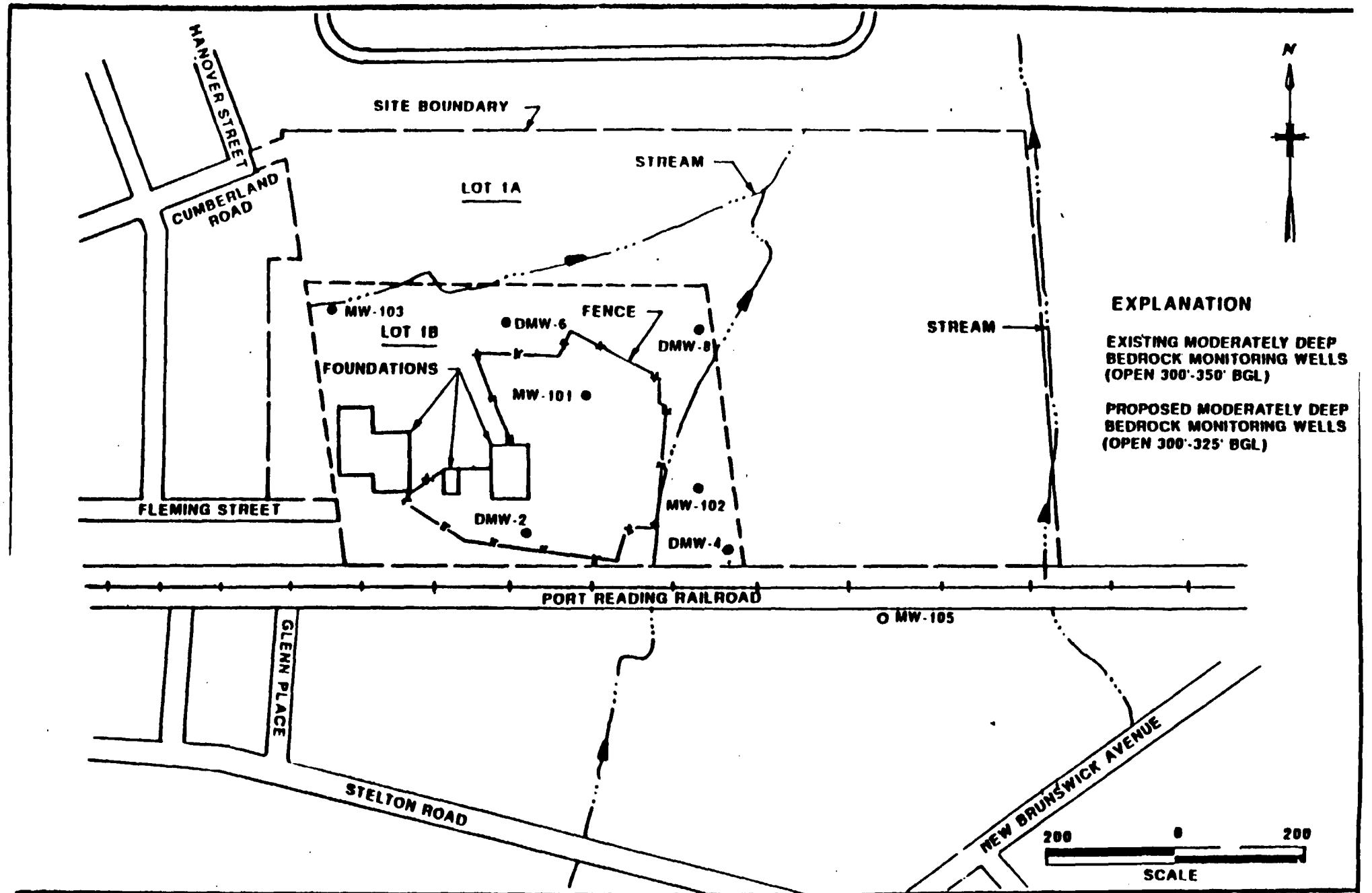
BEDROCK AQUIFER

WELLS (225'-250' BGL)

FIGURE 5-4

CHM 001 0708



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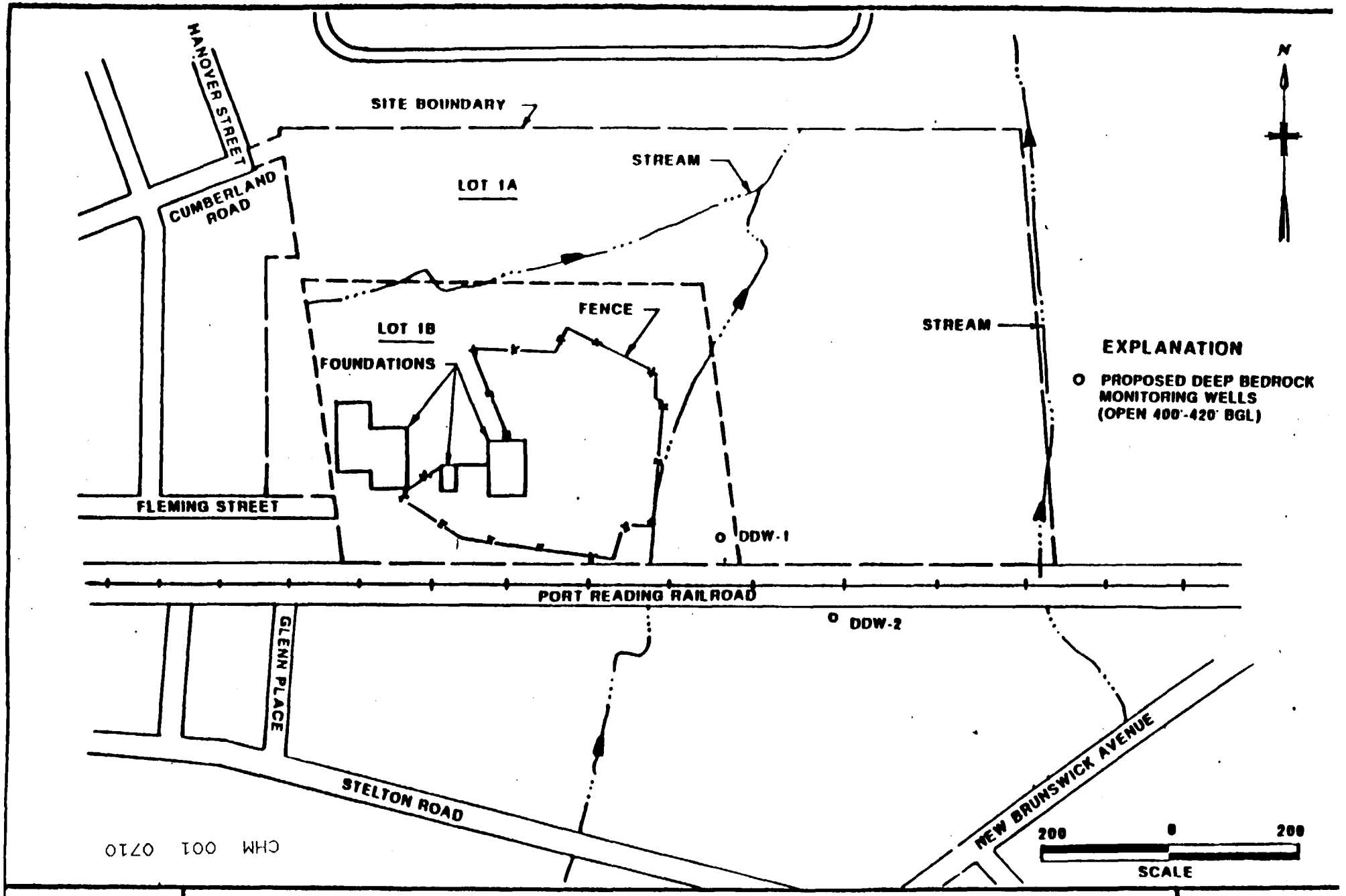
PISCATAWAY, NEW JERSEY

BEDROCK AQUIFER **WELLS (300'-325' BGL)**

FIGURE 5-5

CHM 001 0709



CHEMSOL, INC.

CHM 001 0710

CHM 001 0711

BEDROCK AQUIFER WELLS (400'-420' BGL)

FIGURE 5-6

TABLE 5-1

SUMMARY OF PROPOSED WELLS

Well Number	Zone Monitored	Proposed Monitoring Interval (BGL)
OW-12	Perched Zone	5 - 15 Feet
TW-16	Water Table	40 - 60 Feet
TW-17	Water Table	40 - 60 Feet
TW-18	Water Table	40 - 60 Feet
IW-1	Intermediate Zone	115 - 135 Feet
IW-2	Intermediate Zone	115 - 135 Feet
DMW-9	Moderately Deep Zone	225 - 250 Feet
MW-105	Moderately Deep Zone	300 - 325 Feet
DDW-1	Deep Zone	400 - 420 Feet
DDW-2	Deep Zone	400 - 420 Feet

Drilling Equipment Decontamination Procedures

To prevent the possibility of cross contamination between boreholes, the work area of the drilling rig and drilling tools will be thoroughly decontaminated before arriving on-site and between drilling sites. A pressurized steam cleaner will be used to decontaminate the drilling rig and tools while on-site. All steam cleaning will occur on an on-site decontamination pad. Water collected in the decontamination pad sump will be pumped to DOT approved 55-gallon drums or to an on-site tanker. Split-spoon samplers will be decontaminated between uses.

TABLE 5-2

CASING SETTINGS FOR PROPOSED MONITORING WELLS

Well Series	Zone Monitored	Length of 6" Casing (Feet)	Length of 10" Casing (Feet)
OW	Perched Zone	4*	None
TW	Water Table	40	None
IW	Intermediate	115	None
DMW	Moderately Deep	225	None
MW 100	Moderately Deep	300	None
DDW	Deep	400	325

* Protective casing not used in well construction.

Perched Aquifer Well Installation

The borehole will be drilled using 8-1/4-inch I.D. hollow-stem augers. Split-spoon samples will be collected continuously from ground surface to the top of the relatively impermeable unit that is believed to be responsible for the perched water conditions. Soils will be visually classified using the Unified Soil Classification System or the modified

Burmeister System. The borehole will be advanced through the overburden to weathered bedrock and will be terminated when weathered bedrock is detected in the split-spoon sampler.

A four-inch diameter, Type 304 stainless steel monitoring well will be installed in the borehole. The depth of the perched aquifer wells will be determined by the depth to low permeability unit below ground surface that is responsible for the perched water conditions. The well will be screened from two feet above water to three to eight feet below water. The well will consist of a five-foot to ten-foot section of 0.01-inch slotted well screen and sufficient stainless steel riser pipe to extend two feet above ground surface. The annulus surrounding the screen will be filled with number one sand from one foot below the screen to two feet above the screen. A one-foot thick layer of bentonite pellets will be installed above the sand. The remaining portion of the borehole annulus will be grouted to ground surface with a cement/bentonite slurry. The well will be completed by installing a five foot long black steel protective casing with locking cap over the well. The protective casing will extend approximately three feet below ground surface and will be secured with a cement collar. The cement collar will be sloped away from the well to minimize the accumulation of surface water at the well.

Bedrock Aquifer Well Installation

Bedrock wells will be installed using rotary methods using potable water or mud as a drilling fluid. The smallest possible diameter well casing will be used to minimize the volume of purge water that will be required during sampling efforts and to ensure that water levels measured in these wells will be responsive to water level changes that are occurring in the aquifer. The drilling will be carefully monitored by a geologist and changes in drilling characteristics, flow of water from the borehole, and rock type (as determined by examination of the cuttings) will be noted. Fracture zones will be carefully noted and described for integration into the geologic and stratigraphic site database.

5.3.5 Ground Water Sampling (Task 3e)

Two rounds of ground water samples will be collected from the on-site and off-site monitoring wells. Ground water sampling will be conducted to establish the concentrations and extent of contamination.

Samples will be collected from the existing and proposed wells as shown on Plate 1 and will be analyzed for Target Compound List/Target Analyte List (TCL/TAL) compounds using the EPA Contract Laboratory Program (CLP). Wells MW 2 through 8 and wells OW-3 and OW-7 are not included because they will be abandoned during the remedial investigation. If possible, one round of ground water samples will be collected during a wet period and the other during a drier period to provide information on seasonal impacts to ground water quality.

Ground water samples will be collected at least two weeks after well development is completed. The procedures that will be followed during ground water sampling activities are:

- Open the well casing and measure the headspace air with an HNu.
- Measure and record water level.
- Determine if NAPLs exist on top of the water table or at the bottom of the well using an interface probe. At monitoring well C-1, a water sample will be collected from the water table and bottom of the well prior to purging using a bottom-filling clear teflon bailer. The samples will be visually inspected for the presence of NAPLs. NAPLs are most likely to be present in this well, which contains the most highly contaminated ground water at the site.
- Calculate the volume of water in the wells.
- Purge 3 to 5 well volumes or to dryness using a pump or bailer.
- Measure the pH, specific conductance, temperature at the start of purging and after each well volume is purged.
- Collect a ground water sample using a decontaminated teflon or stainless steel bailer.

Descriptions of ground water sampling procedures, containers, preservations, holding times, and other details will be included in the SAP.

Pumping Test

An aquifer pump test will be considered after the development of a hydrogeologic framework for the site. The pump test might be conducted prior to the installation of new monitor wells to test preliminary conclusions regarding high and low permeability zones and

the degree of connection between them to ensure that the new wells will be properly located. A detailed plan for the aquifer pump test will be developed and submitted to EPA for approval before the test is conducted. The specific objectives of the pump test, methods to be used and documentation requirements will be fully described.

5.3.6 Soil Sampling (Task 3f)

Analytical data from previous soil investigations indicate that site soils are contaminated with PCBs, metals, and volatile organic compounds (VOCs). Available post excavation data does not demonstrate that previously excavated areas have been remediated completely. Several areas of Lot 1B that may have been heavily used during peak operations have not been sampled. Additionally, soil samples have not been collected in Lot 1A. Hence, an extensive soil sampling program will be necessary to further characterize soil contamination on the site for evaluation of source control and remediation measures during the FS.

One element of the soil sampling program is the use of an immunoassay test kit as a field screening device for on-site sampling for PCBs. ENSYS PCB RISc is a system that is currently used by EPA. The PCB RISc Test uses a semi-quantitative, colorimetric method that incorporates immunoassay technology. The test is performed using tubes which are coated with a chemical that specifically binds to PCBs. To perform the test, the standards, samples and reagents are added in a step-wise manner to the coated tubes. The entire procedure takes approximately 20 minutes and results in a color change within each tube proportional to the concentration of PCBs. The color in the tubes is read by inserting the tubes in a comparative photometer. The PCB soil test indicates whether a sample contains more or less than 5 ppm PCBs. The use of other screening methods was considered; however, they were not selected due to extensive mobilization requirements or likelihood of giving false positives in soils where chlorinated compounds are present. It should be noted that field screening is being used as a cost-effective method to complement and optimize the Level IV data collection by directing the biased sampling program.

The proposed soil sampling program is based on the following:

- Field screening will be used as an element of the soil sampling program.
- EPIC (historical overflight) photos indicate that operations occurred over most of the eastern portion of Lot 1B. Some disturbed ground was observed in the western portion of Lot 1B. No disturbed ground was observed in Lot 1A.
- An analysis of soils data taken by other consultants indicates that the highest levels of contaminants were found within the area that was excavated and is now fenced or directly adjacent to that area.

Below, five groups of soils data to be collected at Chemsol are described. These involve grid sampling and biased sampling locations. Grid sampling locations are indicated on Figure 5-7. At each sampling location, samples will be collected at two depths: at the surface and just above the water table using a tripod. In several locations, samples in the saturated zone will be collected (to be discussed). Based on the following proposal, it is estimated that approximately 86 TCL/TAL CLP samples and 166 PCB field screening samples will be obtained.

Group A - Grid Sampling For Level IV TCL/TAL Analysis

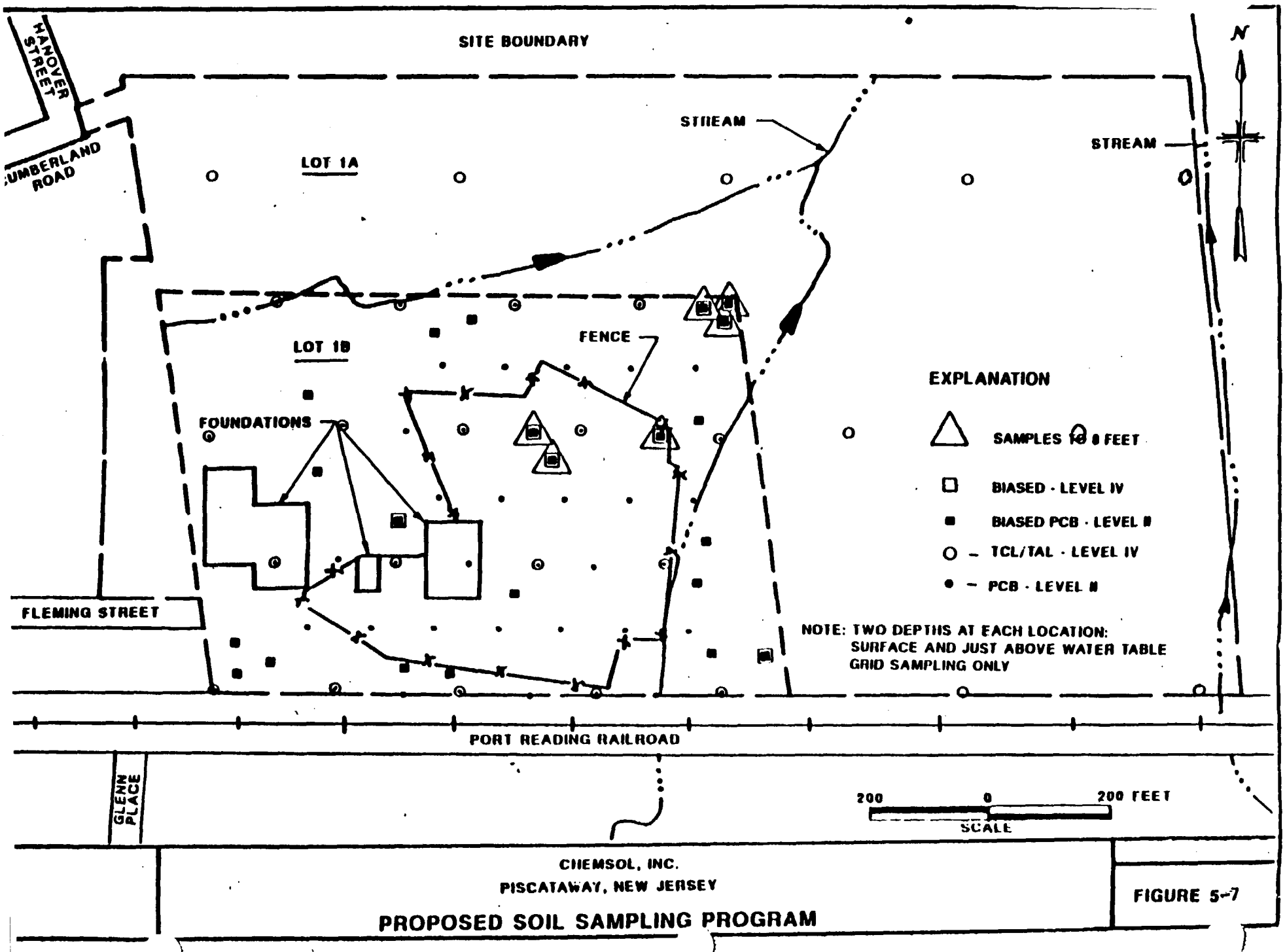
Soil samples will be analyzed for TCL/TAL by a CLP Laboratory as shown by the hollow circles on Figure 5-7. These soil samples correspond to a 400' staggered grid over the entire site, with additional sample locations forming a 200' staggered grid in Lot 1B.

Group B - Grid Sampling for Level II PCB Analysis

Soil samples will be analyzed for PCBs using a field screening device as shown by the small solid circles on Figure 5-7. These soil samples correspond to the 200' staggered grid described above for Lot 1B, with additional sample locations in Lot 1B forming a 100' staggered grid encompassing the fenced area of this Lot.

Group C - Biased Sampling for Level II PCB Analysis

Additional field screen locations have been selected in areas for which activity was observed in the EPIC photos and for which no previous sampling or excavations have occurred. These areas correspond to pools of standing liquid, disturbed ground or high activity as indicated by Figure 2-11. These biased locations are indicated by small solid squares on Figure 5-7.



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PROPOSED SOIL SAMPLING PROGRAM

FIGURE 5-7

An allowance of additional screening sample locations is made for areas that exhibit disturbed ground or staining in the field or in a 50' staggered grid around any locations (grid or biased) at which PCBs are detected. (These locations are not shown on Figure 5-7.)

Group D - Confirmatory Sampling of Group C Samples and Biased TCL/TAL Sampling

An allowance is made for one of every ten samples from Group C to be sent for TCL/TAL analysis for verification. Locations are not shown on Figure 5-7. In addition, biased samples will be sent for TCL/TAL analysis as indicated by hollow squares on Figure 5-7. Samples to 8 feet will also be collected in several locations as shown by triangles on Figure 5-7.

Group E - TCLP Analysis

Samples will be taken for full TCLP analysis. The locations will be determined based on the results of the field screening via PCB screening and using an HNU or PID and will be selected to represent high, medium, and low expected concentrations of contaminants. In the event that field screening does not provide the expected results, TCLP analyses will be conducted on samples taken from those areas previously exhibiting the highest levels of ground water/soil contamination.

Because the site has been razed, much of the soil has been bulldozed, trenched and graded. The surficial soil may not be representative of the original soil surface. In general, soil samples will be collected from two depths at each sampling location: 0-18 inches and immediately above the perched water zone. All samples for VOC analysis will be taken from 12-18 inches below ground level.

CLP protocols will be required for the chemical analyses of the soil samples with the appropriate quality assurance/quality control deliverables. Previous investigations have indicated the presence of PCBs, volatile organic compounds, semi-volatile compounds, and inorganic compounds. All samples will be analyzed for the Target Compound List (TCL) and the Target Analyte List (TAL) by a Contract Laboratory Program (CLP) laboratory.

Table 5-3 is a summary of the soil samples to be collected during the RI.

TABLE 5-4

SUMMARY OF PROPOSED SOIL SAMPLING

Sampling Group	No. Locations	No. Samples
GROUP A GRID SAMPLING, TCL/TAL LEVEL IV	28	56
GROUP B GRID SAMPLING, PCB LEVEL II	43	86
GROUP C BIASED SAMPLING, PCB LEVEL II SAMPLE LOCATION BASED ON EPIC PHOTOS OBSERVED STAINED OR DISTURBED GROUND (Allow) RESAMPLING IN 50' GRID AROUND AREAS WHERE SCREENING INDICATES PCBs PRESENT (Allow)	22 18	44 36
GROUP D CONFIRMATORY SAMPLING, TCL/TAL LEVEL IV CONFIRM (1/10) GROUP C BIASED SAMPLING BIASED SAMPLING TO 8'	8 8 6	8 16 6
GROUP E TCLP SAMPLES (Allow)	8	8
TOTAL TCL\TAL, LEVEL IV	50	86
TOTAL PCB, LEVEL II	83	166
TOTAL TCLP ANALYSIS	8	8

5.3.7 Surface Water Sampling (Task 3g)

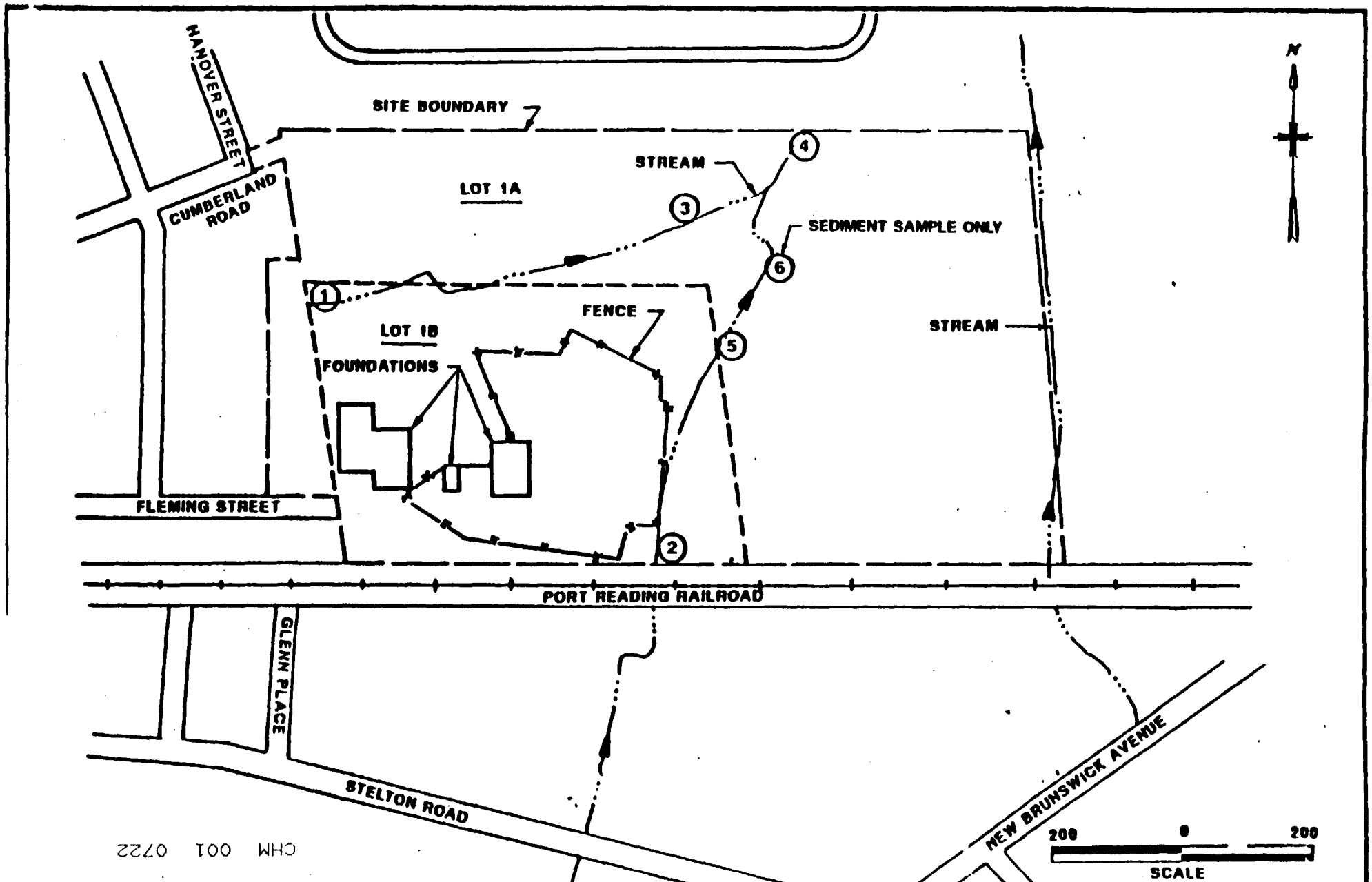
Seasonally, the Chemsol site contains ponded water and possible wetlands in several locations. In addition, two streams and a drainage ditch are present on the site. The presence of these surface water bodies suggests that complex surface water-ground water interactions may occur at the site.

The objective of the proposed surface water sampling is to determine whether site-generated contaminants have been transported to surface waters on and downgradient of the Chemsol site, causing conditions which may inhibit the growth and production of indigenous flora and fauna and act as a threat to human health.

It is proposed that 5 surface water samples each be collected during a period of high surface water flow (spring/early summer) and low surface water flow (late summer/fall); for base flow for a total of 10 samples, to determine whether there is any seasonal variation in contaminant concentrations. These locations will be surveyed. Proposed sampling locations are presented in Figure 5-8 and include the inlet and outlet locations of wetlands, the upgradient portions of the ditch and the stream along Lot 1B, as well as their two downgradient ends along the northern edge of the property boundary. As previously indicated, the stream along the eastern border of Lot 1A has been sampled as part of the FFS.

Surface water samples will be collected before the sediment samples are retrieved. Samples will be collected at mid-depth at each location. The samples will be collected with a Van Dorn water sampler or stainless steel dipper which will be decontaminated before each use. Each sample will be analyzed in the field for odor, pH, temperature, and specific conductivity. Each sample location will be photographed, described, assigned a unique identification number and marked with a fixed stake. Information to be recorded in the field notebook will include: time of sample collection, location, approximate water depth, field parameter data, and observed conditions which might impact the sample chemistry. All samples will be analyzed for TCL/TAL using CLP procedures. Detailed sampling procedures will be described in the SAP.

Based on the results of on-site sampling, EPA may perform additional off-site surface water and sediment sampling down gradient from the site.



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PROPOSED SURFACE WATER AND SEDIMENT SAMPLING LOCATIONS

FIGURE 5

Discharge-recharge relationships may change seasonally. To collect information on these relationships, surface waters and wetlands will be identified and mapped (described in detail in 5.3.9). The direction of flow, depth of water, and dimensions of the water courses will be determined for both periods of high flow (spring/early summer) and low flow (late summer/fall). Three staff gauges will be installed in the stream which flows north through the center of the site. Anticipated locations are adjacent to OW-4, OW-10 and OW-11. The elevations and locations of these gages will be surveyed and water elevations measured at least once during high and low flow periods, as well as whenever water levels are recorded in the monitoring wells.

5.3.8 Sediment Sampling (Task 3h)

The objective of the proposed sediment sampling is to determine if site-generated contaminants have been transported into surface water body sediment on and downgradient of the Chemsol site and are inhibitory to normal growth and production of indigenous flora and fauna. Sediment sampling will also enable an assessment of whether food-chain transfer via benthic infauna and rooted macrophytes represents a potential exposure route to other components of the ecosystem and a threat to human health. Sediment and surface water samples will be collected from the same locations.

Approximately six sediment samples each will be collected during periods of high surface water flow (spring/early summer) and low surface water flow (late summer/fall); for a total of 12 samples. The second round of samples, in conjunction with the surface water samples, will allow a determination of whether or not there is seasonal variation in concentrations due to runoff. Proposed sediment sampling locations are presented in Figure 5-8 and include the inlet and outlet locations of wetlands, the upgradient portions of the ditch and the stream along Lot 1B, as well as their two downgradient ends along the northern edge of the property boundary and a location in within the wetlands. The locations and number of sampling points may change, should any of these water bodies not exist or should other pertinent locations be identified. The locations of the sediment/surface water sampling stations will be surveyed.

At each location, a stainless steel hand core sampler will be used to collect the samples. Sampling equipment will be decontaminated before sampling at each location. At each station, a 12-inch sediment core will be obtained, if possible. To identify the zone of contamination, two sediment samples will be prepared from each core (0-6 and 6-12 inches)

and submitted for laboratory analysis for TCL and TAL parameters. In addition to TCL/TAL analysis, sediment samples collected from wetland locations will be analyzed for total organic carbon (TOC) and grain size. The analyses will be performed using the Contract Laboratory Program (CLP).

Each core sample will be photographed, described and assigned a unique identification number. The EPA will be provided with a copy of all photographs. Information to be recorded in the field notebook will include the time of sample collection, location, approximate depth, stratigraphy, and climatological and other observed conditions which might impact the chemistry of the sample. The amount of compaction of the core will also be estimated based on the adhered material in the core liner. Estimation of compaction is necessary to duplicate the correct depth intervals if necessary. Detailed sampling procedures will be described in the SAP.

5.3.9 Wetlands Delineation (Task 3i)

An Ecological Investigation of the 40-acre Chemsol property and surrounding properties will be conducted to characterize existing on-site conditions relative to vegetation community structure, wildlife utilization and sensitive resources such as surface waters and wetlands. This investigation will identify discernable contaminant pathways and biological/ecological related ARARs. This information, together with surface and ground water data will be used to assess potential adverse effects resulting from identified on-site contaminants and also to assess the ecological effects/impacts of proposed remedial alternatives.

To achieve these goals, surface waters and wetlands will be defined and identified, vegetation patterns and those areas suitable for wildlife habitat will be identified and mapped. Additional biological studies are not planned at this time (i.e. sampling of vegetation and animal tissues). If significant soil and/or ground water contamination are found on the site and/or ground water discharges to wetlands or other sensitive habitats, further biological data will be collected to enable a more quantitative Ecological Risk Assessment.

A review of existing available site data and base mapping will be conducted for the purpose of identifying the characteristics of known contaminants and their potential pathways of exposure and ARARs. Data that will be acquired and reviewed include U.S.

Geological Survey (USGS) and National Wetland Inventory (NWI) mapping, the Soil Survey of Middlesex County, and aerial photography. It should be noted that the U.S. Fish and Wildlife Service has indicated that the federally threatened plant species Helonias bullata (swamp pink) is documented to exist in forested wetlands approximately 6 miles from the site. EPA will conduct a survey to determine whether swamp pink exists at the site.

Biological data will be collected for the purpose of identifying and mapping on-site ecological conditions to determine impacts and possible pathways of contaminants. Pathways leading off-site will be investigated to identify the receiving body of possible contaminants. In the event that on-site contaminants are found to be migrating off-site, pathways and potential receptor sites (e.g., drainage basins, wetlands, water bodies) will be identified. As part of the off-site biological investigation, USGS topographic maps and National Wetland Inventory (NWI) mapping will be used to identify potential off-site receptors in the areas adjacent to and down-gradient of the site. The following areas will be observed and map-located: water bodies, wetlands, open space (e.g., parks, playgrounds, undeveloped lands) and habitat for threatened and endangered species. The resulting data would be used to compare off-site environmental conditions to conditions on-site.

In summary:

- Surface waters and wetlands on-site will be identified and map-located. Because overland surface flow is a potential pathway for transporting and depositing contaminants, streams/drainage courses will be identified. The direction of flow, depth of water, dimensions of the water course, and areas of deposition will also be noted. Wetlands will be formally delineated using the currently recognized Federal Manual for Identifying and Delineating Jurisdictional Wetlands. Data on vegetation, soils, and hydrology will be recorded on the appropriate data forms, wetlands will be identified on site mapping and classified as to type.

- Vegetation patterns will be mapped, plant species identified, and percent areal cover determined for each vegetational stratum. Vegetational communities providing wildlife habitat will be noted and indicated on a site map. In addition, based on New Jersey Fish and Wildlife data for the area, wildlife species likely to utilize specific area vegetational communities will be identified. These data will be used to conduct a comparative assessment of similar vegetational communities found off-site in the Piscataway Plain, if present.

- Wildlife observations will be recorded. Data collected will include the numbers of individuals observed, species utilization of the site (i.e., foraging, nesting, migratory stopper), and species utilization of vegetational stratum (i.e. open field, shrub/scrub, wooded).

The qualitative analyses of the field study outlined above for this ecological investigation will be used to determine the future need for quantitative data. An evaluation of potential biological effects of on-site remediation may demand additional quantitative data. This may require sampling and analysis to determine the extent and concentration of contaminants in biologic tissue or specific on-site media as well as their potential adverse effects on the biological community.

While conducting the wetland delineation, observational information for application of the U.S. Army Corps of Engineers Wetlands Evaluation Technique (WET), Version 2.0. will be collected to assess baseline functional values of on-site wetlands. In the event remedial activities will impact wetlands, the baseline values will be utilized to develop a wetland restoration plan.

5.3.10 Air Monitoring/Sampling (Task 3j)

Odors were recently noted on-site during the remedial investigation studies. The location of the odor is reported to be in the southeast corner of the fenced in portion of Lot 1B. The chemical constituents of odor are unknown at this time. The suspect list of chemicals includes the VOCs and SVOCs found during on-site environmental investigations conducted to date.

An ambient air sampling study is proposed to evaluate the chemical constituents in the ambient air around the reported source of the odors at the southeastern corner of the fenced portion of Lot 1B.

The objectives of this proposed ambient air quality monitoring study are to:

- collect information on the present composition of chemical constituents in the ambient air around the reported source of the odors;
- compare the compound specific air sampling results with appropriate odor threshold values and ambient guideline concentrations.

Air samples will be collected at four on-site locations and three off-site locations. Each of the four on-site locations will be located at the edge of the area which is the reported source of the odors. The four locations will be oriented approximately 90 degrees apart. Two of the off-site locations will be approximately one-quarter mile upwind and downwind of the reported odor source area. In addition, one off-site location will be at a selected receptor site. This receptor point will be at the closest sensitive location to the site fence line. The residences adjoining the site will be considered for this monitoring location (to be described in the SAP).

Correlation of air composition at each location with wind direction will provide information which will be useful to determine the source of various compounds. Information generated by the on-site sampling locations will indicate whether detected compounds might originate at off-site sources. Sampling at a selected off-site receptor will provide information on the compounds present in the ambient air at the receptor site during the periods of sampling.

Ambient air grab samples will be collected in Summa canisters. The sample collection method consists of opening the shutoff valve on the Summa canisters, which are under vacuum, thereby allowing ambient air to enter the canister. A sampling averaging period of eight hours will be used. The samples will be sent to a qualified laboratory for analysis to be conducted by gas chromatograph/mass spectrometer (GC/MS). The samples will be analyzed using EPA Method TO14 for volatile organic compounds.

There will be two separate rounds of sample collection. Samples will be collected during meteorological conditions which might be expected to maximize site odors. These conditions include: falling barometric pressure; wind speeds less than 15 miles per hour, and minimal precipitation.

Field observations will include: monitoring for hydrogen sulfide (H_2S) with an H_2S meter; monitoring for VOCs with a PID; measuring wind speed with an anemometer; determining wind direction with a compass; measuring temperature with a thermometer, and measuring atmospheric pressure with a barometer.

QA/QC procedures will include:

- collecting and analyzing a duplicate on-site Summa canister sample during each sampling round;
- selecting a qualified air laboratory to perform the analysis;
- requiring proper cleaning and handling of the Summa canisters during each sampling round;
- performing vacuum checks of canisters;
- providing for proper calibration and operation of the H_2S meter and the PID during the study period; and
- providing chain-of custody forms for handling of canisters.

Because the summa canister are in a vacuum prior to sampling, TMP blanks and field blank cannot be obtained. The focus of the air sampling effort is sample collection and analysis for VOCs. Although some SVOCs have been found on-site, sampling for them has not been included at this time due to difficulties associated with sample collection and analysis of these compounds. Also, semi-volatiles have low vapor pressures and are less likely to become airborne at detectable concentrations.

5.3.11 Human Populations and Land Use Investigations (Task 3k)

For the purpose of the site health risk assessment, local demographic and land use data will be compiled from available data bases and updated, if appropriate. The information will be evaluated to delineate potential receptors and exposure pathways.

Information on the size, location and characteristics of the human population living within a one-half to three-mile radius of the Chemsol site will be collected from U.S. Census Bureau reports and/or computer files and reports prepared by the Middlesex County Planning Board. Site observations within the area will be conducted to ascertain proximity to and likely human contact with contaminated media.

A Stage I Cultural Resources Survey in accordance with the EPA Region II CERCLA/SARA Review Manual, Section 2.4, will be conducted to determine the presence of cultural or historical resources on the Chemsol site or in the immediate vicinity of the site. This survey is the appropriate level of an initial study for eventual compliance with the national Historic Preservation Act (NHPA), and should determine the presence or absence of any known cultural resources, and whether further investigation within the area impacted by remedial action alternatives is necessary.

5.4 TASK 4 - DATA VALIDATION

Data generated by CLP laboratories will be validated using EPA's Contract Laboratory Program Standard Operating Procedures HW-2 and HW-4, as well as internal contractor data validation guidelines.

Environmental samples will be analyzed through the EPA CLP RAS and SAS and will be subjected to a laboratory testing and data validation program. The data validation portion of the program will conform with the EPA Region II procedures and will verify that the analytical results were obtained following the specified protocols and are of sufficient quality to be relied upon in performing the risk assessment, screening and selecting potential remedial action alternatives, and supporting a Record of Decision (ROD).

Samples collected during the field investigation and analyzed through the CLP will be validated using the following EPA Region II procedures:

- CLP Organics Data Review and Preliminary Review, SOP No. HW-2, Revision No. 7, March 1990 (EPA Region II, 1990)
- Evaluation of Metals Data for the CLP, SOP No. HW-2, Revision No. 10, February, 1990 (EPA Region II, 1990)

Validation of analytical data will be conducted by trained and certified personnel. The results of the data validation will be presented as Appendices to the RI report. Additional information on sample collection, analytical parameters and methods, detection limits, and QA/AC samples will be described in the SAP.

Sample tracking consists of the arrangements for allocating testing with the CLP or with other laboratories. The task includes assuring proper documentation and transport of field samples to the laboratories, correspondence with organizations dealing with the sampling, and assembly of analytical results as they are received.

Sample tracking will include the following activities:

- Scheduling the CLP analytical services with the Regional Sample Control Center (RSCC)
- Interacting with the RSCC, the Sample Management Office (SMO), field personnel and others involved in the sample collection and analysis
- Organizing analytical results as they are received
- Selecting procedures to be used by laboratories providing SAS service

5.5 TASK 5 - DATA EVALUATION

Data collected during prior sampling programs and data from this Remedial Investigation will be assembled, reviewed, and carefully evaluated to satisfy the objectives of the investigation. When possible, the data evaluation task will be performed concurrently with Tasks 3, 4, and 6, with the goal of preparing the Remedial Investigation Report (Task 8).

The data collected to characterize the site will be organized and analyzed to identify the nature and extent of contamination, determine ground water flow direction(s), and identify potential on-site source(s) of the contaminants. Field data and data resulting from laboratory analysis will be entered into a data base. Boring logs will be prepared for all completed borings, and stratigraphic information developed from the site borings will be displayed as cross sections or fence diagrams of the site. Synoptic water level elevations measured at the wells will be used to develop plot(s) of the piezometric surface in the aquifer. Both the horizontal and vertical hydraulic gradients will be determined as appropriate. If necessary, elevations will be corrected for pumping effects observed during long-term water level monitoring.

The water quality data will be evaluated and mapped to illustrate the areal extent of contaminants detected. Field permeability characteristics will be evaluated. The breakdown products of contaminants detected will be considered to help evaluate potential sources of the contaminants and their environmental behavior.

Maps of the data from the previous sampling programs and from this Remedial Investigation will be prepared for each medium sampled (i.e., soil, biota, sediments, surface water) to assist in the analysis. Tables comparing the results of the various phases of the Remedial Investigation will be prepared and evaluated. Where differences are observed, field and laboratory procedures, the passage of time and other factors will be evaluated to try to account for the differences. The results of the evaluation will be discussed in the Remedial Investigation Report.

5.6 TASK 6 - HEALTH RISK AND ENVIRONMENTAL ASSESSMENT

A baseline human health and environmental risk assessment will be conducted to determine the extent to which chemicals present at the site may endanger public health and the environment. Actual or potential human and environmental exposure to site-related chemicals, currently and in the future, will be evaluated in the absence of any remedial action. As such, the assessment will establish baseline conditions representative of the No-Action remedial alternative.

The assessment will utilize guidance prepared by the EPA in their Risk Assessment Guidance for Superfund Volumes I and II.

The public health and environmental risk assessments will each be comprised of a number of similar components. The intent and technical approach for each component for each assessment are briefly described in the following sections.

5.6.1 Human Health Evaluation (Task 6a)

The human health evaluation comprises the following five components:

Hazard Assessment

Chemical contamination detected in all environmental media during the RI and previous investigations will be evaluated for selection for detailed analysis in subsequent assessments. The evaluation will consider the media contaminated, contaminant concentrations, the frequency of detection, the environmental fate and transport characteristics of each contaminant and the likelihood of contacting human or environmental receptors. ARARs will be tabulated and compared to the environmental data. Chemicals of potential concern, representative of the types of contaminants present at the site will be selected for detailed evaluation of human health risk. These will include potentially cancer-causing and noncarcinogenic chemicals.

Toxicity Assessment

Critical evaluation and interpretation of toxicological data for the chemicals of potential concern will be provided. The intent is to indicate the intrinsic toxicity of the chemical, i.e., its ability to pose potential hazards to human health. Brief toxicity profiles will be prepared for chemicals of potential concern found to pose significant risk. The profiles will summarize the scientific literature on the following topics: acute toxicity, chronic toxicity including systemic toxic effects, carcinogenicity, mutagenicity, teratogenicity, and reproductive effects. For potentially cancer causing chemicals, the evidence supporting such a classification will be noted and the derivation of the carcinogenicity potency estimates will be summarized.

Human and environmental health-based standards and criteria will be tabulated as appropriate, for later risk characteristics.

Exposure Assessment

Exposure assessments will be conducted to identify actual or potential pathways of human exposure, characterize potentially exposed human populations, and where possible, quantify the exposure of affected populations. Actual or potential exposure pathways, identified by a source and mechanism of chemical release, an environmental transport medium, a point of potential contact, and an exposure route, will be evaluated in the exposure assessment. An inclusion/exclusion analysis and supporting rationale will be included for each pathway.

Pending the analysis of the analytical data, estimates of exposure point concentrations of the chemicals of potential concern will be determined. The estimates may derive from numerical relationships between the chemical properties and medium-specific environmental concentrations of the contaminants, simplified screening model estimates or more complex numerical modeling. Such determinations will involve detailed analysis of the environmental fate and transport processes operable for each contaminant.

Potentially exposed populations will be characterized with the intent of determining whether there is potential for casual contact or intake of chemical contaminants. This characterization will include estimates of the numbers and ages of people potentially exposed at each exposure point and identification of human activity patterns which may influence exposure.

Exposure scenarios will be constructed to quantify actual or potential exposure levels to human receptors; the scenarios will use standard assumptions of human intake. A Reasonable Maximum Exposure (RME) case will be evaluated for each pathway; parameters and assumptions used for the RME case will be selected to provide reasonable estimates of exposure and yet not underestimate exposure. All parameters and assumptions will be documented, where possible, by reference to the scientific literature.

Risk Characterization

Information from the toxicity assessment and the exposure assessment will be integrated in this step to determine the likelihood, nature and magnitude of adverse human health effects posed by the site. The risk characterization will include an evaluation of carcinogenic and noncarcinogenic human health risk. Regulatory standards and criteria will form the basis for the evaluation of human health risks associated with exposure to chemicals at the levels estimated in the exposure assessment. Human health risks associated with exposure to both individual contaminants and contaminant mixtures will be evaluated. Uncertainty inherent in environmental sampling and analysis, toxicity assessment and exposure assessment will be discussed, as will the sensitivity of the assessment to key parameters and assumptions regarding toxicity, environmental fate and transport, and human exposure.

5.6.2 Environmental Assessment (Task 6b)

To evaluate terrestrial environmental impacts, published information concerning the toxicity of various chemical constituents to terrestrial organisms will be considered in tandem with observations and inventories of biota made during the ecological evaluation. If warranted, concentrations of contamination in on-site contaminated matrices will be extrapolated to probable contaminant concentrations at or within the organism (i.e., extrapolation allowing for dilution, organism uptake, bioaccumulation). Technical guidance needed to determine the level of detail to characterize ecological risks will be consistent with EPA's Risk Assessment Guidance for Superfund, Volume II, Environmental Evaluation Manual, 1989.

An Environmental Assessment (EA) will be performed to evaluate potential impacts of site-generated pollutants to organisms and their respective habitats, both on-site and in the vicinity of the site. Specific guidance provided in the aforementioned EPA document will be employed in the implementation of the EA.

Where possible, existing quantitative data on pollutant concentrations, population size, density, dominance and diversity will be utilized for the site. Background ecological data for the site will be obtained from state and federal agencies, as well as from field observations.

5.7 TASK 7 - TREATABILITY STUDIES/PILOT TESTING

A treatability study on ground water from well TW-5 was conducted during the FFS. The results of that study are included in the FFS Report (July 1991) and will be incorporated into the FS report. Additional pilot studies may be conducted on soils, depending on the technologies undergoing detailed evaluation. These are not included as a task at this time.

5.8 TASK 8 - PREPARATION OF REMEDIAL INVESTIGATION REPORT

A draft Remedial Investigation (RI) Report will be prepared and submitted to the EPA for review. The report will follow the latest EPA formats as described in the EPA 1988 draft "Interim Final Guidance for Conducting Remedial Investigations and Feasibility

Studies Under CERCLA". A draft outline of the report is shown in Table 5-4. This outline should be considered a draft and subject to revision, based on the data obtained. The report will include discussion of the data from the previous sampling programs as well as the data and analyses performed as part of this RI.

When the draft RI report is completed, it will be submitted to the EPA for review and comment. Following receipt of all EPA written comments, the report will be revised and an amended report will be submitted to EPA. When the EPA determines that the report is acceptable, the report will be deemed the Final RI Report.

5.9 TASK 9 - IDENTIFICATION AND SCREENING OF REMEDIAL ALTERNATIVES

After data from the existing data base and those collected during the RI are evaluated, the preliminary remedial action objectives will be refined and developed or, if appropriate, eliminated. Based on the established remedial response objectives and the results of the risk assessment (Task 6), the initial screening of remedial alternatives will be performed according to the procedures recommended in "Interim Final Guidance for Conducting RI/FS under CERCLA" (EPA, October 1988).

This Work Plan includes a preliminary identification and discussion of alternatives, although the process of identifying and screening potential alternatives will be ongoing throughout the RI, as new technological and/or site-specific data emerge. The subtasks comprising Task 9 will accomplish the following objectives:

- Development of remedial response objectives and general response actions
- Identification and screening of remedial technologies and process options
- Development and screening of remedial alternatives

5.9.1 Development of Remedial Action Objectives and General Response Actions

Based on the data collected in the RI along with other existing data, the remedial action objectives will be developed. Prior to the development of these objectives, any significant site problems and contaminant pathways will be identified. Considering these problems and pathways, the remedial response objectives that would eliminate or minimize substantial risks to public health and the environment will be developed further. ARARs will be refined by considering site-specific conditions. Based on the response objectives,

TABLE 5-4
PROPOSED RI REPORT FORMAT

1.0 Introduction
- 1.1 Purpose of Report
- 1.2 Site Background
  - 1.2.1 Site Description
  - 1.2.2 Site History
  - 1.2.3 Previous Investigations
- 1.3 Report Organization

2.0 Study Area Investigation
- 2.1 Surface Features (topographic mapping, etc.) (natural and manmade features)
- 2.2 Contaminant Source Investigations
- 2.3 Meteorological Investigations
- 2.4 Surface Water and Sediment Investigations
- 2.5 Geological Investigations
- 2.6 Soil and Vadose Zone Investigation
- 2.7 Ground Water Investigation
- 2.8 Human Population Surveys
- 2.9 Ecologic Investigation

3.0 Physical Characteristics of Chemsol
- 3.1 Topography
- 3.2 Meteorolgy
- 3.3 Surface Water and Sediment
- 3.4 Geology
- 3.5 Hydrogeology
- 3.6 Soils
- 3.7 Biota and Environmental Resources
- 3.8 Air Quality
- 3.9 Demographics and Land Use

4.0 Nature and Extent of Contamination
- 4.1 Sources of Contamination
- 4.2 Soils
- 4.3 Groundwater
- 4.4 Surface Water and Sediments
- 4.6 Air

5.0 Contaminant Fate and Transport
- 5.1 Routes of Migration
- 5.2 Contaminant Persistence
- 5.3 Contaminant Migration

6.0 Baseline Risk Assessment
- 6.1 Public Health Evaluation
  - 6.1.1 Exposure Assessment
  - 6.1.2 Toxicity Assessment
  - 6.1.3 Risk Characterization
- 6.2 Environmental Assessment

7.0 Summary and Conclusions
- 7.1 Source(s) of Contamination
- 7.2 Nature and Extent of Contamination
- 7.3 Fate and Transport
- 7.4 Risk Assessment
- 7.5 Data Limitations and Recommendations for Future Work
- 7.6 Recommended Remedial Action Objectives

Appendices
- Boring Logs
- Hydrogeologic Data
- Analytical Data/QA/QC Evaluation Results
- Risk Assessment Models
- Toxicity Profiles

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general response actions will be delineated to address each of the site problem areas. These response actions will form the foundation for the screening of remedial technologies. General response actions considered will include the No-Action alternative as a baseline against which all other alternatives can be compared.

5.9.2 Identification of Applicable Technologies/Process Options and Development of Alternatives

Based on the remedial action objectives and each identified general response action, potential treatment technologies and their associated containment or treatment and disposal requirements will be identified. A prescreening of these potential treatment technologies for suitability as part of a remedial alternative will be conducted. Where several process options exist for a particular technology (e.g., rotary kiln, infrared or circulating bed combustion), the process option for which most data exist and whose capacities/constraints most closely match site conditions will be selected for further detailed evaluation.

Technologies that could prove extremely difficult to implement might not achieve the remedial objective in a reasonable time, or might not be applicable or feasible based on the site-specific conditions and will be eliminated from further consideration. A preliminary identification of technologies has been completed and the results can be found in Section 3.0. However, this preliminary identification will be finalized based on the results of the RI and the established remedial response objectives. The revised list of potential remedial technologies/alternatives will be developed as part of Task 9. The development of alternatives requires combining appropriate remedial technologies in a manner that will satisfy the established response objectives and refining them according to the results of the RI.

As required by SARA, alternatives will be developed in each of the following categories:

- An alternative for treatment that would eliminate, or minimize to the extent feasible, the need for long-term management (including monitoring) at the site
- Alternatives that would use treatment as a primary component of an alternative to address the principal threats at the site

- An alternative that relies on containment with little or no treatment, but is protective of human health and the environment by preventing potential exposure and/or by reducing mobility
- A No-Action alternative

5.9.3 Screening of Remedial Alternatives

The list of potential remedial alternatives developed above will be screened. The objective of this effort is to reduce the number of technologies and alternatives for further analysis while preserving a range of options. This screening will be accomplished by evaluating alternatives on the basis of effectiveness, implementability and cost as specified in the most recent EPA guidance document (EPA, 1988). These screening criteria are briefly described below:

Effectiveness Evaluation

The effectiveness evaluation will consider the capability of each remedial alternative to protect human health and the environment. Each alternative will be evaluated as to the protection it would provide, and the reductions in toxicity, mobility or volume of contaminants it would achieve.

Implementability Evaluation

The implementability evaluation will be used to measure both the technical and administrative feasibility of constructing, operating and maintaining a remedial action alternative. In addition, the availability of the technologies involved in a remedial alternative will be considered.

Innovative technologies will be considered throughout the screening process if there is a reasonable belief that they offer potential for better treatment performance or implementability, few or lesser adverse impacts than other available approaches, or lower costs than demonstrated technologies.

Cost Evaluation

Cost evaluation will include estimates of capital costs, annual operation and maintenance (O&M) cost, and present worth analysis. These conceptual cost estimates are order-of-magnitude estimates, and will be prepared based on:

- Preliminary conceptual engineering for major construction components
- Unit costs of capital investment and general annual operation and maintenance costs available from EPA documents (EPA, 1985c and EPA, 1985d) and from contractor in-house files

5.10 TASK 10 - DETAILED EVALUATION OF REMEDIAL ALTERNATIVES

The remedial alternatives that pass the initial screening will be further evaluated. The evaluation will conform to the requirements of the NCP and will consist of a technical, environmental and cost evaluation, as well as an analysis of other factors, as appropriate. The detailed evaluation will follow the process specified in the "Interim Guidance for Conducting RI/FS under CERCLA" (EPA, October 1988).

In the guidance, a set of nine evaluation criteria have been developed that are to be applied in the evaluation of each Remedial Alternative. A brief description of each criterion is provided:

Short-Term Effectiveness

This criterion addresses the effects of the alternative during the construction and implementation phase until the remedial actions have been completed and the selected level of protection has been achieved. Each alternative is evaluated with respect to its effects on the community and on-site workers during the remedial action, environmental impacts resulting from implementation, and the amount of time until protection is achieved.

Long-Term Effectiveness

This criterion addresses the results of a remedial action in terms of the risk remaining at the site after the response objectives have been met. The primary focus of this evaluation is to determine the extent and effectiveness of the controls that may be required to manage the risk posed by treatment residuals and/or untreated wastes. The factors to be evaluated include the magnitude of remaining risk (measured by numerical standards

such as cancer risk levels), and the adequacy, suitability and long-term reliability of management controls for providing continued protection from residuals (i.e., assessment of potential failure of the technical components).

Reduction of Toxicity, Mobility, or Volume

This criterion addresses the statutory preference for selecting remedial actions that employ treatment technologies that permanently and significantly reduce toxicity, mobility or volume of the contaminants. The factors to be evaluated include the treatment process employed, the amount of hazardous material destroyed or treated, the degree of reduction expected in toxicity, mobility or volume, and the type and quantity of treatment residuals.

Implementability

This criterion addresses the technical and administrative feasibility of implementing an alternative and the availability of various services and materials required during its implementation. Technical feasibility considers construction and operational difficulties, reliability, ease of undertaking additional remedial action (if required), and the ability to monitor its effectiveness. Administrative feasibility considers activities needed to coordinate with other agencies (e.g., state and local) in regard to obtaining permits or approvals for implementing remedial actions.

Cost

This criterion addresses the capital costs, annual operation and maintenance costs, and present worth analysis.

Capital costs consist of direct (construction) and indirect (nonconstruction and overhead) costs. Direct costs include expenditures for the equipment, labor and material necessary to perform remedial actions. Indirect costs include expenditures for engineering, financial and other services that are not part of actual installation activities but are required to complete the installation of remedial alternatives.

Annual operation and maintenance costs are post-construction costs necessary to ensure the continued effectiveness of a remedial action. These costs will be estimated to provide an accuracy of +50 percent to -30 percent.

A present worth analysis is used to evaluate expenditures that occur over different time periods by discounting all future costs to a common base year, usually the current year. This allows the cost of remedial action alternatives to be compared on the basis of a single figure representing the amount of money that would be sufficient to cover all costs associated with the remedial action over its planned life.

Compliance With ARARs

This criterion is used to determine how each alternative complies with applicable or relevant and appropriate Federal and State requirements, as defined in CERCLA Section 121.

Overall Protection of Human Health and the Environment

This criterion provides a final check to assess whether each alternative meets the requirement that it is protective of human health and the environment. The overall assessment of protection is based on a composite of factors assessed under the evaluation criteria, especially long-term effectiveness and permanence, short-term effectiveness, and compliance with ARARs.

State Acceptance

This criterion evaluates the technical and administrative issues and concerns the state may have regarding each of the alternatives. The factors to be evaluated include those features of alternatives that the state supports, reservations of the state, and opposition of the state.

Community Acceptance

This criterion incorporates public concerns into the evaluation of the remedial alternatives. Often, community (and also state) acceptance cannot be determined during development of the RI/FS. Evaluation of these criteria is postponed until the RI/FS report has been released for state and public review. These criteria are then addressed in the ROD and the responsiveness summary.

After each of the remedial alternatives has been assessed against the evaluation criteria, a comparative analysis will be performed. This analysis will compare all of the remedial alternatives against each other for each of the evaluation criteria.

5.11 TASK 11 - PREPARATION OF FEASIBILITY STUDY REPORT

An FS report will be prepared to summarize the activities performed and to present the results and associated conclusions for Tasks 1 through 10. The report will include a summary of a description of the initial screening study process and the detailed evaluations of the remedial action alternatives studied. The FS report will be prepared and presented in the format specified in "Interim Final Guidance for Conducting RI/FS under CERCLA" (EPA, October 1988).

The FS Report will be comprised of an executive summary and four sections. The executive summary will be a brief overview of the FS and the analysis underlying the remedial actions that were evaluated.

The FS will contain the following four sections:

- Introduction and Site Background
- Identification and Screening of Remedial Technologies
- Development and Initial Screening of Remedial Alternatives
- Description and Detailed Analysis of Alternatives

A discussion of each component is presented below. The format used to develop the FS report is presented in Table 5-5.

The introduction will provide background information regarding site location and facility history and operation. The nature of the problem, as identified through the various studies, will be presented. A summary of hydrogeological conditions, remedial action objectives, nature and extent of contamination, and risk assessment addressed in the RI Report will also be provided.

The feasible technologies and process options for site remediation will be identified for each general response action, and the results of the remedial technologies screening will be described. Remedial alternatives will be developed by combining the technologies identified in the previous screening process. The results of the initial screening of remedial alternatives, with respect to effectiveness, implementability and cost, will be described.

TABLE 5-5
PROPOSED FS REPORT FORMAT

1.0 Introduction
- 1.1 Purpose and Organization of Report
- 1.2 Site Description and History
- 1.3 Site
- 1.4 Source(s) of Contamination
- 1.5 Nature and Extent of Contamination
- 1.6 Contaminant Fate and Transport
- 1.7 Baseline Risk Assessment

2.0 Identification and Screening of Technologies
- 2.1 Remedial Action Objectives for each Medium
  - Contaminants of Interest
  - Allowable Exposure Based on Risk Assessment
  - Allowable Exposure Based on ARARs
  - Development of Remedial Action Objectives
- 2.2 General Response Actions for Each Medium
  - Areas of Volumes to Which Treatment
  - Containment
  - Technologies
- 2.3 Screening of Technology and Process Option for Each Medium
  - 2.3.1 Description of Technologies
  - 2.3.2 Evaluation of Technologies
  - 2.3.3 Screening of Alternatives
  - Effectiveness
  - Implementability
  - Cost

3.0 Development of Alternatives
- 3.1 Development of Alternatives for Each Medium
- 3.2 Screening of Alternatives
  - 3.2.1 Alternative 1
  - 3.2.2 Alternative 2
  - 3.2.3 Alternative 3

4.0 Detailed Analysis of Alternatives
- 4.1 Description of Evaluation Criteria
  - Short-Term Effectiveness
  - Long-Term Effectiveness and Permanence
  - Implementability
  - Reduction of Mobility, Toxicity, or Volume Through Treatment
  - Compliance with ARARs
  - Overall Protection
  - Cost
  - State Acceptance
  - Community Acceptance
- 4.2 Individual Analysis of Alternatives
  - 4.2.1 Alternative 1
  - 4.2.2 Alternative 2
  - 4.2.3 Alternative 3
- 4.3 Comparative Analysis
- 4.4 Summary

A detailed description of the cost and non-cost features of each remedial action alternative passing the initial screening of the previous section will be presented. A detailed evaluation of each remedial alternative with respect to each of the evaluation criteria will be presented. A comparison of these alternatives will also be presented.

6.0 COSTS AND KEY ASSUMPTIONS

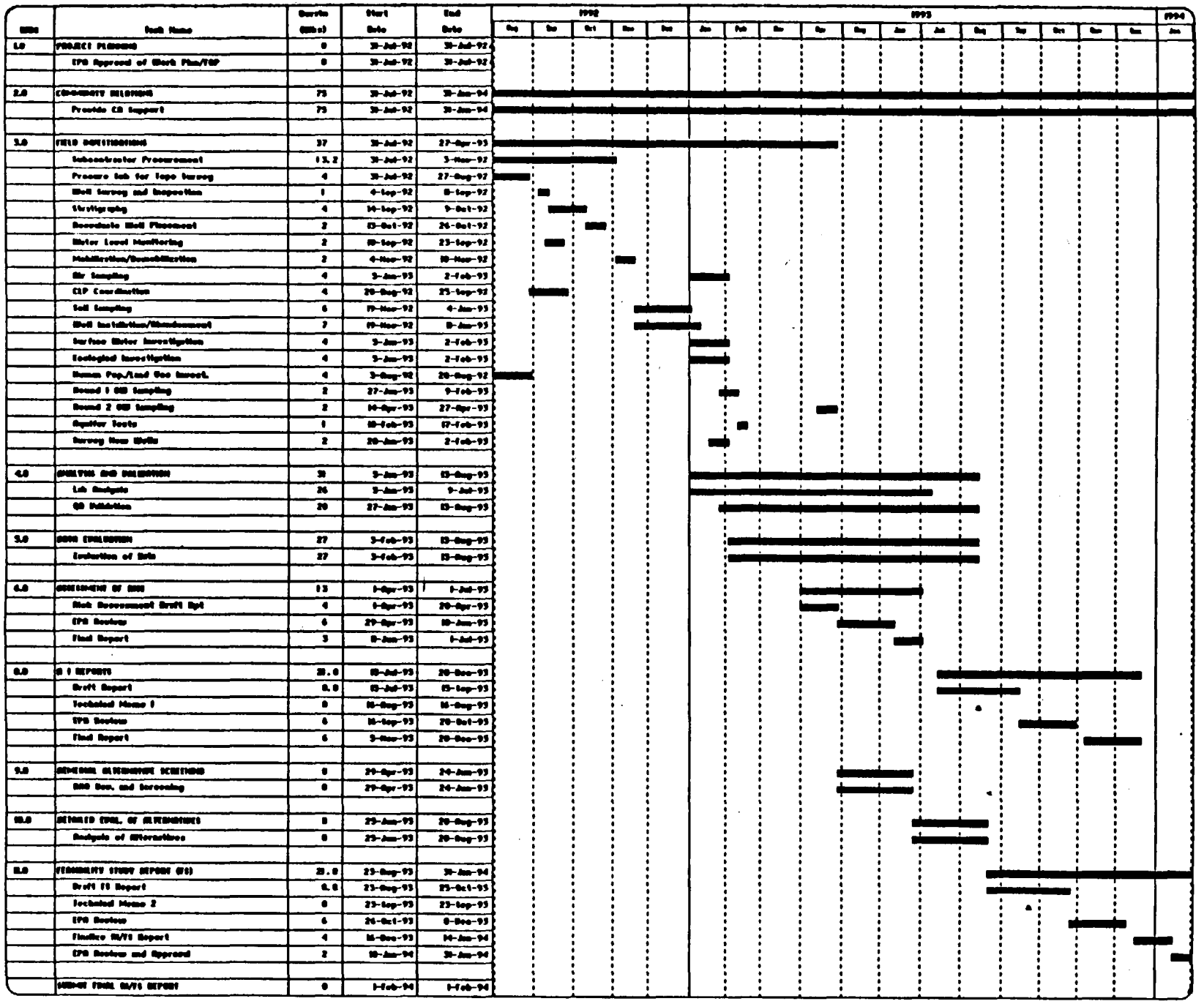
Cost estimates for conducting the Chemsol RI/FS, along with detailed assumptions, are submitted as Volume 2 of this Work Plan. The cost breakdown is comparable to the breakdown of activities as shown on the project schedule which is discussed in Section 7.0. Costs are provided for the RI/FS activities discussed under Tasks 1 through 11. The cost estimate does not include analysis of samples. All analyses will be conducted through the EPA CLP.

7.0 PROJECT SCHEDULE

The project schedule for the Chemsol RI/FS is presented on Figure 7-1. The schedule presents the time required for completion of the Final RI/FS from the date of EPA Work Plan approval. The schedule for this project is based on assumptions which include the following:

- The schedule is based on a six-week period for EPA review of the draft RI and FS reports;
- Timely access to the site will be procured by the EPA as required;
- Contractual requirements (such as timely approval of subcontracts) are authorized by the EPA; and
- Timely receipt of analytical data from the CLP laboratory.

As the project proceeds, progress will be monitored against the schedule and deliverable due dates, with update of the schedule as necessary. The task numbering system for the RI/FS effort is described in Section 5 of this Work Plan. Each of these tasks has been scheduled and will be tracked separately during the RI/FS work. If a delay occurs or is anticipated, available methods to maintain the overall project schedule will be developed. Progress meetings will be held, as needed, to evaluate project status, discuss current items of interest, and review major deliverables.



WBS	Task Name	Duration (Wks)	Start Date	End Date
1.0	PROJECT PLANNING	0	30-Jul-92	30-Jul-92
	EPA Approval of Work Plan/FSP	0	30-Jul-92	30-Jul-92
2.0	COMMUNITY RELATIONS	75	30-Jul-92	30-Jun-94
	Provide CR Support	75	30-Jul-92	30-Jun-94
3.0	FIELD INVESTIGATIONS	37	30-Jul-92	27-Apr-93
	Subcontractor Procurement	13.2	30-Jul-92	3-Nov-92
	Procure Sub for Tape Survey	4	30-Jul-92	27-Aug-92
	Well Survey and Inspection	1	4-Sep-92	8-Sep-92
	Stratigraphy	4	14-Sep-92	9-Oct-92
	Groundwater Well Placement	2	13-Oct-92	26-Oct-92
	Water Level Monitoring	2	10-Sep-92	23-Sep-92
	Mobilization/Demobilization	2	4-Nov-92	18-Nov-92
	Air Sampling	4	5-Jan-93	2-Feb-93
	CLP Coordination	4	28-Aug-92	25-Sep-92
	Soil Sampling	6	19-Nov-92	4-Jan-93
	Well Installation/Abandonment	7	19-Nov-92	8-Jan-93
	Surface Water Investigation	4	5-Jan-93	2-Feb-93
	Ecological Investigation	4	5-Jan-93	2-Feb-93
	Human Pop./Land Use Invest.	4	3-Aug-92	28-Aug-92
	Round 1 GED Sampling	2	27-Jan-93	9-Feb-93
	Round 2 GED Sampling	2	14-Apr-93	27-Apr-93
	Aquifer Tests	1	10-Feb-93	17-Feb-93
	Survey New Wells	2	20-Jan-93	2-Feb-93
4.0	ANALYSIS AND EVALUATION	31	5-Jan-93	13-Aug-93
	Lab Analysis	26	5-Jan-93	9-Jul-93
	QA Validation	28	27-Jan-93	13-Aug-93
5.0	RISK EVALUATION	27	3-Feb-93	13-Aug-93
	Evaluation of Data	27	3-Feb-93	13-Aug-93
6.0	ASSESSMENT OF RISK	13	1-Apr-93	1-Jul-93
	Risk Assessment Draft Rpt	4	1-Apr-93	29-Apr-93
	EPA Review	6	29-Apr-93	10-Jun-93
	Final Report	3	8-Jun-93	1-Jul-93
8.0	RI REPORTS	22.0	30-Jul-93	29-Dec-93
	Draft Report	8.0	30-Jul-93	15-Sep-93
	Technical Memo 3	0	15-Sep-93	15-Sep-93
	EPA Review	6	15-Sep-93	29-Oct-93
	Final Report	6	5-Nov-93	29-Dec-93
9.0	REMEDIAL ALTERNATIVE SCREENING	8	29-Apr-93	24-Jun-93
	ARAR Dev. and Screening	8	29-Apr-93	24-Jun-93
10.0	DETAILED EVAL. OF ALTERNATIVES	8	25-Jun-93	20-Aug-93
	Analysis of Alternatives	8	25-Jun-93	20-Aug-93
11.0	FEASIBILITY STUDY REPORT (FS)	22.0	23-Aug-93	30-Jun-94
	Draft FS Report	8.0	23-Aug-93	25-Oct-93
	Technical Memo 2	0	23-Sep-93	23-Sep-93
	EPA Review	6	25-Oct-93	8-Dec-93
	Finalize RI/FS Report	4	15-Dec-93	14-Jan-94
	EPA Review and Approval	2	18-Jun-94	30-Jun-94
	SUBMIT FINAL RI/FS REPORT	0	1-Feb-94	1-Feb-94

FIGURE 7-1

RI/FS WORKPLAN SCHEDULE

8.0 PROJECT MANAGEMENT

8.1 ORGANIZATION

The RI/FS activities will be implemented by CDM Federal Programs Corporation. Maheyar Bilimoria, Ph.D., will serve as the site manager and will report to the EPA RPM, James Haklar, P.E. Dr. Bilimoria has primary responsibility for implementation of the RI/FS, including coordination among support staff, acquisition of engineering or specialized technical support, and other aspects of the day-to-day activities associated with the project. His activities also include identification of staff requirements, direction and monitoring of site progress, ensuring implementation of quality control procedures and being responsible for performance within the established budget and schedule. Dr. Bilimoria will work directly with the EPA RPM.

In performing RI/FS activities, Dr. Bilimoria will be assisted by Ms. Susan Schofield, P.G. Ms. Schofield will serve as project geologist for the RI/FS.

The project team members were selected for their qualifications and experience with the technical issues to be addressed at the site. If unanticipated site problems or project needs are encountered that cannot be adequately handled by this team, technical experts from other offices may be used as necessary, with EPA concurrence.

8.2 COORDINATION WITH AGENCIES

The site manager will coordinate all project activities with the RPM. Regular telephone contact will be maintained to provide updates on project status. Field activities at the site will require coordination among federal, state, and local agencies and coordination with involved private organizations. Coordination of activities with these agencies is described below.

EPA is responsible for overall direction and approval of all activities for the Chemsol site. EPA may designate technical advisors and experts from academia or its technical support branches to assist on the site. Agency advisors could provide important sources of

technical information and review, which the CDM team will use from initiation of RI/FS activities through final reporting.

Sources of technical information include EPA, U.S. Army Corps of Engineers, Agency for Toxic Substances and Disease Registry (ATSDR), U.S. Geological Survey (USGS), U.S. Department of Interior, and the National Oceanic and Atmospheric Administration. These sources can be used for background information on the site and surrounding areas.

The state, through NJDEPE, may provide review, direction, and input during the RI/FS. EPA's RPM will coordinate contacts with NJDEPE.

Local agencies that may be involved include Middlesex County and Piscataway Township departments such as planning boards, zoning and building commissions, police, fire, and health department, and utilities (water and sewer). Contacts with these local agencies will be coordinated through the EPA RPM.

Private organizations requiring coordination during the RI/FS include PRPs, concerned residents in the area, and public interest groups such as environmental organizations and the press. Coordination with these interested parties will be performed through the EPA RPM.

8.3 QUALITY ASSURANCE

Work on this assignment will be conducted in accordance with the procedures defined in the site-specific sampling and analysis plan (SAP) which includes the quality Assurance Project Plan (QAPjP) and the Field Sampling Plan (FSP) as approved by EPA Region II. Field blanks, field replicates, trip blanks and samples for laboratory matrix spikes and duplicates will be submitted to the laboratory as outlined in the SAP. The desired precision and accuracy of laboratory and field data will be documented in the SAP. Laboratory data will be validated in accordance with Region II data validation guidelines.

Deliverables will be reviewed by the quality control review team assigned to this project. The comments of the review team will be incorporated into the deliverables before review drafts are submitted to EPA.

8.4 USE OF CLP LABORATORIES

Samples from Chemsol will be analyzed by CLP laboratories procured through the RSCC. The project team assigned to work on the site will:

- Submit only the number of samples to CLP laboratories that are necessary to meet DQOs.
- Request analyses of only those compounds needed to meet the DQOs, tailoring analyses to site-specific conditions, as necessary.
- Schedule analyses with EPA Region II and SMO through the RSCC well in advance of sampling trips as required for RAS and SAS.
- Maintain sample shipment schedules to promote an orderly progression of samples into the CLP laboratories.

The status of analyses to be performed by CLP laboratories will be monitored and potential delays noted through contact with the RSCC.

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PLATES 1 AND 2

Plates 1 and 2 are retained at the following location:

U.S. Environmental Protection Agency
Region II
Emergency & Remedial Response Division
26 Federal Plaza - Room 747
New York, New York 10278

To schedule a time for review of these plates, please contact Mr. James S. Haklar, Remedial Project Manager, at (212) 264-8736.

APPENDIX A

PREVIOUSLY COLLECTED GROUND WATER DATA

DIRECTORY

NOTES ON DATA TABLES

A blank box indicates that analysis was not reported for that compound.

nd means the compound was not detected, but the minimum detection limit was not reported.

< indicates that the compound was not detected at quantitation limit reported.

Qualifiers are reported where available only.

DATA QUALIFIERS USED FOR ORGANICS

U	Compound was not detected at quantitation limit. Quantitation limits are adjusted for dilution.
J	Indicates an estimated value.
D	Indicates that the concentration was obtained using a secondary dilution factor.
B	Indicates that the compound was detected in the associated blank.
P	Used for a pesticide target analyte when there is greater than 25% difference for detected concentrations between the two GC columns. The lower concentration is reported with the "P" flag.
E	Indicates compound exceeded the calibration limit of the detector.

DATA QUALIFIERS USED FOR INORGANICS

U	Compound was not detected at quantitation limits. Quantitation limits are adjusted for dilution.
M	The duplicate injection precision was not met.
N	The spiked sample recovery was not within control limits.
W	The post-digestion spike for furnace AA analysis is outside of the 85-115% control limits, while sample absorbance is less than 50% of the spiked absorbance.
S	The value reported was determined by the Method of Standard Additions (MSA).
*	Duplicate analysis was not within control limits.
J	Indicates an estimated value.
B	The reported value is less than the CDRL but greater than the IDL.

Table A-1 Previously Collected Data for the OW series Wells

Well	OW-01			OW-02		OW-03
Consultant	AGES	MPI	MPI [1]	AGES	MPI	AGES
Date of Sampling	10/12/88	4/5/91	4/5/91	10/12/88	4/5/91	10/12/88
VOCs						
Chloromethane		420 U	2900 U		42 U	
Bromomethane		420 U	2900 U		42 U	
Vinyl Chloride	0 8	420 U	2900 U	nd	46	nd
Chloroethane	nd	420 U	2900 U	nd	42 U	nd
Methylene Chloride	0 5	3000 B	5300 BD	nd	13 BJ	nd
Acetone		4400 B	9100 D		30 B	
Carbon Disulfide		46 J	2900 U		42 U	
1 1-Dichloroethene	4 9	900	460 DJ	nd	42 U	nd
1 1-Dichloroethane	25 9	630	490 DJ	nd	12 J	nd
trans-1 2-Dichloroethene	54 1	2500	1900 J		700	nd
Chloroform	18 1	28000 E	25000 D	nd	5 J	nd
1 2-Dichloroethane	15 9	8000	4800 D	nd	42 U	nd
2-Butanone		980	2900 U		42 U	
1 1 1-Trichloroethane	15 1	3900	2400 DJ	nd	42 U	nd
Carbon Tetrachloride	nd	270 J	2900 U	nd	42 U	nd
Vinyl Acetate						
Bromodichloromethane		420 U	2900 U		42 U	
1 2-Dichloropropane	0 6	420 U	2900 U	nd	42 U	nd
cis-1 3-Dichloropropene	nd	420 U	2900 U		42 U	
Trichloroethene	1 2 5	30000 E	34000 D	nd	56	nd
Dibromochloromethane		420 U	2900 U		42 U	
1 1 2-Trichloroethane	nd	88 J	2900 U	nd	42 U	nd
Benzene	0 5	3400	2400 DJ	nd	190	nd
trans-1 3-Dichloropropene	nd	420 U	2900 U	nd	42 U	nd
Bromoform		420 U	2900 U		42 U	
4-Methyl-2-Pentanone		680	520 DJ		42 U	
2-Hexanone		420 U	2900 U		42 U	
Tetrachloroethene	nd	88 J	2900 U	nd	42 U	nd
1 1 2 2-Tetrachloroethane	nd	61 J	2900 U	nd	42 U	nd
Toluene	2 0	5000	3800 D	nd	38 J	nd
Chlorobenzene	nd	46 J	2900 U	nd	8 J	nd
Ethylbenzene	nd	81 J	2900 U	nd	97	nd
Styrene		420 U	2900 U		42 U	
Xylene		410 J	290 DJ		220	
SVOCs						
Phenol		16 J	2900 U		8 J	
bis(2-Chloroethyl)Ether		8200 E	11000 D		10 U	
2-chlorophenol		140 U	2900 U		10 U	
1 3-Dichlorobenzene	nd [2]	140 U	2900 U	nd [2]	1 J	nd [2]
1 4-Dichlorobenzene	nd [2]	140 U	2900 U	nd [2]	10 U	nd [2]
Benzyl Alcohol						
1 2-Dichlorobenzene	nd [2]	140 U	2900 U	nd [2]	36	nd [2]
2-Methylphenol		140 U	2900 U		4 J	
2 2'-Oxybis(1-Chloropropane)		170	2900 U		0 J	
4-Methylphenol		140 U	2900 U		2 J	
N-Nitroso-Di-n-Propylamine		140 U	2900 U		10 U	
Hexachloroethane		140 U	2900 U		10 U	
Nitrobenzene		140 U	2900 U		10 U	
Isophorone		35 J	2900 U		4 J	
2-Nitrophenol		28 J	2900 U		10 U	
2 4-Dimethylphenol		140 U	2900 U		7 J	
Benzoic Acid						
bis(2-Chloroethoxy)Methane		140 U	2900 U		10 U	
2 4-Dichlorophenol		140 U	2900 U		10 U	
1 2 4-Trichlorobenzene		140 U	2900 U		1 J	
Naphthalene		140 U	2900 U		24	
4-Chloroaniline		140 U	2900 U		10 U	
Hexachlorobutadiene		140 U	2900 U		10 U	
4-Chloro-3-Methylphenol		140 U	2900 U		10 U	
2-Methylnaphthalene		140 U	2900 U		10 U	

[1] A dilution was used

[2] Value is reported as dichlorobenzenes

Table A-1 Previously Collected Data for the OW series Wells

Well	OW-01			OW-02		OW-03
Consultant	AGES	MPI	MPI [1]	AGES	MPI	AGES
Date of Sampling	10/12/88	4/5/91	4/5/91	10/12/88	4/5/91	10/12/88
Hexachlorocyclopentadiene		140 U	2900 U		10 U	
2,4,6-Trichlorophenol		140 U	2900 U		10 U	
2,4,5-Trichlorophenol		360 U	7200 U		25 U	
2-Chloronaphthalene		140 U	2900 U		10 U	
2-Nitroaniline		360 U	7200 U		25 U	
Dimethyl Phthalate		21 J	2900 U		10 U	
Acenaphthylene		140 U	2900 U		10 U	
2,6-Dinitrotoluene		140 U	2900 U		10 U	
3-Nitroaniline		360 U	7200 U		25 U	
Acenaphthene		140 U	2900 U		2 J	
2,4-Dinitrophenol		360 U	7200 U		25 U	
4-Nitrophenol		360 U	7200 U		14 J	
Dibenzofuran		140 U	2900 U		10 U	
2,4-Dinitrotoluene		140 U	2900 U		10 U	
Diethylphthalate		91 J	2900 U		4 BJ	
4-Chlorophenyl-phenylether		140 U	2900 U		10 U	
Fluorene		140 U	2900 U		10 U	
4-Nitroaniline		360 U	7200 U		25 U	
4,6-Dinitro-2-Methylphenol		360 U	7200 U		25 U	
N-Nitrosodiphenylamine		140 U	2900 U		10 U	
4-Bromophenyl-phenylether		140 U	2900 U		10 U	
Hexachlorobenzene		140 U	2900 U		10 U	
Pentachlorophenol		360 U	7200 U		25 U	
Phenanthrene		140 U	2900 U		10 U	
Anthracene		140 U	2900 U		10 U	
Carbazole		140 U	2900 U		10 U	
Di-n-Butylphthalate		140 U	2900 U		1 J	
Fluoranthene		140 U	2900 U		10 U	
Pyrene		140 U	2900 U		10 U	
Butylbenzylphthalate		140 U	2900 U		10 U	
3,3'-Dichlorobenzidine		140 U	2900 U		10 U	
Benzo (a) Anthracene		140 U	2900 U		10 U	
Chrysene		140 U	2900 U		10 U	
bis(2-Ethylhexyl) Phthalate		33 J	2900 U		10 U	
Di-n-Octyl Phthalate		140 U	2900 U		10 U	
Benzo (b) Fluoranthene		140 U	2900 U		10 U	
Benzo (k) Fluoranthene		140 U	2900 U		10 U	
Benzo (a) Pyrene						
Indeno (1,2,3-cd) Pyrene						
Dibenz (a,h) Anthracene						
Benzo (g,h,i) Perylene						
Pesticides						
alpha-BHC		0.05 U			0.05 U	
beta-BHC		0.05 U			0.004 J	
delta-BHC		0.011 JP			0.05 U	
gamma-BHC		0.05 U			0.0081 JP	
Heptachlor		0.05 U			0.05 U	
Aldrin		0.008 JP			0.013 JP	
Heptachlor epoxide		0.011 JP			0.05 U	
Endosulfan I		0.05 U			0.05 U	
Dieldrin		0.1 U			0.0087 JP	
4,4'-DDE		0.1 U			0.1 U	
Endrin		0.1 U			0.1 U	
Endosulfan II		0.1 U			0.1 U	
4,4'-DDD		0.1 U			0.1 U	
Endosulfan sulfate		0.1 U			0.1 U	
4,4'-DDT		0.1 U			0.1 U	
Methoxychlor		0.5 U			0.5 U	
Endrin ketone		0.1 U			0.1 U	
Endrin Aldehyde		0.1 U			0.1 U	
alpha-Chlordane		0.05 U			0.05 U	

[1] A dilution was used

[2] Value is reported as dichlorobenzenes

Table A-1 Previously Collected Data for the OW series Wells

Well	OW-01			OW-02		OW-03
Consultant	AGES	MPI	MPI [1]	AGES	MPI	AGES
Date of Sampling	10/12/88	4/5/91	4/5/91	10/12/88	4/5/91	10/12/88
gamma-Chlordane		0.05 U			0.05 U	
Toxaphene		5.0 U			5.0 U	
PCBs						
Aroclor-1016		1.0 U			1.0 U	
Aroclor-1221		2.0 U			2.0 U	
Aroclor-1232		1.0 U			1.0 U	
Aroclor-1242		1.0 U			1.0 U	
Aroclor-1248						
Aroclor-1254						
Aroclor-1260						
Metals						
Aluminum					7280.0 *J	
Antimony					17.0 U	
Arsenic					18.3	
Barium					416.0	
Beryllium					1.0 U	
Cadmium					3.0 U	
Calcium					34500.0	
Chromium					31.4	
Cobalt					6.5 B	
Copper					4.0 U	
Iron					10200.0	
Lead					33.4	
Magnesium					9560.0	
Manganese					623.0	
Mercury					0.2 U	
Nickel					15.9 B	
Potassium					5110.0	
Selenium					4.0 UWNWJ	
Silver					5.0 U	
Sodium					26100.0 J	
Thallium					2.0 UWNWJ	
Vanadium					20.4 B	
Zinc					34.9 J	
Cyanide					10.0 UWN*J	

[1] A dilution was used

[2] Value is reported as dichlorobenzene

Table A-1 Previously Collected Data for the OW series Wells

Well	OW-04			OW-10		OW-11
Consultant	AGES	MPI	MPI [1]	AGES	MPI	MPI
Date of Sampling	10/12/88	4/5/91	4/5/91	10/12/88	4/5/91	4/5/91
VOCs						
Chloromethane		100 U	250 U		10 U	10 U
Bromomethane		100 U	250 U		10 U	10 U
Vinyl Chloride	12.3	66 J	73 DJ	nd	10 U	10 U
Chloroethane	nd	100 U	250 U	nd	10 U	10 U
Methylene Chloride	1.5	90 BJ	100 BDJ	2.1	2 BJ	2 BJ
Acetone		220 B	360 D		10 U	10 U
Carbon Disulfide		100 U	250 U		10 U	1 J
1,1-Dichloroethene	4.9	26 J	250 U	nd	10 U	10 U
1,1-Dichloroethane	62.7	370	230 DJ	nd	10 U	10 U
trans-1,2-Dichloroethene	77.0	4300 E	3400 D	1.3	10 U	10 U
Chloroform	19.4	500	380 D	nd	1 J	10 U
1,2-Dichloroethane	12.2	46 J	250 U	nd	10 U	10 U
2-Butanone		370	380 D		10 U	10 U
1,1,1-Trichloroethane	12.4	433 J	31 DJ	nd	10 U	10 U
Carbon Tetrachloride	15.2	3 J	6 DJ	nd	10 U	10 U
Vinyl Acetate						
Bromodichloromethane		100 U	250 U		10 U	10 U
1,2-Dichloropropane	nd	100 U	250 U	nd	10 U	10 U
cis-1,3-Dichloropropene		100 U	250 U		10 U	10 U
Trichloroethene	14.7	1600 E	1500 D	0.8	4 J	2 J
Dibromochloromethane		100 U	250 U		10 U	10 U
1,1,2-Trichloroethane	1.6	25 J	250 U	nd	10 U	10 U
Benzene	188	340	250 D	nd	10 U	10 U
trans-1,3-Dichloropropene	3.7	100 U	250 U	nd	10 U	10 U
Bromoform		100 U	250 U		10 U	10 U
4-Methyl-2-Pentanone		220	140 DJ		10 U	10 U
2-Hexanone		12 J	250 U		10 U	10 U
Tetrachloroethene	1.3	180	120 DJ	1.4	3 J	10 U
1,1,2,2-Tetrachloroethane	nd	42 J	250 U	nd	10 U	10 U
Toluene	194	37000 E	5100 DE	nd	10 U	10 U
Chlorobenzene	40.2	450	340 D	nd	10 U	10 U
Ethylbenzene	356.0	1100	940 D	nd	10 U	10 U
Styrene		100 U	250 U		10 U	10 U
Xylene		4600 E	4700 D		10 U	10 U
SVOCs						
Phenol		85	30 DJ		10 U	10 U
bis(2-Chloroethyl)Ether		2 J	200 U		10 U	10 U
2-chlorophenol		6 J	20 U		10 U	10 U
1,3-Dichlorobenzene	nd [2]	42	22 DJ	nd [2]	10 U	10 U
1,4-Dichlorobenzene	nd [2]	170 E	110 DJ	nd [2]	10 U	10 U
Benzyl Alcohol						
1,2-Dichlorobenzene	245 [2]	670 E	1600 D	245 [2]	10 U	10 U
2-Methylphenol		88	38 DJ		10 U	10 U
2,2'-Oxybis(1-Chloropropane)		10 U	200 U		10 U	10 U
4-Methylphenol		98 E	47 DJ		10 U	10 U
N-Nitroso-Di-n-Propylamine		1 J	200 U		10 U	10 U
Hexachloroethane		10 U	200 U		10 U	10 U
Nitrobenzene		5 J	200 U		10 U	10 U
Isophorone		3 J	200 U		10 U	10 U
2-Nitrophenol		10 U	25 DJ		10 U	10 U
2,4-Dimethylphenol		29	25 DJ		10 U	10 U
Benzoic Acid						
bis(2-Chloroethoxy)Methane		3 J	200 U		10 U	10 U
2,4-Dichlorophenol		7 J	38 DJ		10 U	10 U
1,2,4-Trichlorobenzene		15	200 U		10 U	10 U
Naphthalene		36	36 DJ		10 U	10 U
4-Chloroaniline		10 U	200 U		10 U	10 U
Hexachlorobutadiene		10 U	200 U		10 U	10 U
4-Chloro-3-Methylphenol		4 J	400 D		10 U	10 U
2-Methylnaphthalene		11	200 U		10 U	10 U

[1] A dilution was used

[2] Value is reported as dichlorobenzene

Table A-1 Previously Collected Data for the OW series Wells

Well	OW-04			OW-10		OW-11
Consultant	AGES	MPI	MPI [1]	AGES	MPI	MPI
Date of Sampling	10/12/88	4/5/91	4/5/91	10/12/88	4/5/91	4/5/91
Hexachlorocyclopentadiene		10 U	200 U		10 U	10 U
2,4,6-Trichlorophenol		10 U	200 U		10 U	10 U
2,4,5-Trichlorophenol		25 U	500 U		25 U	25 U
2-Chloronaphthalene		10 U	200 U		10 U	10 U
2-Nitroaniline		6 J	500 U		25 U	25 U
Dimethyl Phthalate		1 J	200 U		10 U	10 U
Acenaphthylene		10 U	200 U		10 U	10 U
2,6-Dinitrotoluene		2 J	200 U		10 U	10 U
3-Nitroaniline		7 J	500 U		25 U	25 U
Acenaphthene		2 J	200 U		10 U	10 U
2,4-Dinitrophenol		4 J	500 U		25 U	
4-Nitrophenol		25 U	500 U		25 U	
Dibenzofuran		10 U	200 U		10 U	
2,4-Dinitrotoluene		10 U	200 U		10 U	
Diethylphthalate		13 B	200 U		10 U	
4-Chlorophenyl-phenylether		10 U	200 U		10 U	
Fluorene		10 U	400 D		10 U	
4-Nitroaniline		25 U	500 U		25 U	
4,6-Dinitro-2-Methylphenol		25 U	500 U		25 U	
N-Nitrosodiphenylamine		10 U	200 U		10 U	
4-Bromophenyl-phenylether		10 U	200 U		10 U	
Hexachlorobenzene		10 U	200 U		10 U	
Pentachlorophenol		25 U	500 U		25 U	
Phenanthrene		10 U	200 U		10 U	
Anthracene		10 U	200 U		10 U	
Carbazole		10 U	200 U		10 U	
Di-n-Butylphthalate		19	200 U		10 U	
Fluoranthene		10 U	400 D		10 U	
Pyrene		10 U	200 U		10 U	
Butylbenzylphthalate		10 U	200 U		44	
3,3'-Dichlorobenzidine		10 U	200 U		10 U	
Benzo (a) Anthracene		10 U	200 U		10 U	
Chrysene		10 U	400 D		10 U	
bis(2-Ethylhexyl) Phthalate		10 U	200 U		10 U	
Di-n-Octyl Phthalate		10 U	200 U		10 U	
Benzo (b) Fluoranthene		10 U	200 U		10 U	
Benzo (k) Fluoranthene		10 U	200 U		10 U	
Benzo (a) Pyrene						
Indeno (1,2,3-cd) Pyrene						
Dibenz (a,h) Anthracene						
Benzo (g,h,i) Perylene						
Pesticides						
alpha-BHC		0.05 U			0.05 U	0.05 U
beta-BHC		0.05 U			0.05 U	0.05 U
delta-BHC		0.015 JP			0.05 U	0.05 U
gamma-BHC		0.01 JP			0.05 U	0.05 U
Heptachlor		0.05 U			0.05 U	0.05 U
Aldrin		0.05 U			0.05 U	0.05 U
Heptachlor epoxide		0.05 U			0.05 U	0.05 U
Endosulfan I		0.05 U			0.05 U	0.05 U
Dieldrin		0.017 JP			0.1 U	0.1 U
4,4'-DDE		0.1 U			0.1 U	0.1 U
Endrin		0.1 U			0.1 U	0.1 U
Endosulfan II		0.0079 J			0.1 U	0.1 U
4,4-DDD		0.1 I			0.019 JB	0.1 U
Endosulfan sulfate		0.1 I			0.1 U	0.1 U
4,4-DDT		0.029 JP			0.1 U	0.1 U
Methoxychlor		0.5 U			0.5 U	0.5 U
Endrin ketone		0.1 U			0.1 U	0.1 U
Endrin Aldehyde		0.1 U			0.1 U	0.1 U
alpha-Chlordane		0.05 U			0.05 U	0.05 U

[1] A dilution was used

[2] Value is reported as dichlorobenzene

Table A-1 Previously Collected Data for the OW series Wells

Well	OW-04			OW-10		OW-11	
Consultant	AGES	MPI	MPI [1]	AGES	MPI	MPI	
Date of Sampling	10/12/88	4/5/91	4/5/91	10/12/88	4/5/91	4/5/91	
gamma-Chlordane		0.05 U			0.05 U	0.05 U	
Toxaphene		5.0 U			5.0 U	5.0 U	
PCBs							
Aroclor-1016		1.0 U			1.0 U	1.0 U	
Aroclor-1221		2.0 U			2.0 U	2.0 U	
Aroclor-1232		1.0 U			1.0 U	1.0 U	
Aroclor-1242		1.0 U			1.0 U	1.0 U	
Aroclor-1248							
Aroclor-1254							
Aroclor-1260							
Metals							
Aluminum		21100.0 *J			867.0 *J	9430.0 *J	
Antimony		17.0 U			17.0 U	17.0 U	
Arsenic		10.8			2.0 U	2.0 U	
Barium		530.0			217.0	111.0 B	
Beryllium		1.3 B			1.0 U	1.0 U	
Cadmium		3.0 U			3.0 U	3.0 U	
Calcium		37300.0			51000.0	14400.0	
Chromium		46.5			3.0 U	14.5	
Cobalt		42.9 B			4.0 U	5.0 B	
Copper		17.2 B			4.0 U	4.6 B	
Iron		26200.0			743.0	19400.0	
Lead		27.0 S			7.8 W	5.8	
Magnesium		17400.0			9810.0	10800.0	
Manganese		727.0			29.0	199.0	
Mercury		0.2 U			0.2 U	0.2 U	
Nickel		77.8			5.0 U	22.5 B	
Potassium		8010.0			1880.0 B	2760.0 B	
Selenium		4.0 UWJ			4.0 UWJ	4.0 UWJ	
Silver		5.0 U			5.0 U	5.0 U	
Sodium		34200.0 J			8480.0 J	14800.0 J	
Thallium		2.4 BWJ			2.0 UWJ	2.0 UWJ	
Vanadium		50.2			3.0 U	29.5 B	
Zinc		183.0			30.4 J	50.2 J	
Cyanide		50.7 W*J			21.9 W*J	10.0 UW*J	

[1] A dilution was used

[2] Value is reported as dichlorobenzene

Table A-2 Previously Collected Data for the TW Series Wells

WELL	TW-01					
CONSULTANT	Lancy	NJDEP	Lancy	AGES	HLA	MPI
SAMPLING DATE	9/27/84	9/27/84	9/23/85	12/19/88	2/21/90	4/91
VOCs						
Chloromethane	5 U	6.62 U		1 U	350 U	10 U
Bromomethane	5 U	1.3 U		1 U	350 U	10 U
Vinyl Chloride	5 U	1.3 U		1 U	350 U	10 U
Chloroethane	5 U	0.89 U		1 U	350 U	10 U
Methylene Chloride	38	0.26 U	35 U	1 U	350 U	7 BJ
Acetone			1800 U			10 U
Carbon Disulfide						10 U
1,1-Dichloroethene	5 U	0.81 U	35 U	1 U	350 U	10 U
1,1-Dichloroethane	5 U	0.38 U	10 U	1 U	350 U	10 U
1,2-Dichloroethene (total)	5 U					10 U
trans-1,2-dichloroethene	***	2.77	10 U	1 U	350 U	
Chloroform	26	25.6 B	10 U	10	350 U	5 J
1,2-Dichloroethane	5 U	3.74	10 U	8	350 U	2 J
2-Butanone						10 U
1,1,1-Trichloroethane	5 U	0.53 U	10 U	1 U	350 U	10 U
Carbon Tetrachloride	5 U	0.38 U	10 U	2	350 U	10 U
Bromodichloromethane	5 U	0.38 U	10 U	1 U	350 U	10 U
1,2-Dichloropropane	5 U	0.44 U	10 U	1 U	350 U	10 U
cis-1,3-Dichloropropene	5 U	0.35 U		1 U	2.5 U	10 U
Trichloroethene	14	13.7	35	15	350 U	7 J
Dibromochloromethane	5 U	0.68 U	10 U	1 U	350 U	10 U
1,1,2-Trichloroethane	5 U	0.35 U	10 U	1 U	350 U	10 U
Benzene	5 U	13.3	10 U	35	350 U	5 J
trans-1,3-Dichloropropene	5 U	0.44 U	35 U	1 U	350 U	10 U
Bromoform	5 U	1.1 U	35 U	1 U	350 U	10 U
4-Methyl-2-Pentanone						10 U
2-Hexanone						10 U
Tetrachloroethene	5 U	4.12	35 U	2	350 U	1 J
1,1,2,2-Tetrachloroethane	5 U	0.5 U		1 U	350 U	10 U
Toluene	5 U	0.11	2 U	1 U	350 U	10 U
Chlorobenzene	5 U	2.53	2 U	1 U	350 U	4 J
Ethylbenzene	5 U	1.4 U	2 U	1 U	350 U	10 U
Styrene						10 U
Xylene			10 U		350 U	10 U
Methyl Isobutyl Ketone			10 U			
Trichlorofluoromethane	5 U	0.35 U		1 U	350 U	
Vinyl Acetate						
BNOCs						
Phenol						10 U
bis(2-Chloroethyl)Ether						10 U
2-Chlorophenol						10 U
1,3-Dichlorobenzene	5 U	0.56 U	310	350	350 U	13
1,4-Dichlorobenzene	5 U	0.51 U		350	350 U	58
1,2-Dichlorobenzene	5 U	0.5 U	*	27	4300	1400 D
2-Methylphenol						10 U
2,2'-Oxybis(1-Chloropropane)						10 U
4-Methylphenol						10 U
N-Nitroso-Di-n-Propylamine						10 U
Hexachloroethane						10 U
Nitrobenzene						10 U
Isophorone						10 U
2-Nitrophenol						10 U
2,4-Dimethylphenol						10 U
bis(2-Chloroethoxy)Methane						10 U
2,4-Dichlorophenol						10 U
1,2,4-Trichlorobenzene						81
Naphthalene						10 U
4-Chloroaniline						10 U
Hexachlorobutadiene						10 U
4-Chloro-3-Methylphenol						10 U
2-Methylnaphthalene						10 U
Hexachlorocyclopentadiene						10 U
2,4,6-Trichlorophenol						10 U
2,4,5-Trichlorophenol						25 U
2-Chloronaphthalene						10 U
2-Nitroaniline						25 U
Dimethyl Phthalate						10 U
Acenaphthylene						10 U
2,6-Dinitrotoluene						10 U
3-Nitroaniline						25 U
Acenaphthene						10 U
2,4-Dinitrophenol						25 U
4-Nitrophenol						25 U
Dibenzofuran						10 U
2,4-Dinitrotoluene						10 U
Diethylphthalate						10 U
4-Chlorophenyl-phenylether						10 U
Fluorene						10 U
4-Nitroaniline						25 U

NOTES
[1] Split Sample to NJDEP showed non detects on V.O. scan
* 1,2-Dichlorobenzene reported as total with 1,3-Dichlorobenzene
*** Indicates that trans-1,2-DCE coeluted with cis-1,2-DCE during GC/MS analysis
The concentration therefore is shown as total DCE.
A blank entry indicates a compound which was not analyzed

Table A-2 Previously Collected Data for the TW Series Wells

WELL	TW-01					
CONSULTANT	Lancy	NJDEP	Lancy	AGES	HLA	MPI
SAMPLING DATE	9/27/84	9/27/84	9/23/85	12/19/88	2/21/90	4/91
4,6-Dinitro-2-methylphenol						25 U
N-Nitrosodiphenylamine						10 U
4-Bromophenyl-phenylether						10 U
Hexachlorobenzene						10 U
Pentachlorophenol						25 U
Phenanthrene						10 U
Anthracene						10 U
Carbazole						10 U
Di-n-Butylphthalate						10 U
Fluoranthene						10 U
Pyrene						10 U
Butylbenzylphthalate						10 U
3,3'-Dichlorobenzidine						10 U
Benzo (a) Anthracene						10 U
Chrysene						10 U
bis(2-Ethylhexyl) Phthalate						3 J
Di-n-Octyl Phthalate						10 U
Benzo (b) Fluoranthene						10 U
Benzo (k) Fluoranthene						10 U
Benzo (a) Pyrene						10 U
Indeno (1,2,3-cd) Pyrene						10 U
Dibenz (a,h) Anthracene						10 U
Benzo (g,h,i) Perylene						10 U
Benzyl Alcohol						
Benzoic Acid						
Pesticides						
alpha-BHC						0.05 U
beta-BHC						0.05 U
delta-BHC						0.05 U
gamma-BHC						0.05 U
Heptachlor						0.05 U
Aldrin						0.05 U
Heptachlor epoxide						0.05 U
Endosulfan I						0.05 U
Dieldrin						0.10 U
4,4'-DDE						0.10 U
Endrin						0.10 U
Endosulfan II						0.10 U
4,4'-DDD						0.10 U
Endosulfan sulfate						0.10 U
4,4'-DDT						0.10 U
Methoxychlor						0.50 U
Endrin ketone						0.10 U
Endrin Aldehyde						0.10 U
alpha-Chlordane						0.05 U
gamma-Chlordane						0.05 U
Toxaphene						5.00 U
PCBs						
Aroclor-1016						1.00 U
Aroclor-1221						2.00 U
Aroclor-1232						1.00 U
Aroclor-1242						1.00 U
Aroclor-1248						1.00 U
Aroclor-1254						1.00 U
Aroclor-1260						1.00 U
Metals						
Aluminum						7200.0 *J
Antimony						17.0 U
Arsenic						2.0 UW
Barium						662.0
Beryllium						1.0 U
Cadmium						3.0 U
Calcium						75800.0
Chromium						15.0
Cobalt						6.0 B
Copper						4.0 U
Iron						25000.0
Lead						22.0
Magnesium						14800.0
Manganese						1020.0
Mercury						0.2 U
Nickel						19.0 B
Potassium						3110.0 BJ
Selenium						4.0 UWnJ
Silver						5.0 U
Sodium						9480.0 J
Thallium						2.0 UWnJ
Vanadium						29.2 B
Zinc						46.7 J
Cyanide						10.0 UN*J

NOTES

[1] Split Sample to NJDEP showed non detects on V.O. scan

* 1,2-Dichlorobenzene reported as total with 1,3-Dichlorobenzene

*** Indicates that trans-1,2-DCE coeluted with cis-1,2-DCE during GC/MS analysis
The concentration therefore is shown as total DCE.

A blank entry indicates a compound which was not analyzed

Table A-2 Previously Collected Data for the TW Series Wells

WELL	TW-02					
CONSULTANT	Lancy	NJDEP	Lancy	AGES	HLA	MPI
SAMPLING DATE	9/27/84	9/27/84	9/23/85	12/19/88	2/21/90	4/91
Volatiles						
Chloromethane	2 U	8.82 U		1 U	5 U	10 U
Bromomethane	2 U	1.3 U		1 U	2.5 U	10 U
Vinyl Chloride	2 U	1.3 U		1 U	2.5 U	10 U
Chloroethane	2 U	6.59 U		1 U	3.2	10 U
Methylene Chloride	2 U	8.28 U	25 U	25	5 U	6 BJ
Acetone			1000 U			10 U
Carbon Disulfide						10 U
1,1-Dichloroethene	2 U	6.81 U	25 U	1 U	2.5 U	2 J
1,1-Dichloroethane	2 U	6.38 U	10 U	1 U	2.5 U	2 J
1,2-Dichloroethene (total)	3.2					4 J
trans-1,2-Dichloroethene	***	6.38 U	10 U	1 U	2.5 U	
Chloroform	18	23.2 B	10 U	11	2.5 U	8 J
1,2-Dichloroethane	2.2	6.38 U	10 U	1 U	2.5 U	2 J
2-Butanone						10 U
1,1,1-Trichloroethane	2 U	6.83 U	10 U	1 U	2.5 U	10 U
Carbon Tetrachloride	5.2	6.64	50 U	1 U	2.5 U	4 J
Bromodichloromethane	2 U	6.38 U	25 U	1 U	2.5 U	10 U
1,2-Dichloropropane	2 U	6.44 U	10 U	1 U	2.5 U	10 U
cis-1,3-Dichloropropene	2 U	6.35 U			2.5 U	10 U
Trichloroethene	8.4	16.9	20	7	6.2	15 B
Dibromochloromethane	2 U	6.66 U	50 U	1 U	2.5 U	10 U
1,1,2-Trichloroethane	2 U	6.38 U	10 U	1 U	2.5 U	10 U
Benzene	2 U	6.64 U	2 U	1 U	3.5	1 J
trans-1,3-Dichloropropene	2 U	6.44 U	25 U	1 U	2.5 U	10 U
Bromoform	2 U	11 U	50 U	1 U	2.5 U	10 U
4-Methyl-2-Pentanone						10 U
2-Hexanone						10 U
Tetrachloroethene	2 U	6.85 U	25 U	1 U	2.5 U	10 U
1,1,2,2-Tetrachloroethane	2 U	6.52 U		1 U	2.5 U	10 U
Toluene	4	5.56	2 U	1 U	21	10 U
Chlorobenzene	2 U	6.75 U	2 U	1 U	2.5 U	1 J
Ethylbenzene	2 U	1.4 U	2 U	1 U	2.5 U	10 U
Styrene						10 U
Xylene			10 U		2.5 U	10 U
Methyl Isobutyl Ketone			10 U			
Trichlorofluoromethane	2 U	6.38 U		1 U	2.5 U	
Vinyl Acetate						
BN/OEs						
Phenol						35 U
bis(2-Chloroethyl)Ether						35 U
2-Chlorophenol						35 U
1,3-Dichlorobenzene	2 U	6.58 U	2 U	1 U	3.2	6 J
1,4-Dichlorobenzene	2 U	6.51 U		1 U	2.5 U	11 J
1,2-Dichlorobenzene	2 U	31.6	*	1 U	160	160
2-Methylphenol						35 U
2,2'-Oxybis(1-Chloropropane)						35 U
4-Methylphenol						35 U
N-Nitroso-Di-n-Propylamine						35 U
Hexachloroethane						35 U
Nitrobenzene						35 U
Isophorone						35 U
2-Nitrophenol						35 U
2,4-Dimethylphenol						35 U
bis(2-Chloroethoxy)Methane						35 U
2,4-Dichlorophenol						35 U
1,2,4-Trichlorobenzene						35 U
Naphthalene						35 U
4-Chloroaniline						35 U
Hexachlorobutadiene						35 U
4-Chloro-3-Methylphenol						35 U
2-Methylnaphthalene						35 U
Hexachlorocyclopentadiene						35 U
2,4,6-Trichlorophenol						35 U
2,4,5-Trichlorophenol						75 U
2-Chloronaphthalene						35 U
2-Nitroaniline						75 U
Dimethyl Phthalate						35 U
Acenaphthylene						35 U
2,6-Dinitrotoluene						35 U
3-Nitroaniline						75 U
Acenaphthene						35 U
2,4-Dinitrophenol						75 U
4-Nitrophenol						75 U
Dibenzofuran						35 U
2,4-Dinitrotoluene						35 U
Diethylphthalate						35 U
4-Chlorophenyl-phenylether						35 U
Fluorene						35 U
4-Nitroaniline						75 U

NOTES

[1] Split Sample to NJDEP showed non detects on V.O. scan

* 1,2-Dichlorobenzene reported as total with 1,3-Dichlorobenzene

*** Indicates that trans-1,2-DCE coeluted with cis-1,2-DCE during GC/MS analysis
The concentration therefore is shown as total DCE.

A blank entry indicates a compound which was not analyzed

Table A-2 Previously Collected Data for the TW Series Wells

WELL	TW-02					
CONSULTANT	Lancy	NJDEP	Lancy	AGES	HLA	MPI
SAMPLING DATE	9/27/84	9/27/84	9/23/85	12/19/88	2/21/90	4/91
4,6-Dinitro-2-Methylphenol						75 U
N-Nitrosodiphenylamine						35 U
4-Bromophenyl-phenylether						35 U
Hexachlorobenzene						35 U
Pentachlorophenol						75 U
Phenanthrene						35 U
Anthracene						35 U
Carbazole						35 U
Di-n-Butylphthalate						35 U
Fluoranthene						35 U
Pyrene						35 U
Butylbenzylphthalate						35 U
3,3'-Dichlorobenzidine						35 U
Benzo (a) Anthracene						35 U
Chrysene						35 U
bis(2-Ethylhexyl) Phthalate						35 U
Di-n-Octyl Phthalate						35 U
Benzo (b) Fluoranthene						35 U
Benzo (k) Fluoranthene						35 U
Benzo (a) Pyrene						35 U
Indeno (1,2,3-cd) Pyrene						35 U
Dibenz (a,h) Anthracene						35 U
Benzo (g,h,i) Perylene						35 U
Benzyl Alcohol						
Benzoic Acid						
Pesticides						
alpha-BHC						0.05 U
beta-BHC						0.05 U
delta-BHC						0.05 U
gamma-BHC						0.05 U
Heptachlor						0.05 U
Aldrin						0.05 U
Heptachlor epoxide						0.05 U
Endosulfan I						0.05 U
Dieldrin						0.10 U
4,4'-DDE						0.10 U
Endrin						0.10 U
Endosulfan II						0.10 U
4,4'-DDD						0.10 U
Endosulfan sulfate						0.10 U
4,4'-DDT						0.10 U
Methoxychlor						0.50 U
Endrin ketone						0.10 U
Endrin Aldehyde						0.10 U
alpha-Chlordane						0.05 U
gamma-Chlordane						0.05 U
Toxaphene						5.00 U
PCBs						
Aroclor-1016						1.00 U
Aroclor-1221						2.00 U
Aroclor-1232						1.00 U
Aroclor-1242						1.00 U
Aroclor-1248						1.00 U
Aroclor-1254						1.00 U
Aroclor-1260						1.00 U
Metals						
Aluminum						4210 *J
Antimony						17 U
Arsenic						2 UW
Barium						1080
Beryllium						1 U
Cadmium						3 U
Calcium						48800
Chromium						11.8
Cobalt						6.1 B
Copper						5.3 B
Iron						11400
Lead						13.7
Magnesium						11300
Manganese						358
Mercury						0.2 U
Nickel						15.3 B
Potassium						2540 BJ
Selenium						4 UWJ
Silver						5 U
Sodium						6850 J
Thallium						2 UWJ
Vanadium						22.5 B
Zinc						42.7 J
Cyanide						10 UW*J

NOTES

[1] Split Sample to NJDEP showed non detects on V.O. scan

* 1,2-Dichlorobenzene reported as total with 1,3-Dichlorobenzene

*** Indicates that trans-1,2-DCE coeluted with cis-1,2-DCE during GC/MS analysis
The concentration therefore is shown as total DCE.

A blank entry indicates a compound which was not analyzed

Table A-2 Previously Collected Data for the TW Series Wells

WELL	TW-03					
CONSULTANT	Lancy	NJDEP	Lancy	AGES	HLA	MPI
SAMPLING DATE	9/27/84	9/27/84	9/23/85	12/19/88	2/21/90	4/91
VOCs						
Chloromethane	10 U	0.62 U		1 U	1.0 U	10 U
Bromomethane	10 U	1.3 U		1 U	0.5 U	10 U
Vinyl Chloride	10 U	1.3 U		1 U	0.5 U	10 U
Chloroethane	10 U	0.56 U		1 U	0.5 U	10 U
Methylene Chloride	58	0.39 U	25 U	35	1.0 U	5 BJ
Acetone			180 U			6 BJ
Carbon Disulfide						10 U
1,1-Dichloroethene	10 U	0.51 U	25 U	6	0.5 U	10 U
1,1-Dichloroethane	10 U	0.38 U	10 U	2	0.5 U	10 U
1,2-Dichloroethene (total)	10 U					- -
trans-1,2-dichloroethene	***	0.36 U	10 U	7	0.5 U	
Chloroform	10 U	0.65 B	10 U	882	2.4	2 J
1,2-Dichloroethane	10 U	0.36 U	25 U	39	0.5 U	10 U
2-Butanone						10 U
1,1,1-Trichloroethane	10 U	0.55 U	10 U	16	0.5 U	10 U
Carbon Tetrachloride	10 U	0.26 U	50 U	45	0.5 U	10 U
Bromodichloromethane	10 U	0.38 U	25 U	1 U	0.5 U	10 U
1,2-Dichloropropane	10 U	0.44 U	10 U	1 U	0.5 U	10 U
cis-1,3-Dichloropropene	10 U	0.35 U		1 U	0.5 U	10 U
Trichloroethene	17	3.21	10 U	530	1.7	3 J
Dibromochloromethane	10 U	0.48 U	50 U	1 U	0.5 U	10 U
1,1,2-Trichloroethane	10 U	0.36 U	10 U	1 U	0.5 U	10 U
Benzene	10 U	0.64 U	2 U	85	0.5 U	10 U
trans-1,3-Dichloropropene	10 U	0.44 U	25 U	1 U	0.5 U	10 U
Bromoform	10 U	1.1 U	50 U	1 U	0.5 U	10 U
4-Methyl-2-Pentanone						10 U
2-Hexanone						10 U
Tetrachloroethene	10 U	0.85 U	25 U	3	0.5 U	10 U
1,1,2,2-Tetrachloroethane	10 U	0.52 U		14	0.5 U	10 U
Toluene	10 U	4.75	2 U	39	0.5 U	10 U
Chlorobenzene	10 U	0.75 U	2 U	1 U	0.5 U	10 U
Ethylbenzene	10 U	1.4 U	2 U	3	0.5 U	10 U
Styrene						10 U
Xylene			10 U		0.5 U	10 U
Methyl Isobutyl Ketone			10 U			
Trichlorofluoromethane	22	0.55 U			0.5 U	
Vinyl Acetate						
SVOCs						
Phenol						10 U
bis(2-Chloroethyl)Ether						10 U
2-Chlorophenol						10 U
1,3-Dichlorobenzene	10 U	0.58 U	25 U	1 U	0.5 U	10 U
1,4-Dichlorobenzene	10 U	0.51 U		1 U	0.5 U	10 U
1,2-Dichlorobenzene	10 U	31.6	*	4	0.5 U	10 U
2-Methylphenol						10 U
2,2'-Oxybis(1-Chloropropane)						10 U
4-Methylphenol						10 U
N-Nitroso-Di-n-Propylamine						10 U
Hexachloroethane						10 U
Nitrobenzene						10 U
Isophorone						10 U
2-Nitrophenol						10 U
2,4-Dimethylphenol						10 U
bis(2-Chloroethoxy)Methane						10 U
2,4-Dichlorophenol						10 U
1,2,4-Trichlorobenzene						10 U
Naphthalene						10 U
4-Chloroaniline						10 U
Hexachlorobutadiene						10 U
4-Chloro-3-Methylphenol						10 U
2-Methylnaphthalene						10 U
Hexachlorocyclopentadiene						10 U
2,4,6-Trichlorophenol						10 U
2,4,5-Trichlorophenol						25 U
2-Chloronaphthalene						10 U
2-Nitroaniline						25 U
Dimethyl Phthalate						10 U
Acenaphthylene						10 U
2,6-Dinitrotoluene						10 U
3-Nitroaniline						25 U
Acenaphthene						10 U
2,4-Dinitrophenol						25 U
4-Nitrophenol						25 U
Dibenzofuran						10 U
2,4-Dinitrotoluene						10 U
Diethylphthalate						10 U
4-Chlorophenyl-phenylether						10 U
Fluorene						10 U
4-Nitroaniline						25 U

NOTES
[1] Split Sample to NJDEP showed non detects on V.O. scan
* 1,2-Dichlorobenzene reported as total with 1,3-Dichlorobenzene
*** Indicates that trans-1,2-DCE coeluted with cis-1,2-DCE during GC/MS analysis
The concentration therefore is shown as total DCE.
A blank entry indicates a compound which was not analyzed

Table A-2 Previously Collected Data for the TW Series Wells

WELL	TW-03					
CONSULTANT	Lancy	NJDEP	Lancy	AGES	HLA	MPI
SAMPLING DATE	9/27/84	9/27/84	9/23/85	12/19/88	2/21/90	4/91
4,6-Dinitro-2-Methylphenol						35 U
N-Nitrosodiphenylamine						10 U
4-Bromophenyl-phenylether						10 U
Hexachlorobenzene						10 U
Pentachlorophenol						35 U
Phenanthrene						10 U
Anthracene						10 U
Carbazole						10 U
Di-n-Butylphthalate						10 U
Fluoranthene						10 U
Pyrene						10 U
Butylbenzylphthalate						3 J
3,3'-Dichlorobenzidine						10 U
Benzo (a) Anthracene						10 U
Chrysene						10 U
bis(2-Ethylhexyl Phthalate						1 BJ
Di-n-Octyl Phthalate						10 U
Benzo (b) Fluoranthene						10 U
Benzo (k) Fluoranthene						10 U
Benzo (a) Pyrene						10 U
Indeno (1,2,3-cd) Pyrene						10 U
Dibenz (a,h) Anthracene						10 U
Benzo (g,h,i) Perylene						10 U
Benzyl Alcohol						
Benzoic Acid						
Pesticides						
alpha-BHC						0.0029 JP
beta-BHC						0.05 U
delta-BHC						0.05 U
gamma-BHC						0.05 U
Heptachlor						0.05 U
Aldrin						0.05 U
Heptachlor epoxide						0.05 U
Endosulfan I						0.05 U
Dieldrin						0.10 U
4,4'-DDE						0.10 U
Endrin						0.10 U
Endosulfan II						0.10 U
4,4'-DDD						0.0583 JP
Endosulfan sulfate						0.10 U
4,4'-DDT						0.10 U
Methoxychlor						0.50 U
Endrin ketone						0.10 U
Endrin Aldehyde						0.10 U
alpha-Chlordane						0.05 U
gamma-Chlordane						0.05 U
Toxaphene						5.00 U
PCBs						
Aroclor-1016						1.00 U
Aroclor-1221						2.00 U
Aroclor-1232						1.00 U
Aroclor-1242						1.00 U
Aroclor-1248						1.00 U
Aroclor-1254						1.00 U
Aroclor-1260						1.00 U
Metals						
Aluminum						1700.00 *J
Antimony						17.00 U
Arsenic						2.00 U
Barium						*34.00
Beryllium						1.00 U
Cadmium						3.00 U
Calcium						54400.00
Chromium						5.00 B
Cobalt						4.00 U
Copper						4.00 U
Iron						7460.00
Lead						5.00
Magnesium						8710.00
Manganese						1100.00
Mercury						0.20 U
Nickel						6.00 B
Potassium						1540.00 BJ
Selenium						4.00 UWN*J
Silver						5.00 U
Sodium						9720.00 J
Thallium						2.00 UWJ
Vanadium						11.00 B
Zinc						60.00 J
Cyanide						12.50 UW*J

NOTES
[1] Split Sample to NJDEP showed non detects on V.O. scan
* 1,2-Dichlorobenzene reported as total with 1,3-Dichlorobenzene
*** Indicates that trans-1,2-DCE coeluted with cis-1,2-DCE during GC/MS analysis
The concentration therefore is shown as total DCE.
A blank entry indicates a compound which was not analyzed

Table A-2 Previously Collected Data for the TW Series Wells

WELL	TW-04					
CONSULTANT	Lancy	NJDEP	Lancy	AGES	HLA	MPI
SAMPLING DATE	9/27/84	9/27/84	9/23/85	12/19/88	2/21/90	4/91
8000s						
Chloromethane	10 U	6.82 U		1 U	500 U	1000 U
Bromomethane	10 U	1.3 U		1 U	500 U	1000 U
Vinyl Chloride	10 U	1.3 U		118	500 U	1000 U
Chloroethane	10 U	0.58 U		88	500 U	1000 U
Methylene Chloride	8500	5484	2500 U	2242	500 U	2300 B
Acetone			25000			15000
Carbon Disulfide						1000 U
1,1-Dichloroethene	880	486	2500 U	1345	2800	440 J
1,1-Dichloroethane	280	282	6186	1878	500 U	140 J
1,2-Dichloroethene (total)	1850					880 J
trans-1,2-dichloroethene	***	854	7186	2853	1000	
Chloroform	13500	14316 B	14000	8885	6800	8300
1,2-Dichloroethane	2186	2211	3800	3448	980	760 J
2-Butanone						3800
1,1,1-Trichloroethane	540	747	880	880	500 U	180 J
Carbon Tetrachloride	18800	12886	13500	8380	18000	7400
Bromodichloromethane	10 U	0.68 U	2500 U	1 U	500 U	1000 U
1,2-Dichloropropane	10 U	0.44 U	18000 U	1 U	500 U	1000 U
cis-1,3-Dichloropropene	10 U	0.35 U		136	500 U	1000 U
Trichloroethene	12500	9251	15000	3812	7600	5800
Dibromochloromethane	10 U	0.68 U	5000 U	1 U	500 U	1000 U
1,1,2-Trichloroethane	10 U	0.35 U	1600 U	1 U	500 U	1000 U
Benzene	2700	3881	2200	1478	1100	1300
trans-1,3-Dichloropropene	10 U	0.44 U	2500 U	1 U	500 U	1000 U
Bromoform	10 U	1.1 U	5000 U	1 U	500 U	1000 U
4-Methyl-2-Pentanone						850 J
2-Hexanone						1000 U
Tetrachloroethene	1186	444	2500 U	1613	500 U	500 J
1,1,2,2-Tetrachloroethane	10 U	0.82 U		1 U	500 U	1000 U
Toluene	15000	1616	18000	3488	12000	11000
Chlorobenzene	186	0.75 U	300 U	1 U	500 U	1000 U
Ethylbenzene	850	807	300 U	1853	500 U	250 J
Styrene						1000 U
Xylene			5786		1300	1300
Methyl Isobutyl Ketone			1500			
Trichlorofluoromethane	10 U	0.35 U		1 U	500 U	
Vinyl Acetate						
BN/OEs						
Phenol						43
bis(2-Chloroethyl)Ether						4 J
2-Chlorophenol						10 U
1,3-Dichlorobenzene	10 U	0.58 U	2500	1 U	500 U	10 U
1,4-Dichlorobenzene	10 U	0.81 U		1 U	500 U	10 U
1,2-Dichlorobenzene	10 U	0.5 U	*	1 U	500 U	10 U
2-Methylphenol						70
2,2'-Oxybis(1-Chloropropane)						10 U
4-Methylphenol						31
N-Nitroso-Di-n-Propylamine						10 U
Hexachloroethane						10
Nitrobenzene						10 U
Isophorone						11
2-Nitrophenol						10 U
2,4-Dimethylphenol						10 U
bis(2-Chloroethoxy Methane						10 U
2,4-Dichlorophenol						10 U
1,2,4-Trichlorobenzene						10 U
Naphthalene						100 D
4-Chloroaniline						10 U
Hexachlorobutadiene						10 U
4-Chloro-3-Methylphenol						10 U
2-Methylnaphthalene						8 J
Hexachlorocyclopentadiene						10 U
2,4,6-Trichlorophenol						10 U
2,4,5-Trichlorophenol						25 U
2-Chloronaphthalene						10 U
2-Nitroaniline						25 U
Dimethyl Phthalate						10 U
Acenaphthylene						10 U
2,6-Dinitrotoluene						10 U
3-Nitroaniline						25 U
Acenaphthene						10 U
2,4-Dinitrophenol						25 U
4-Nitrophenol						25 U
Dibenzofuran						10 U
2,4-Dinitrotoluene						10 U
Diethylphthalate						110 D
4-Chlorophenyl-phenylether						10 U
Fluorene						10 U
4-Nitroaniline						25 U

NOTES
[1] Split Sample to NJDEP showed non detects on V.O. scan
* 1,2-Dichlorobenzene reported as total with 1,3-Dichlorobenzene
*** Indicates that trans-1,2-DCE coeluted with cis-1,2-DCE during GC/MS analysis
The concentration therefore is shown as total DCE.
A blank entry indicates a compound which was not analyzed

Table A-2 Previously Collected Data for the TW Series Wells

WELL	TW-04						
CONSULTANT	Lawler	NJDEP	Lawler	AGES	RCA	IMPI	
SAMPLING DATE	9/27/84	9/27/84	9/23/85	12/18/88	2/21/90	4/91	
4,6-Dinitro-2-Methylphenol						25	U
N-Nitrosodiphenylamine						10	U
4-Bromophenyl-phenylether						10	U
Hexachlorobenzene						10	U
Pentachlorophenol						25	U
Phenanthrene						10	U
Anthracene						10	U
Carbazole						10	U
Di-n-Butylphthalate						10	U
Fluoranthene						10	U
Pyrene						10	U
Butylbenzylphthalate						10	U
3,3'-Dichlorobenzidine						10	U
Benzo (a) Anthracene						10	U
Chrysene						10	U
bis(2-Ethylhexyl) Phthalate						4	J
Di-n-Octyl Phthalate						10	U
Benzo (b) Fluoranthene						10	U
Benzo (k) Fluoranthene						10	U
Benzo (a) Pyrene						10	U
Indeno (1,2,3-cd) Pyrene						10	U
Dibenz (a,h) Anthracene						10	U
Benzo (g,h,i) Perylene						10	U
Benzyl Alcohol							
Benzoic Acid							
Pesticides							
alpha-BHC							
beta-BHC							
delta-BHC							
gamma-BHC							
Heptachlor							
Aldrin							
Heptachlor epoxide							
Endosulfan I							
Dieldrin							
4,4'-DDE							
Endrin							
Endosulfan II							
4,4'-DDD							
Endosulfan sulfate							
4,4'-DDT							
Methoxychlor							
Endrin ketone							
Endrin Aldehyde							
alpha-Chlordane							
gamma-Chlordane							
Toxaphene							
PCBs							
Aroclor-1016							
Aroclor-1221							
Aroclor-1232							
Aroclor-1242							
Aroclor-1248							
Aroclor-1254							
Aroclor-1260							
Metals							
Aluminum						380	*J
Antimony						17.6	U
Arsenic						2.6	U
Barium						2800.0	
Beryllium						1.8	U
Cadmium						3.6	U
Calcium						141000.0	
Chromium						5.6	B
Cobalt						4.8	U
Copper						4.8	U
Iron						7730.0	
Lead						4.2	
Magnesium						24800.0	
Manganese						1610.0	
Mercury						0.2	U
Nickel						768.0	B
Potassium						1480.0	B,J
Selenium						4.0	U/N/W,J
Silver						5.0	U
Sodium						13100.0	J
Thallium						2.0	U/N/W,J
Vanadium						8.7	B
Zinc						38.2	J
Cyanide						10.0	U/N*,J

NOTES
[1] Split Sample to NJDEP showed non detects on V.O. scan
* 1,2-Dichlorobenzene reported as total with 1,3-Dichlorobenzene
*** Indicates that trans-1,2-DCE coeluted with cis-1,2-DCE during GC/MS analysis
The concentration therefore is shown as total DCE.
A blank entry indicates a compound which was not analyzed

Table A-2 Previously Collected Data for the TW Series Wells

WELL	TW-06					
CONSULTANT	Clancy	NJDEP	Clancy	RCA	RCA	MPI
SAMPLING DATE	9/27/84	9/27/84	9/23/85	2/22/90	7/6/90	4/91
VOCs						
Chloromethane	500 U	6.62 U		1000 U	ND	10 U
Bromomethane	500 U	1.3 U		1000 U	ND	10 U
Vinyl Chloride	1000	1100		1000 U	430	10 U
Chloroethane	500 U	0.55 U		1000 U	ND	10 U
Methylene Chloride	18000	26374	13000 U	5000	8000	8000 B5
Acetone			14000		15000	10 U
Carbon Disulfide					ND	10 U
1,1-Dichloroethene	1200	0.91 U	5000	600	640	430 D
1,1-Dichloroethane	500 U	1002	6000	1000 U	380	380 D
1,2-Dichloroethene (total)	14000					20000 D
trans-1,2-dichloroethene	***	13548	72000	58000	20000	
Chloroform	45000	42452 B	130000	10000	17000	13000 D
1,2-Dichloroethane	18000	25000	12000	6000	6000	5300 D
2-Butanone					ND	3800 D
1,1,1-Trichloroethane	800	3884	3400	1000 U	980	830 D
Carbon Tetrachloride	8000	13221	13000	2400	2800	1700 D
Bromodichloromethane	500 U	0.36 U	13000 U	1000 U	ND	10 U
1,2-Dichloropropane	500 U	0.44 U	500 U	1000 U	180	110
cis-1,3-Dichloropropene	500 U	0.36 U		1000 U	ND	10 U
Trichloroethene	76000	101857	85000	36000	46000	23000 D
Dibromochloromethane	500 U	0.66 U	3800 U	1000 U	ND	10 U
1,1,2-Trichloroethane	500 U	0.36 U	500 U	1000 U	ND	82
Benzene	25000	47638	50000	8500	11000	7500 D
trans-1,3-Dichloropropene	500 U	0.44 U	13000 U	1000 U	ND	10 U
Bromoform	500 U	1.1 U	3800 U	1000 U	ND	10 U
4-Methyl-2-Pentanone					4000	3800 D
2-Hexanone					5000	35
Tetrachloroethene	1100	0.66 U	2700	1000 U	850	800 D
1,1,2,2-Tetrachloroethane	500 U	0.53 U		1000 U	850	470 D
Toluene	1800	48114	23000	8000	13000	8500 D
Chlorobenzene	2800	888	3000	1000 U	1000	1100 D
Ethylbenzene	1000	354	100 U	1000 U	850	810 D
Styrene					ND	10 U
Xylene			14000	1000	3000	3000 D
Methyl Isobutyl Ketone			7100			
Trichlorofluoromethane	500 U	0.35 U		1000 U	ND	
Vinyl Acetate						
SVOCs						
Phenol					54	100 D
bis(2-Chloroethyl)Ether					51	35
2-Chlorophenol					ND	3 J
1,3-Dichlorobenzene	500 U	0.56 U	1000 U	1000 U	4	5 J
1,4-Dichlorobenzene	500 U	0.51 U		1000 U	37	30
1,2-Dichlorobenzene	500 U	0.5 U	*	1000 U	540	330 D
2-Methylphenol					380	540 D
2,2'-Oxybis(1-Chloropropane)						10 U
4-Methylphenol					ND	28
N-Nitroso-Di-n-Propylamine					ND	10 U
Hexachloroethane					ND	10 U
Nitrobenzene					ND	10 U
Isophorone					18	18
2-Nitrophenol					ND	10 U
2,4-Dimethylphenol					5	10 U
bis(2-Chloroethoxy)Methane					ND	10 U
2,4-Dichlorophenol					ND	10 U
1,2,4-Trichlorobenzene					54	50
Naphthalene					48	34
4-Chloroaniline					ND	10 U
Hexachlorobutadiene					ND	10 U
4-Chloro-3-Methylphenol					ND	10 U
2-Methylnaphthalene					2	3 J
Hexachlorocyclopentadiene					ND	10 U
2,4,6-Trichlorophenol					ND	10 U
2,4,5-Trichlorophenol					ND	25 U
2-Chloronaphthalene					ND	10 U
2-Nitroaniline					ND	25 U
Dimethyl Phthalate					ND	4 J
Acenaphthylene					ND	10 U
2,6-Dinitrotoluene					ND	10 U
3-Nitroaniline					ND	25 U
Acenaphthene					ND	10 U
2,4-Dinitrophenol					ND	25 U
4-Nitrophenol					0.6	25 U
Dibenzofuran					0.5	10 U
2,4-Dinitrotoluene					ND	10 U
Diethylphthalate					6	10 B
4-Chlorophenyl-phenylether					ND	10 U
Fluorene					ND	10 U
4-Nitroaniline					ND	25 U

NOTES
[1] Split Sample to NJDEP showed non detects on V.O. scan
* 1,2-Dichlorobenzene reported as total with 1,3-Dichlorobenzene
*** Indicates that trans-1,2-DCE coeluted with cis-1,2-DCE during GC/MS analysis
The concentration therefore is shown as total DCE.
A blank entry indicates a compound which was not analyzed

Table A-2 Previously Collected Data for the TW Series Wells

WELL	TW-05					
CONSULTANT	Lancy	NJDEP	Lancy	RCA	RCA	MPI
SAMPLING DATE	9/27/84	9/27/84	9/23/85	2/22/90	7/6/90	4/91
4,6-Dinitro-2-Methylphenol					ND	35 U
N-Nitrosodiphenylamine					ND	10 U
4-Bromophenyl-phenylether					ND	10 U
Hexachlorobenzene					ND	10 U
Pentachlorophenol					ND	35 U
Phenanthrene					ND	10 U
Anthracene					ND	10 U
Carbazole						10 U
Di-n-Butylphthalate					4	10 U
Fluoranthene					ND	10 U
Pyrene					ND	10 U
Butylbenzylphthalate					ND	10 U
3,3'-Dichlorobenzidine					ND	10 U
Benzo (a) Anthracene					ND	10 U
Chrysene					ND	10 U
bis(2-Ethylhexyl Phthalate					ND	10 U
Di-n-Octyl Phthalate					6.2	10 U
Benzo (b) Fluoranthene					ND	10 U
Benzo (k) Fluoranthene					ND	10 U
Benzo (a) Pyrene					ND	10 U
Indeno (1,2,3-cd) Pyrene					ND	10 U
Dibenz (a,h) Anthracene					ND	10 U
Benzo (g,h,i) Perylene					ND	10 U
Benzyl Alcohol						
Benzoic Acid					180	
Pesticides						
alpha-BHC						0.053 P
beta-BHC						0.05 U
delta-BHC						0.05 U
gamma-BHC						0.01 JP
Heptachlor						0.05 U
Aldrin						0.05 U
Heptachlor epoxide						0.05 U
Endosulfan I						0.0027 JP
Dieldrin						0.10 U
4,4' - DDE						0.0058 JP
Endrin						0.10 U
Endosulfan II						0.10 U
4,4'-DDD						0.10 U
Endosulfan sulfate						0.10 U
4,4'-DDT						0.10 U
Methoxychlor						0.50 U
Endrin ketone						0.10 U
Endrin Aldehyde						0.10 U
alpha-Chlordane						0.05 U
gamma-Chlordane						0.05 U
Toxaphene						0.50 U
PCBs						
Aroclor-1016						1.00 U
Aroclor-1221						2.00 U
Aroclor-1232						1.00 U
Aroclor-1242						1.00 U
Aroclor-1248						1.00 U
Aroclor-1254						1.00 U
Aroclor-1260						1.00 U
Metals						
Aluminum					1480	1480.0 *J
Antimony					1 U	17.0 U
Arsenic					4	2.1 B
Barium					200	200.0
Beryllium					5 U	1.0 U
Cadmium					5 U	3.0 U
Calcium					250000	134000
Chromium					10 U	5.1 B
Cobalt					50 U	4.0 U
Copper					25 U	4.0 U
Iron					11000	18400.0
Lead					15	5.1
Magnesium					13000	11700.0
Manganese					2000	2000.0
Mercury					1 U	0.2 U
Nickel					40 U	16.1 B
Potassium					1100	1300.0 BJ
Selenium					1 U	4.0 UWJ
Silver					10 U	5.0 U
Sodium					20000	19000.0 J
Thallium					1 U	2.0 UWJ
Vanadium					50 U	8.1 B
Zinc					180	43.4 J
Cyanide					10 U	10.0 UW*J

NOTES
[1] Split Sample to NJDEP showed non detects on V.O. scan
* 1,2-Dichlorobenzene reported as total with 1,3-Dichlorobenzene
*** Indicates that trans-1,2-DCE coeluted with cis-1,2-DCE during GC/MS analysis
The concentration therefore is shown as total DCE.
A blank entry indicates a compound which was not analyzed

Table A-2 Previously Collected Data for the TW Series Wells

WELL	TW-07				
CONSULTANT	Clancy	NJDEP	Clancy	HLA	MPI
SAMPLING DATE	9/27/84	9/27/84	8/23/85	2/23/90	4/91
4,6-Dinitro-2-Methylphenol					35 U
N-Nitrosodiphenylamine					10 U
4-Bromophenyl-phenylether					10 U
Hexachlorobenzene					10 U
Pentachlorophenol					35 U
Phenanthrene					10 U
Anthracene					10 U
Carbazole					10 U
Di-n-Butylphthalate					10 U
Fluoranthene					10 U
Pyrene					10 U
Butylbenzylphthalate					4 J
3,3'-Dichlorobenzidine					10 U
Benzo (a) Anthracene					10 U
Chrysene					10 U
bis(2-Ethylhexyl) Phthalate					1 BJ
Di-n-Octyl Phthalate					10 U
Benzo (b) Fluoranthene					10 U
Benzo (k) Fluoranthene					10 U
Benzo (a) Pyrene					10 U
Indeno (1,2,3-cd) Pyrene					10 U
Dibenz (a,h) Anthracene					10 U
Benzo (g,h,i) Perylene					10 U
Benzyl Alcohol					
Benzoic Acid					
Pesticides					
alpha-BHC					0.05 U
beta-BHC					0.05 U
delta-BHC					0.05 U
gamma-BHC					0.05 U
Heptachlor					0.05 U
Aldrin					0.05 U
Heptachlor epoxide					0.0059 JP
Endosulfan I					0.05 U
Dieldrin					0.10 U
4,4'-DDE					0.10 U
Endrin					0.10 U
Endosulfan II					0.10 U
4,4'-DDD					0.10 U
Endosulfan sulfate					0.10 U
4,4'-DDT					0.10 U
Methoxychlor					0.50 U
Endrin ketone					0.10 U
Endrin Aldehyde					0.10 U
alpha-Chlordane					0.05 U
gamma-Chlordane					0.05 U
Toxaphene					5.00 U
PCBs					
Aroclor-1016					1.00 U
Aroclor-1221					2.00 U
Aroclor-1232					1.00 U
Aroclor-1242					1.00 U
Aroclor-1248					1.00 U
Aroclor-1254					1.00 U
Aroclor-1260					1.00 U
Metals					
Aluminum					509.0 BJ
Antimony					17.0 U
Arsenic					2.8 B
Barium					1250.0
Beryllium					1.0 U
Cadmium					3.0 U
Calcium					88400.0
Chromium					3.0 U
Cobalt					4.0 U
Copper					6.7 BJ
Iron					2080.0
Lead					1.0 BJ
Magnesium					8570.0
Manganese					2580.0
Mercury					0.2 U
Nickel					5.0 B
Potassium					1660.0 B
Selenium					4.0 UWJ
Silver					5.0 U
Sodium					11800.0 J
Thallium					3.0 UW
Vanadium					12.0 B
Zinc					14.2 BJ
Cyanide					12.5 U

NOTES
[1] Split Sample to NJDEP showed non detects on V.O. scan
* 1,2-Dichlorobenzene reported as total with 1,3-Dichlorobenzene
*** Indicates that trans-1,2-DCE coeluted with cis-1,2-DCE during GC/MS analysis
The concentration therefore is shown as total DCE.
A blank entry indicates a compound which was not analyzed

Table A-2 Previously Collected Data for the TW Series Wells

WELL	TW-08					
CONSULTANT	Lancy	NJDEP	Lancy	AGES	HLA	MPI
SAMPLING DATE	9/27/84	9/27/84	9/23/85	12/19/88	2/20/90	4/91
VOCs						
Chloromethane	50 U	5.62 U		1 U	100 U	670 U
Bromomethane	50 U	1.3 U		1 U	50 U	670 U
Vinyl Chloride	50 U	1.3 U		35	50 U	670 U
Chloroethane	50 U	5.59 U		1 U	50 U	670 U
Methylene Chloride	50 U	970	125 U	725	1800	1500 B
Acetone			500 U			1500 B
Carbon Disulfide						670 U
1,1-Dichloroethene	140	6.81 U	125 U	414	300	300 J
1,1-Dichloroethane	50 U	6.38 U	230	99	240	670 U
1,2-Dichloroethene (total)	53					180 J
trans-1,2-dichloroethene	---	6.38 U	230	316	50 U	
Chloroform	13000	14000 B	30000	600	1400	13000
1,2-Dichloroethane	240	788	230	662	880	300 J
2-Butanone						670 U
1,1,1-Trichloroethane	150	262	230	588	14000	250 J
Carbon Tetrachloride	800	882	1300	439	580	850
Bromodichloromethane	50 U	6.88 U	125 U	1 U	50 U	670 U
1,2-Dichloropropane	50 U	6.44 U	50 U	1 U	53	670 U
cis-1,3-Dichloropropene	50 U	6.38 U		28	50 U	670 U
Trichloroethene	600	5388	6900	671	50 U	6600
Dibromochloromethane	50 U	6.88 U	250 U	1 U	50 U	670 U
1,1,2-Trichloroethane	50 U	6.38 U	50 U	7	50 U	670 U
Benzene	1200	1743	1800	1548	1700	1400
trans-1,3-Dichloropropene	50 U	6.44 U	125 U	1 U	50 U	670 U
Bromoform	50 U	11 U	250 U	1 U	50 U	670 U
4-Methyl-2-Pentanone						670 U
2-Hexanone						670 U
Tetrachloroethene	50 U	8.85 U	125 U	365	50 U	120 J
1,1,2,2-Tetrachloroethane	50	3786		31	50 U	670 U
Toluene	300	563	480	386	50 U	1000
Chlorobenzene	50 U	0.75 U	10 U	1 U	50 U	670 U
Ethylbenzene	50 U	1.4 U	10 U	229	50 U	670 U
Styrene						670 U
Xylene			50 U		50 U	140 J
Methyl Isobutyl Ketone			50 U			
Trichlorofluoromethane	50 U	8.38 U		16	50 U	
Vinyl Acetate						
BNOs						
Phenol						1 J
bis(2-Chloroethyl)Ether						2 J
2-Chlorophenol						10 U
1,3-Dichlorobenzene	50 U	6.56 U	100 U		50 U	10 U
1,4-Dichlorobenzene	50 U	6.51 U			50 U	10 U
1,2-Dichlorobenzene	50 U	0.5 U	*		50 U	4 J
2-Methylphenol						10 U
2,2'-Oxybis(1-Chloropropane)						10 U
4-Methylphenol						10 U
N-Nitroso-Di-n-Propylamine						10 U
Hexachloroethane						10 U
Nitrobenzene						25
Isophorone						13
2-Nitrophenol						10 U
2,4-Dimethylphenol						10 U
bis(2-Chloroethoxy)Methane						10 U
2,4-Dichlorophenol						10 U
1,2,4-Trichlorobenzene						10 U
Naphthalene						10 U
4-Chloroaniline						10 U
Hexachlorobutadiene						10 U
4-Chloro-3-Methylphenol						10 U
2-Methylnaphthalene						10 U
Hexachlorocyclopentadiene						10 U
2,4,6-Trichlorophenol						10 U
2,4,5-Trichlorophenol						25 U
2-Chloronaphthalene						25 U
2-Nitroaniline						10 U
Dimethyl Phthalate						10 U
Acenaphthylene						10 U
2,6-Dinitrotoluene						10 U
3-Nitroaniline						25 U
Acenaphthene						10 U
2,4-Dinitrophenol						25 U
4-Nitrophenol						25 U
Dibenzofuran						10 U
2,4-Dinitrotoluene						10 U
Diethylphthalate						2 BJ
4-Chlorophenyl-phenylether						10 U
Fluorene						10 U
4-Nitroaniline						25 U

NOTES
[1] Split Sample to NJDEP showed non detects on V.O. scan
* 1,2-Dichlorobenzene reported as total with 1,3-Dichlorobenzene
--- Indicates that trans-1,2-DCE coeluted with cis-1,2-DCE during GC/MS analysis
The concentration therefore is shown as total DCE.
A blank entry indicates a compound which was not analyzed

Table A-2 Previously Collected Data for the TW Series Wells

WELL	TW-08					
CONSULTANT	Lancy	NJDEP	Lancy	AGES	RCA	MPI
SAMPLING DATE	9/27/84	9/27/84	9/23/85	12/18/88	2/20/90	4/91
4,6-Dinitro-2-Methylphenol						35 U
N-Nitrosodiphenylamine						10 U
4-Bromophenyl-phenylether						10 U
Hexachlorobenzene						10 U
Pentachlorophenol						35 U
Phenanthrene						10 U
Anthracene						10 U
Carbazole						10 U
Di-n-Butylphthalate						10 U
Fluoranthene						10 U
Pyrene						10 U
Butylbenzylphthalate						2 J
3,3'-Dichlorobenzidine						10 U
Benzo (a) Anthracene						10 U
Chrysene						10 U
bis(2-Ethylhexyl) Phthalate						1 BJ
Di-n-Octyl Phthalate						10 U
Benzo (b) Fluoranthene						10 U
Benzo (k) Fluoranthene						10 U
Benzo (a) Pyrene						10 U
Indeno (1,2,3-cd) Pyrene						10 U
Dibenz (a,h) Anthracene						10 U
Benzo (g,h,i) Perylene						10 U
Benzyl Alcohol						
Benzoic Acid						
Pesticides						
alpha-BHC						0.05 U
beta-BHC						0.05 U
delta-BHC						0.05 U
gamma-BHC						0.05 U
Heptachlor						0.05 U
Aldrin						0.05 U
Heptachlor epoxide						0.05 U
Endosulfan I						0.05 U
Dieldrin						0.10 U
4,4'-DDE						0.10 U
Endrin						0.10 U
Endosulfan II						0.10 U
4,4'-DDD						0.10 U
Endosulfan sulfate						0.10 U
4,4'-DDT						0.10 U
Methoxychlor						0.50 U
Endrin ketone						0.10 U
Endrin Aldehyde						0.10 U
alpha-Chlordane						0.05 U
gamma-Chlordane						0.05 U
Toxaphene						5.00 U
PCBs						
Aroclor-1016						1.00 U
Aroclor-1221						2.00 U
Aroclor-1232						1.00 U
Aroclor-1242						1.00 U
Aroclor-1248						1.00 U
Aroclor-1254						1.00 U
Aroclor-1260						1.00 U
Metals						
Aluminum						5410.0 NJ
Antimony						17.0 U
Arsenic						5.5 *
Barium						503.0
Beryllium						1.0 U
Cadmium						3.0 U
Calcium						67800.0
Chromium						14.0
Cobalt						4.7 B
Copper						14.1 BJ
Iron						10800.0
Lead						8.1
Magnesium						12400.0
Manganese						1850.0
Mercury						0.2 U
Nickel						12.7 B
Potassium						3640.0 B
Selenium						4.0 UWJ
Silver						5.0 U
Sodium						11000.0 J
Thallium						3.0 UW
Vanadium						13.5 B
Zinc						44.8 J
Cyanide						12.5 U

NOTES
[1] Split Sample to NJDEP showed non detects on V.O. scan
* 1,2-Dichlorobenzene reported as total with 1,3-Dichlorobenzene
*** Indicates that trans-1,2-DCE coeluted with cis-1,2-DCE during GC/MS analysis
The concentration therefore is shown as total DCE.
A blank entry indicates a compound which was not analyzed

Table A-2 Previously Collected Data for the TW Series Wells

WELL	TW-08					TW-10		
CONSULTANT	Lancy	NJDEP	AGES	HLA	MPI	Lancy [1]	HLA	MPI
SAMPLING DATE	9/23/85	9/23/85	12/19/88	2/23/90	4/91	9/23/85	2/27/90	4/91
VOCs								
Chloromethane			1 U	10 U	10 U		10 U	10 U
Bromomethane			1 U	10 U	10 U		0.5 U	10 U
Vinyl Chloride			1 U	10 U	10 U		0.5 U	10 U
Chloroethane			1 U	10 U	10 U		0.5 U	10 U
Methylene Chloride	25 U		1 U	10 U	4 BJ	25 U	10 U	3 BJ
Acetone	100 U				10 U	100 U		14 B
Carbon Disulfide					10 U			10 U
1,1-Dichloroethene	25 U		1 U	10 U	10 U	25 U	0.5 U	10 U
1,1-Dichloroethane	30	1.9	6	10 U	2 J	10 U	0.5 U	10 U
1,2-Dichloroethene (total)		10			* J			10 J
trans-1,2-dichloroethene	60		11	10 U		10 U	0.5 U	
Chloroform	10 U	14 B	25	10 U	10	10 U	0.5 U	10 U
1,2-Dichloroethane	10 U	4	5	10 U	4 J	10 U	0.5 U	10 U
2-Butanone					10 U			10 U
1,1,1-Trichloroethane	10 U		1 U	10 U	10 U	10 U	0.5	10 U
Carbon Tetrachloride	220	180	340	70	91 J	50 U	0.75	1 J
Bromodichloromethane	25 U		1 U	10 U	10 U	25 U	0.5 U	10 U
1,2-Dichloropropane	10 U		1 U	10 U	10 U	10 U	0.5 U	10 U
cis-1,3-Dichloropropene			1 U	10 U	10 U		0.5 U	10 U
Trichloroethene	10	7.7	13	10 U	8 J	10 U	0.5 U	10 U
Dibromochloromethane	50 U		1 U	10 U	10 U	50 U	0.5 U	10 U
1,1,2-Trichloroethane	10 U		1 U	10 U	10 U	10 U	0.5 U	10 U
Benzene	2 U		1 U	10 U	1 J	2 U	0.5 U	10 U
trans-1,3-Dichloropropene	25 U		1 U	10 U	10 U	25 U	0.5 U	10 U
Bromoform	50 U		1 U	10 U	10 U	50 U	0.5 U	10 U
4-Methyl-2-Pentanone					10 U			10 U
2-Hexanone					10 U			10 U
Tetrachloroethene	25 U	25	5	25	4 J	25 U	0.5 U	10 U
1,1,2,2-Tetrachloroethane			1 U	10 U	10 U		0.5 U	10 U
Toluene	2 U		5	10 U	2 J	2 U	1.3	10 U
Chlorobenzene	2 U		1 U	10 U	10 U	2 U	0.5 U	10 U
Ethylbenzene	2 U		1 U	10 U	10 U	2 U	0.5 U	10 U
Styrene					10 U			10 U
Xylene	10 U			10 U	10 U	10 U	0.5 U	10 U
Methyl Isobutyl Ketone	10 U					10 U		
Trichlorofluoromethane			1 U	10 U			0.5 U	
Vinyl Acetate								
BNOs								
Phenol					10 U			
bis(2-Chloroethyl)Ether					10 U			
2-Chlorophenol					10 U			
1,3-Dichlorobenzene	25 U		1 U	10 U	10 U	25 U	0.5 U	
1,4-Dichlorobenzene			1 U	10 U	10 U		0.5 U	
1,2-Dichlorobenzene	*		1 U	10 U	10 U	*	0.5 U	
2-Methylphenol					10 U			
2,2'-Oxybis(1-Chloropropane)					10 U			
4-Methylphenol					10 U			
N-Nitroso-Di-n-Propylamine					10 U			
Hexachloroethane					10 U			
Nitrobenzene					10 U			
Isophorone					10 U			
2-Nitrophenol					10 U			
2,4-Dimethylphenol					10 U			
bis(2-Chloroethoxy)Methane					10 U			
2,4-Dichlorophenol					10 U			
1,2,4-Trichlorobenzene					10 U			
Naphthalene					10 U			
4-Chloroaniline					10 U			
Hexachlorobutadiene					10 U			
4-Chloro-3-Methylphenol					10 U			
2-Methylnaphthalene					10 U			
Hexachlorocyclopentadiene					10 U			
2,4,6-Trichlorophenol					10 U			
2,4,5-Trichlorophenol					25 U			
2-Chloronaphthalene					10 U			
2-Nitroaniline					25 U			
Dimethyl Phthalate					10 U			
Acenaphthylene					10 U			
2,6-Dinitrotoluene					10 U			
3-Nitroaniline					25 U			
Acenaphthene					10 U			
2,4-Dinitrophenol					25 U			
4-Nitrophenol					25 U			
Dibenzofuran					10 U			
2,4-Dinitrotoluene					10 U			
Diethylphthalate					10 U			
4-Chlorophenyl-phenylether					10 U			
Fluorene					10 U			
4-Nitroaniline					25 U			

NOTES
[1] Split Sample to NJDEP showed non detects on V.O. scan
* 1,2-Dichlorobenzene reported as total with 1,3-Dichlorobenzene
*** Indicates that trans-1,2-DCE coeluted with cis-1,2-DCE during GC/MS analyses
The concentration therefore is shown as total DCE.
A blank entry indicates a compound which was not analyzed

Table A-2 Previously Collected Data for the TW Series Wells

WELL	TW-09						TW-10			
CONSULTANT	Lancy	NJDEP	AGES	HLA	MPI		Lancy [1]	HLA	MPI	
SAMPLING DATE	9/23/85	9/23/85	12/19/88	2/23/90	4/91		9/23/85	2/27/90	4/91	
4,6-Dinitro-2-Methylphenol					25	U				
N-Nitrosodiphenylamine					10	U				
4-Bromophenyl-phenylether					10	U				
Hexachlorobenzene					10	U				
Pentachlorophenol					25	U				
Phenanthrene					10	U				
Anthracene					10	U				
Carbazole					10	U				
Di-n-Butylphthalate					10	U				
Fluoranthene					10	U				
Pyrene					10	U				
Butylbenzylphthalate					10	U				
3,3'-Dichlorobenzidine					10	U				
Benzo (a) Anthracene					10	U				
Chrysene					10	U				
bis(2-Ethylhexyl) Phthalate					1	BJ				
Di-n-Octyl Phthalate					10	U				
Benzo (b) Fluoranthene					10	U				
Benzo (k) Fluoranthene					10	U				
Benzo (a) Pyrene					10	U				
Indeno (1,2,3-cd) Pyrene					10	U				
Dibenz (a,h) Anthracene					10	U				
Benzo (g,h,i) Perylene					10	U				
Benzyl Alcohol										
Benzoic Acid										
Pesticides										
alpha-BHC					0.05	U				
beta-BHC					0.05	U				
delta-BHC					0.05	U				
gamma-BHC					0.05	U				
Heptachlor					0.05	U				
Aldrin					0.05	U				
Heptachlor epoxide					0.05	U				
Endosulfan I					0.05	U				
Dieldrin					0.10	U				
4,4'-DDE					0.10	U				
Endrin					0.10	U				
Endosulfan II					0.10	U				
4,4'-DDD					0.10	U				
Endosulfan sulfate					0.10	U				
4,4'-DDT					0.10	U				
Methoxychlor					0.50	U				
Endrin ketone					0.10	U				
Endrin Aldehyde					0.10	U				
alpha-Chlordane					0.05	U				
gamma-Chlordane					0.05	U				
Toxaphene					5.00	U				
PCBs										
Aroclor-1016					1.00	U				
Aroclor-1221					2.00	U				
Aroclor-1232					1.00	U				
Aroclor-1242					1.00	U				
Aroclor-1248					1.00	U				
Aroclor-1254					1.00	U				
Aroclor-1260					1.00	U				
Metals										
Aluminum					827.0	NJ			1370.0	NJ
Antimony					17.9	UWJ			17.6	UWJ
Arsenic					2.9	U			2.4	BJ
Barium					864.0				466.0	
Beryllium					1.9	U			1.0	U
Cadmium					3.8	U			3.0	U
Calcium					88100.0				38500.0	
Chromium					5.9	B			5.4	B
Cobalt					4.8	U			4.0	U
Copper					4.3	BJ			4.0	U
Iron					12900.0				20400.0	
Lead					6.8				7.8	
Magnesium					7650.0				7610.0	
Manganese					288.0				661.0	
Mercury					0.2	U			0.2	U
Nickel					8.7	B			5.0	U
Potassium					1260.0	B			1090.0	B
Selenium					4.8	UWJ			4.0	UWJ
Silver					5.0	U			5.0	U
Sodium					10550.0	J			14500.0	J
Thallium					3.0	UW			3.0	U
Vanadium					8.9	B			20.4	B
Zinc					28.8	J			15.4	BJ
Cyanide					10.0	U			10.0	U

NOTES
[1] Split Sample to NJDEP showed non detects on V.O. scan
* 1,2-Dichlorobenzene reported as total with 1,3-Dichlorobenzene
*** Indicates that trans-1,2-DCE coeluted with cis-1,2-DCE during GC/MS analysis
The concentration therefore is shown as total DCE.
A blank entry indicates a compound which was not analyzed

Table A-2 Previously Collected Data for the TW Series Wells

WELL	TW-11			TW-12		
CONSULTANT	Lancy [1]	RCA	MPI	Lancy [1]	RCA	MPI
SAMPLING DATE	9/23/85	3/8/90	4/91	9/23/85	3/7/90	4/91
600s						
Chloromethane		1.0 U	10 U		1.0 U	10 U
Bromomethane		1.0 U	10 U		1.0 U	10 U
Vinyl Chloride		1.0 U	10 U		1.0 U	10 U
Chloroethane		1.0 U	10 U		1.0 U	10 U
Methylene Chloride	25 U	1.0 U	2 BJ	25 U	1.0 U	6 BJ
Acetone	100 U		10 U	100 U		10 U
Carbon Disulfide			2 J			10 U
1,1-Dichloroethene	25 U	1 U	10 U	25 U	1.0 U	10 U
1,1-Dichloroethane	10 U	1 U	10 U	10 U	1.0 U	10 U
1,2-Dichloroethene (total)			3 J			10 U
trans-1,2-dichloroethene	10 U	1 U		10 U	1.0 U	
Chloroform	10 U	1 U	10 U	10 U	1.0 U	10 U
1,2-Dichloroethane	10 U	1 U	10 U	10 U	1.0 U	10 U
2-Butanone			10 U			10 U
1,1,1-Trichloroethane	10 U	1 U	10 U	10 U	1.0 U	10 U
Carbon Tetrachloride	50 U	1 U	10 U	50 U	1.0 U	10 U
Bromodichloromethane	25 U	1 U	10 U	25 U	1.0 U	10 U
1,2-Dichloropropane	10 U	1 U	10 U	10 U	1.0 U	10 U
cis-1,3-Dichloropropene		1 U	10 U		1.0 U	10 U
Trichloroethene	10 U	1 U	2 J	10 U	1.0 U	10 U
Dibromochloromethane	50 U	1 U	10 U	50 U	1.0 U	10 U
1,1,2-Trichloroethane	10 U	1 U	10 U	10 U	1.0 U	10 U
Benzene	2 U	1 U	10 U	2 U	1.0 U	10 U
trans-1,3-Dichloropropene	25 U	1 U	10 U	25 U	1.0 U	10 U
Bromoform	50 U	1 U	10 U	50 U	1.0 U	10 U
4-Methyl-2-Pentanone			10 U			10 U
2-Hexanone			10 U			10 U
Tetrachloroethene	25 U	1 U	10 U	25 U	1.0 U	10 U
1,1,2,2-Tetrachloroethane		1 U	10 U		1.0 U	10 U
Toluene	2 U	1 U	10 U	2 U	1.0 U	10 U
Chlorobenzene	2 U	1 U	10 U	2 U	1.0 U	10 U
Ethylbenzene	2 U	1 U	10 U	2 U	1.0 U	10 U
Styrene			10 U			10 U
Xylene	10 U	1 U	10 U	10 U	1.0 U	10 U
Methyl Isobutyl Ketone	10 U			10 U		
Trichlorofluoromethane		1.0 U			1.0 U	
Vinyl Acetate						
8000s						
Phenol			10 U			10 U
bis(2-Chloroethyl)Ether			10 U			10 U
2-Chlorophenol			10 U			10 U
1,3-Dichlorobenzene	30 U	1 U	10 U	30 U	1.0 U	10 U
1,4-Dichlorobenzene		1 U	10 U		1.0 U	10 U
1,2-Dichlorobenzene	*	1 U	10 U	*	1.0 U	10 U
2-Methylphenol			10 U			10 U
2,2'-Oxybis(1-Chloropropane)			10 U			10 U
4-Methylphenol			10 U			10 U
N-Nitroso-Di-n-Propylamine			10 U			10 U
Hexachloroethane			10 U			10 U
Nitrobenzene			10 U			10 U
Isophorone			10 U			10 U
2-Nitrophenol			10 U			10 U
2,4-Dimethylphenol			10 U			10 U
bis(2-Chloroethoxy)Methane			10 U			10 U
2,4-Dichlorophenol			10 U			10 U
1,2,4-Trichlorobenzene			10 U			32
Naphthalene			10 U			10 U
4-Chloroaniline			10 U			10 U
Hexachlorobutadiene			10 U			10 U
4-Chloro-3-Methylphenol			10 U			83
2-Methylnaphthalene			10 U			10 U
Hexachlorocyclopentadiene			10 U			10 U
2,4,6-Trichlorophenol			10 U			10 U
2,4,5-Trichlorophenol			25 U			25 U
2-Chloronaphthalene			10 U			10 U
2-Nitroaniline			25 U			25 U
Dimethyl Phthalate			10 U			10 U
Acenaphthylene			10 U			10 U
2,6-Dinitrotoluene			10 U			10 U
3-Nitroaniline			25 U			25 U
Acenaphthene			10 U			35
2,4-Dinitrophenol			25 U			25 U
4-Nitrophenol			25 U			25 U
Dibenzofuran			10 U			10 U
2,4-Dinitrotoluene			10 U			10 U
Diethylphthalate			10 U			10 U
4-Chlorophenyl-phenylether			10 U			10 U
Fluorene			10 U			10 U
4-Nitroaniline			25 U			25 U

NOTES
[1] Split Sample to NJDEP showed non detects on V.O. scan
* 1,2-Dichlorobenzene reported as total with 1,3-Dichlorobenzene
*** Indicates that trans-1,2-DCE coeluted with cis-1,2-DCE during GC/MS analysis
The concentration therefore is shown as total DCE.
A blank entry indicates a compound which was not analyzed

Table A-2 Previously Collected Data for the TW Series Wells

WELL	TW-11				TW-12			
CONSULTANT	Lancy [1]	HLA	MPI		Lancy [1]	HLA	MPI	
SAMPLING DATE	9/23/85	3/6/90	4/91		9/23/85	3/7/90	4/91	
4,6-Dinitro-2-Methylphenol			25	U			25	U
N-Nitrosodiphenylamine			10	U			10	U
4-Bromophenyl-phenylether			10	U			10	U
Hexachlorobenzene			10	U			10	U
Pentachlorophenol			25	U			25	U
Phenanthrene			10	U			10	U
Anthracene			10	U			10	U
Carbazole			10	U			10	U
Di-n-Butylphthalate			10	U			10	U
Fluoranthene			10	U			10	U
Pyrene			10	U			10	U
Butylbenzylphthalate			10	U			10	U
3,3'-Dichlorobenzidine			10	U			10	U
Benzo (a) Anthracene			10	U			10	U
Chrysene			10	U			10	U
bis(2-Ethylhexyl) Phthalate			10	U			10	U
Di-n-Octyl Phthalate			10	U			10	U
Benzo (b) Fluoranthene			10	U			10	U
Benzo (k) Fluoranthene			10	U			10	U
Benzo (a) Pyrene			10	U			10	U
Indeno (1,2,3-cd) Pyrene			10	U			10	U
Dibenz (a,h) Anthracene			10	U			10	U
Benzo (g,h,i) Perylene			10	U			10	U
Benzyl Alcohol								
Benzoic Acid								
Pesticides								
alpha-BHC			0.05	U			0.05	U
beta-BHC			0.05	U			0.05	U
delta-BHC			0.05	U			0.05	U
gamma-BHC			0.05	U			0.05	U
Heptachlor			0.05	U			0.05	U
Aldrin			0.05	U			0.05	U
Heptachlor epoxide			0.05	U			0.05	U
Endosulfan I			0.05	U			0.05	U
Dieldrin			0.10	U			0.10	U
4,4' - DDE			0.10	U			0.10	U
Endrin			0.10	U			0.10	U
Endosulfan II			0.10	U			0.10	U
4,4 -DDD			0.10	U			0.10	U
Endosulfan sulfate			0.10	U			0.10	U
4,4 -DDT			0.10	U			0.10	U
Methoxychlor			0.50	U			0.10	U
Endrin ketone			0.10	U			0.10	U
Endrin Aldehyde			0.10	U			0.10	U
alpha-Chlordane			0.05	U			0.05	U
gamma-Chlordane			0.05	U			0.05	U
Toxaphene			5.0	U			5.0	U
PCBs								
Aroclor-1016			1.0	U			1.0	U
Aroclor-1221			2.0	U			2.0	U
Aroclor-1232			1.0	U			1.0	U
Aroclor-1242			1.0	U			1.0	U
Aroclor-1248			1.0	U			1.0	U
Aroclor-1254			1.0	U			1.0	U
Aroclor-1260			1.0	U			1.0	U
Metals								
Aluminum			182.0	B,*,J			268.0	*,J
Antimony			17.0	U			17.0	U
Arsenic			4.2	B			3.8	B
Barium			346.0				388.0	
Beryllium			1.0	U			1.0	U
Cadmium			3.0	U			3.0	U
Calcium			108000.0				71400.0	
Chromium			3.0	B			6.0	B
Cobalt			4.0	U			4.0	U
Copper			4.0	U			4.0	U
Iron			84000.0	J			80100.0	
Lead			3.2	J			6.7	
Magnesium			13000.0				4530.0	B
Manganese			188.0	J			213.0	
Mercury			0.4	J			0.2	U
Nickel			9.0	B			6.0	B
Potassium			985.0	B			676.0	B
Selenium			4.0	U/N/W/J			4.0	U/N/W/J
Silver			5.0	U			5.0	U
Sodium			19000.0	J			11000.0	J
Thallium			2.0	U/N/J			2.0	U/N/J
Vanadium			30.2	B			40.0	B
Zinc			7.0	U/J			115.0	
Cyanide			10.0	U/N*J			10.0	U/N*J

NOTES
[1] Split Sample to NJDEP showed non detects on V.O. scan
* 1,2-Dichlorobenzene reported as total with 1,3-Dichlorobenzene
*** Indicates that trans-1,2-DCE coeluted with cis-1,2-DCE during GC/MS analysis
The concentration therefore is shown as total DCE.
A blank entry indicates a compound which was not analyzed

Table A-2 Previously Collected Data for the TW Series Wells

WELL	TW-13			TW-14		
CONSULTANT	Lancy [1]	RCA	MPI	Lancy [1]	RCA	MPI
SAMPLING DATE	9/23/85	3/23/90	4/91	12/19/85	3/22/90	4/91
8260						
Chloromethane		1.0 U	10 U		1.0 U	10 U
Bromomethane		1.0 U	10 U		1.0 U	10 U
Vinyl Chloride		1.0 U	10 U		1.0 U	10 U
Chloroethane		1.0 U	10 U		1.0 U	10 U
Methylene Chloride	25 U	1.0 U	2 BJ	25 U	1.0 U	2 BJ
Acetone	100 U		10 U	100 U		10 U
Carbon Disulfide			10 U			10 U
1,1-Dichloroethene	25 U	1.0 U	10 U	25 U	1.0 U	10 U
1,1-Dichloroethane	10 U	1.0 U	10 U	10 U	1.0 U	10 U
1,2-Dichloroethene (total)			10 U			10 U
trans-1,2-dichloroethene	10 U	1.0 U		10 U	1.0 U	
Chloroform	10 U	1.0 U	10 U	10 U	1.0 U	10 U
1,2-Dichloroethane	10 U	1.0 U	10 U	10 U	1.0 U	10 U
2-Butanone			10 U			10 U
1,1,1-Trichloroethane	10 U	1.7	10 U	10 U	1.0 U	10 U
Carbon Tetrachloride	50 U	1.0 U	10 U	50 U	1.0 U	10 U
Bromodichloromethane	25 U	1.0 U	10 U	25 U	1.0 U	10 U
1,2-Dichloropropane	10 U	1.0 U	10 U	10 U	1.0 U	10 U
cis-1,3-Dichloropropene		1.0 U	10 U		1.0 U	10 U
Trichloroethene	10 U	2.4	10 U	10 U	1.0 U	10 U
Dibromochloromethane	50 U	1.0 U	10 U	50 U	1.0 U	10 U
1,1,2-Trichloroethane	10 U	1.0 U	10 U	10 U	1.0 U	10 U
Benzene	2 U	1.0 U	10 U	2 U	1.0 U	10 U
trans-1,3-Dichloropropene	25 U	1.0 U	10 U	25 U	1.0 U	10 U
Bromoform	50 U	1.0 U	10 U	50 U	1.0 U	10 U
4-Methyl-2-Pentanone			10 U			10 U
2-Hexanone			10 U			10 U
Tetrachloroethene	25 U	1.0 U	10 U	25 U	1.0 U	10 U
1,1,2,2-Tetrachloroethane		1.0 U	10 U		1.0 U	10 U
Toluene	2 U	1.0 U	10 U	2 U	1.0 U	10 U
Chlorobenzene	2 U	1.0 U	10 U	2 U	1.0 U	10 U
Ethylbenzene	2 U	1.0 U	10 U	2 U	1.0 U	10 U
Styrene			10 U			10 U
Xylene	10 U	1.0 U	10 U	10 U	1.0 U	10 U
Methyl Isobutyl Ketone	10 U					
Trichlorofluoromethane		1.0 U			1.0 U	
Vinyl Acetate						
8100						
Phenol			10 U			10 U
bis(2-Chloroethyl)Ether			10 U			10 U
2-Chlorophenol			10 U			10 U
1,3-Dichlorobenzene	30 U	1.0 U	10 U	30 U	1.0 U	10 U
1,4-Dichlorobenzene		1.0 U	10 U		1.0 U	10 U
1,2-Dichlorobenzene	*	1.0 U	10 U	*	1.0 U	10 U
2-Methylphenol			10 U			10 U
2,2'-Oxybis(1-Chloropropane)			10 U			10 U
4-Methylphenol			10 U			10 U
N-Nitroso-Di-n-Propylamine			10 U			10 U
Hexachloroethane			10 U			10 U
Nitrobenzene			10 U			10 U
Isophorone			10 U			10 U
2-Nitrophenol			10 U			10 U
2,4-Dimethylphenol			10 U			10 U
bis(2-Chloroethoxy)Methane			10 U			10 U
2,4-Dichlorophenol			10 U			10 U
1,2,4-Trichlorobenzene			44			10 U
Naphthalene			10 U			10 U
4-Chloroaniline			10 U			10 U
Hexachlorobutadiene			10 U			10 U
4-Chloro-3-Methylphenol			88			10 U
2-Methylnaphthalene			10 U			10 U
Hexachlorocyclopentadiene			10 U			10 U
2,4,6-Trichlorophenol			10 U			10 U
2,4,5-Trichlorophenol			25 U			25 U
2-Chloronaphthalene			10 U			10 U
2-Nitroaniline			25 U			25 U
Dimethyl Phthalate			10 U			10 U
Acenaphthylene			10 U			10 U
2,6-Dinitrotoluene			10 U			10 U
3-Nitroaniline			25 U			25 U
Acenaphthene			42			10 U
2,4-Dinitrophenol			25 U			25 U
4-Nitrophenol			25 U			25 U
Dibenzofuran			10 U			10 U
2,4-Dinitrotoluene			10 U			10 U
Diethylphthalate			10 U			10 U
4-Chlorophenyl-phenylether			10 U			10 U
Fluorene			10 U			10 U
4-Nitroaniline			25 U			25 U

NOTES
[1] Split Sample to NJDEP showed non detects on V.O. scan
* 1,2-Dichlorobenzene reported as total with 1,3-Dichlorobenzene
*** Indicates that trans-1,2-DCE coeluted with cis-1,2-DCE during GC/MS analysis
The concentration therefore is shown as total DCE.
A blank entry indicates a compound which was not analyzed

Table A-2 Previously Collected Data for the TW Series Wells

WELL	TW-13				TW-14			
CONSULTANT	Lancy [1]	HLA	MPI		Lancy [1]	HLA	MPI	
SAMPLING DATE	9/23/85	3/23/90	4/91		12/19/85	3/22/90	4/91	
4,6-Dinitro-2-Methylphenol			25	U			25	U
N-Nitrosodiphenylamine			10	U			10	U
4-Bromophenyl-phenylether			10	U			10	U
Hexachlorobenzene			10	U			10	U
Pentachlorophenol			25	U			25	U
Phenanthrene			10	U			10	U
Anthracene			10	U			10	U
Carbazole			10	U			10	U
Di-n-Butylphthalate			10	U			10	U
Fluoranthene			10	U			10	U
Pyrene			10	U			10	U
Butylbenzylphthalate			10	U			75	
3,3'-Dichlorobenzidine			10	U			10	U
Benzo (a) Anthracene			10	U			10	U
Chrysene			10	U			10	U
bis(2-Ethylhexyl) Phthalate			10	U			1	J
Di-n-Octyl Phthalate			10	U			10	U
Benzo (b) Fluoranthene			10	U			10	U
Benzo (k) Fluoranthene			10	U			10	U
Benzo (a) Pyrene			10	U			10	U
Indeno (1,2,3-cd) Pyrene			10	U			10	U
Dibenz (a,h) Anthracene			10	U			10	U
Benzo (g,h,i) Perylene			10	U			10	U
Benzyl Alcohol								
Benzoic Acid								
Pesticides								
alpha-BHC			0.05	U			0.05	U
beta-BHC			0.05	U			0.05	U
delta-BHC			0.05	U			0.05	U
gamma-BHC			0.05	U			0.05	U
Heptachlor			0.05	U			0.05	U
Aldrin			0.05	U			0.05	U
Heptachlor epoxide			0.05	U			0.05	U
Endosulfan I			0.05	U			0.05	U
Dieldrin			0.10	U			0.10	U
4,4'-DDE			0.10	U			0.10	U
Endrin			0.10	U			0.10	U
Endosulfan II			0.10	U			0.10	U
4,4'-DDD			0.0007	JPB			0.10	U
Endosulfan sulfate			0.10	U			0.10	U
4,4'-DDT			0.10	U			0.10	U
Methoxychlor			0.50	U			0.50	U
Endrin ketone			0.10	U			0.10	U
Endrin Aldehyde			0.10	U			0.10	U
alpha-Chlordane			0.05	U			0.05	U
gamma-Chlordane			0.05	U			0.05	U
Toxaphene			5.0	U			5.0	U
PCBs								
Aroclor-1016			1.0	U			1.0	U
Aroclor-1221			2.0	U			2.0	U
Aroclor-1232			1.0	U			1.0	U
Aroclor-1242			1.0	U			1.0	U
Aroclor-1248			1.0	U			1.0	U
Aroclor-1254			1.0	U			1.0	U
Aroclor-1260			1.0	U			1.0	U
Metals								
Aluminum			788.0	*J			6530.0	*J
Antimony			17.6	U			17.6	U
Arsenic			2.0	U			5.4	B
Barium			468.0				545.0	
Beryllium			1.0	U			1.0	U
Cadmium			5.0	U			5.0	U
Calcium			65700.0				60000.0	
Chromium			4.2	B			15.3	
Cobalt			4.0	U			8.1	B
Copper			4.0	U			664.0	
Iron			6580.0				13800.0	
Lead			3.0	JB			18.1	
Magnesium			11200.0				14400.0	
Manganese			412.0				516.0	
Mercury			0.2	U			0.2	U
Nickel			5.0	U			19.8	B
Potassium			1660.0	B			3610.0	B
Selenium			4.0	UWWJ			4.5	BJW+
Silver			5.0	U			5.0	U
Sodium			18500.0	J			9780.0	J
Thallium			2.0	UWWJ			2.0	UWWJ
Vanadium			8.2	B			25.3	B
Zinc			15.1	BJ			58.6	J
Cyanide			10.0	UW*J			26.1	W*J

NOTES

[1] Split Sample to NJDEP showed non detects on V.O. scan

* 1,2-Dichlorobenzene reported as total with 1,3-Dichlorobenzene

*** Indicates that trans-1,2-DCE coeluted with cis-1,2-DCE during GC/MS analysis
The concentration therefore is shown as total DCE.

A blank entry indicates a compound which was not analyzed

Table A-2 Previously Collected Data for the TW Series Wells

WELL	TW-15			
CONSULTANT	Lancy	NJDEP	HLA	RPI
SAMPLING DATE	12/19/85	12/19/85	4/12/90	4/91
VOCs				
Chloromethane			5.0 U	10 U
Bromomethane			5.0 U	10 U
Vinyl Chloride			5.0 U	10 U
Chloroethane			5.0 U	10 U
Methylene Chloride	25 U		5.0 U	2 BJ
Acetone				10 U
Carbon Disulfide				10 U
1,1-Dichloroethene	25 U		5.0 U	10 U
1,1-Dichloroethane	10 U	1.3	5.0 U	10 U
1,2-Dichloroethene (total)		28		10
trans-1,2-dichloroethene	165		5.0 U	
Chloroform	10 U	2.6	5.0 U	1 J
1,2-Dichloroethane	10 U		5.0 U	10 U
2-Butanone				10 U
1,1,1-Trichloroethane	10 U		5.0 U	10 U
Carbon Tetrachloride	50 U	1.6	5.0 U	10 U
Bromodichloromethane	25 U		5.0 U	10 U
1,2-Dichloropropane	10 U		5.0 U	10 U
cis-1,3-Dichloropropene			5.0 U	10 U
Trichloroethene	14	11	5.0 U	6 J
Dibromochloromethane	50 U		5.0 U	10 U
1,1,2-Trichloroethane	10 U		5.0 U	10 U
Benzene	2 U		5.0 U	10 U
trans-1,3-Dichloropropene	25 U		5.0 U	10 U
Bromoform	50 U		5.0 U	10 U
4-Methyl-2-Pentanone				10 U
2-Hexanone				10 U
Tetrachloroethene	75	65	5.0 U	41
1,1,2,2-Tetrachloroethane			5.0 U	10 U
Toluene	25	1.7	5.0 U	10 U
Chlorobenzene	2 U	3.6	5.0 U	10 U
Ethylbenzene	2 U		5.0 U	10 U
Styrene				10 U
Xylene			5.0 U	10 U
Methyl Isobutyl Ketone				
Trichlorofluoromethane			5.0 U	
Vinyl Acetate				
BNOCs				
Phenol				10 U
bis(2-Chloroethyl)Ether				10 U
2-Chlorophenol				10 U
1,3-Dichlorobenzene	10 U		5.0 U	10 U
1,4-Dichlorobenzene	10 U		5.0 U	10 U
1,2-Dichlorobenzene	10 U		5.0 U	10 U
2-Methylphenol				10 U
2,2'-Oxybis(1-Chloropropane)				10 U
4-Methylphenol				10 U
N-Nitroso-Di-n-Propylamine				10 U
Hexachloroethane				10 U
Nitrobenzene				10 U
Isophorone				10 U
2-Nitrophenol				10 U
2,4-Dimethylphenol				10 U
bis(2-Chloroethoxy)Methane				10 U
2,4-Dichlorophenol				10 U
1,2,4-Trichlorobenzene				10 U
Naphthalene				10 U
4-Chloroaniline				10 U
Hexachlorobutadiene				10 U
4-Chloro-3-Methylphenol				10 U
2-Methylnaphthalene				10 U
Hexachlorocyclopentadiene				10 U
2,4,6-Trichlorophenol				10 U
2,4,5-Trichlorophenol				25 U
2-Chloronaphthalene				10 U
2-Nitroaniline				25 U
Dimethyl Phthalate				10 U
Acenaphthylene				10 U
2,6-Dinitrotoluene				10 U
3-Nitroaniline				25 U
Acenaphthene				10 U
2,4-Dinitrophenol				25 U
4-Nitrophenol				25 U
Dibenzofuran				10 U
2,4-Dinitrotoluene				10 U
Diethylphthalate				10 U
4-Chlorophenyl-phenylether				10 U
Fluorene				10 U
4-Nitroaniline				25 U

NOTES
[1] Split Sample to NJDEP showed non detects on V.O. scan
* 1,2-Dichlorobenzene reported as total with 1,3-Dichlorobenzene
*** Indicates that trans-1,2-DCE coeluted with cis-1,2-DCE during GC/MS analysis
The concentration therefore is shown as total DCE.
A blank entry indicates a compound which was not analyzed

Table A-2 Previously Collected Data for the TW Series Wells

WELL	TW-15			
CONSULTANT	Clancy	NJDEP	HLA	MPI
SAMPLING DATE	12/16/85	12/19/85	4/12/90	4/91
4,6-Dinitro-2-Methylphenol				35 U
N-Nitrosodiphenylamine				10 U
4-Bromophenyl-phenylether				10 U
Hexachlorobenzene				10 U
Pentachlorophenol				35 U
Phenanthrene				10 U
Anthracene				10 U
Carbazole				10 U
Di-n-Butylphthalate				10 U
Fluoranthene				10 U
Pyrene				10 U
Butylbenzylphthalate				10 U
3,3'-Dichlorobenzidine				10 U
Benzo (a) Anthracene				10 U
Chrysene				10 U
bis(2-Ethylhexyl) Phthalate				10 U
Di-n-Octyl Phthalate				10 U
Benzo (b) Fluoranthene				10 U
Benzo (k) Fluoranthene				10 U
Benzo (a) Pyrene				10 U
Indeno (1,2,3-cd) Pyrene				10 U
Dibenz (a,h) Anthracene				10 U
Benzo (g,h,i) Perylene				10 U
Benzyl Alcohol				
Benzoic Acid				
Pesticides				
alpha-BHC				0.05 U
beta-BHC				0.05 U
delta-BHC				0.05 U
gamma-BHC				0.05 U
Heptachlor				0.05 U
Aldrin				0.05 U
Heptachlor epoxide				0.05 U
Endosulfan I				0.05 U
Dieldrin				0.10 U
4,4' - DDE				0.10 U
Endrin				0.10 U
Endosulfan II				0.10 U
4,4'-DDD				0.0098 JPB
Endosulfan sulfate				0.10 U
4,4 -DDT				0.10 U
Methoxychlor				0.50 U
Endrin ketone				0.10 U
Endrin Aldehyde				0.10 U
alpha-Chlordane				0.05 U
gamma-Chlordane				0.05 U
Toxaphene				5.0 U
PCBs				
Aroclor-1016				1.0 U
Aroclor-1221				2.0 U
Aroclor-1232				1.0 U
Aroclor-1242				1.0 U
Aroclor-1248				1.0 U
Aroclor-1254				1.0 U
Aroclor-1260				1.0 U
Metals				
Aluminum				1350 *J
Antimony				17 U
Arsenic				* -
Barium				438
Beryllium				1 U
Cadmium				3 U
Calcium				77100
Chromium				5.8 B
Cobalt				4 U
Copper				4 U
Iron				3850
Lead				4.8
Magnesium				8470
Manganese				388
Mercury				0.2 U
Nickel				5.8 B
Potassium				1250 B
Selenium				4 UWJ
Silver				5 U
Sodium				11800 J
Thallium				2 UWJ
Vanadium				8.7 B
Zinc				18.1 BJ
Cyanide				10 UW*J

NOTES
[1] Split Sample to NJDEP showed non detects on V.O. scan
* 1,2-Dichlorobenzene reported as total with 1,3-Dichlorobenzene
*** Indicates that trans-1,2-DCE coeluted with cis-1,2-DCE during GC/MS analysis
The concentration therefore is shown as total DCE.
A blank entry indicates a compound which was not analyzed

Table A-7 Previously Collected Data for the Off-Site Wells

Street Address	861 Station (Plastics)	861 Station (Plastics)	1217 Washington (Rubber)
Sampled By:	Prod. Well	Prod. Well	NJDEP
Sampling Date	8/27/80	12/11/80	8-7/80
4-Methylphenol			
N-Nitroso-Di-n-Propylamine			
Hexachloroethane			
Nitrobenzene			
Isophorone			
2-Nitrophenol			
2,4-Dimethylphenol			
Benzoic Acid			
bis(2-Chloroethoxy)Methane			
2,4-Dichlorophenol			
1,2,4-Trichlorobenzene			
Naphthalene			
4-Chloroaniline			
Hexachlorobutadiene			
4-Chloro-3-Methylphenol			
2-Methylnaphthalene			
Hexachlorocyclopentadiene			
2,4,6-Trichlorophenol			
2,4,5-Trichlorophenol			
2-Chloronaphthalene			
2-Nitroaniline			
Dimethyl Phthalate			
Acenaphthylene			
2,6-Dinitrotoluene			
3-Nitroaniline			
Acenaphthene			
2,4-Dinitrophenol			
4-Nitrophenol			
Dibenzofuran			
2,4-Dinitrotoluene			
Diethylphthalate			
4-Chlorophenyl-phenylether			
Fluorene			
4-Nitroaniline			
4,6-Dinitro-2-Methylphenol			
N-Nitrosodiphenylamine			
4-Bromophenyl-phenylether			
Hexachlorobenzene			
Pentachlorophenol			
Phenanthrene			
Anthracene			
Carbazole			
Di-n-Butylphthalate			
Fluoranthene			
Pyrene			
Butylbenzylphthalate			
3,3'-Dichlorobenzidine			
Benzo (a) Anthracene			
Chrysene			
bis(2-Ethylhexyl) Phthalate			
Di-n-Octylphthalate			
Benzo (b) Fluoranthene			
Benzo (k) Fluoranthene			
Benzo (a) Pyrene			
Indeno (1,2,3-cd) Pyrene			
Dibenz (a,h) Anthracene			
Benzo (g,h,i) Perylene			
Dichlorofluoromethane			
Methyl Tertiary Butyl Ether			
Acrolein	50 U	50 U	
Acrylonitrile	50 U	50 U	
1,2,3-Trichlorobenzene			
1,3,5-Trimethylbenzene			
Tert-butyl-benzene			
1,2,4-Trimethylbenzene			
Pesticides			
alpha-BHC			
beta-BHC			
delta-BHC			
gamma-BHC			
Heptachlor			
Aldrin			

Table A-7 Previously Collected Data for the Off-Site Wells

Street Address	961 Station (Plastics) Prod. Well	961 Station (Plastics) Prod. Well	1217 Washington (Plastics)
Sampled By			NJDEP
Sampling Date	9/27/80	12/11/80	5-7/80
Heptachlor epoxide			
Endosulfan I			
Dieldrin			
4,4' - DDE			
Endrin			
Endosulfan II			
4,4'-DDD			
Endosulfan sulfate			
4,4'-DDT			
Methoxychlor			
Endrin ketone			
Endrin Aldehyde			
alpha-Chlordane			
gamma-Chlordane			
Toxaphene			
PCBs			
Aroclor-1016			
Aroclor-1221			
Aroclor-1232			
Aroclor-1242			
Aroclor-1248			
Aroclor-1254			
Aroclor-1260			
INORGANICS			
Aluminum			
Antimony			
Arsenic			
Barium			
Calcium			
Iron			
Lead			
Magnesium			
Manganese			
Potassium			
Selenium			
Sodium			
Zinc			

Table A-3 Previously Collected Data for the DMW series Wells

Well	DMW-7			DMW-8		
Consultant	AGES	AGES	HLA	AGES	AGES	HLA
Sampling Date	5/20/88	6/20/88	2/13/90	5/20/88	5/20/88	2/15/90
Aluminum						
Antimony						
Arsenic						
Barium						
Beryllium						
Cadmium						
Calcium						
Chromium						
Cobalt						
Copper						
Iron						
Lead						
Magnesium						
Manganese						
Mercury						
Nickel						
Potassium						
Selenium						
Silver						
Sodium						
Thallium						
Vanadium						
Zinc						
Cyanide						

nd = no detection minimum detection

* More than one sample was collect

APPENDIX B

PREVIOUSLY COLLECTED SOIL DATA

DIRECTORY

Table B-1 Previously Collected PCB Data for Channel Soils

Sample Collected By	Date	Location [1]	Sample ID	Depth (if known)	PCB conc. (mg/kg)
Paterson	1981	Patterson Figure 12	S-1	10"	15.6
Paterson	1981	Patterson Figure 12	S-2	12"	1.8
Paterson	1981	Patterson Figure 12	S-3	4"	7.6
Paterson	1981	Patterson Figure 12	S-4	10"	5.5
Paterson	1981	Patterson Figure 12	S-5	30"	1.8
Paterson	1981	Patterson Figure 12	S-6	18"	ND
Paterson	1981	Patterson Figure 12	S-6A	6"	ND
Paterson	1981	Patterson Figure 12	S-7	30"	ND
Paterson	1981	Patterson Figure 12	S-8	16"	ND
Paterson	1981	Patterson Figure 12	S-9	8"	4.7
Paterson	1981	Patterson Figure 12	S-10	12"	1.1
Paterson	1981	Patterson Figure 12	S-11	6"	10.1
Paterson	1981	Patterson Figure 12	S-11A	10"	4.9
Lancy	1985	CDM Figure 5	1		0.13
Lancy	1985	CDM Figure 5	2		1.2
Lancy	1985	CDM Figure 5	3		0.11
Lancy	1985	CDM Figure 5	4		0.45
Lancy	1985	CDM Figure 5	5		6.9
Lancy	1985	CDM Figure 5	6		0.09
Lancy	1985	CDM Figure 5	7		9.2
Lancy	1985	CDM Figure 5	8		4.8
Lancy	1985	CDM Figure 5	9		5.3
Lancy	1985	CDM Figure 5	10		0.15
Lancy	1985	CDM Figure 5	11		16.0
Lancy	1985	CDM Figure 5	12		9.4
Lancy	1985	CDM Figure 5	13		5.2
Lancy	1985	CDM Figure 5	14		180.0
Lancy	1985	CDM Figure 5	15		94.0
Lancy	1985	CDM Figure 5	16		170.0
Lancy	1985	CDM Figure 5	17		3.9
Lancy	1985	CDM Figure 5	18		120.0

[1] Figures from other consultants' documents are included at the end of this appendix.
NS Location not shown on any figure.
SS Stockpile sample not shown on any figure.

Table B-1 Previously Collected PCB Data for Channel Soils

Sample Collected By	Date	Location [1]	Sample ID	Depth (if known)	PCB conc. (mg/kg)
Lancy	1985	CDM Figure 5	19		73.0
Lancy	1985	CDM Figure 5	20		64.0
Lancy	1985	CDM Figure 5	21		300.0
Lancy	1985	CDM Figure 5	22		46.0
Lancy	1985	CDM Figure 5	23		42.0
Lancy	1985	CDM Figure 5	24		1.0
AGES	10/87	AGES Plate 6	2	6-12"	<0.5
AGES	10/87	AGES Plate 6	3	6-12"	<0.5
AGES	10/87	AGES Plate 6	7	6-12"	1.0
AGES	10/87	AGES Plate 6	11	6-12"	<0.5
AGES	10/87	AGES Plate 6	12	6-12"	<0.5
AGES	10/87	AGES Plate 6	13	0-6"	1
AGES	10/87	AGES Plate 6	13	6-12"	<0.5
AGES	10/87	AGES Plate 6	14	6-12"	4
AGES	10/87	AGES Plate 6	14	12-18"	4
AGES	10/87	AGES Plate 6	15	6-12"	<0.5
AGES	10/87	AGES Plate 6	15	12-18"	<0.5
AGES	10/87	AGES Plate 6	16	6-12"	<0.5
AGES	10/87	AGES Plate 6	16	12-18"	<0.5
AGES	10/87	AGES Plate 6	17	6-12"	<0.5
AGES	10/87	AGES Plate 6	17	12-18"	<0.5
AGES	10/87	AGES Plate 6	18	6-12"	<0.5
AGES	10/87	AGES Plate 6	18	12-18"	<0.5
AGES	10/87	AGES Plate 6	19	6-12"	0.6
AGES	10/87	AGES Plate 6	19	12-18"	<0.5
AGES	10/87	AGES Plate 6	20	6-12	<0.5
AGES	10/87	AGES Plate 6	20	12-18	<0.5
AGES	10/87	AGES Plate 6	21	6-12	<0.5
AGES	10/87	AGES Plate 6	21	12-18	<0.5
AGES	10/87	AGES Plate 6	22	6-12	<0.5
AGES	10/87	AGES Plate 6	22	12-18	<0.5
AGES	10/87	AGES Plate 6	23	6-12	<0.5

[1] Figures from other consultants' documents are included at the end of this appendix.
NS Location not shown on any figure.
SS Stockpile sample not shown on any figure.

Table B-1 Previously Collected PCB Data for Channel Soils

Sample Collected By	Date	Location [1]	Sample ID	Depth (if known)	PCB conc. (mg/kg)
AGES	10/87	AGES Plate 6	23	12-18	<0.5
AGES	10/87	AGES Plate 6	24	6-12	4.0
AGES	10/87	AGES Plate 6	24	12-18	<0.5
AGES	10/87	AGES Plate 6	25	0-6	<0.5
AGES	10/87	AGES Plate 6	25	6-12	2.0
AGES	10/87	AGES Plate 6	25	12-18	<0.5
AGES	10/87	AGES Plate 6	26	0-6	<0.5
AGES	10/87	AGES Plate 6	26	6-12	<0.5
AGES	10/87	AGES Plate 6	26	12-18	<0.5
AGES	10/87	AGES Plate 6	27	0-6	2.3
AGES	10/87	AGES Plate 6	27	6-12	12.0
AGES	10/87	AGES Plate 6	27	12-18	3.0
AGES	10/87	AGES Plate 6	28	0-6	3.0
AGES	10/87	AGES Plate 6	28	6-12	5.0
AGES	10/87	AGES Plate 6	28	12-18	4.0
AGES	10/87	AGES Plate 6	29	0-6	.0.5
AGES	10/87	AGES Plate 6	29	6-12	<0.5
AGES	10/87	AGES Plate 6	29	12-18	<0.5
AGES	10/87	AGES Plate 6	30	0-6	5.0
AGES	10/87	AGES Plate 6	30	6-12	7.0
AGES	10/87	AGES Plate 6	30	12-18	<0.5
AGES	10/87	AGES Plate 6	31	0-6	2.0
AGES	10/87	AGES Plate 6	31	6-12	<0.5
AGES	10/87	AGES Plate 6	31	12-18	<0.5
AGES	10/87	AGES Plate 6	32	0-6	4.2
AGES	10/87	AGES Plate 6	32	6-12	<0.5
AGES	10/87	AGES Plate 6	32	12-18	0.8
AGES	10/87	AGES Plate 6	33	0-6	<0.5
AGES	10/87	AGES Plate 6	33	6-12	<0.5
AGES	10/87	AGES Plate 6	33	12-18	<0.5
AGES	10/87	AGES Plate 6	34	0-6	<0.5
AGES	10/87	AGES Plate 6	34	6-12	<0.5

[1] Figures from other consultants' documents are included at the end of this appendix.
NS Location not shown on any figure.
SS Stockpile sample not shown on any figure.

Table B-1 Previously Collected PCB Data for Channel Soils

Sample Collected By	Date	Location [1]	Sample ID	Depth (if known)	PCB conc. (mg/kg)
AGES	10/87	AGES Plate 6	34	12-18	<0.5
AGES	10/87	AGES Plate 6	35	0-6	<0.5
AGES	10/87	AGES Plate 6	35	6-12	<0.5
AGES	10/87	AGES Plate 6	35	12-18	<0.5
AGES	10/87	AGES Plate 6	36	0-6	<0.5
AGES	10/87	AGES Plate 6	36	6-12	<0.5
AGES	10/87	AGES Plate 6	36	12-18	<0.5
AGES	10/87	AGES Plate 6	37	0-6	<0.5
AGES	10/87	AGES Plate 6	37	6-12	<0.5
AGES	10/87	AGES Plate 6	37	12-18	<0.5
AGES	10/87	AGES Plate 6	38	0-6	<0.5
AGES	10/87	AGES Plate 6	38	6-12	<0.5
AGES	10/87	AGES Plate 6	38	12-18	<0.5
AGES	10/87	AGES Plate 6	39	0-6	<0.5
AGES	10/87	AGES Plate 6	39	6-12	<0.5
AGES	10/87	AGES Plate 6	39	12-18	<0.5
AGES	10/87	AGES Plate 6	40	0-6	<0.5
AGES	10/87	AGES Plate 6	40	6-12	<0.5
AGES	10/87	AGES Plate 6	40	12-18	<0.5
AGES	10/87	AGES Plate 6	41	0-6	<0.5
AGES	10/87	AGES Plate 6	41	6-12	<0.5
AGES	10/87	AGES Plate 6	41	12-18	<0.5
AGES	10/87	AGES Plate 6	42	0-6	3.8
AGES	10/87	AGES Plate 6	42	6-12	<0.5
AGES	10/87	AGES Plate 6	42	12-18	<0.5
AGES	10/87	AGES Plate 6	43	0-6	<0.5
AGES	10/87	AGES Plate 6	43	6-12	<0.5
AGES	10/87	AGES Plate 6	43	12-18	<0.5
AGES	10/87	AGES Plate 6	44	0-6	<0.5
AGES	10/87	AGES Plate 6	44	6-12	<0.5
AGES	10/87	AGES Plate 6	44	12-18	<0.5
AGES	10/87	AGES Plate 6	45	0-6	<0.5

[1] Figures from other consultants' documents are included at the end of this appendix.
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SS Stockpile sample not shown on any figure.

Table B-1 Previously Collected PCB Data for Channel Soils

Sample Collected By	Date	Location [1]	Sample ID	Depth (If known)	PCB conc. (mg/kg)
AGES	10/87	AGES Plate 6	45	6-12	<0.5
AGES	10/87	AGES Plate 6	45	12-18	<0.5
AGES	10/87	AGES Plate 6	46	0-6	<0.5
AGES	10/87	AGES Plate 6	46	6-12	1.0
AGES	10/87	AGES Plate 6	46	12-18	<0.5
AGES	12/87	NS	SS-13	0-6	<1
AGES	12/87	NS	SS-49	0-8	16
AGES	12/87	NS	SS-17	0-6	1
AGES	12/87	NS	SS-21	0-6	1
AGES	12/87	NS	SS-52	0-8	19
AGES	12/87	NS	SS-53	0-8	12
AGES	12/87	NS	SS-54	0-8	4
AGES	12/87	NS	SS-27		1
AGES	12/87	NS	SS-28		15
AGES	12/87	NS	SS-50	0-8	35
AGES	12/87	NS	SS-51	0-8	94
AGES	12/87	NS	SS-14	0-6	131
AGES	12/87	NS	SS-14	18-24	125
AGES	12/87	NS	SS-48	0-8	173
AGES	12/87	NS	SS-28	18-24	13
AGES	6/88	NS	SS-22		46.4
AGES	6/88	NS	SS-23		351
AGES	6/88	NS	Soil 55		4
AGES	6/88	NS	Soil 56		37
AGES	6/88	NS	Soil 57		2
AGES	6/88	NS	SS-56		35.3
AGES	6/88	NS	SS-58		4.9
AGES	6/88	NS	Soil 58		43
AGES	6/88	NS	Soil 59		1
AGES	7/88	SS	58-2		5.7
AGES	7/88	SS	2HC		9.2
AGES	7/88	SS	52-2		4.7/8.1

[1] Figures from other consultants' documents are included at the end of this appendix.
NS Location not shown on any figure.
SS Stockpile sample not shown on any figure.

Table B-1 Previously Collected PCB Data for Channel Soils

Sample Collected By	Date	Location [1]	Sample ID	Depth (if known)	PCB conc. (mg/kg)
AGES	7/88	SS	54-2		78
AGES	7/88	SS	56-2		7.3
AGES	7/88	SS	49-2		30.1
AGES	7/88	SS	50-2		80.6
AGES	7/88	SS	51-2		18.9
AGES	7/88	SS	28-2A		15.6
AGES	7/88	SS	28-2B		6.2
AGES	7/88	SS	30-2		108
AGES	7/88	SS	23-2		28.5
AGES	7/88	SS	27-2A		12.2
AGES	7/88	SS	27-2B		12.3
AGES	7/88	SS	20-2		42.9
AGES	7/88	SS	21-2		38.3
AGES	7/88	SS	22-2		22.3
AGES	7/88	SS	23-2		28.5
AGES	7/88	SS	16-2A		24.2
AGES	7/88	SS	16-2B		9.9/8.9
AGES	7/88	AGES Plate 8	DRUM SAMPLE		0.5 UG/ML
AGES	7/88	AGES Plate 7	51-EXC		<1
AGES	7/88	AGES Plate 7	30-EXC-NORTH		65
AGES	7/88	AGES Plate 7	47-EXC-NORTH		<1
AGES	7/88	AGES Plate 7	56-EXC		<1
		AGES Plate 7	20-EXC-SOUTH		<1
		AGES Plate 7	25-EXC		<1
AGES	7/88	AGES Plate 8	GRAB 1 THRU 10		<1
AGES	8/88	AGES Plate 8	23-EXC-A		2
AGES	8/88	AGES Plate 8	28-EXC-A		9
AGES	8/88	AGES Plate 7	52-EXC-A		3
AGES	8/88	AGES Plate 8	19-EXC-A		66/47
AGES	8/88	AGES Plate 8	30-EXC-A		385
AGES	8/88	AGES Plate 8	30-EXC-B		140

[1] Figures from other consultants' documents are included at the end of this appendix.
NS Location not shown on any figure.
SS Stockpile sample not shown on any figure.

Table B-1 Previously Collected PCB Data for Channel Soils

Sample Collected By	Date	Location [1]	Sample ID	Depth (if known)	PCB conc. (mg/kg)
AGES	10/88	SS	47-2A		1384
AGES	10/88	SS	47-2B		110
AGES	10/88	SS	47-2C		75
AGES	10/88	SS	47-2D		1265
AGES	10/88	SS	20-2B		56
AGES	10/88	SS	51-2B		10.1
AGES	10/88	AGES Plate 9	19-EXC-2		10
AGES	10/88	SS	19-2A		20
AGES	10/88	SS	19-2B		33
AGES	10/88	SS	24-2A		51
AGES	10/88	AGES Plate 8	16-FINAL-1		8
AGES	10/88	AGES Plate 8	24-EXC-1		27
AGES	10/88	SS	21-2B		40
AGES	10/88	SS	OLD PILE		12
AGES	10/88	SS	47-2A-A		1095
AGES	10/88	SS	47-2B-B		55
AGES	10/88	SS	47-2C-B		11
AGES	10/88	SS	47-2D-A		361
AGES	10/88	SS	47-2D-B		496
AGES	10/88	SS	REPLACE SOIL		0.4
AGES	10/88	AGES Plate 8	16-EXC-3		<1
AGES	10/88	AGES Plate 8	16-EXC-O&B		8
AGES	10/88	SS	OLD PILE A		91
AGES	10/88	SS	OLD PILE B		17
AGES	10/88	AGES Plate 10	29-11		3437
AGES	10/88	AGES Plate 8	28-EXC-1		11
AGES	10/88	Ages Plate 7	52-EXC-1		3
AGES	10/88	SS	47-C-A MIX		22
AGES	10/88	SS	47-C-2A MIX		26
AGES	10/88	SS	28-2C		22
AGES	10/88	SS	27-2C		27
AGES	10/88	AGES Plate 9	27-FINAL-1		22

[1] Figures from other consultants' documents are included at the end of this appendix.
NS Location not shown on any figure.
SS Stockpile sample not shown on any figure.

Table B-1 Previously Collected PCB Data for Channel Soils

Sample Collected By	Date	Location [1]	Sample ID	Depth (if known)	PCB conc. (mg/kg)
AGES	10/88	SS	51-2C		27
AGES	10/88	AGES Plate 9	19-OUT-EXC-2		26
AGES	10/88	AGES Plate 9	19-EXC-2		21/19
AGES	10/88	AGES Plate 9	20-EXC-2		19
AGES	10/88	AGES Plate 8	28-EXC-2		39
AGES	10/88	AGES Plate 8	52-EXC-2		12
AGES	10/88	AGES Plate 8	51-EXC-2		48
AGES	10/88	SS	19-2C		6
AGES	10/88	AGES Plate 9	20-EXC-3		42
AGES	10/88	AGES Plate 8	51-EXC-3		32
AGES	10/88	AGES Plate 8	51-EXC-4		159/399
AGES	10/88	AGES Plate 9	20-EXC-4		41
AGES	10/88	AGES Plate 8	52-EXC-4		30
AGES	10/88	AGES Plate 8	28-EXC-3		31
AGES	10/88	AGES Plate 9	27-EXC-3		27
AGES	10/88	AGES Plate 9	19-EXC-3		413
AGES	10/88	AGES Plate 9	54-EXC-2		95
AGES	11/88	AGES Plate 10	47-GRAB-EXC2		44.2
AGES	11/88	AGES Plate 10	20-GRAB-EXC5		15
AGES	11/88	AGES Plate 9	47-EXC-2A		5
AGES	11/88	AGES Plate 9	47-EXC-2B		17.6
AGES	11/88	AGES Plate 9	47-EXC-2C		60.2
AGES	11/88	AGES Plate 10	SW-OUT-1		<0.6
AGES	11/88	AGES Plate 10	27-GRAB-EXC4D		0.6
AGES	11/88	AGES Plate 10	27-GRAB-EXC4C		30.4
AGES	11/88	AGES Plate 10	27-GRAB-EXC-4B		92
AGES	11/88	AGES Plate 10	27-GRAB-EXC-4A		44.2
AGES	11/88	SS	REPLACE SOIL		<1
AGES	11/88	AGES Plate 9	28-PATCH1		6.3
AGES	11/88	AGES Plate 8	16-EXC-SHALE		<2.4
AGES	11/88	SS	BES-OUT1-COMP		23.2
AGES	11/88	SS	BES-OUT2-COMP		30.1

[1] Figures from other consultants' documents are included at the end of this appendix.
NS Location not shown on any figure.
SS Stockpile sample not shown on any figure.

Table B-1 Previously Collected PCB Data for Channel Soils

Sample Collected By	Date	Location [1]	Sample ID	Depth (if known)	PCB conc. (mg/kg)
AGES	11/88	SS	BES-OUT3-COMP		<2.6
AGES	11/88	SS	BES-OUT4-COMP		16
AGES	11/88	SS	BES-OUT5-COMP		44
AGES	11/88	SS	BES-OUT6-COMP		<1
AGES	11/88	SS	BES-OUT7-COMP		<1
AGES	11/88	SS	BES-OUT8-COMP		<1
AGES	11/88	SS	BES-OUT9-COMP		16
AGES	11/88	SS	30-3A		220
AGES	11/88	AGES Plate 8	PADPATCH		6
AGES	12/88	SS	BES-OUT1-PCB		8
AGES	12/88	SS	BES-OUT2-PCB		10
AGES	12/88	SS	BES-OUT3-PCB		38
AGES	12/88	SS	BES-OUT5-PCB		71
AGES	12/88	AGES Plate 10	PIT-OUT1		<0.2
AGES	12/88	SS	REPLACE SOIL3		<0.5
AGES	12/88	SS	PIT1-B WATER		<1.0
AGES	12/88	SS	BES-OUT1B-PCB		2
AGES	12/88	SS	BES-OUT2B-PCB		0.7
AGES	12/88	SS	BES-OUT3B-PCB		2
AGES	12/88	SS	BES-OUT4B-PCB		2
AGES	12/88	SS	BES-OUT9B-PCB		20
AGES	12/88	SS	51-EXC-5A		<1
AGES	12/88	SS	47-EXC-3E		35
AGES	12/88	SS	BES-OUT11-PCB		1.7
AGES	12/88	SS	BES-OUT12-PCB		0.7
AGES	12/88	SS	BES-OUT13-PCB		16.6
AGES	12/88	SS	BES-OUT14-PCB		3.8
AGES	12/88	SS	REPLACE SOIL		<1
AGES	12/88	AGES Plate 8	24-EXC-2		<0.5
AGES	12/88	SS	OLD PILE OUT1		1.6
AGES	12/88	AGES Plate 10	27 LAGOON EAST		9.1
AGES	12/88	AGES Plate 10	29-III		32.8

[1] Figures from other consultants' documents are included at the end of this appendix.
NS Location not shown on any figure.
SS Stockpile sample not shown on any figure.

Table B-1 Previously Collected PCB Data for Channel Soils

Sample Collected By	Date	Location [1]	Sample ID	Depth (if known)	PCB conc. (mg/kg)
AGES	12/88	SS	BES-OUT15-PCB		<0.5
AGES	12/88	SS	BES-OUT16-PCB		<0.5
AGES	12/88	SS	BES-OUT17-PCB		3.7
AGES	12/88	AGES Plate 9	16-II-EXC1		1.7
AGES	12/88	AGES Plate 13	PIT 1D SUBLAY		<0.5
AGES	12/88	SS	BES-OUT18-PCB		11.8
AGES	12/88	SS	BES-OUT19-PCB		9.1
AGES	12/88	SS	BES-OUT20-PCB		1.3
AGES	1/89	AGES Plate 9	16-II-EXC1		0.8
AGES	1/89	AGES Plate 9	16-II-EXC1		1.9
AGES	1/89	AGES Plate 9	16-II-EXC1		<0.5
AGES	1/89	AGES Plate 9	16-II-EXC1		1.1
AGES	1/89	AGES Plate 9	16-II-EXC1		1.3
AGES	1/89	AGES Plate 9	16-II-EXC1		1.2
AGES	1/89	AGES Plate 9	GATE 1 PAD		1
AGES	2/89	SS	BES-OUT-21		2.8
AGES	2/89	SS	BES-OUT-22		3.2
AGES	2/89	SS	BES-OUT-23		<0.5
AGES	2/89	SS	BES-OUT-24		3.6
AGES	2/89	SS	BES-OUT-25		1
AGES	2/89	SS	BES-OUT-26		26
AGES	2/89	AGES Plate 9	RD#1		<1
AGES	2/89	AGES Plate 9	RD#2		2
AGES	2/89	AGES Plate 9	RD#3		4
AGES	2/89	AGES Plate 9	RD#4		1
AGES	2/89	AGES Plate 9	RD#5		3
AGES	2/89	AGES Plate 9	RD#6		9
AGES	2/89	AGES Plate 9	RD#7		6
AGES	2/89	AGES Plate 9	RD#8		3
AGES	2/89	AGES Plate 8	SLAB PIT		<1
AGES	2/89	SS	BES-OUT-27		9
AGES	2/89	SS	BES-OUT-28		9

[1] Figures from other consultants' documents are included at the end of this appendix.
NS Location not shown on any figure.
SS Stockpile sample not shown on any figure.

Table B-1 Previously Collected PCB Data for Channel Soils

Sample Collected By	Date	Location [1]	Sample ID	Depth (if known)	PCB conc. (mg/kg)
AGES	2/89	SS	BES-OUT-29		3
AGES	2/89	SS	BES-OUT-30		8
AGES	2/89	SS	BES-OUT-31		11
AGES	2/89	SS	BES-OUT-32		5
AGES	2/89	AGES Plate 13	LOW/PAD#1		1
AGES	2/89	AGES Plate 13	LOW/PAD#2		<1
AGES	2/89	AGES Plate 13	LOW/PAD#3		<1
AGES	2/89	AGES Plate 13	LOW/PAD#4		1
AGES	2/89	AGES Plate 10	DEMO#1WIPE		<0.1UG/L
AGES	2/89	AGES Plate 10	DEMO#2WIPE		<0.1UG/L
AGES	2/89	AGES Plate 9	RD#9		10
AGES	2/89	AGES Plate 9	RD#7A		4
AGES	2/89	AGES Plate 9	RD#6A		8
AGES	2/89	AGES Plate 10	SOIL DEMO		23
AGES	3/89	SS	BES-OUT-33		13
AGES	3/89	SS	BES-OUT-34		15
AGES	3/89	SS	BES-OUT-35		<1
AGES	3/89	SS	BES-OUT-36		7
AGES	3/89	SS	BES-OUT-37		11
AGES	3/89	SS	BES-OUT-38		11
AGES	3/89	SS	BES-OUT-39		35/89
AGES	3/89	SS	BES-OUT-40		30
AGES	3/89	SS	BES-OUT-41		12
AGES	3/89	SS	BES-OUT-42		64/172
AGES	3/89	SS	BES-OUT-43		45/83
AGES	3/89	SS	BES-OUT-44		11
AGES	3/89	AGES Plate 9	OLD PILE #1		23
AGES	3/89	AGES Plate 9	OLD PILE #2		2
AGES	3/89	SS	BES-OUT-45		5
AGES	3/89	SS	BES-OUT-46		<1
AGES	3/89	SS	BES-OUT-47		<1
AGES	3/89	SS	BES-OUT-48		95

[1] Figures from other consultants' documents are included at the end of this appendix.
NS Location not shown on any figure.
SS Stockpile sample not shown on any figure.

Table B-1 Previously Collected PCB Data for Channel Soils

Sample Collected By	Date	Location [1]	Sample ID	Depth (if known)	PCB conc. (mg/kg)
AGES	3/89	SS	BES-OUT-49		16
AGES	3/89	SS	BES-OUT-50		17
AGES	3/89	AGES Plate 10	BERM-1		7.4
AGES	3/89	AGES Plate 10	BERM-2		<1
AGES	3/89	AGES Plate 10	BERM-3		26
AGES	3/89	AGES Plate 10	BERM-4		<1
AGES	3/89	AGES Plate 10	BERM-5		<1
AGES	3/89	AGES Plate 10	BERM-6		9.4
AGES	3/89	AGES Plate 10	NORTH ALGAE		16 UG/L
AGES	3/89	SS	QUARTER COMP		42
AGES	4/89	AGES Plate 10	BLOWN DUST		3.1 UG/L
AGES	4/89	AGES Plate 10	SOIL 1		0.6
AGES	4/89	AGES Plate 10	SOIL 2		8.4
AGES	4/89	AGES Plate 10	SOIL 3		13
AGES	4/89	AGES Plate 10	SOIL 4		9.4
AGES	4/89	AGES Plate 10	SOIL 5		4.9
AGES	4/89	AGES Plate 10	SOIL 6		5.6
AGES	4/89	AGES Plate 10	SOIL 7		21
AGES	4/89	AGES Plate 10	SOIL 8		50
AGES	4/89	AGES Plate 10	SOIL 9		6
AGES	4/89	AGES Plate 10	SOIL 10		4.8
AGES	4/89	AGES Plate 10	SOIL 11		5.8
AGES	4/89	AGES Plate 10	SOIL 12		200
AGES	4/89	AGES Plate 10	SOIL 13		280
AGES	4/89	AGES Plate 10	SOIL 14		0.5
AGES	4/89	AGES Plate 10	SOIL 15		3.4
AGES	4/89	AGES Plate 10	SOIL 16		28
AGES	4/89	AGES Plate 10	SOIL 17		170
AGES	4/89	AGES Plate 10	SOIL 18		240
AGES	4/89	AGES Plate 10	SOIL 19		1.1
AGES	4/89	AGES Plate 10	SOIL 20		1.4
AGES	4/89	AGES Plate 10	SOIL 21		12

[1] Figures from other consultants' documents are included at the end of this appendix.
NS Location not shown on any figure.
SS Stockpile sample not shown on any figure.

Table A-3 Previously Collected Data for the DMW series Wells

Well	DMW-1				DMW-2			DMW-3		
Consultant	AGES	AGES	HLA	HLA	AGES	AGES	HLA	AGES	AGES	HLA
Sampling Date	1/21/88	5/20/88	2/7/90	7/9/90	1/21/88	5/20/88	2/7/90	1/21/88	5/20/88	2/9/90
VOCs										
Chloromethane			nd	nd			nd			nd
Bromomethane			nd	nd			nd			nd
Vinyl Chloride			17	6			nd			nd
Chloroethane			nd	nd			nd			nd
Methylene Chloride	83 8	61	14	21	1 5	nd	1 6	0 4	nd	nd
Acetone		nd		nd		nd			nd	
Carbon Disulfide				nd						
1 1-Dichloroethene	78 7		9 8	12	nd		nd	nd		nd
1 1-Dichloroethane			23	20			nd			nd
1 2-Dichloroethene (Total)				330						
trans-1 2-Dichloroethene	133		380	nd	nd		nd	0 1		52
Chloroform	27 3	980	910	1300	nd	nd	11	6 8	150	150
1 2-Dichloroethane	236		180	150	39		nd	152		15
2-Butanone				nd						
1 1 1-Trichloroethane	151	nd	26	29	7 4	nd	nd	nd	nd	5 4
Carbon Tetrachloride		264	380	nd	nd	nd	0 9		nd	340
Bromodichloromethane	2 8		nd	nd	nd		nd	nd		nd
1 2-Dichloropropane			15	6			nd			nd
cis-1 3-Dichloropropene			nd	nd			nd			nd
Trichloroethene	101		1100	1400	5 9		0 79	132		200
1 1 2-Trichloroethane			nd	320			nd			nd
Benzene		97	76	80	10	28	1 1		nd	nd
trans-1 3-Dichloropropene			nd	nd			nd			nd
Bromoform			nd	nd			nd			nd
4-Methyl-2-Pentanone				nd						
2-Hexanone				nd						
Tetrachloroethene		20	21	15	3 9	nd	nd		nd	nd
1 1 2 2-Tetrachloroethane			nd	nd			nd			nd
Toluene	5	nd	7 7	5	59	13	15	7	nd	5 4
Chlorobenzene			nd	nd			nd			nd
Ethylbenzene		nd	nd	nd		nd	nd		nd	nd
Styrene				nd						
Xylene (total)			nd	nd			nd			nd
Trichlorofluoromethane	57 4		nd	nd	nd		nd	3		nd
SEMI-VOLATILE ORGANICS										
Phenol				nd						
bis(2-Chloroethyl) Ether				nd						
2-Chlorophenol				nd						
1 3-Dichlorobenzene			nd	nd			nd			nd
1 4-Dichlorobenzene			nd	nd			nd			nd
1 2-Dichlorobenzene			99	64			2 3			nd
2-Methylphenol				nd						
2 2'-Oxybis(1-Chloropropane)				nd						
4-Methylphenol				nd						
N-nitroso-Di-n-Propylamine				nd						
Hexachloroethane				nd						
Nitrobenzene				nd						
Isophorone				nd						
2-Nitrophenol				nd						
2 4-Dimethylphenol				nd						
bis(2-chloroethoxy)Methane				nd						
2 4-Dichlorophenol				nd						
1 2 4-Trichlorobenzene				nd						
Naphthalene				nd						
4-Chloroaniline				nd						
Hexachlorobutadiene				nd						
4-Chloro-3-Methylphenol				nd						
2-Methylnaphthalene				nd						
2 4 6-Trichlorophenol				nd						
2 4 5-Trichlorophenol				nd						
2-Chloronaphthalene				nd						
2-Nitroaniline				nd						
Dimethyl Phthalate				nd						
Acenaphthylene				nd						
2 6-Dinitrotoluene				nd						

nd = no detection, minimum detection limit unknown

* More than one sample was collected on this date, only one is reported in this table

Table A-3 Previously Collected Data for the DMW series Wells

Well	DMW-1				DMW-2			DMW-3		
Consultant	AGES	AGES	HLA	HLA	AGES	AGES	HLA	AGES	AGES	HLA
Sampling Date	1/21/88	5/20/88	2/7/90	7/9/90	1/21/88	5/20/88	2/7/90	1/21/88	5/20/88	2/9/90
3-Nitroaniline				nd						
Acenaphthene				nd						
2,4-Dinitrophenol				nd						
4-Nitrophenol				nd						
Dibenzofuran				nd						
2,4-Dinitrotoluene				nd						
Diethylphthalate				nd						
4-Chlorophenyl-phenylether				nd						
Fluorene				nd						
4-Nitroaniline				nd						
4,6-Dinitro-2-Methylphenol				nd						
N-nitrosodiphenylamine				nd						
4-Bromophenyl-phenylether				nd						
Hexachlorobenzene				nd						
Pentachlorophenol				nd						
Phenanthrene				nd						
Anthracene				nd						
Carbazole				nd						
Di-n-Butylphthalate				nd						
Fluoranthene				nd						
Pyrene				nd						
Butylbenzylphthalate				nd						
3,3'-Dichlorobenzidine				nd						
Benzo(a)Anthracene				nd						
Chrysene				nd						
bis(2-Ethylhexyl) Phthalate				nd						
Di-n-Octylphthalate				nd						
Benzo (b) Fluoranthene				nd						
Benzo (k) Fluoranthene				nd						
Benzo (a) Pyrene				nd						
Indeno (1,2,3-cd) Pyrene				nd						
Dibenz (a,h) Anthracene				nd						
Benzo (g,h,i) Perylene				nd						
Benzoic Acid				nd						
Dichlorofluoromethane			17	nd			nd			nd
Pesticides										
alpha-BHC				nd						
beta-BHC				nd						
delta-BHC				nd						
gamma-BHC				nd						
Heptachlor				nd						
Aldrin				nd						
Heptachlor epoxide				nd						
Endosulfan I				nd						
Dieldrin				nd						
4,4'-DDE										
Endrin				nd						
Endosulfan II				nd						
4,4'-DDD				nd						
Endosulfan sulfate				nd						
4,4'-DDT				nd						
Methoxychlor				nd						
Endrin ketone				nd						
Endrin Aldehyde										
alpha-Chlordane				nd						
gamma-Chlordane				nd						
Toxaphene				nd						
PCBs										
Aroclor-1016				nd						
Aroclor-1221				nd						
Aroclor-1232				nd						
Aroclor-1242				nd						
Aroclor-1248				nd						
Aroclor-1254				nd						
Aroclor-1260				nd						
INORGANICS										

nd - no detection, minimum dilution limit unknown

* More than one sample was collected on this date, only one is reported in this table

Table A-3 Previously Collected Data for the DMW series Wells

Well	DMW-1				DMW-2			DMW-3		
Consultant	AGES	AGES	HLA	HLA	AGES	AGES	HLA	AGES	AGES	HLA
Sampling Date	1/21/88	5/20/88	2/7/90	7/9/90	1/21/88	5/20/88	2/7/90	1/21/88	5/20/88	2/9/90
Aluminum				< 200						
Antimony				< 1						
Arsenic				5						
Barium				300						
Beryllium				< 5						
Cadmium				< 5						
Calcium				54000						
Chromium				< 30						
Cobalt				< 50						
Copper				< 20						
Iron				19000						
Lead				5						
Magnesium				23000						
Manganese				200						
Mercury				< 1						
Nickel				< 40						
Potassium				1500						
Selenium				< 1						
Silver				< 30						
Sodium				8800						
Thallium				< 1						
Vanadium				< 50						
Zinc				1300						
Cyanide				< 10						

nd - no detection minimum detection limit unknown

* More than one sample was collected on this date only one is reported in this table

Table A-3 Previously Collected Data for the DMW series Wells

Well	DMW-4			DMW-5			DMW-6			
Consultant	AGES	AGES	HLA	AGES	AGES	HLA	AGES	AGES	HLA	HLA
Sampling Date	1/21/88	5/20/88	2/14/90	5/20/88	6/20/88	2/15/90	5/20/88	6/20/88	2/14/90	7/9/90
VOCs										
Chloromethane			nd			nd			nd	nd
Bromomethane			nd			nd			nd	nd
Vinyl Chloride			nd			nd			nd	nd
Chloroethane			nd			nd			nd	nd
Methylene Chloride	nd	nd	nd	89		37	nd		39	46
Acetone		nd		899			3300			270
Carbon Disulfide										nd
1,1-Dichloroethene	nd		nd			nd			nd	nd
1,1-Dichloroethane			nd			nd			nd	nd
1,2-Dichloroethene (Total)										nd
trans-1,2-Dichloroethene	nd		nd			16			6.7	nd
Chloroform	nd	nd	38	566		510	1492		73	66
1,2-Dichloroethane	1.1		nd			62			nd	14
2-Butanone										nd
1,1,1-Trichloroethane	2.1	nd	5.3	nd		nd	81		nd	nd
Carbon Tetrachloride		nd	44	143		nd	221		110	96
Bromodichloromethane	nd		nd			nd			nd	nd
1,2-Dichloropropane			nd			nd			nd	nd
cis-1,3-Dichloropropene			nd			nd			nd	nd
Trichloroethene	3.8		120			nd			65	57
1,1,2-Trichloroethane			nd			nd			nd	nd
Benzene		nd	nd	143	24	nd	221	92	4.3	5
trans-1,3-Dichloropropene			nd			nd			nd	nd
Bromoform			nd			nd			nd	nd
4-Methyl-2-Pentanone										nd
2-Hexanone										nd
Tetrachloroethene		nd	nd	nd		nd	nd		nd	nd
1,1,2,2-Tetrachloroethane			nd			nd			nd	nd
Toluene	7	nd	8.5	128	72	19	650	241	27	12
Chlorobenzene			nd	nd		nd	15		nd	nd
Ethylbenzene		nd	nd			nd			nd	nd
Styrene										nd
Xylene (total)			nd			nd			nd	nd
Trichlorofluoromethane	nd		nd			nd			nd	nd
SEMI-VOLATILE ORGANICS										
Phenol										nd
bis(2-Chloroethyl) Ether										nd
2-Chlorophenol										nd
1,3-Dichlorobenzene			nd			nd			nd	nd
1,4-Dichlorobenzene			nd			nd			nd	nd
1,2-Dichlorobenzene			nd			nd			nd	nd
2-Methylphenol										nd
2,2'-Oxybis(1-Chloropropane)										
4-Methylphenol										nd
N-nitroso-Di-n-Propylamine										nd
Hexachloroethane										nd
Nitrobenzene										nd
Isophorone										nd
2-Nitrophenol										nd
2,4-Dimethylphenol										nd
bis(2-chloroethoxy)Methane										nd
2,4-Dichlorophenol										nd
1,2,4-Trichlorobenzene										nd
Naphthalene										nd
4-Chloroaniline										nd
Hexachlorobutadiene										nd
4-Chloro-3-Methylphenol										nd
2-Methylnaphthalene										nd
2,4,6-Trichlorophenol										nd
2,4,5-Trichlorophenol										nd
2-Chloronaphthalene										nd
2-Nitroaniline										nd
Dimethyl Phthalate										nd
Acenaphthylene										nd
2,6-Dinitrotoluene										nd

nd - no detection, minimum detection

* More than one sample was collect

Table A-3 Previously Collected Data for the DMW series Wells

Well	DMW-4			DMW-5			DMW-6			
Consultant	AGES	AGES	HLA	AGES	AGES	HLA	AGES	AGES	HLA	HLA
Sampling Date	1/21/88	5/20/88	2/14/90	5/20/88	6/20/88	2/15/90	5/20/88	6/20/88	2/14/90	7/9/90
3-Nitroaniline										nd
Acenaphthene										nd
2,4-Dinitrophenol										nd
4-Nitrophenol										nd
Dibenzofuran										nd
2,4-Dinitrotoluene										nd
Diethylphthalate										nd
4-Chlorophenyl-phenylether										nd
Fluorene										nd
4-Nitroaniline										nd
4,6-Dinitro-2-Methylphenol										nd
N-nitrosodiphenylamine										nd
4-Bromophenyl-phenylether										nd
Hexachlorobenzene										nd
Pentachlorophenol										nd
Phenanthrene										nd
Anthracene										nd
Carbazole										
Di-n-Butylphthalate										nd
Fluoranthene										nd
Pyrene										nd
Butylbenzylphthalate										nd
3,3'-Dichlorobenzidine										nd
Benzo(a)Anthracene										nd
Chrysene										nd
bis(2-Ethylhexyl) Phthalate										nd
Di-n-Octylphthalate										nd
Benzo (b) Fluoranthene										nd
Benzo (k) Fluoranthene										nd
Benzo (a) Pyrene										nd
Indeno (1,2,3-cd) Pyrene										nd
Dibenz (a,h) Anthracene										nd
Benzo (g,h,i) Perylene										nd
Benzoic Acid										nd
Dichlorofluoromethane			nd			nd			nd	nd
Pesticides										
alpha-BHC										nd
beta-BHC										nd
delta-BHC										nd
gamma-BHC										nd
Heptachlor										nd
Aldrin										nd
Heptachlor epoxide										nd
Endosulfan I										nd
Dieldrin										
4,4'-DDE										
Endrin										nd
Endosulfan II										nd
4,4'-DDD										nd
Endosulfan sulfate										nd
4,4'-DDT										nd
Methoxychlor										nd
Endrin ketone										nd
Endrin Aldehyde										
alpha-Chlordane										nd
gamma-Chlordane										nd
Toxaphene										nd
PCBs										
Aroclor-1016										nd
Aroclor-1221										nd
Aroclor-1232										nd
Aroclor-1242										nd
Aroclor-1248										nd
Aroclor-1254										nd
Aroclor-1260										nd
INORGANICS										

nd = no detection, minimum detection

* More than one sample was collect

Table A-3 Previously Collected Data for the DMW series Wells

Well	DMW-4			DMW-5			DMW-6			
Consultant	AGES	AGES	HLA	AGES	AGES	HLA	AGES	AGES	HLA	HLA
Sampling Date	1/21/88	5/20/88	2/14/90	5/20/88	6/20/88	2/15/90	5/20/88	6/20/88	2/14/90	7/9/90
Aluminum										320
Antimony										2
Arsenic										4
Barium										210
Beryllium										< 5
Cadmium										< 5
Calcium										43000
Chromium										< 20
Cobalt										< 50
Copper										< 20
Iron										46000
Lead										8
Magnesium										19000
Manganese										370
Mercury										< 1
Nickel										< 40
Potassium										1800
Selenium										< 1
Silver										< 30
Sodium										13000
Thallium										< 1
Vanadium										< 50
Zinc										1160
Cyanide										< 10

ND - no detection minimum detection

* More than one sample was collect

Table A-3 Previously Collected Data for the DMW series Wells

Well	DMW-7			DMW-8		
Consultant	AGES	AGES	HLA	AGES	AGES	HLA
Sampling Date	5/20/88	6/20/88	2/13/90	5/20/88	5/20/88	2/15/90
VOCs						
Chloromethane			nd			nd
Bromomethane			nd			nd
Vinyl Chloride			nd			nd
Chloroethane			nd			nd
Methylene Chloride	nd		nd	13		nd
Acetone	717			nd		
Carbon Disulfide						
1,1-Dichloroethene			nd			nd
1,1-Dichloroethane			nd			nd
1,2-Dichloroethene (Total)						
trans-1,2-Dichloroethene			39			2.8
Chloroform	818		220	126		44
1,2-Dichloroethane			17			6.8
2-Butanone						
1,1,1-Trichloroethane	nd		nd	nd		nd
Carbon Tetrachloride	156		500	nd		92
Bromodichloromethane			nd			nd
1,2-Dichloropropane			5.9			nd
cis-1,3-Dichloropropene			nd			nd
Trichloroethene			150			40
1,1,2-Trichloroethane			nd			nd
Benzene	156	88	nd	nd	nd	2.6
trans-1,3-Dichloropropene			nd			nd
Bromoform			nd			nd
4-Methyl-2-Pentanone						
2-Hexanone						
Tetrachloroethene	nd		5.6	nd		nd
1,1,2,2-Tetrachloroethane			5.6			nd
Toluene	89	27	5.4	nd	nd	12
Chlorobenzene	nd		nd	nd		nd
Ethylbenzene			nd			nd
Styrene						
Xylene (total)			nd			nd
Trichlorofluoromethane			nd			nd
BASE-NEUTRAL ORGANICS						
Phenol						
bis(2-Chloroethyl) Ether						
2-Chlorophenol						
1,3-Dichlorobenzene			nd			nd
1,4-Dichlorobenzene			nd			nd
1,2-Dichlorobenzene			nd			nd
2-Methylphenol						
2,2'-Oxybis(1-Chloropropane)						
4-Methylphenol						
N-nitroso-Di-n-Propylamine						
Hexachloroethane						
Nitrobenzene						
Isophorone						
2-Nitrophenol						
2,4-Dimethylphenol						
bis(2-chloroethoxy)Methane						
2,4-Dichlorophenol						
1,2,4-Trichlorobenzene						
Naphthalene						
4-Chloroaniline						
Hexachlorobutadiene						
4-Chloro-3-Methylphenol						
2-Methylnaphthalene						
2,4,6-Trichlorophenol						
2,4,5-Trichlorophenol						
2-Chloronaphthalene						
2-Nitroaniline						
Dimethyl Phthalate						
Acenaphthylene						
2,6-Dinitrotoluene						

nd - no detection at minimum detection

* More than one sample was collected

Table A-3 Previously Collected Data for the DMW series Wells

Well	DMW-7			DMW-8		
Consultant	AGES	AGES	HLA	AGES	AGES	HLA
Sampling Date	5/20/88	8/20/88	2/13/90	5/20/88	5/20/88	2/15/90
3-Nitroaniline						
Acenaphthene						
2,4-Dinitrophenol						
4-Nitrophenol						
Dibenzofuran						
2,4-Dinitrotoluene						
Diethylphthalate						
4-Chlorophenyl-phenylether						
Fluorene						
4-Nitroaniline						
4,6-Dinitro-2-Methylphenol						
N-nitrosodiphenylamine						
4-Bromophenyl-phenylether						
Hexachlorobenzene						
Pentachlorophenol						
Phenanthrene						
Anthracene						
Carbazole						
Di-n-Butylphthalate						
Fluoranthene						
Pyrene						
Butylbenzylphthalate						
3,3'-Dichlorobenzidine						
Benzo(a)Anthracene						
Chrysene						
bis(2-Ethylhexyl) Phthalate						
Di-n-Octylphthalate						
Benzo (b) Fluoranthene						
Benzo (k) Fluoranthene						
Benzo (a) Pyrene						
Indeno (1,2,3-cd) Pyrene						
Dibenz (a,h) Anthracene						
Benzo (g,h,i) Perylene						
Benzoic Acid						
Dichlorofluoromethane			nd			nd
Pesticides						
alpha-BHC						
beta-BHC						
delta-BHC						
gamma-BHC						
Heptachlor						
Aldrin						
Heptachlor epoxide						
Endosulfan I						
Dieldrin						
4,4'-DDE						
Endrin						
Endosulfan II						
4,4'-DDD						
Endosulfan sulfate						
4,4'-DDT						
Methoxychlor						
Endrin ketone						
Endrin Aldehyde						
alpha-Chlordane						
gamma-Chlordane						
Toxaphene						
PCBs						
Aroclor-1016						
Aroclor-1221						
Aroclor-1232						
Aroclor-1242						
Aroclor-1248						
Aroclor-1254						
Aroclor-1260						
INORGANICS						

nd = no detection, minimum detection

* More than one sample was collect

Table A-3 Previously Collected Data for the DMW series Wells

Well	DMW-7			DMW-8		
Consultant	AGES	AGES	HLA	AGES	AGES	HLA
Sampling Date	5/20/88	6/20/88	2/13/90	5/20/88	5/20/88	2/15/90
Aluminum						
Antimony						
Arsenic						
Barium						
Beryllium						
Cadmium						
Calcium						
Chromium						
Cobalt						
Copper						
Iron						
Lead						
Magnesium						
Manganese						
Mercury						
Nickel						
Potassium						
Selenium						
Silver						
Sodium						
Thallium						
Vanadium						
Zinc						
Cyanide						

nd = no detection minimum detection

* More than one sample was collect

Table A-4 Previously Collected Data for the MW Series Wells

Well	MW-1	MW-2			MW-3					MW-4		
Consultant	Patterson	Patterson	LANCY	LANCY	JWP&A *	LANCY 1	LANCY 2	LANCY 1	LANCY 2	Patterson *	LANCY	LANCY
Sampling Date	6/28/80	12/19/80	8/83	10/7/83	12/19/80	8/83	8/83	10/7/83	10/7/83	12/19/80	8/83	10/7/83
VOCs												
Chloromethane												
Bromomethane												
Vinyl Chloride						nd	< 10	nd	< 10			
Chloroethane	22	43.6			nd	nd	< 10	nd	< 10	nd		
Methylene Chloride	400	18000			5130	620	150	nd	1700	1410		
Acetone												
Carbon Disulfide												
1,1-Dichloroethene	22	110	4380	1110	60	280	100	< 1000	< 10	175	< 1000	< 1000
1,1-Dichloroethane	350	3880			286	nd	110	nd	< 10	172		
1,2-Dichloroethene (Total)			< 1000	510				< 1000			2000	43400
trans-1,2-Dichloroethene	2.8	nd			nd					nd		
Chloroform	720	52200	39800	79800	19400	1080	2300	18800	9800	10800	6430	5530
1,2-Dichloroethane	1100	24200			2800	nd	< 10	nd	< 10	3440		
2-Butanone												
1,1,1-Trichloroethane	680	323000			11800	nd	100	nd	1100	9410		
Carbon Tetrachloride	880	6640	< 10000	16800	1480	nd	750	< 1000	800	1530	< 10000	< 10000
Vinyl Acetate												
Bromodichloromethane												
1,2-Dichloropropane	nd	nd			nd	nd	< 10	nd	< 10	2.71		
cis-1,3-Dichloropropene												
Trichloroethene	6800	228000	60300	76300	51900	6170	6800	71000*	9800	47100	25800	37300
Dibromochloromethane												
1,1,2-Trichloroethane	nd	nd			42.9	nd	< 10	nd	< 10	nd		
Benzene	480	244000	16200	18000	28800	4800	9800	3800	10700	66400	9820	4430
trans-1,3-Dichloropropene												
Bromoform												
4-Methyl-2-Pentanone												
2-Hexanone												
Tetrachloroethene	170	816	2470	1970	179		280	<1000	280	431	<1000	<1000
1,1,2,2-Tetrachloroethane	nd	28.4			nd	nd	< 10		220	nd		
Toluene	2000	97800	12100	6280	6790	3880	3800	3480	3800	46700	650	14200
Chlorobenzene	780	4740			128	nd	220	nd	< 10	nd		
Ethylbenzene	480	1880			198	1480	< 10	240	200	547		
Styrene												
Xylene (total)												
Trichlorofluoromethane	1.7	4880			3820					nd		
Diethylphthalate	nd	nd										
SEMI-VOLATILE ORGANICS												
Phenol	320	1380										
bis(2-Chloroethyl) Ether	nd	nd										
2-Chlorophenol												
1,3-Dichlorobenzene	nd	nd										
1,4-Dichlorobenzene	nd	nd										
Benzyl Alcohol												
1,2-Dichlorobenzene	nd	nd										
2-Methylphenol												
2,2'-Oxybis(1-Chloropropane)												
4-Methylphenol												
N-Nitroso-Di-n-Propylamine												
Hexachloroethane												
Nitrobenzene												
Isophorone	6.3	48.3										
2-Nitrophenol	4.16	nd										
2,4-Dimethylphenol	11.2	nd										
Benzoic Acid												
bis(2-Chloroethoxy)Methane												
2,4-Dichlorophenol												
1,2,4-Trichlorobenzene												
Naphthalene	nd	13										
4-Chloroaniline												
Hexachlorobutadiene												
4-Chloro-3-Methylphenol												
2-Methylnaphthalene												
Hexachlorocyclopentadiene												
2,4,6-Trichlorophenol	4.16	nd										
2,4,5-Trichlorophenol												

1 Analyzed by purge and trap gas chromatography.
2 Analyzed by GC/MS.
< Compound was not detected at quantitation limits.
* Data sets are incomplete.
nd - no detection

Table A–4 Previously Collected Data for the MW Series Wells

Well	MW–1	MW–2			MW–3					MW–4		
Consultant	Patterson	Patterson	LANCY	LANCY	JWP&A *	LANCY 1	LANCY 2	LANCY 1	LANCY 2	Patterson *	LANCY	LANCY
Sampling Date	6/26/80	12/19/80	8/83	10/7/83	12/19/80	8/83	8/83	10/7/83	10/7/83	12/19/80	8/83	10/7/83
2–Chloronaphthalene												
2–Nitroaniline												
Dimethyl Phthalate												
Acenaphthylene												
2,6–Dinitrotoluene												
3–Nitroaniline												
Acenaphthene	43	88.2										
2,4–Dinitrophenol												
4–Nitrophenol	5.80	nd										
Dibenzofuran												
2,4–Dinitrotoluene												
Diethylphthalate	nd	nd										
4–Chlorophenyl–phenylether												
Fluorene												
4–Nitroaniline												
4,6–Dinitro–2–Methylphenol												
N–Nitrosodiphenylamine												
4–Bromophenyl–phenylether												
Hexachlorobenzene												
Pentachlorophenol												
Phenanthrene												
Anthracene												
Carbazole												
Di–n–Butylphthalate	25	234										
Fluoranthene												
Pyrene												
Butylbenzylphthalate												
3,3'–Dichlorobenzidine												
Benzo (a) Anthracene												
Chrysene												
bis(2–Ethylhexyl) Phthalate	21	72.5										
Di–n–Octylphthalate	nd	nd										
Benzo (b) Fluoranthene												
Benzo (k) Fluoranthene												
Benzo (a) Pyrene												
Indeno (1,2,3–cd) Pyrene												
Dibenz (a,h) Anthracene												
Benzo (g,h,i) Perylene												
Dichlorodifluoromethane	nd	nd			nd	nd	< 10	nd	< 10	nd		
1,2,3–Trichlorobenzene	33	122										
1,2–Diphenylhydrazine	14	12.2										
Acrolein	2900	nd			nd					nd		
Pesticides												
alpha–BHC	nd	nd			nd					10.8		
beta–BHC	nd	nd			17.1					74.4		
delta–BHC	nd	nd			nd					16.4		
gamma–BHC	nd	nd			8.8					nd		
Heptachlor												
Aldrin												
Heptachlor epoxide												
Endosulfan I												
Dieldrin												
4,4' – DDE												
Endrin												
Endosulfan II												
4,4'–DDD												
Endosulfan sulfate												
4,4'–DDT												
Methoxychlor												
Endrin ketone												
Endrin Aldehyde												
alpha–Chlordane												
gamma–Chlordane												
Toxaphene												

1 Analyzed by purge and trap gas chromatography.
2 Analyzed by GC/MS.
< Compound was not detected at quantitation limits.
* Data sets are incomplete.
nd – no detection

Table A–4 Previously Collected Data for the MW Series Wells

Well	MW–1	MW–2			MW–3					MW–4		
Consultant	Patterson	Patterson	LANCY	LANCY	JWP&A *	LANCY 1	LANCY 2	LANCY 1	LANCY 2	Patterson *	LANCY	LANCY
Sampling Date	6/28/80	12/19/80	8/83	10/7/83	12/19/80	8/83	8/83	10/7/83	10/7/83	12/19/80	8/83	10/7/83
PCBs	---											
Aroclor-1016												
Aroclor-1221												
Aroclor-1232												
Aroclor-1242												
Aroclor-1248		770										
Aroclor-1254												
Aroclor-1260												
Metals												
Aluminum												
Antimony												
Arsenic												
Barium												
Beryllium												
Cadmium												
Calcium												
Chromium												
Cobalt												
Copper												
Iron												
Lead												
Magnesium												
Manganese												
Mercury												
Nickel												
Potassium												
Selenium												
Silver												
Sodium												
Thallium												
Vanadium												
Zinc												
Cyanide												

1 Analyzed by purge and trap gas chromatography.
2 Analyzed by GC/MS.
< Compound was not detected at quantitation limits.
* Data sets are incomplete.
nd – no detection

Table A–4 Previously Collected Data for the MW Series Wells

Well	MW–5		MW–6			MW–7		MW–8	
Consultant	Patterson *	LANCY	Patterson *	LANCY	LANCY	Patterson *	LANCY	LANCY	LANCY
Sampling Date	12/19/80	10/7/83	12/19/80	8/83	10/7/83	12/19/80	10/7/83	8/83	10/7/83
VOCs									
Chloromethane									
Bromomethane									
Vinyl Chloride									
Chloroethane	nd		nd			nd			
Methylene Chloride	6820		1500			2270			
Acetone									
Carbon Disulfide									
1,1-Dichloroethene	46.9	< 1000	16.7	< 1000	< 1000	19.6	< 1000	< 1000	< 1000
1,1-Dichloroethane	198		3.37			17.9			
1,2-Dichloroethene (Total)		7740		7810	4780		< 1000	< 1000	< 1000
trans-1,2-Dichloroethene	nd		nd			nd			
Chloroform	17800	12500	180	< 1000	1430	725	7260	11200	10000
1,2-Dichloroethane	1650		322			544			
2-Butanone									
1,1,1-Trichloroethane	11200		212			384			
Carbon Tetrachloride	9120	< 10000	67.4	< 10000	< 10000	33.4	< 10000	< 10000	< 10000
Vinyl Acetate									
Bromodichloromethane									
1,2-Dichloropropane	0.801		nd			nd			
cis-1,3-Dichloropropene									
Trichloroethene	14500	20000	375*	< 1000	3280	*	19800	11800	6900
Dibromochloromethane									
1,1,2-Trichloroethane	nd		nd			nd			
Benzene	38000	3710	1020	640	740	2070	2750	9000	3110
trans-1,3-Dichloropropene									
Bromoform									
4-Methyl-2-Pentanone									
2-Hexanone									
Tetrachloroethene	948	<1000	nd	<1000	<1000	8.38	<1000	15000	13500
1,1,2,2-Tetrachloroethane	nd		nd			nd			
Toluene	20000	9450	16.4	2170	1900	987	1750	40800	28300
Chlorobenzene	nd		0.578			18.2			
Ethylbenzene	1580		nd			52.6			
Styrene									
Xylene (total)									
Trichlorofluoromethane	2380		nd			nd			
Diethylphthalate	nd		nd			nd			
SEMI-VOLATILE ORGANICS									
Phenol	19.7		9.8			184			
bis(2-Chloroethyl) Ether	nd		nd			nd			
2-Chlorophenol									
1,3-Dichlorobenzene	nd		nd			nd			
1,4-Dichlorobenzene	nd		nd			nd			
Benzyl Alcohol									
1,2-Dichlorobenzene	nd		nd			nd			
2-Methylphenol									
2,2'-Oxybis(1-Chloropropane)									
4-Methylphenol									
N-Nitroso-Di-n-Propylamine									
Hexachloroethane									
Nitrobenzene									
Isophorone	28.4		nd			nd			
2-Nitrophenol	nd		nd			nd			
2,4-Dimethylphenol	144		62.9			nd			
Benzoic Acid									
bis(2-Chloroethoxy)Methane									
2,4-Dichlorophenol									
1,2,4-Trichlorobenzene									
Naphthalene	1.97		7.93			nd			
4-Chloroaniline									
Hexachlorobutadiene									
4-Chloro-3-Methylphenol									
2-Methylnaphthalene									
Hexachlorocyclopentadiene									
2,4,6-Trichlorophenol	nd		nd			nd			
2,4,5-Trichlorophenol									

1 Analyzed by purge and trap gas chromatography.
2 Analyzed by GC/MS.
< Compound was not detected at quantitation limits.
* Data sets are incomplete.
nd – no detection

Table A–4 Previously Collected Data for the MW Series Wells

Well	MW–5		MW–6			MW–7		MW–8	
Consultant	Patterson *	LANCY	Patterson *	LANCY	LANCY	Patterson *	LANCY	LANCY	LANCY
Sampling Date	12/19/80	10/7/83	12/19/80	8/83	10/7/83	12/19/80	10/7/83	8/83	10/7/83
2–Chloronaphthalene									
2–Nitroaniline									
Dimethyl Phthalate									
Acenaphthylene									
2,6–Dinitrotoluene									
3–Nitroaniline									
Acenaphthene	1 43		nd			nd			
2,4–Dinitrophenol									
4–Nitrophenol	nd		nd			nd			
Dibenzofuran									
2,4–Dinitrotoluene									
Diethylphthalate	nd		nd			nd			
4–Chlorophenyl–phenylether									
Fluorene									
4–Nitroaniline									
4,6–Dinitro–2–Methylphenol									
N–Nitrosodiphenylamine									
4–Bromophenyl–phenylether									
Hexachlorobenzene									
Pentachlorophenol									
Phenanthrene									
Anthracene									
Carbazole									
Di–n–Butylphthalate	nd		nd			nd			
Fluoranthene									
Pyrene									
Butylbenzylphthalate									
3 3 –Dichlorobenzidine									
Benzo (a) Anthracene									
Chrysene									
bis(2–Ethylhexyl) Phthalate	nd		nd			nd			
Di–n–Octylphthalate	1 62		nd			28 1			
Benzo (b) Fluoranthene									
Benzo (k) Fluoranthene									
Benzo (a) Pyrene									
Indeno (1,2,3–cd) Pyrene									
Dibenz (a,h) Anthracene									
Benzo (g,h,i) Perylene									
Dichlorodifluoromethane	nd		nd			nd			
1,2,3–Trichlorobenzene	nd		nd			nd			
1,2–Diphenylhydrazine	nd		nd			nd			
Acrolein	nd		nd			nd			
Pesticides									
alpha–BHC	nd		nd			nd			
beta–BHC	nd		nd			nd			
delta–BHC	nd		nd			nd			
gamma–BHC	nd		nd			nd			
Heptachlor									
Aldrin									
Heptachlor epoxide									
Endosulfan I									
Dieldrin									
4,4' – DDE									
Endrin									
Endosulfan II									
4,4'–DDD									
Endosulfan sulfate									
4,4'–DDT									
Methoxychlor									
Endrin ketone									
Endrin Aldehyde									
alpha–Chlordane									
gamma–Chlordane									
Toxaphene									

1 Analyzed by purge and trap gas chromatography.
2 Analyzed by GC/MS.
< Compound was not detected at quantitation limits.
* Data sets are incomplete.
nd – no detection

Table A–4 Previously Collected Data for the MW Series Wells

Well	MW–5		MW–6			MW–7			MW–8
Consultant	Patterson *	LANCY	Patterson *	LANCY	LANCY	Patterson *	LANCY	LANCY	LANCY
Sampling Date	12/19/80	10/7/83	12/19/80	8/83	10/7/83	12/19/80	10/7/83	8/83	10/7/83
PCBs									
Aroclor-1016									
Aroclor-1221									
Aroclor-1232									
Aroclor-1242									
Aroclor-1248									
Aroclor-1254									
Aroclor-1260									
Metals									
Aluminum									
Antimony									
Arsenic									
Barium									
Beryllium									
Cadmium									
Calcium									
Chromium									
Cobalt									
Copper									
Iron									
Lead									
Magnesium									
Manganese									
Mercury									
Nickel									
Potassium									
Selenium									
Silver									
Sodium									
Thallium									
Vanadium									
Zinc									
Cyanide									

1 Analyzed by purge and trap gas chromatography.
2 Analyzed by GC/MS.
< Compound was not detected at quantitation limits.
* Data sets are incomplete.
nd – no detection

Table A-5 Previously Collected Data for the MW-100 Series Wells

Analytical Parameters	MW-101 HLA * 7/6/90	MW-102 HLA 7/3/90	MW-103 HLA 7/6/90	MW-104 HLA 7/5/90
VOCs				
Chloromethane				
Bromomethane				
Vinyl Chloride	nd	nd	nd	nd
Chloroethane	nd	nd	nd	nd
Methylene Chloride	5	nd	nd	nd
Acetone	nd			
Carbon Disulfide				
1,1-Dichloroethene	nd	nd	nd	nd
1,1-Dichloroethane	nd	nd	nd	nd
1,2-Dichloroethene (Total)	nd			
trans-1,2-Dichloroethene	nd	1.3	nd	nd
Chloroform	31	24	6.9	nd
1,2-Dichloroethane	3	2	nd	nd
2-Butanone				
1,1,1-Trichloroethane	nd	nd	nd	nd
Carbon Tetrachloride	66	nd	nd	nd
Vinyl Acetate				
Bromodichloromethane	nd	nd	nd	nd
1,2-Dichloropropane	nd	nd	nd	nd
cis-1,3-Dichloropropene				
Trichloroethene	19	88	2.3	52
Dibromochloromethane				
1,1,2-Trichloroethane	nd	2.5	nd	nd
Benzene	nd	nd	nd	nd
trans-1,3-Dichloropropene				
Bromoform				
4-Methyl-2-Pentanone	nd			
2-Hexanone	nd			
Tetrachloroethene	3	nd	nd	6700
1,1,2,2-Tetrachloroethane	nd	nd	nd	nd
Toluene	nd			
Chlorobenzene	nd	nd	nd	nd
Ethylbenzene	nd	nd	nd	nd
Styrene				
Xylene (total)	9	nd	1.5	nd
Trichlorofluoromethane	nd	nd	nd	nd
Dichlorodifluoromethane	nd	nd	nd	nd
SVOCs				
Phenol	nd			
bis(2-Chloroethyl) Ether	nd			
2-chlorophenol				
1,3-Dichlorobenzene	nd	nd	nd	nd
1,4-Dichlorobenzene	nd	nd	nd	nd
Benzyl Alcohol				
1,2-Dichlorobenzene	nd	nd	nd	nd
2-Methylphenol	nd			
2,2'-Oxybis(1-Chloropropane)				
4-Methylphenol				
N-Nitroso-Di-n-Propylamine				
Hexachloroethane				
Nitrobenzene				
Isophorone	nd			
2-Nitrophenol				
2,4-Dimethylphenol	nd			
Benzoic Acid	nd			
bis(2-Chloroethoxy)Methane				
2,4-Dichlorophenol				
1,2,4-Trichlorobenzene	nd			
Naphthalene	nd			
4-Chloroaniline				
Hexachlorobutadiene				
4-Chloro-3-Methylphenol				
2-Methylnaphthalene	nd			
Hexachlorocyclopentadiene				
2,4,6-Trichlorophenol				
2,4,5-Trichlorophenol				

nd - no detection minimum detectable limit unknown

* An additional VOC sample was collected on the date which is not reported here

Table A-5 Previously Collected Data for the MW-100 Series Wells

Analytical Parameters	MW-101 HLA * 7/6/90	MW-102 HLA 7/3/90	MW-103 HLA 7/6/90	MW-104 HLA 7/5/90
2-Chloronaphthalene				
2-Nitroaniline				
Dimethyl Phthalate				
Acenaphthylene				
2,6-Dinitrotoluene				
3-Nitroaniline				
Acenaphthene				
2,4-Dinitrophenol				
4-Nitrophenol	nd			
Dibenzofuran	nd			
2,4-Dinitrotoluene				
Diethylphthalate	nd			
4-Chlorophenyl-phenylether				
Fluorene				
4-Nitroaniline				
4,6-Dinitro-2-Methylphenol				
N-Nitrosodiphenylamine				
4-Bromophenyl-phenylether				
Hexachlorobenzene				
Pentachlorophenol				
Phenanthrene				
Anthracene				
Carbazole				
Di-n-Butylphthalate	nd			
Fluoranthene				
Pyrene				
Butylbenzylphthalate				
3,3'-Dichlorobenzidine				
Benzo (a) Anthracene				
Chrysene				
bis(2-Ethylhexyl) Phthalate	4			
Di-n-Octylphthalate	0.6			
Benzo (b) Fluoranthene				
Benzo (k) Fluoranthene				
Benzo (a) Pyrene				
Indeno (1,2,3-cd) Pyrene				
Dibenz (a,h) Anthracene				
Benzo (g,h,i) Perylene				
Pesticides				
alpha-BHC				
beta-BHC				
delta-BHC				
gamma-BHC				
Heptachlor				
Aldrin				
Heptachlor epoxide				
Endosulfan I				
Dieldrin				
4,4'-DDE				
Endrin				
Endosulfan II				
4,4'-DDD				
Endosulfan sulfate				
4,4'-DDT				
Methoxychlor				
Endrin ketone				
Endrin Aldehyde				
alpha-Chlordane				
gamma-Chlordane				
Toxaphene				
PCBs				
Aroclor-1016				
Aroclor-1221				
Aroclor-1232				
Aroclor-1242				
Aroclor-1248				
Aroclor-1254				

nd - no detection. Minimum detection limit unknown.

* An additional VOC sample was collected on this date which is not reported here.

Table A-5 Previously Collected Data for the MW-100 Series Wells

Analytical Parameters	MW-101 HLA * 7/6/90	MW-102 HLA 7/3/90	MW-103 HLA 7/6/90	MW-104 HLA 7/5/90
Aroclor-1260				
Metals				
Aluminum	540			
Antimony	10			
Arsenic	4			
Barium	120			
Beryllium				
Cadmium				
Calcium	41			
Chromium				
Cobalt				
Copper				
Iron	22000			
Lead	7			
Magnesium	21000			
Manganese	97			
Mercury				
Nickel				
Potassium	2700			
Selenium	1			
Silver				
Sodium	13			
Thallium				
Vanadium				
Zinc	2800			
Cyanide				

nd - no detection minimum detectable limit unknown

* An additional VOC sample was collected on this date which is not reported here

Table A-6 Previously Collected Data From the C-Series Wells

Analytical Parameters	AGES Sample 1 7/21/87	AGES Sample 2 7/21/87	AGES Sample 3 7/22/87	AGES Sample 4 7/22/87	AGES Sample 5 7/23/87	AGES Sample 6 7/23/87	AGES Sample 7 7/23/87	MPI 4/91	JWP&A 7/9/80	NJDEP 11/80	Lancy 10/7/83
VOCs											
Chloromethane								670 U	nd		
Bromomethane								670 U	nd		
Vinyl Chloride								450 J	909 5		
Chloroethane								670 U	nd		
Methylene Chloride			0 05 U	2843	293	340	1581	27000 BE	4264		
Acetone								85000 BE	nd		
Carbon Disulfide								310 J			
1,1-Dichloroethene			0 05 U	1797	0 05 U	0 05 U	2044	2300	258 4		
1,1-Dichloroethane					4488	4488		880	72 6		70
1,2-Dichloroethene (total)								12000			
trans-1,2-dichloroethene			0 05 U	147	10851	11134	0 05 U		747 47		
Chloroform			0 05 U	1500	0 05 U	0 05 U	1767	53000 E	3831 2	380	60
1,2-Dichloroethane			0 05 U	1798	3162	3338	1941	29000 E	1262 1		
2-Butanone								28000 E			400
1,1,1-Trichloroethane			0 05 U	0 05 U	2803	6340	624	1400 E	207 8	14140	
Carbon Tetrachloride			0 05 U	7381	0 05 U	0 05 U	1992	40000 E	2384 8		200 U
Vinyl Acetate											
Bromodichloromethane								670 U	nd		
1,2-Dichloropropane					120	184		300 J	nd		
cis-1,3-Dichloropropene								670 U	nd		
Trichloroethene			3184	3887	308	340	2618	92000 E	1184 6	2880	220
Dibromochloromethane								670 U	nd		
1,1,2-Trichloroethane								150 J	nd		
Benzene	38262	10137	275	3817	24481	6754	1012	31000 E	208 1	360	20
trans-1,3-Dichloropropene								670 U	nd		
Bromoform								670 U	nd		
4-Methyl-2-Pentanone								100000			
2-Hexanone								190 J			
Tetrachloroethene			256	908	2016	2445	656	1300	233 9	1940	10 U
1,1,2,2-Tetrachloroethane									nd		
Toluene	12004	10887	305	4880	7913	8840	519	24000 E		2880	140
Chlorobenzene	1918	2243	1857	756	0 05	0 05	426	5000			
Ethylbenzene	1018	1100	487	251	0 05	0 05	0 05	1000			
Styrene								670 U			
Xylene			1881	1881			1000	6000			
Trichlorofluoromethane									2 30		2 30
Methyl Isobutyl Ketone			1973	1885			2113				
SVOCs											
Phenol								1500	56 8		
bis(2-Chloroethyl)Ether								3200 E	nd		
2-chlorophenol								200 U	nd		
1,3-Dichlorobenzene								200 U	nd		
1,4-Dichlorobenzene					518	887		44 J	37 84		
Benzyl Alcohol											
1,2-Dichlorobenzene	580	181			0 05 U	0 05 U		660	570 5		
2-Methylphenol								580			
2,2'-Oxybis(1-Chloropropane)								200 U			
4-Methylphenol								450			
N-Nitroso-Di-n-Propylamine								200 U			
Hexachloroethane								84 J	nd		

Table A-6 Previou Collected Data From the C-Series Wells

Well	C-1										C-2
Consultant / Sampling Date	AGES Sample 1 7/21/87	AGES Sample 2 7/21/87	AGES Sample 3 7/22/87	AGES Sample 4 7/22/87	AGES Sample 5 7/23/87	AGES Sample 6 7/23/87	AGES Sample 7 7/23/87	MPI 4/91	JWP&A 7/9/80	NJDEP 11/80	Lancy 10/7/83
VOCs											
Chloromethane								670 U	nd		
Bromomethane								670 U	nd		
Vinyl Chloride								450 J	809 5		
Chloroethane								670 U	nd		
Methylene Chloride			0 05 U	2643	793	340	1581	27000 BE	4204		
Acetone								85000 BE	nd		
Carbon Disulfide								310 J			
1,1-Dichloroethene			0 05 U	1797	0 05 U	0 05 U	2044	2300	256 4		
1,1-Dichloroethane					4489	4489		680	72 6		70
1,2-Dichloroethene (total)								12000			
trans-1,2-dichloroethene			0 05 U	147	10851	11134	0 05 U		747 47		
Chloroform			0 05 U	1560	0 05 U	0 05 U	1767	53000 E	3631 2	350	60
1,2-Dichloroethane			0 05 U	1755	3182	3339	1841	28000 E	1202 1		
2-Butanone								28000 E			400
1,1,1-Trichloroethane			0 05 U	0 05 U	2603	6349	824	1400 E	297 8	14140	
Carbon Tetrachloride			0 05 U	7391	0 05 U	0 05 U	1992	48000 E	2304 8		200 U
Vinyl Acetate											
Bromodichloromethane								670 U	nd		
1,2-Dichloropropane					120	184		300 J	nd		
cis-1,3-Dichloropropene								670 U	nd		
Trichloroethene			3184	3987	308	340	2518	92000 E	1184 6	2060	220
Dibromochloromethane								670 U	nd		
1,1,2-Trichloroethane								150 J	nd		
Benzene	38208	16137	275	2017	24481	6754	1912	21000 E	250 1	380	20
trans-1,3-Dichloropropene								670 U	nd		
Bromoform								670 U	nd		
4-Methyl-2-Pentanone								100000			
2-Hexanone								150 J			
Tetrachloroethene			258	938	2016	2445	858	1300	233 0	1040	10 U
1,1,2,2-Tetrachloroethane									nd		
Toluene	12884	16057	305	6883	7015	8849	810	24000 E		2000	140
Chlorobenzene	1010	2243	1857	758	0 05	0 05	420	5500			
Ethylbenzene	1010	1109	407	251	0 05	0 05	0 05	1000			
Styrene								670 U			
Xylene			1801	1801			1908	5000			
Trichlorofluoromethane									2 30		2 30
Methyl Isobutyl Ketone			1023	1885			2113				
BNAs											
Phenol								1500	88 6		
bis(2-Chloroethyl)Ether								3300 E	nd		
2-chlorophenol								200 U	nd		
1,3-Dichlorobenzene								200 U	nd		
1,4-Dichlorobenzene					510	887		44 J	37 84		
Benzyl Alcohol											
1,2-Dichlorobenzene	980	101			0 05 U	0 05 U		980	570 5		
2-Methylphenol								980			
2,2'-Oxybis(1-Chloropropane)								200 U			
4-Methylphenol								450			

Table A-6 Previou(Collected Data From the C-Series Wells (

Well	C-1									C-2	
Consultant Sampling Date	AGES Sample 1 7/21/87	AGES Sample 2 7/21/87	AGES Sample 3 7/22/87	AGES Sample 4 7/22/87	AGES Sample 5 7/23/87	AGES Sample 6 7/23/87	AGES Sample 7 7/23/87	MPI 4/91	JWP&A 7/9/80	NJDEP 11/80	Lancy 10/7/83
N-Nitroso-Di-n-Propylamine								200 U			
Hexachloroethane								64 J	nd		
Nitrobenzene								580	nd		
Isophorone								230	nd		
2 Nitrophenol								230			
2,4-Dimethylphenol								38 J	120		
Benzoic Acid											
bis(2-Chloroethoxy)Methane								200 U	nd		
2,4-Dichlorophenol								980	nd		
1,2,4-Trichlorobenzene								120 J	nd		
Naphthalene								110 J	140		
4-Chloroaniline								200 U			
Hexachlorobutadiene								200 U	nd		
4-Chloro-3-Methylphenol								200 U			
2-Methylnaphthalene								200 U			
Hexachlorocyclopentadiene								200 U	nd		
2,4,6-Trichlorophenol								200 U	nd		
2,4,5-Trichlorophenol								200 U			
2-Chloronaphthalene								200 U			
2-Nitroaniline								500 U			
Dimethyl Phthalate								63 J	nd		
Acenaphthylene								200 U	nd		
2,6-Dinitrotoluene								200 U	nd		
3-Nitroaniline								500 U			
Acenaphthene								200 U	nd		
2,4-Dinitrophenol								500 U	nd		
4-Nitrophenol								500 U	nd		
Dibenzofuran								200 U			
2,4-Dinitrotoluene								200 U	nd		
Diethylphthalate								530	981		
4-Chlorophenyl-phenylether								200 U	nd		
Fluorene								200 U	nd		
Diphenylhydrazine/Azobenzene									nd		
4-Nitroaniline								500 U			
4,6-Dinitro-2-Methylphenol								500 U	nd		
N-Nitrosodiphenylamine								200 U			
4-Bromophenyl-phenylether								200 U	nd		
Hexachlorobenzene								200 U	nd		
Pentachlorophenol								500 U	nd		
Phenanthrene								200 U	nd		
Anthracene								200 U	nd		
Carbazole								200 U			
Di-n-Butylphthalate								160 J	nd		
Fluoranthene								200 U	nd		
Pyrene								200 U	nd		
Butylbenzylphthalate								200 U	nd		
3,3'-Dichlorobenzidine								200 U			
Benzo (a) Anthracene								200 U	nd		
Chrysene								200 U	nd		

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Table A-6 Previou Collected Data From the C-Series Wells

Well	C-1										C-2	
Consultant / Sampling Date	AGES Sample 1 7/21/87	AGES Sample 2 7/21/87	AGES Sample 3 7/22/87	AGES Sample 4 7/22/87	AGES Sample 5 7/23/87	AGES Sample 6 7/23/87	AGES Sample 7 7/23/87	MPI 4/91	JWP&A 7/9/80	NJDEP 11/80	Lancy 10/7/83
bis(2-Ethylhexyl) Phthalate								32 J	151		
Di-n-Octyl Phthalate								200 U	nd		
Benzo (b) Fluoranthene								200 U	nd		
Benzo (k) Fluoranthene								200 U	nd		
Benzo (a) Pyrene								200 U	nd		
Indeno (1,2,3-cd) Pyrene								200 U	nd		
Dibenz (a,h) Anthracene								200 U	nd		
Benzo (g,h,i) Perylene								200 U	nd		
Pesticides											
alpha-BHC								0.43 P	nd		
beta-BHC								0.05 U	nd		
delta-BHC								0.064 P	nd		
gamma-BHC								0.023 JP	nd		
Heptachlor								0.05 U	nd		
Aldrin								0.05 U	nd		
Heptachlor epoxide								0.05 U	nd		
Endosulfan I								0.05 U	nd		
Dieldrin								0.5 P	nd		
4,4' - DDE								0.1 U	nd		
Endrin								0.21 P	nd		
Endosulfan II								0.18 P	nd		
4,4'-DDD								0.1 U	nd		
Endosulfan sulfate								0.1 U	nd		
4,4'-DDT								0.1 U	nd		
Methoxychlor								0.5 U	nd		
Endrin ketone								0.083 J	nd		
Endrin Aldehyde								0.038 JP	nd		
alpha-Chlordane								0.05 U	nd		
gamma-Chlordane								0.11	nd		
Toxaphene								5.0 U	nd		
PCBs											
Aroclor-1016								1.0 U	nd		
Aroclor-1221								1	nd		
Aroclor-1232								2	nd		
Aroclor-1242								1	nd		
Aroclor-1248								1	nd		
Aroclor-1254								1	nd		
Aroclor-1260								1	nd		
Metals											
Aluminum								236 * J			
Antimony								47.5 B			
Arsenic								4.7 B			
Barium								1000			
Beryllium								1 U			
Cadmium								3 U			
Calcium								250000			
Chromium								3.5 B			
Cobalt								4.0 U			
Copper								4.0 U			

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Table A-6 Previou(Collected Data From the C-Series Wells (

Well	C-1										C-2
Consultant Sampling Date	AGES Sample 1 7/21/87	AGES Sample 2 7/21/87	AGES Sample 3 7/22/87	AGES Sample 4 7/22/87	AGES Sample 5 7/23/87	AGES Sample 6 7/23/87	AGES Sample 7 7/23/87	MPI 4/91	JWP&A 7/9/80	NJDEP 11/80	Lancy 10/7/83
Iron								8140			
Lead								5 1 J9			
Magnesium								24600			
Manganese								3980			
Mercury								0 2 U			
Nickel								11 4 B			
Potassium								1600 B			
Selenium								4 UWNWJ			
Silver								5 U			
Sodium								30000			
Thallium								2 UWNWJ			
Vanadium								6 8 B			
Zinc								32 4 J			
Cyanide								66 5 N*J			

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Table A-7 Previously Collected Data for the Off-Site Wells

Street Address	12 Selsdon (Dist)	12 Selsdon (Dist) *1	7 Coppelia (Rychman)	7 Coppelia (Rychman)	1288 Chester	6 Franklin (Ghandi)	8 Franklin (Smith)
Sampled By	NJDEP	NJDEP	MCDOH	USEPA	NJDEP	HLA	HLA
Sampling Date	6-7/90	9/25/89	1/8/90	2/7/91	6-7/90	1/11/90	1/11/90
VOCs							
Chloromethane			1.0 U			0.42 U	0.42 U
Bromomethane			1.0 U				
Vinyl Chloride			0.5 U	0.39 U		0.59 U	0.59 U
Chloroethane			1.0 U	0.59 U		0.63 U	0.63 U
Methylene Chloride			0.5 U	0.51 U		0.67 U	0.67 U
Acetone				nd			
Carbon Disulfide							
1,1-Dichloroethene			1.0 U	0.37 U		1.2	0.15 U
1,1-Dichloroethane			0.5 U	0.37 U		3.1	0.17 U
1,2-Dichloroethene (Total)							
trans-1,2-Dichloroethene			0.5 U	0.38 U		13	0.21 U
Chloroform			1.0 U	0.21 U	3.9	0.13 U	0.13 U
1,2-Dichloroethane			0.5 U	0.40 U		0.31 U	0.31 U
2-Butanone							
1,1,1-Trichloroethane			0.5 U	0.20 U	0.6	1.9	0.14 U
Carbon Tetrachloride			0.5 U	0.17 U		0.16 U	0.16 U
Vinyl Acetate							
Bromodichloromethane			1.0 U			0.28 U	0.28 U
1,2-Dichloropropane			1.0 U	0.35 U		0.35 U	0.25 U
cis-1,3-Dichloropropene			1.0 U				
trans 1,3-Dichloropropene			1.0 U			0.56 U	0.56 U
2,2-Dichloropropane			1.0 U				
1,1-Dichloropropene			1.0 U				
1,3-Dichloropropane			1.0 U				
cis-1,3-Dichloropropene							
Trichloroethene			0.5 U	0.36 U	0.8	0.6	0.78 U
Dibromochloromethane			1.0 U			0.41 U	0.41 U
1,1,2-Trichloroethane			1.0 U	0.69 U		0.69 U	0.69 U
Benzene	0.8		0.5 U	0.36 U	0.5	0.18 U	0.18 U
Bromoform			1.0 U			0.45 U	0.45 U
4-Methyl-2-Pentanone				nd			
2-Hexanone				nd			
Tetrachloroethene			4.6	5.00	nd	319	28
1,1,2,2-Tetrachloroethane			1.0 U	1.00 U		0.76 U	0.76 U
Toluene			1.0 U	0.75 U	nd	0.38 U	0.38 U
Chlorobenzene			0.5 U	0.13 U		0.19 U	0.19 U
Ethylbenzene			1.0 U	0.22 U	1.1	0.21 U	0.21 U
Styrene							
Xylene (total)				0.24 U		1.2 U	1.2 U
o-Xylene			0.5 U				
m-Xylene			0.5 U				
p-Xylene			0.5 U				
Methyl Bromide							
Methyl Chloride							
Methyl-tert-Butyl Ether			1.0 U				
Isopropyl Ether			1.0 U				
cis-1,2-Dichloroethene			1.0 U				
Bromochloromethane			1.0 U				
Dibromomethane			1.0 U				
1,3-Dibromoethane			1.0 U				
1,1,1,2-Tetrachloroethane			1.0 U				
Isopropyl Benzene			1.0 U				
1,2,3-Trichloropropane			1.0 U				
n-Propyl Benzene			1.0 U				
Bromobenzene			1.0 U				
2-Chlorotoluene			1.0 U				
4-Chlorotoluene			1.0 U				
sec-butylbenzene			1.0 U				
p-Isopropyltoluene			1.0 U				
n-Butylbenzene			1.0 U				
1,3-Dibromo-3-Chloropropane			1.0 U				
SEMI-VOLATILE ORGANICS							
Phenol							
bis(2-Chloroethyl) Ether							
2-Chlorophenol							
1,3-Dichlorobenzene			0.5 U			0.46 U	0.46 U
1,4-Dichlorobenzene			0.5 U			0.40 U	0.40 U
Benzyl Alcohol							
1,2-Dichlorobenzene			0.5 U			0.65 U	0.65 U
2-Methylphenol							
2,2'-Oxybis(1-Chloropropane)							

Table A-7 Previously Collected Data for the Off-Site Wells

Street Address	12 Beholsen (Dist)	12 Beholsen (Dist) *1	7 Carpathia (Rychman)	7 Carpathia (Rychman)	1289 Chester	5 Franklin (Ghandi)	9 Franklin (Smith)
Sampled By:	NJDEP	NJDEP	MCDOH	USEPA	NJDEP	HLA	HLA
Sampling Date	6-7/90	6/25/90	1/8/90	2/7/91	6-7/90	1/11/90	1/11/90
4-Methylphenol							
N-Nitroso-Di-n-Propylamine							
Hexachloroethane							
Nitrobenzene							
Isophorone							
2-Nitrophenol							
2,4-Dimethylphenol							
Benzoic Acid							
bis(2-Chloroethoxy)Methane							
2,4-Dichlorophenol							
1,2,4-Trichlorobenzene							
Naphthalene			1.0 U				
4-Chloroaniline							
Hexachlorobutadiene			0.5 U				
4-Chloro-3-Methylphenol							
2-Methylnaphthalene							
Hexachlorocyclopentadiene							
2,4,6-Trichlorophenol							
2,4,5-Trichlorophenol							
2-Chloronaphthalene							
2-Nitroaniline							
Dimethyl Phthalate							
Acenaphthylene							
2,6-Dinitrotoluene							
3-Nitroaniline							
Acenaphthene							
2,4-Dinitrophenol							
4-Nitrophenol							
Dibenzofuran							
2,4-Dinitrotoluene							
Diethylphthalate							
4-Chlorophenyl-phenylether							
Fluorene							
4-Nitroaniline							
4,6-Dinitro-2-Methylphenol							
N-Nitrosodiphenylamine							
4-Bromophenyl-phenylether							
Hexachlorobenzene							
Pentachlorophenol							
Phenanthrene							
Anthracene							
Carbazole							
Di-n-Butylphthalate							
Fluoranthene							
Pyrene							
Butylbenzylphthalate							
3,3'-Dichlorobenzidine							
Benzo (a) Anthracene							
Chrysene							
bis(2-Ethylhexyl) Phthalate							
Di-n-Octylphthalate							
Benzo (b) Fluoranthene							
Benzo (k) Fluoranthene							
Benzo (a) Pyrene							
Indeno (1,2,3-cd) Pyrene							
Dibenz (a,h) Anthracene							
Benzo (g,h,i) Perylene							
Dichlorofluoromethane			1.0 U			0.50 U	0.50 U
Methyl Tertiary Butyl Ether			1.0 U				
Acrolein							
Acrylonitrile							
1,2,3-Trichlorobenzene			1.0 U				
1,3,5-Trimethylbenzene			1.0 U				
Tert-butyl-benzene			1.0 U				
1,2,4-Trimethylbenzene			1.0 U				
Pesticides							
alpha-BHC							
beta-BHC							
delta-BHC							
gamma-BHC							
Heptachlor							
Aldrin							

Table A-7 Previously Collected Data for the Off-Site Wells

Street Address	12 Bethlehem (Elvid)	12 Bethlehem (Elvid) *1	7 Coppelkill (Ryshmore)	7 Coppelkill (Ryshmore)	1388 Chester	5 Franklin (Gerhardt)	9 Franklin (Smith)
Sampled By:	NJDEP	NJDEP	MCDOH	USEPA	NJDEP	HLA	HLA
Sampling Date	6-7/89	9/25/89	1/8/90	2/7/91	6-7/89	1/11/90	1/11/90
Heptachlor epoxide							
Endosulfan I							
Dieldrin							
4,4' - DDE							
Endrin							
Endosulfan II							
4,4'-DDD							
Endosulfan sulfate							
4,4'-DDT							
Methoxychlor							
Endrin ketone							
Endrin Aldehyde							
alpha-Chlordane							
gamma-Chlordane							
Toxaphene							
PCBs							
Aroclor-1016							
Aroclor-1221							
Aroclor-1232							
Aroclor-1242							
Aroclor-1248							
Aroclor-1254							
Aroclor-1260							
INORGANICS							
Aluminum							
Antimony							
Arsenic							
Barium							
Calcium							
Iron							
Lead							
Magnesium							
Manganese							
Potassium							
Selenium							
Sodium							
Zinc							

Table A-7 Previously Collected Data for the Off-Site Wells

Street Address	16 Franklin (Robertson)	16 Franklin (Robertson) *2	16 Franklin (Robertson)	16 Franklin (West)	27 Franklin (Aguilo) *1	27 Franklin (Aguilo)	17 Franklin St (Ambrose)
Sampled By:	NJDEP	NJDEP	HLA	HLA	NJDEP	USEPA	MCDOH
Sampling Date	6-7/90	9/25/90	1/11/90	1/11/90	9/25/90	2/6/91	1/16/90
VOCs							
Chloroethane							1 U
Bromomethane							1 U
Vinyl Chloride		0.77	0.50 U	0.50 U		0.20 U	0.5 U
Chloroethane			0.63 U	0.65 U		0.5 U	1 U
Methylene Chloride			0.67 U	0.67 U		0.51 U	0.5 U
Acetone						nd	
Carbon Disulfide							
1,1-Dichloroethene			0.15 U	0.15 U		0.37 U	1 U
1,1-Dichloroethene		0.50	0.17 U	0.17 U		0.37 U	0.5 U
1,2-Dichloroethene (Total)							
trans-1,2-Dichloroethene		7.2	10	0.21 U		0.38 U	0.5 U
Chloroform	1.8		0.13 U	0.13 U		0.21 U	1 U
1,2-Dichloroethane			0.31 U	0.31 U		0.4 U	0.5 U
2-Butanone							
1,1,1-Trichloroethane	nd		0.14 U	0.7		0.2 U	0.5 U
Carbon Tetrachloride			0.19 U	0.19 U		0.17 U	0.5 U
Vinyl Acetate							
Bromodichloromethane			0.26 U	0.26 U			1 U
1,2-Dichloropropane			0.25 U	0.25 U		0.35 U	1 U
cis-1,3-Dichloropropene							1 U
trans 1,3-Dichloropropene		1.5	0.56 U	0.56 U			1 U
2,2-Dichloropropane							1 U
1,1-Dichloropropene							1 U
1,3-Dichloropropane							1 U
cis-1,3-Dichloropropene							
Trichloroethene	0.7	4.4	10	0.78 U		0.28 U	0.5 U
Dibromochloromethane		1.5	0.41 U	0.41 U			1 U
1,1,2-Trichloroethane		1.5	0.69 U	0.65 U		0.69 U	1 U
Benzene	1.3		0.19 U	0.19 U		0.38 U	0.5 U
Bromoform		1	0.45 U	0.45 U			1 U
4-Methyl-2-Pentanone						nd	
2-Hexanone						nd	
Tetrachloroethene	44.4	560	1400	41		0.74 U	0.5
1,1,2,2-Tetrachloroethane		560	0.76 U	0.76 U		1 U	1 U
Toluene	nd		0.39 U	0.39 U		0.75 U	1 U
Chlorobenzene		2.5	0.19 U	0.19 U		0.13 U	0.5 U
Ethylbenzene	0.9		0.21 U	0.21 U		0.22 U	1 U
Styrene							
Xylene (total)			1.2 U	1.2 U		0.24 U	
o-Xylene							0.5 U
m-Xylene							0.5 U
p-Xylene							0.5 U
Methyl Bromide							
Methyl Chloride							
Methyl-tert-Butyl Ether							1 U
Isopropyl Ether							1 U
cis-1,2-Dichloroethene							1 U
Bromochloromethane							1 U
Dibromomethane							1 U
1,2-Dibromoethane							1 U
1,1,1,2-Tetrachloroethane							1 U
Isopropyl Benzene							1 U
1,2,3-Trichloropropane							1 U
n-Propyl Benzene							1 U
Bromobenzene							1 U
2-Chlorotoluene							1 U
4-Chlorotoluene							1 U
sec-butylbenzene							1 U
p-isopropyltoluene							1 U
n-Butylbenzene							1 U
1,2-Dibromo-3-Chloropropane							1 U
SEMI-VOLATILE ORGANICS							
Phenol							
bis(2-Chloroethyl) Ether							
2-Chlorophenol							
1,3-Dichlorobenzene			0.45 U	0.45 U			0.5 U
1,4-Dichlorobenzene			0.40 U	0.40 U			0.5 U
Benzyl Alcohol							
1,2-Dichlorobenzene			0.65 U	0.65 U			0.5 U
2-Methylphenol							
2,2'-Oxybis(1-Chloropropane)							

Table A-7 Previously Collected Data for the Off-Site Wells

Street Address	16 Franklin (Robertson)	16 Franklin (Robertson) *2	16 Franklin (Robertson)	15 Franklin (Mraz)	27 Franklin (Aguilra) *1	27 Franklin (Aguilra)	17 Franklin St (Ambrose)
Sampled By:	NJDEP	NJDEP	HLA	HLA	NJDEP	USEPA	MCDOH
Sampling Date	6-7/89	9/28/89	1/11/90	1/11/90	9/28/89	2/6/91	1/16/90
4-Methylphenol							
N-Nitroso-Di-n-Propylamine							
Hexachloroethane							
Nitrobenzene							
Isophorone							
2-Nitrophenol							
2,4-Dimethylphenol							
Benzoic Acid							
bis(2-Chloroethoxy)Methane							
2,4-Dichlorophenol							
1,2,4-Trichlorobenzene							
Naphthalene							1 U
4-Chloroaniline							
Hexachlorobutadiene							0.5 U
4-Chloro-3-Methylphenol							
2-Methylnaphthalene							
Hexachlorocyclopentadiene							
2,4,6-Trichlorophenol							
2,4,5-Trichlorophenol							
2-Chloronaphthalene							
2-Nitroaniline							
Dimethyl Phthalate							
Acenaphthylene							
2,6-Dinitrotoluene							
3-Nitroaniline							
Acenaphthene							
2,4-Dinitrophenol							
4-Nitrophenol							
Dibenzofuran							
2,4-Dinitrotoluene							
Diethylphthalate							
4-Chlorophenyl-phenylether							
Fluorene							
4-Nitroaniline							
4,6-Dinitro-2-Methylphenol							
N-Nitrosodiphenylamine							
4-Bromophenyl-phenylether							
Hexachlorobenzene							
Pentachlorophenol							
Phenanthrene							
Anthracene							
Carbazole							
Di-n-Butylphthalate							
Fluoranthene							
Pyrene							
Butylbenzylphthalate							
3,3'-Dichlorobenzidine							
Benzo (a) Anthracene							
Chrysene							
bis(2-Ethylhexyl) Phthalate							
Di-n-Octylphthalate							
Benzo (b) Fluoranthene							
Benzo (k) Fluoranthene							
Benzo (a) Pyrene							
Indeno (1,2,3-cd) Pyrene							
Dibenz (a,h) Anthracene							
Benzo (g,h,i) Perylene							
Dichlorofluoromethane		0.77	0.50 U	0.50 U			1 U
Methyl Tertiary Butyl Ether		39					1 U
Acrolein							
Acrylonitrile							
1,2,3-Trichlorobenzene							1.0 U
1,3,5-Trimethylbenzene							1.0 U
Tert-butyl-benzene							1.0 U
1,2,4-Trimethylbenzene							1.0 U
Pesticides							
alpha-BHC							
beta-BHC							
delta-BHC							
gamma-BHC							
Heptachlor							
Aldrin							

Table A-7 Previously Collected Data for the Off-Site Wells

Street Address	19 Franklin (Robertson)	19 Franklin (Robertson) *2	19 Franklin (Robertson)	15 Franklin (Mraz)	27 Franklin (Aguirre) *1	27 Franklin (Aguirre)	17 Franklin St (Ambrose)
Sampled By:	NJDEP	NJDEP	HLA	HLA	NJDEP	USEPA	MCDOH
Sampling Date	6-7/90	8/28/89	1/11/90	1/11/90	8/28/89	2/6/91	1/18/90
Heptachlor epoxide							
Endosulfan I							
Dieldrin							
4,4' - DDE							
Endrin							
Endosulfan II							
4,4'-DDD							
Endosulfan sulfate							
4,4'-DDT							
Methoxychlor							
Endrin ketone							
Endrin Aldehyde							
alpha-Chlordane							
gamma-Chlordane							
Toxaphene							
PCBs							
Aroclor-1016							
Aroclor-1221							
Aroclor-1232							
Aroclor-1242							
Aroclor-1248							
Aroclor-1254							
Aroclor-1260							
INORGANICS							
Aluminum							
Antimony							
Arsenic							
Barium							
Calcium							
Iron							
Lead							
Magnesium							
Manganese							
Potassium							
Selenium							
Sodium							
Zinc							

Table A-7 Previously Collected Data for the Off-Site Wells

Street Address	22 Franks St (Hargrave)	31 Franks St (Gallone)	32 Franks St (Lowry)	36 Franks St (Jacobs)	39 Franks St (Gassis)	1288 Hanover (Machlowsky)	1224 Hanover (Chagnon)
Sampled By:	MCDOH	MCDOH	MCDOH	MCDOH	MCDOH	NJDEP	NJDEP
Sampling Date	1/10/90	1/8/90	1/10/90	1/10/90	1/10/90	6-7/90	6-7/90
VOCs							
Chloromethane	1 U	1 U	1 U	3.7	1 U		
Bromomethane	1 U	1 U	1 U	1 U	1 U		
Vinyl Chloride	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U		
Chloroethane	1 U	1.0 U	1.0 U	1.0 U	1 U		
Methylene Chloride	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U		
Acetone							
Carbon Disulfide							
1,1-Dichloroethene	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U		
1,1-Dichloroethane	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U		
1,2-Dichloroethene (Total)							
trans-1,2-Dichloroethene	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U		
Chloroform	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	10.2	4.0
1,2-Dichloroethane	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U		
2-Butanone							
1,1,1-Trichloroethane	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	nd	1.4
Carbon Tetrachloride	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U		
Vinyl Acetate							
Bromodichloromethane	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U		
1,2-Dichloropropane	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U		
cis-1,3-Dichloropropene							
trans 1,3-Dichloropropene	1 U	1 U	1 U	1 U	1 U		
2,2-Dichloropropane	1 U	1 U	1 U	1 U	1 U		
1,1-Dichloropropene	1 U	1 U	1 U	1 U	1 U		
1,3-Dichloropropane	1 U	1 U	1 U	1 U	1 U		
cis-1,3-Dichloropropene							
Trichloroethene	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	nd	1.5
Dibromochloromethane	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U		
1,1,2-Trichloroethane	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U		
Benzene	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	nd	nd
Bromoform	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U		
4-Methyl-2-Pentanone							
2-Hexanone							
Tetrachloroethene	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	nd	nd
1,1,2,2-Tetrachloroethane	1 U	1.0 U	1.0 U	1.0 U	1.0 U		
Toluene	1 U	1.0 U	1.0 U	1.0 U	1.0 U	nd	nd
Chlorobenzene	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U		
Ethylbenzene	1 U	1.0 U	1.0 U	1.0 U	1.0 U	nd	nd
Styrene							
Xylene (total)							
o-Xylene	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U		
m-Xylene	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U		
p-Xylene	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U		
Methyl Bromide							
Methyl Chloride							
Methyl-tert-Butyl Ether	1 U	1 U	1 U	1 U	1 U		
Isopropyl Ether	1 U	1 U	1 U	1 U	1 U		
cis-1,2-Dichloroethene	1 U	1 U	1 U	1 U	1 U		
Bromochloromethane	1 U	1 U	1 U	1 U	1 U		
Dibromomethane	1 U	1 U	1 U	1 U	1 U		
1,2-Dibromoethene	1 U	1 U	1 U	1 U	1 U		
1,1,1,2-Tetrachloroethane	1 U	1 U	1 U	1 U	1 U		
Isopropyl Benzene	1 U	1 U	1 U	1 U	1 U		
1,2,3-Trichloropropane	1 U	1 U	1 U	1 U	1 U		
n-Propyl Benzene	1 U	1 U	1 U	1 U	1 U		
Bromobenzene	1 U	1 U	1 U	1 U	1 U		
2-Chlorotoluene	1 U	1 U	1 U	1 U	1 U		
4-Chlorotoluene	1 U	1 U	1 U	1 U	1 U		
sec-butylbenzene	1 U	1 U	1 U	1 U	1 U		
p-Isopropyltoluene	1 U	1 U	1 U	1 U	1 U		
n-Butylbenzene	1 U	1 U	1 U	1 U	1 U		
1,2-Dibromo-3-Chloropropane	1 U	1 U	1 U	1 U	1 U		
SEMI-VOLATILE ORGANICS							
Phenol							
bis(2-Chloroethyl Ether							
2-Chlorophenol							
1,3-Dichlorobenzene	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U		
1,4-Dichlorobenzene	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U		
Benzyl Alcohol							
1,2-Dichlorobenzene	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U		
2-Methylphenol							
2,2'-Oxybis(1-Chloropropane)							

Table A-7 Previously Collected Data for the Off-Site Wells

Street Address	22 Frankie St (Hargrove)	31 Frankie St (Gallena)	32 Frankie St (Lowry)	36 Frankie St (Jacobs)	39 Frankie St (Gassio)	1288 Hanover (Mashkowsky)	1224 Hanover (Chagoya)
Sampled By:	MCDOH	MCDOH	MCDOH	MCDOH	MCDOH	NJDEP	NJDEP
Sampling Date	1/16/90	1/8/90	1/16/90	1/16/90	1/16/90	6-7/90	6-7/90
4-Methylphenol							
N-Nitroso-Di-n-Propylamine							
Hexachloroethane							
Nitrobenzene							
Isophorone							
2-Nitrophenol							
2,4-Dimethylphenol							
Benzoic Acid							
bis(2-Chloroethoxy)Methane							
2,4-Dichlorophenol							
1,2,4-Trichlorobenzene							
Naphthalene	1 U	1 U	1 U	1 U	1 U		
4-Chloroaniline							
Hexachlorobutadiene	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U		
4-Chloro-3-Methylphenol							
2-Methylnaphthalene							
Hexachlorocyclopentadiene							
2,4,6-Trichlorophenol							
2,4,5-Trichlorophenol							
2-Chloronaphthalene							
2-Nitroaniline							
Dimethyl Phthalate							
Acenaphthylene							
2,6-Dinitrotoluene							
3-Nitroaniline							
Acenaphthene							
2,4-Dinitrophenol							
4-Nitrophenol							
Dibenzofuran							
2,4-Dinitrotoluene							
Diethylphthalate							
4-Chlorophenyl-phenylether							
Fluorene							
4-Nitroaniline							
4,6-Dinitro-2-Methylphenol							
N-Nitrosodiphenylamine							
4-Bromophenyl-phenylether							
Hexachlorobenzene							
Pentachlorophenol							
Phenanthrene							
Anthracene							
Carbazole							
Di-n-Butylphthalate							
Fluoranthene							
Pyrene							
Butylbenzylphthalate							
3,3'-Dichlorobenzidine							
Benzo (a) Anthracene							
Chrysene							
bis(2-Ethylhexyl) Phthalate							
Di-n-Octylphthalate							
Benzo (b) Fluoranthene							
Benzo (k) Fluoranthene							
Benzo (a) Pyrene							
Indeno (1,2,3-cd) Pyrene							
Dibenz (a,h) Anthracene							
Benzo (g,h,i) Perylene							
Dichlorofluoromethane	1 U	1 U	1 U	1 U	1 U		
Methyl Tertiary Butyl Ether	1 U	1 U	1 U	1 U	1 U		
Acrolein							
Acrylonitrile							
1,2,3-Trichlorobenzene	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U		
1,3,5-Trimethylbenzene	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U		
Tert-butyl-benzene	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U		
1,2,4-Trimethylbenzene	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U		
Pesticides							
alpha-BHC							
beta-BHC							
delta-BHC							
gamma-BHC							
Heptachlor							
Aldrin							

Table A-7 Previously Collected Data for the Off-Site Wells

Street Address	22 Franks St (Hargrave)	31 Franks St (Gallena)	32 Franks St (Lowry)	35 Franks St (Jacobs)	39 Franks St (Gacsis)	1288 Hanover (Mashbourne)	1294 Hanover (Chagnot)
Sampled By	MCDOH	MCDOH	MCDOH	MCDOH	MCDOH	NJDEP	NJDEP
Sampling Date	1/10/90	1/8/90	1/10/90	1/10/90	1/10/90	6-7/90	6-7/90
Heptachlor epoxide							
Endosulfan I							
Dieldrin							
4,4' - DDE							
Endrin							
Endosulfan II							
4,4'-DDD							
Endosulfan sulfate							
4,4'-DDT							
Methoxychlor							
Endrin ketone							
Endrin Aldehyde							
alpha-Chlordane							
gamma-Chlordane							
Toxaphene							
PCBs							
Aroclor-1016							
Aroclor-1221							
Aroclor-1232							
Aroclor-1242							
Aroclor-1248							
Aroclor-1254							
Aroclor-1260							
INORGANICS							
Aluminum							
Antimony							
Arsenic							
Barium							
Calcium							
Iron							
Lead							
Magnesium							
Manganese							
Potassium							
Selenium							
Sodium							
Zinc							

Table A-7 Previously Collected Data for the Off-Site Wells

Street Address	1224 Hanover (Chagaski) #1	1560 Jersey (Derby)	1561 Jersey (American Steel)	1699 Route	1215 Route	4301 New Brunswick (Ravine Prop.)	4613 New Brunswick (Middlesex)
Sampled By:	NJDEP	NJDEP	NJDEP	NJDEP	NJDEP	NJDEP	MCDOH
Sampling Date	8/25/89	6-7/89	6-7/89	6-7/89	6-7/89	6-7/89	1/18/90
VOCs							
Chloromethane							1.0 U
Bromomethane							1.0 U
Vinyl Chloride							0.5 U
Chloroethane							1.0 U
Methylene Chloride							0.5 U
Acetone							
Carbon Disulfide							
1,1-Dichloroethene							1.0 U
1,1-Dichloroethane							0.5 U
1,2-Dichloroethene (Total)							
trans-1,2-Dichloroethene							0.5 U
Chloroform	0.91	1.7	nd	1.9	2.9	nd	1.0 U
1,2-Dichloroethane							0.5 U
2-Butanone							
1,1,1-Trichloroethane		5.6	nd	nd	nd	nd	0.5 U
Carbon Tetrachloride							0.5 U
Vinyl Acetate							
Bromodichloromethane							1.0 U
1,2-Dichloropropane							1.0 U
cis-1,3-Dichloropropene							1.0 U
trans 1,3-Dichloropropene							1 U
2,2-Dichloropropane							1.0 U
1,1-Dichloropropene							1.0 U
1,3-Dichloropropane							1.0 U
cis-1,3-Dichloropropene							1 U
Trichloroethene		0.8	nd	0.6	nd	nd	0.5 U
Dibromochloromethane							1.0 U
1,1,2-Trichloroethane							1.0 U
Benzene		0.8	nd	1.6	2.2	nd	0.5 U
Bromoform							1.0 U
4-Methyl-2-Pentanone							
2-Hexanone							
Tetrachloroethene		0.6	nd	0.6	13.5	nd	1.4
1,1,2,2-Tetrachloroethane							1.0 U
Toluene		nd	nd	nd	nd	nd	1.0 U
Chlorobenzene							0.5 U
Ethylbenzene		1.5	nd	1.1	3.8	nd	1.0 U
Styrene							
Xylene (total)							
o-Xylene							0.5 U
m-Xylene							0.5 U
p-Xylene							0.5 U
Methyl Bromide							
Methyl Chloride							
Methyl-tert-Butyl Ether							1.0 U
Isopropyl Ether							1.0 U
cis-1,2-Dichloroethene							1.0 U
Bromochloromethane							1.0 U
Dibromomethane							1.0 U
1,2-Dibromoethane							1 U
1,1,1,2-Tetrachloroethane							1 U
Isopropyl Benzene							1 U
1,2,3-Trichloropropane							1 U
n-Propyl Benzene							1 U
Bromobenzene							1 U
2-Chlorotoluene							1 U
4-Chlorotoluene							1 U
sec-butylbenzene							1 U
p-Isopropyltoluene							1 U
n-Butylbenzene							1 U
1,2-Dibromo-3-Chloropropane							1 U
SEMI-VOLATILE ORGANICS							
Phenol							
bis(2-Chloroethyl) Ether							
2-Chlorophenol							
1,3-Dichlorobenzene							0.5 U
1,4-Dichlorobenzene							0.5 U
Benzyl Alcohol							
1,2-Dichlorobenzene							0.5 U
2-Methylphenol							
2,2'-Oxybis(1-Chloropropane)							

Table A-7 Previously Collected Data for the Off-Site Wells

Street Address	1224 Hanover (Chagaris) #1	1500 Jersey (Derby)	1501 Jersey (American Steel)	1600 Kenvin	1215 Kenvin	4301 New Brunswick (Ronnie Poly.)	4613 New Brunswick (Middlesex)
Sampled By:	NJDEP	NJDEP	NJDEP	NJDEP	NJDEP	NJDEP	MCDOH
Sampling Date	9/28/88	6-7/88	6-7/88	6-7/88	6-7/88	6-7/88	1/18/90
4-Methylphenol							
N-Nitroso-Di-n-Propylamine							
Hexachloroethane							
Nitrobenzene							
Isophorone							
2-Nitrophenol							
2,4-Dimethylphenol							
Benzoic Acid							
bis(2-Chloroethoxy)Methane							
2,4-Dichlorophenol							
1,2,4-Trichlorobenzene							
Naphthalene							1 U
4-Chloroaniline							
Hexachlorobutadiene							0.5 U
4-Chloro-3-Methylphenol							
2-Methylnaphthalene							
Hexachlorocyclopentadiene							
2,4,6-Trichlorophenol							
2,4,5-Trichlorophenol							
2-Chloronaphthalene							
2-Nitroaniline							
Dimethyl Phthalate							
Acenaphthylene							
2,6-Dinitrotoluene							
3-Nitroaniline							
Acenaphthene							
2,4-Dinitrophenol							
4-Nitrophenol							
Dibenzofuran							
2,4-Dinitrotoluene							
Diethylphthalate							
4-Chlorophenyl-phenylether							
Fluorene							
4-Nitroaniline							
4,6-Dinitro-2-Methylphenol							
N-Nitrosodiphenylamine							
4-Bromophenyl-phenylether							
Hexachlorobenzene							
Pentachlorophenol							
Phenanthrene							
Anthracene							
Carbazole							
Di-n-Butylphthalate							
Fluoranthene							
Pyrene							
Butylbenzylphthalate							
3,3'-Dichlorobenzidine							
Benzo (a) Anthracene							
Chrysene							
bis(2-Ethylhexyl) Phthalate							
Di-n-Octylphthalate							
Benzo (b) Fluoranthene							
Benzo (k) Fluoranthene							
Benzo (a) Pyrene							
Indeno (1,2,3-cd) Pyrene							
Dibenz (a,h) Anthracene							
Benzo (g,h,i) Perylene							
Dichlorofluoromethane							1 U
Methyl Tertiary Butyl Ether							1 U
Acrolein							
Acrylonitrile							
1,2,3-Trichlorobenzene							1 U
1,3,5-Trimethylbenzene							1 U
Tert-butyl-benzene							1 U
1,2,4-Trimethylbenzene							1 U
Pesticides							
alpha-BHC							
beta-BHC							
delta-BHC							
gamma-BHC							
Heptachlor							
Aldrin							

Table A-7 Previously Collected Data for the Off-Site Wells

Street Address	1224 Hanover (Chagaski) #1	1500 Jersey (Derby)	1561 Jersey (American Steel)	1600 Karvin	1215 Karvin	4361 New Brunswick (Ravine Pulp.)	4513 New Brunswick (McMaster)
Sampled By	NJDEP	NJDEP	NJDEP	NJDEP	NJDEP	NJDEP	MCDOH
Sampling Date	9/25/80	6-7/80	6-7/80	6-7/80	6-7/80	6-7/80	1/16/80
Heptachlor epoxide							
Endosulfan I							
Dieldrin							
4,4' - DDE							
Endrin							
Endosulfan II							
4,4'-DDD							
Endosulfan sulfate							
4,4'-DDT							
Methoxychlor							
Endrin ketone							
Endrin Aldehyde							
alpha-Chlordane							
gamma-Chlordane							
Toxaphene							
PCBs							
Aroclor-1016							
Aroclor-1221							
Aroclor-1232							
Aroclor-1242							
Aroclor-1248							
Aroclor-1254							
Aroclor-1260							
INORGANICS							
Aluminum							
Antimony							
Arsenic							
Barium							
Cadmium							
Iron							
Lead							
Magnesium							
Manganese							
Potassium							
Selenium							
Sodium							
Zinc							

Table A-7 Previously Collected Data for the Off-Site Wells

Street Address	4615 New Brunswick (Farley)	4615 New Brunswick (Farley)	New Market (Harris Steel)+	6 St Michael (Pashanski)	6 St Michael (Pashanski)	10 St Michael (Diehl)	11 St Michael (Konshnak)
Sampled By:	MCDOH	USEPA	NJDEP	MCDOH	MCDOH	MCDOH	MCDOH
Sampling Date	1/8/90	2/6/91	6-7/90	1/8/90	2/5/90	1/8/90	2/6/90
VOCs							
Chloromethane	1.0 U			1.0 U	1.0 U	1 U	1 U
Bromomethane	1.0 U			1.0 U	1.0 U	1.0 U	1.0 U
Vinyl Chloride	0.5 U	0.29 U		0.5 U	0.5 U	0.5 U	0.5 U
Chloroethane	1.0 U	0.5 U		1.0 U	1.0 U	1 U	1 U
Methylene Chloride	0.5 U	0.51 U		0.5 U	0.5 U	0.5 U	0.5 U
Acetone		nd					
Carbon Disulfide							
1,1-Dichloroethene	1.0 U	0.37 U		1.0 U	1.0 U	1 U	1 U
1,1-Dichloroethene	0.5 U	0.37 U		0.5 U	0.5 U	0.5 U	0.5 U
1,2-Dichloroethene (Total)							
trans-1,2-Dichloroethene	0.5 U	0.38 U		0.5 U	0.5 U	0.5 U	0.5 U
Chloroform	1.0 U	0.21 U		1.0 U	1.0 U	1.0 U	1.0 U
1,2-Dichloroethane	0.5 U	0.4 U		0.5 U	0.5 U	0.5 U	0.5 U
2-Butanone							
1,1,1-Trichloroethane	0.5 U	0.2 U		0.7	0.6	0.5 U	0.5 U
Carbon Tetrachloride	0.5 U	0.17 U		0.5 U	0.5 U	0.5 U	0.5 U
Vinyl Acetate							
Bromodichloromethane	1.0 U			1.0 U	1.0 U	1.0 U	1.0 U
1,2-Dichloropropane	1.0 U	0.35 U		1.0 U	1.0 U	1.0 U	1.0 U
cis-1,3-Dichloropropene	1.0 U			1.0 U	1.0 U		
trans 1,3-Dichloropropene	1 U			1 U	1 U	1 U	1 U
2,2-Dichloropropane	1.0 U			1 U	1 U	1 U	1 U
1,1-Dichloropropene	1.0 U			1 U	1 U	1 U	1 U
1,3-Dichloropropane	1.0 U			1 U	1 U	1 U	1 U
cis-1,3-Dichloropropene	1 U			1 U	1 U	1 U	1 U
Trichloroethene	0.5 U	0.28 U		0.5 U	0.5 U	0.5 U	0.5 U
Dibromochloromethane	1.0 U			1.0 U	1.0 U	1.0 U	1.0 U
1,1,2-Trichloroethane	1.0 U	0.68 U		1.0 U	1.0 U	1.0 U	1.0 U
Benzene	0.5 U	0.36 U		0.5 U	0.5 U	0.5 U	0.5 U
Bromoform	1.0 U			1.0 U	1 U	1 U	1 U
4-Methyl-2-Pentanone		nd					
2-Hexanone		nd					
Tetrachloroethene	0.5 U	0.74 U		4.0	2.2	0.8	18.2
1,1,2,2-Tetrachloroethane	1.0 U	1 U		1.0 U	1.0 U	1.0 U	1.0 U
Toluene	1.0 U	0.75 U		1.0 U	1.0 U	1.0 U	1.0 U
Chlorobenzene	0.5 U	0.13 U		0.5 U	0.5 U	0.5 U	0.5 U
Ethylbenzene	1.0 U	0.22 U		1.0 U	1.0 U	1.0 U	1.0 U
Styrene							
Xylene (total)		0.24 U					
o-Xylene	0.5 U			0.5 U	0.5 U	0.5 U	0.5 U
m-Xylene	0.5 U			0.5 U	0.5 U	0.5 U	0.5 U
p-Xylene	0.5 U			0.5 U	0.5 U	0.5 U	0.5 U
Methyl Bromide							
Methyl Chloride							
Methyl-tert-Butyl Ether	1.0 U			1 U	1 U	1 U	1 U
Isopropyl Ether	1.0 U			1 U	1 U	1 U	1 U
cis-1,2-Dichloroethene	1.0 U			1 U	1 U	1 U	1 U
Bromochloromethane	1.0 U			1 U	1 U	1 U	1 U
Dibromomethane	1.0 U			1 U	1 U	1 U	1 U
1,2-Dibromoethane	1 U			1 U	1 U	1 U	1 U
1,1,1,2-Tetrachloroethane	1 U			1 U	1 U	1 U	1 U
Isopropyl Benzene	1 U			1 U	1 U	1 U	1 U
1,2,3-Trichloropropane	1 U			1 U	1 U	1 U	1 U
n-Propyl Benzene	1 U			1 U	1 U	1 U	1 U
Bromobenzene	1 U			1 U	1 U	1 U	1 U
2-Chlorotoluene	1 U			1 U	1 U	1 U	1 U
4-Chlorotoluene	1 U			1 U	1 U	1 U	1 U
sec-butylbenzene	1 U			1 U	1 U	1 U	1 U
p-Isopropyltoluene	1 U			1 U	1 U	1 U	1 U
n-Butylbenzene	1 U			1 U	1 U	1 U	1 U
1,2-Dibromo-3-Chloropropane	1 U			1 U	1 U	1 U	1 U
SEMI-VOLATILE ORGANICS							
Phenol							
bis(2-Chloroethyl) Ether							
2-Chlorophenol							
1,3-Dichlorobenzene	0.5 U			0.5 U	0.5 U	0.5 U	0.5 U
1,4-Dichlorobenzene	0.5 U			0.5 U	0.5 U	0.5 U	0.5 U
Benzyl Alcohol							
1,2-Dichlorobenzene	0.5 U			0.5 U	0.5 U	0.5 U	0.5 U
2-Methylphenol							
2,2'-Oxybis(1-Chloropropane)							

Table A-7 Previously Collected Data for the Off-Site Wells

Street Address	4615 New Brunswick (Farley)	4615 New Brunswick (Farley)	New Market (Harris Stack+	6 St Michael (Pasharski)	6 St Michael (Pasharski)	10 St Michael (Diehl)	11 St Michael (Kershaw)
Sampled By	MCDOH	USEPA	NJDEP	MCDOH	MCDOH	MCDOH	MCDOH
Sampling Date	1/8/90	2/6/91	6-7/90	1/8/90	2/6/90	1/8/90	2/6/90
4-Methylphenol							
N-Nitroso-Di-n-Propylamine							
Hexachloroethane							
Nitrobenzene							
Isophorone							
2-Nitrophenol							
2,4-Dimethylphenol							
Benzoic Acid							
bis(2-Chloroethoxy)Methane							
2,4-Dichlorophenol							
1,2,4-Trichlorobenzene							
Naphthalene	1 U			1 U	1 U	1 U	1 U
4-Chloroaniline							
Hexachlorobutadiene	0.5 U			0.5 U	0.5 U	0.5 U	0.5 U
4-Chloro-3-Methylphenol							
2-Methylnaphthalene							
Hexachlorocyclopentadiene							
2,4,6-Trichlorophenol							
2,4,5-Trichlorophenol							
2-Chloronaphthalene							
2-Nitroaniline							
Dimethyl Phthalate							
Acenaphthylene							
2,6-Dinitrotoluene							
3-Nitroaniline							
Acenaphthene							
2,4-Dinitrophenol							
4-Nitrophenol							
Dibenzofuran							
2,4-Dinitrotoluene							
Diethylphthalate							
4-Chlorophenyl-phenylether							
Fluorene							
4-Nitroaniline							
4,6-Dinitro-2-Methylphenol							
N-Nitrosodiphenylamine							
4-Bromophenyl-phenylether							
Hexachlorobenzene							
Pentachlorophenol							
Phenanthrene							
Anthracene							
Carbazole							
Di-n-Butylphthalate							
Fluoranthene							
Pyrene							
Butylbenzylphthalate							
3,3'-Dichlorobenzidine							
Benzo (a) Anthracene							
Chrysene							
bis(2-Ethylhexyl) Phthalate							
Di-n-Octylphthalate							
Benzo (b) Fluoranthene							
Benzo (k) Fluoranthene							
Benzo (a) Pyrene							
Indeno (1,2,3-cd) Pyrene							
Dibenz (a,h) Anthracene							
Benzo (g,h,i) Perylene							
Dichlorofluoromethane	1 U			1 U	1 U	1 U	1 U
Methyl Tertiary Butyl Ether	1 U			1 U	1 U	1 U	1.7
Acrolein							
Acrylonitrile							
1,2,3-Trichlorobenzene	1 U			1 U	1 U	1 U	1 U
1,3,5-Trimethylbenzene	1 U			1 U	1 U	1 U	1 U
Tert-butyl-benzene	1 U			1 U	1 U	1 U	1 U
1,2,4-Trimethylbenzene	1 U			1 U	1 U	1 U	1 U
Pesticides							
alpha-BHC							
beta-BHC							
delta-BHC							
gamma-BHC							
Heptachlor							
Aldrin							

Table A-7 Previously Collected Data for the Off-Site Wells

Street Address	4615 New Brunswick (Parlay)	4615 New Brunswick (Parlay)	New Market (Harris Steel+	8 St Michael (Pasheneki)	6 St Michael (Pasheneki)	10 St Michael (Diehl)	11 St Michael (Konsheski)
Sampled By:	MCDOH	USEPA	NJDEP	MCDOH	MCDOH	MCDOH	MCDOH
Sampling Date	1/8/90	2/6/91	6-7/90	1/8/90	2/5/90	1/8/90	2/6/90
Heptachlor epoxide							
Endosulfan I							
Dieldrin							
4,4' - DDE							
Endrin							
Endosulfan II							
4,4 -DDD							
Endosulfan sulfate							
4,4'-DDT							
Methoxychlor							
Endrin ketone							
Endrin Aldehyde							
alpha-Chlordane							
gamma-Chlordane							
Toxaphene							
PCBs							
Aroclor-1016							
Aroclor-1221							
Aroclor-1232							
Aroclor-1242							
Aroclor-1248							
Aroclor-1254							
Aroclor-1260							
INORGANICS							
Aluminum							
Antimony							
Arsenic							
Barium							
Calcium							
Iron							
Lead							
Magnesium							
Manganese							
Potassium							
Selenium							
Sodium							
Zinc							

Table A-7 Previously Collected Data for the Off-Site Wells

Street Address	23 St Michael (Tremont)	28 St Michael (Pond)	37 St Michael (Otselon)	39 St Michael (Behrenburg)	South Clinton (I & R Metals)	South Clinton (National Tanks)	3451 South Clinton (Keystone)
Sampled By:	MCDOH	MCDOH	MCDOH	MCDOH	NJDEP	NJDEP	NJDEP
Sampling Date	1/25/90	1/8/90	1/18/90	1/8/90	6-7/80	6-7/80	6-7/80
VOCs							
Chloromethane	1.0 U	1.0 U	1.0 U	1.0 U			
Bromomethane	1.0 U	1.0 U	1.0 U	1.0 U			
Vinyl Chloride	0.5 U	0.5 U	0.5 U	0.5 U			
Chloroethane	1.0 U	1.0 U	1.0 U	1.0 U			
Methylene Chloride	0.5 U	0.5 U	0.5 U	0.5 U			
Acetone							
Carbon Disulfide							
1,1-Dichloroethene	1.0 U	1.0 U	1.0 U	1.0 U			
1,1-Dichloroethane	0.5 U	0.5 U	0.5 U	0.5 U			
1,2-Dichloroethene (Total)							
trans-1,2-Dichloroethene	0.5 U	0.5 U	0.5 U	0.5 U			
Chloroform	1.0 U	1.0 U	2.0	1.0 U	nd	2.5	nd
1,2-Dichloroethane	0.5 U	0.5 U	0.5 U	0.5 U			
2-Butanone							
1,1,1-Trichloroethane	0.5 U	0.5 U	0.5 U	0.5 U	9.2	1.1	nd
Carbon Tetrachloride	0.5 U	0.5 U	0.5 U	0.5 U			
Vinyl Acetate							
Bromodichloromethane	1.0 U	1.0 U	1.0 U	1.0 U			
1,2-Dichloropropane	1.0 U	1.0 U	1.0 U	1.0 U			
cis-1,3-Dichloropropene							
trans 1,3-Dichloropropene	1 U	1 U	1 U	1 U			
2,2-Dichloropropane	1 U	1 U	1 U	1 U			
1,1-Dichloropropene	1 U	1 U	1 U	1 U			
1,3-Dichloropropane	1 U	1 U	1 U	1 U			
cis-1,3-Dichloropropene	1 U	1 U	1 U	1 U			
Trichloroethene	0.5 U	0.5 U	0.5 U	3.5	3100	0.7	nd
Dibromochloromethane	1.0 U	1.0 U	1.1	1.0 U			
1,1,2-Trichloroethane	1.0 U	1.0 U	1.0 U	1.0 U			
Benzene	0.5 U	0.5 U	0.5 U	0.5 U	nd	0.8	nd
Bromoform	1.0 U	1.0 U	1.0 U	1.0 U			
4-Methyl-2-Pentanone							
2-Hexanone							
Tetrachloroethene	0.5 U	0.5 U	0.5 U	0.5 U	110	nd	nd
1,1,2,2-Tetrachloroethane	1.0 U	1.0 U	1.0 U	1.0 U			
Toluene	1.0 U	1.0 U	32.4	1.0 U	nd	nd	nd
Chlorobenzene	0.5 U	0.5 U	0.5 U	0.5 U			
Ethylbenzene	1.0 U	1.0 U	1.0 U	1.0 U	nd	1.2	nd
Styrene							
Xylene (total)							
o-Xylene	0.5 U	0.5 U	0.5 U	0.5 U			
m-Xylene	0.5 U	0.5 U	0.5 U	0.5 U			
p-Xylene	0.5 U	0.5 U	0.5 U	0.5 U			
Methyl Bromide							
Methyl Chloride							
Methyl-tert-Butyl Ether	1 U	1 U	1 U	1 U			
Isopropyl Ether	1 U	1 U	1 U	1 U			
cis-1,2-Dichloroethene	1 U	1 U	1 U	1 U			
Bromochloromethane	1 U	1 U	1 U	1 U			
Dibromomethane	1 U	1 U	1 U	1 U			
1,2-Dibromoethane	1 U	1 U	1 U	1 U			
1,1,1,2-Tetrachloroethane	1 U	1 U	1 U	1 U			
Isopropyl Benzene	1 U	1 U	1 U	1 U			
1,2,3-Trichloropropene	1 U	1 U	1 U	1 U			
n-Propyl Benzene	1 U	1 U	1 U	1 U			
Bromobenzene	1 U	1 U	1 U	1 U			
2-Chlorotoluene	1 U	1 U	1 U	1 U			
4-Chlorotoluene	1 U	1 U	1 U	1 U			
sec-Butylbenzene	1 U	1 U	1 U	1 U			
p-Isopropyltoluene	1 U	1 U	1 U	1 U			
n-Butylbenzene	1 U	1 U	1 U	1 U			
1,2-Dibromo-3-Chloropropane	1 U	1 U	1 U	1 U			
SEMI-VOLATILE ORGANICS							
Phenol							
bis(2-Chloroethyl) Ether							
2-Chlorophenol							
1,3-Dichlorobenzene	0.5 U	0.5 U	0.5 U	0.5 U			
1,4-Dichlorobenzene	0.5 U	0.5 U	0.5 U	0.5 U			
Benzyl Alcohol							
1,2-Dichlorobenzene	0.5 U	0.5 U	0.5 U	0.5 U			
2-Methylphenol							
2,2 -Oxybis(1-Chloropropane)							

Table A-7 Previously Collected Data for the Off-Site Wells

Street Address	28 St Michael ([illegible])	28 St Michael (Paul)	37 St Michael ([illegible])	39 St Michael ([illegible])	South Clinton (I & R Metals)	South Clinton (National Tanks)	3451 South Clinton (Keystone)
Sampled By:	MCDOH	MCDOH	MCDOH	MCDOH	NJDEP	NJDEP	NJDEP
Sampling Date	1/25/90	1/8/90	1/16/90	1/8/90	6-7/90	6-7/90	6-7/90
4-Methylphenol							
N-Nitroso-Di-n-Propylamine							
Hexachloroethane							
Nitrobenzene							
Isophorone							
2-Nitrophenol							
2,4-Dimethylphenol							
Benzoic Acid							
bis(2-Chloroethoxy)Methane							
2,4-Dichlorophenol							
1,2,4-Trichlorobenzene							
Naphthalene	1 U	1 U	1 U	1 U			
4-Chloroaniline							
Hexachlorobutadiene	0.5 U	0.5 U	0.5 U	0.5 U			
4-Chloro-3-Methylphenol							
2-Methylnaphthalene							
Hexachlorocyclopentadiene							
2,4,6-Trichlorophenol							
2,4,5-Trichlorophenol							
2-Chloronaphthalene							
2-Nitroaniline							
Dimethyl Phthalate							
Acenaphthylene							
2,6-Dinitrotoluene							
3-Nitroaniline							
Acenaphthene							
2,4-Dinitrophenol							
4-Nitrophenol							
Dibenzofuran							
2,4-Dinitrotoluene							
Diethylphthalate							
4-Chlorophenyl-phenylether							
Fluorene							
4-Nitroaniline							
4,6-Dinitro-2-Methylphenol							
N-Nitrosodiphenylamine							
4-Bromophenyl-phenylether							
Hexachlorobenzene							
Pentachlorophenol							
Phenanthrene							
Anthracene							
Carbazole							
Di-n-Butylphthalate							
Fluoranthene							
Pyrene							
Butylbenzylphthalate							
3,3'-Dichlorobenzidine							
Benzo (a) Anthracene							
Chrysene							
bis(2-Ethylhexyl) Phthalate							
Di-n-Octylphthalate							
Benzo (b) Fluoranthene							
Benzo (k) Fluoranthene							
Benzo (a) Pyrene							
Indeno (1,2,3-cd) Pyrene							
Dibenz (a,h) Anthracene							
Benzo (g,h,i) Perylene							
Dichlorofluoromethane	1 U	1 U	1 U	1 U			
Methyl Tertiary Butyl Ether	1 U	1 U	1 U	1 U			
Acrolein							
Acrylonitrile							
1,2,3-Trichlorobenzene	1 U	1 U	1 U	1 U			
1,3,5-Trimethylbenzene	1 U	1 U	1 U	1 U			
Tert-butyl-benzene	1 U	1 U	1 U	1 U			
1,2,4-Trimethylbenzene	1 U	1 U	1 U	1 U			
Pesticides							
alpha-BHC							
beta-BHC							
delta-BHC							
gamma-BHC							
Heptachlor							
Aldrin							

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Table A-7 Previously Collected Data for the Off-Site Wells

Street Address	23 St Michael (Tremont)	26 St Michael (Paul)	27 St Michael (Ottesen)	28 St Michael (Schronsburg)	South Clinton (T & R Metals)	South Clinton (National Tanks)	3461 South Clinton (Keystone)
Sampled By	MCDOH	MCDOH	MCDOH	MCDOH	NJDEP	NJDEP	NJDEP
Sampling Date	1/25/90	1/8/90	1/16/90	1/8/90	6-7/90	6-7/90	6-7/90
Heptachlor epoxide							
Endosulfan I							
Dieldrin							
4,4' - DDE							
Endrin							
Endosulfan II							
4,4'-DDD							
Endosulfan sulfate							
4,4'-DDT							
Methoxychlor							
Endrin ketone							
Endrin Aldehyde							
alpha-Chlordane							
gamma-Chlordane							
Toxaphene							
PCBs							
Aroclor-1016							
Aroclor-1221							
Aroclor-1232							
Aroclor-1242							
Aroclor-1248							
Aroclor-1254							
Aroclor-1260							
INORGANICS							
Aluminum							
Antimony							
Arsenic							
Barium							
Calcium							
Iron							
Lead							
Magnesium							
Manganese							
Potassium							
Selenium							
Sodium							
Zinc							

Table A-7 Previously Collected Data for the Off-Site Wells

Street Address	3800 South Clinton (Metz)	951 Station (Plastics)	921 Station	951 Station (Plastics) Rear	951 Station (Plastics) Front	951 Station (Plastics) Prod. Well	951 Station (Plastics) Prod. Well
Sampled By	NJDEP	NJDEP	LANCY	LANCY	LANCY		
Sampling Date	6-7/90	6-7/90	12/19/85	12/19/85	12/19/85	2/22/90	5/11/90
VOCs							
Chloromethane							
Bromomethane							
Vinyl Chloride						10 U	10 U
Chloroethane						10 U	10 U
Methylene Chloride			25 U	25 U	25 U	10	10 U
Acetone							
Carbon Disulfide							
1,1-Dichloroethene			10 U	10 U	10 U	10 U	10 U
1,1-Dichloroethane			25 U	25 U	25 U	13	10 U
1,2-Dichloroethene (Total)							
trans-1,2-Dichloroethene			10 U	510	755	240	140
Chloroform	nd	133	10 U	305	110	172	80
1,2-Dichloroethane			10 U	83	10 U	46	13
2-Butanone							
1,1,1-Trichloroethane	nd	nd	10 U	25	10 U	14	10 U
Carbon Tetrachloride			50 U	130	44	81	22
Vinyl Acetate							
Bromodichloromethane			25 U	25 U	25 U	10 U	10 U
1,2-Dichloropropane			10 U	10 U	10 U	10 U	10 U
cis-1,3-Dichloropropene						10 U	10 U
trans 1,3-Dichloropropene			25 U	25 U	25 U	10 U	10 U
2,2-Dichloropropane							
1,1-Dichloropropene							
1,3-Dichloropropane							
cis-1,3-Dichloropropene							
Trichloroethene	nd	20	10 U	480	145	241	85
Dibromochloromethane			25 U	25 U	25 U	10 U	10 U
1,1,2-Trichloroethane			10 U	10 U	10 U	10 U	10 U
Benzene	nd	nd	2 U	2 U	2 U	10 U	10 U
Bromoform			50 U	50 U	50 U	10 U	10 U
4-Methyl-2-Pentanone							
2-Hexanone							
Tetrachloroethene	nd	2751	25 U	385	2000	650	909
1,1,2,2-Tetrachloroethane						10 U	10 U
Toluene	nd	nd	2 U	2 U	2 U	10 U	10 U
Chlorobenzene			2 U	2 U	2 U	10 U	10 U
Ethylbenzene	nd	nd	2 U	2 U	2 U	10 U	10 U
Styrene							
Xylene (total)							
o-Xylene							
m-Xylene							
p-Xylene							
Methyl Bromide						10 U	10 U
Methyl Chloride						10 U	10 U
Methyl-tert-Butyl Ether							
Isopropyl Ether							
cis-1,2-Dichloroethene							
Bromochloroethane							
Dibromomethane							
1,2-Dibromoethane							
1,1,1,2-Tetrachloroethane							
Isopropyl Benzene							
1,2,3-Trichloropropane							
n-Propyl Benzene							
Bromobenzene							
2-Chlorotoluene							
4-Chlorotoluene							
sec-butylbenzene							
p-Isopropyltoluene							
n-Butylbenzene							
1,2-Dibromo-3-Chloropropane							
SEMI-VOLATILE ORGANICS							
Phenol							
bis(2-Chloroethyl) Ether							
2-Chlorophenol							
1,3-Dichlorobenzene			10 U	10 U	10 U		
1,4-Dichlorobenzene			10 U	10 U	10 U		
Benzyl Alcohol							
1,2-Dichlorobenzene			10 U	10 U	10 U		
2-Methylphenol							
2,2'-Oxybis(1-Chloropropane)							

Table A-7 Previously Collected Data for the Off-Site Wells

Street Address	3900 South Clinton (Metz)	891 Station (Plastics)	821 Station	891 Station (Plastics) Rear	891 Station (Plastics) Front	891 Station (Plastics) Prod. Well	891 Station (Plastics) Prod. Well
Sampled By	NJDEP	NJDEP	LANCY	LANCY	LANCY		
Sampling Date	6-7/90	6-7/90	12/19/88	12/19/88	12/19/88	2/23/90	5/11/90
4-Methylphenol							
N-Nitroso-Di-n-Propylamine							
Hexachloroethane							
Nitrobenzene							
Isophorone							
2-Nitrophenol							
2,4-Dimethylphenol							
Benzoic Acid							
bis(2-Chloroethoxy)Methane							
2,4-Dichlorophenol							
1,2,4-Trichlorobenzene							
Naphthalene							
4-Chloroaniline							
Hexachlorobutadiene							
4-Chloro-3-Methylphenol							
2-Methylnaphthalene							
Hexachlorocyclopentadiene							
2,4,6-Trichlorophenol							
2,4,5-Trichlorophenol							
2-Chloronaphthalene							
2-Nitroaniline							
Dimethyl Phthalate							
Acenaphthylene							
2,6-Dinitrotoluene							
3-Nitroaniline							
Acenaphthene							
2,4-Dinitrophenol							
4-Nitrophenol							
Dibenzofuran							
2,4-Dinitrotoluene							
Diethylphthalate							
4-Chlorophenyl-phenylether							
Fluorene							
4-Nitroaniline							
4,6-Dinitro-2-Methylphenol							
N-Nitrosodiphenylamine							
4-Bromophenyl-phenylether							
Hexachlorobenzene							
Pentachlorophenol							
Phenanthrene							
Anthracene							
Carbazole							
Di-n-Butylphthalate							
Fluoranthene							
Pyrene							
Butylbenzylphthalate							
3,3'-Dichlorobenzidine							
Benzo (a) Anthracene							
Chrysene							
bis(2-Ethylhexyl) Phthalate							
Di-n-Octylphthalate							
Benzo (b) Fluoranthene							
Benzo (k) Fluoranthene							
Benzo (a) Pyrene							
Indeno (1,2,3-cd) Pyrene							
Dibenz (a,h) Anthracene							
Benzo (g,h,i) Perylene							
Dichlorofluoromethane							
Methyl Tertiary Butyl Ether							
Acrolein						50 U	50 U
Acrylonitrile						50 U	50 U
1,2,3-Trichlorobenzene							
1,3,5-Trimethylbenzene							
Tert-butyl-benzene							
1,2,4-Trimethylbenzene							
Pesticides							
alpha-BHC							
beta-BHC							
delta-BHC							
gamma-BHC							
Heptachlor							
Aldrin							

Table A-7 Previously Collected Data for the Off-Site Wells

Street Address	3800 South Clinton (Metz)	561 Station (Plastose)	521 Station	561 Station (Plastose) Rear	561 Station (Plastose) Front	561 Station (Plastose) Prod. Well	561 Station (Plastose) Prod. Well
Sampled By	NJDEP	NJDEP	LANCY	LANCY	LANCY		
Sampling Date	6-7/80	6-7/80	12/19/85	12/19/85	12/19/85	2/22/90	5/11/90
Heptachlor epoxide							
Endosulfan I							
Dieldrin							
4,4' - DDE							
Endrin							
Endosulfan II							
4,4'-DDD							
Endosulfan sulfate							
4,4'-DDT							
Methoxychlor							
Endrin ketone							
Endrin Aldehyde							
alpha-Chlordane							
gamma-Chlordane							
Toxaphene							
PCBs							
Aroclor-1016							
Aroclor-1221							
Aroclor-1232							
Aroclor-1242							
Aroclor-1248							
Aroclor-1254							
Aroclor-1260							
INORGANICS							
Aluminum							
Antimony							
Arsenic							
Barium							
Calcium							
Iron							
Lead							
Magnesium							
Manganese							
Potassium							
Selenium							
Sodium							
Zinc							

Table A-7 Previously Collected Data for the Off-Site Wells

Street Address	861 Station (Plastimo) Prod. Well	861 Station (Plastimo) Prod. Well	1217 Washington (Russo)
Sampled By:			NJDEP
Sampling Date	9/27/90	12/11/90	6-7/90
VOCs			
Chloromethane			
Bromomethane			
Vinyl Chloride	10 U	10 U	
Chloroethane	10 U	10 U	
Methylene Chloride	12	10 U	
Acetone			
Carbon Disulfide			
1,1-Dichloroethene	10 U	10 U	
1,1-Dichloroethane	10 U	10 U	
1,2-Dichloroethene (Total)			
trans-1,2-Dichloroethene	205	220	
Chloroform	163	180	1.4
1,2-Dichloroethane	48	62	
2-Butanone			
1,1,1-Trichloroethane	10 U	11	1.2
Carbon Tetrachloride	37	46	
Vinyl Acetate			
Bromodichloromethane	10 U	10 U	
1,2-Dichloropropane	10 U	10 U	
cis-1,3-Dichloropropene	10 U	10 U	
trans 1,3-Dichloropropene	10 U	10 U	
2,2-Dichloropropane			
1,1-Dichloropropene			
1,3-Dichloropropane			
cis-1,3-Dichloropropene			
Trichloroethene	200	205	0.8
Dibromochloromethane	10 U		
1,1,2-Trichloroethane	10 U	10 U	
Benzene	10 U	14	nd
Bromoform	10 U	10 U	
4-Methyl-2-Pentanone			
2-Hexanone			
Tetrachloroethene	378	336	7.8
1,1,2,2-Tetrachloroethane	10 U	10 U	
Toluene	10 U	10 U	nd
Chlorobenzene	10 U	10 U	
Ethylbenzene	10 U	10 U	nd
Styrene			
Xylene (total)			
o-Xylene			
m-Xylene			
p-Xylene			
Methyl Bromide	10 U	10 U	
Methyl Chloride	10 U	10 U	
Methyl-tert-Butyl Ether			
Isopropyl Ether			
cis-1,2-Dichloroethene			
Bromochloromethane			
Dibromomethane			
1,3-Dibromoethane			
1,1,1,2-Tetrachloroethane			
Isopropyl Benzene			
1,2,3-Trichloropropane			
n-Propyl Benzene			
Bromobenzene			
2-Chlorotoluene			
4-Chlorotoluene			
sec-butylbenzene			
p-isopropyltoluene			
n-Butylbenzene			
1,2-Dibromo-3-Chloropropane			
SEMI-VOLATILE ORGANICS			
Phenol			
bis(2-Chloroethyl) Ether			
2-Chlorophenol			
1,3-Dichlorobenzene			
1,4-Dichlorobenzene			
Benzyl Alcohol			
1,2-Dichlorobenzene			
2-Methylphenol			
2,2'-Oxybis(1-Chloropropane)			

Table B-1 Previously Collected PCB Data for Channel Soils

Sample Collected By	Date	Location [1]	Sample ID	Depth (if known)	PCB conc. (mg/kg)
AGES	4/89	AGES Plate 10	SOIL 22		230
AGES	4/89	AGES Plate 10	SOIL 23		81
AGES	5/89	SS	BES-OUT-51		125
AGES	5/89	SS	BES-OUT-52		16
AGES	5/89	SS	BES-OUT-53		120
AGES	5/89	SS	BES-OUT-54		18
AGES	5/89	SS	BES-OUT-55		32
AGES	5/89	SS	BES-OUT-56		56
AGES	5/89	AGES Plate 10	BERM#1		45
AGES	5/89	AGES Plate 10	BERM#2		100
AGES	5/89	AGES Plate 10	BERM#3		40
AGES	5/89	AGES Plate 10	BERM#4		<1
AGES	5/89	AGES Plate 10	BERM#5		24
AGES	5/89	AGES Plate 10	BERM @ SAMPLE		15
AGES	5/89	SS	PIT 10 STOCK 1		<1
AGES	5/89	SS	PIT 10 STOCK 2		<1
AGES	5/89	SS	PIT 10 STOCK 3		<1
AGES	5/89	SS	PIT 10 STOCK 4		<1
AGES	5/89	AGES Plate 10	BERM PILE 1A		130
AGES	5/89	AGES Plate 10	BERM PILE 2A		34
AGES	5/89	AGES Plate 10	BERM PILE 3A		48
AGES	5/89	AGES Plate 10	BERM PILE 4A		32
AGES	5/89	AGES Plate 10	BERM PILE 5A		20
AGES	5/89	SS	TOP BERM #1 N		<1
AGES	5/89	SS	TOP BERM #2 N		<1
AGES	6/89	AGES Plate 9	POND LOW #1C		<1
AGES	6/89	AGES Plate 9	POND 1A NORTH		12
AGES	6/89	AGES Plate 9	POND 1A SOUTH		1.9
AGES	6/89	AGES Plate 10	BERM PILE #6		3.2
AGES	6/89	AGES Plate 10	BERM PILE #7		<1
AGES	6/89	AGES Plate 10	BERM PILE #8		<1
AGES	6/89	AGES Plate 10	BERM PILE #9		<1

[1] Figures from other consultants' documents are included at the end of this appendix.
NS Location not shown on any figure.
SS Stockpile sample not shown on any figure.

Table B-1 Previously Collected PCB Data for Channel Soils

Sample Collected By	Date	Location [1]	Sample ID	Depth (if known)	PCB conc. (mg/kg)
AGES	6/89	AGES Plate 10	BERM PILE #10		25
AGES	6/89	AGES Plate 10	BERM PILE #11		79
AGES	6/89	AGES Plate 10	BERM PILE #12		1.8
AGES	6/89	AGES Plate 10	BERM PILE #13		16
AGES	6/89	AGES Plate 10	BERM PILE #14		73
AGES	6/89	AGES Plate 10	BERM PILE #15		14

[1] Figures from other consultants' documents are included at the end of this appendix.
NS Location not shown on any figure.
SS Stockpile sample not shown on any figure.

Table B-2 Previously Collected VOC Data for Chemsol Soils

Constituent	Laney	Laney	Laney	Laney	Laney	Laney	Laney	Laney	Laney	Laney
ID # [1]	#3	#6	#10	#12	#13	OW1-A	OW1-B	OW1-C	OW2-A	OW2-B
Sampling Date	11/83	11/83	11/83	11/83	11/83	2/85	2/85	2/85	2/85	2/85
Benzene	0.062	< 0.020	< 0.020	< 0.020	< 0.020	0.07	< 0.050	< 0.050	< 0.050	0.21
Bromoform						< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Bromomethane										
Carbon Tetrachloride	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Chlorobenzene	0.027	< 0.020	< 0.020	1.225	< 0.020	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050
Chlorodibromomethane						< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Chloroethane										
2-Chloroethylvinyl Ether										
Chloroform	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050	< 0.100	< 0.100	< 0.100	< 0.100	< 0.100
Chloromethane										
Dichlorobromomethane						< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
1,1-Dichloroethane	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050	< 0.100	< 0.100	< 0.100	< 0.100	< 0.100
1,2-Dichloroethane						< 0.100	< 0.100	< 0.100	< 0.100	< 0.100
1,1-Dichloroethylene						< 0.500	< 0.500	< 0.500	< 0.500	< 0.500
1,2-trans-Dichloroethylene	< 0.100	< 0.100	< 0.100	< 0.100	< 0.100	< 0.100	< 0.100	< 0.100	< 0.100	< 0.100
1,2-Dichloropropane						< 0.100	< 0.100	< 0.100	< 0.100	< 0.100
Dichlorodifluoromethane										
1,2-Dichlorobenzene										
1,3-Dichlorobenzene										
1,4-Dichlorobenzene										
Ethylbenzene	0.164	0.026	< .020	0.23	< .020	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050
Methylene Chloride						0.36	0.42	< 0.100	< 0.100	< 0.100
Trans-1,3-Dichloropropene						< 0.500	< 0.500	< 0.500	< 0.500	< 0.500
Cis-1,3-Dichloropropene										
Tetrachloroethylene	< 0.01	0.485	< 0.01	0.772	< 0.01	< 0.500	< 0.500	< 0.500	< 0.500	< 0.500
Toluene	0.385	< 0.020	< 0.020	0.113	< 0.020	< 0.050	0.56	< 0.050	< 0.050	4.8
1,1,1-Trichloroethane						0.23	< 0.100	< 0.100	< 0.100	< 0.100
1,1,2-Trichloroethane						< 0.100	< 0.100	< 0.100	< 0.100	< 0.100
1,1,2,2-Tetrachloroethane										
Trichloroethylene	0.52	< 0.050	< 0.050	0.148	< 0.050	0.23	< 0.100	< 0.100	< 0.100	0.5
Trichlorofluoromethane										
Vinyl Chloride										
Methyl Ethyl Ketone						< 0.100	< 0.100	< 0.100	< 0.100	< 0.100
Methyl Isobutyl Ketone						< 0.050	< 0.050	< 0.050	< 0.050	< 0.050
Xylenes						2.6	2	< 0.100	< 0.100	< 0.100
Total Volatiles Detected	1.158	0.513	0	2.488	0	3.51	3.28	0	0	5.51

Table B-2 Previously Collected VOC Data for Chemsol Soils

Consultant ID # [1] Sampling Date	Lancy OW2-C 2/85	Lancy OW3-A 2/85	Lancy OW3-B 2/85	Lancy OW3-C 2/85	Lancy OW4-A 2/85	Lancy OW4-B 2/85	Lancy OW4-C 2/85	Lancy OW5-A 2/85	Lancy OW5-B 2/85	Lancy OW5-C 2/85
Benzene	< 0.050	10	2.1	0.08	0.32	0.12	< 0.050	< 0.050	< 0.050	< 0.050
Bromoform	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Bromomethane										
Carbon Tetrachloride	< 1.0	602	1.3	< 1.0	2.3	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Chlorobenzene	< 0.050	24	8.7	0.35	2	0.39	< 0.050	< 0.050	< 0.050	< 0.050
Chlorodibromomethane	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Chloroethane										
2-Chloroethylvinyl Ether										
Chloroform	< 0.100	5.9	1.7	< 0.100	< 0.100	< 0.100	< 0.100	< 0.100	< 0.100	< 0.100
Chloromethane										
Dichlorobromomethane	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
1,1-Dichloroethane	< 0.100	< 0.100	< 0.100	< 0.100	< 0.100	< 0.100	< 0.100	< 0.100	< 0.100	< 0.100
1,2-Dichloroethane	< 0.100	2.4	1.6	0.58	< 0.100	< 0.100	< 0.100	< 0.100	< 0.100	< 0.100
1,1-Dichloroethylene	< 0.500	< 0.500	< 0.500	< 0.500	< 0.500	< 0.500	< 0.500	< 0.500	< 0.500	< 0.500
1,2-trans-Dichloroethylene	< 0.100	< 0.100	< 0.100	< 0.100	< 0.100	< 0.100	< 0.100	< 0.100	< 0.100	< 0.100
1,2-Dichloropropane	< 0.100	< 0.100	< 0.100	< 0.100	< 0.100	< 0.100	< 0.100	< 0.100	< 0.100	< 0.100
Dichlorodifluoromethane										
1,2-Dichlorobenzene										
1,3-Dichlorobenzene										
1,4-Dichlorobenzene										
Ethylbenzene	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050
Methylene Chloride	< 0.100	0.34	0.27	0.71	0.17	0.51	< 0.100	< 0.100	< 0.100	< 0.100
Trans-1,3-Dichloropropene	< 0.500	< 0.500	< 0.500	< 0.500	< 0.500	< 0.500	< 0.500	< 0.500	< 0.500	< 0.500
Cis-1,3-Dichloropropene										
Tetrachloroethylene	< 0.500	74	28	11	8.7	5.8	< 0.500	< 0.500	< 0.500	< 0.500
Toluene	0.32	150	30	0.52	27	1.2	0.066	< 0.050	< 0.050	< 0.050
1,1,1-Trichloroethane	< 0.100	8	1.2	0.2	0.74	< 0.100	< 0.100	< 0.100	< 0.100	< 0.100
1,1,2-Trichloroethane	< 0.100	< 0.100	< 0.100	< 0.100	< 0.100	< 0.100	< 0.100	< 0.100	< 0.100	< 0.100
1,1,2,2-Tetrachloroethane										
Trichloroethylene	< 0.100	110	17	0.84	2.9	1.1	< 0.100	< 0.100	< 0.100	< 0.100
Trichlorofluoromethane										
Vinyl Chloride										
Methyl Ethyl Ketone	< 0.100	< 0.100	< 0.100	< 0.100	< 0.100	0.55	0.19	< 0.100	< 0.100	< 0.100
Methyl Isobutyl Ketone	< 0.050	1.2	1	0.77	0.09	0.43	< 0.050	< 0.050	< 0.050	< 0.050
Xylenes	< 0.100	84	27	3.1	18	2.4	< 0.100	< 0.100	< 0.100	< 0.100
Total Volatiles Detected	0.32	1081.84	116.87	17.84	60.22	12.80	0.25	0.00	0.00	0.00

Notes:
All values given in mg/kg soil.
A blank space indicates that no value was reported for that compound.
[1] Numbers in parentheses are depths of samples (if known).

Data Source:
Phase II Hydrogeologic Investigation Plans. Lancy 1985.
Lancy Labs Nov. 1985.
Third Revision to the Work Plan. HLA July 1990.

Table B-2 Previously Collected VOC Data for Chemsol Soils

Consultant	Lancy	Lancy	Lancy	Lancy	Lancy	Lancy	Lancy	Lancy	Lancy	Lancy
ID # [1]	OW8-A	OW8-B	OW8-C	OW7-A	OW7-B	OW7-C	OW8-A	OW8-B	OW8-C	OW8-A
Sampling Date	2/85	2/85	2/85	2/85	2/85	2/85	2/85	2/85	2/85	2/85
Benzene	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050	0.19
Bromoform	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Bromomethane										
Carbon Tetrachloride	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	2.5
Chlorobenzene	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050
Chlorodibromomethane	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Chloroethane										
2-Chloroethylvinyl Ether										
Chloroform	< 0.100	< 0.100	< 0.100	< 0.100	< 0.100	< 0.100	< 0.100	< 0.100	< 0.100	4.9
Chloromethane										
Dichlorobromomethane	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
1,1-Dichloroethane	< 0.100	< 0.100	< 0.100	< 0.100	< 0.100	< 0.100	< 0.100	< 0.100	< 0.100	< 0.100
1,2-Dichloroethane	< 0.100	< 0.100	< 0.100	< 0.100	< 0.100	< 0.100	< 0.100	< 0.100	< 0.100	< 0.100
1,1-Dichloroethylene	< 0.500	< 0.500	< 0.500	< 0.500	< 0.500	< 0.500	< 0.500	< 0.500	< 0.500	< 0.500
1,2-trans-Dichloroethylene	< 0.100	< 0.100	< 0.100	< 0.100	< 0.100	< 0.100	< 0.100	< 0.100	< 0.100	< 0.100
1,2-Dichloropropane	< 0.100	< 0.100	< 0.100	< 0.100	< 0.100	< 0.100	< 0.100	< 0.100	< 0.100	< 0.100
Dichlorodifluoromethane										
1,2-Dichlorobenzene										
1,3-Dichlorobenzene										
1,4-Dichlorobenzene										
Ethylbenzene	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050
Methylene Chloride	< 0.100	1.9	< 0.100	< 0.100	< 0.100	< 0.100	< 0.100	< 0.100	< 0.100	< 0.100
Trans-1,3-Dichloropropene	< 0.500	< 0.500	< 0.500	< 0.500	< 0.500	< 0.500	< 0.500	< 0.500	< 0.500	< 0.500
Cis-1,3-Dichloropropene										
Tetrachloroethylene	< 0.500	< 0.500	< 0.500	< 0.500	< 0.500	< 0.500	< 0.500	< 0.500	< 0.500	< 0.500
Toluene	< 0.050	0.09	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050	1.8
1,1,1-Trichloroethane	< 0.100	< 0.100	< 0.100	< 0.100	< 0.100	< 0.100	< 0.100	< 0.100	< 0.100	< 0.100
1,1,2-Trichloroethane	< 0.100	< 0.100	< 0.100	< 0.100	< 0.100	< 0.100	< 0.100	< 0.100	< 0.100	< 0.100
1,1,2,2-Tetrachloroethane										
Trichloroethylene	< 0.100	< 0.100	< 0.100	< 0.100	< 0.100	< 0.100	< 0.100	< 0.100	< 0.100	0.6
Trichlorofluoromethane										
Vinyl Chloride										
Methyl Ethyl Ketone	< 0.100	< 0.100	< 0.100	< 0.100	< 0.100	< 0.100	< 0.100	< 0.100	< 0.100	< 0.100
Methyl Isobutyl Ketone	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050
Xylenes	< 0.100	< 0.100	< 0.100	< 0.100	< 0.100	< 0.100	< 0.100	< 0.100	< 0.100	2.7
Total Volatiles Detected	0.00	1.99	0.00	0.00	0.00	0.00	0.00	0.00	0.00	12.89

Notes

All values given in mg/kg soil.
A blank space indicates that no value was reported for that compound.
[1] Numbers in parentheses are depths of samples (if known).

Data Source:

Phase II Hydrogeologic Investigation Phase, Lancy 1985.
Lancy Labs Nov. 1985.
Third Revision to the Work Plan, HLA July 1990.

Table B-2 Previously Collected VOC Data for Chemsol Soils

Consultant	Lancy	Lancy	AGES	AGES	AGES	AGES	AGES	AGES	AGES	AGES
ID # [1]	OW6-B	OW6-C	#12(6-12)	#13(6-12)	#14(6-12)	#14(12-18)	#15(6-12)	#15(12-18)	#16(6-12)	#16(6-12)
Sampling Date	2/86	2/86	10/87	10/87	10/87	10/87	10/87	10/87	10/87	10/87
Benzene	< 0.050	< 0.050	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1
Bromoform	< 1.0	< 1.0	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1
Bromomethane			< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1
Carbon Tetrachloride	3.2	0.89	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1
Chlorobenzene	< 0.050	< 0.050	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1
Chlorodibromomethane	< 1.0	< 1.0	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1
Chloroethane			< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1
2-Chloroethylvinyl Ether			< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1
Chloroform	5.8	0.335	1	< 1	6.5	< 1	< 1	< 1	< 1	< 1
Chloromethane			< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1
Dichlorobromomethane	< 1.0	< 1.0	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1
1,1-Dichloroethane	< 0.100	< 0.100	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1
1,2-Dichloroethane	< 0.100	< 0.100	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1
1,1-Dichloroethylene	< 0.500	< 0.500	1.1	< 1	35	2.9	1.8	< 1	2.4	< 1
1,2-trans-Dichloroethylene	< 0.100	< 0.100	< 1	< 1	6.8	2.5	< 1	< 1	< 1	< 1
1,2-Dichloropropane	< 0.100	< 0.100	< 1	< 1	1.8	< 1	< 1	< 1	< 1	< 1
Dichlorodifluoromethane			< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1
1,2-Dichlorobenzene			< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1
1,3-Dichlorobenzene			< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1
1,4-Dichlorobenzene			9.8	< 1	2.9	< 1	15	< 1	< 1	< 1
Ethylbenzene	< 0.050	< 0.050	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1
Methylene Chloride	< 0.100	< 0.100	< 1	< 1	1.4	< 1	< 1	< 1	< 1	< 1
Trans-1,3-Dichloropropene	< 0.500	< 0.500	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1
Cis-1,3-Dichloropropene			< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1
Tetrachloroethylene	0.47	< 0.500	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1
Toluene	0.135	< 0.050	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1
1,1,1-Trichloroethane	< 0.100	< 0.100	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1
1,1,2-Trichloroethane	< 0.100	< 0.100	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1
1,1,2,2-Tetrachloroethane			< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1
Trichloroethylene	0.22	< 0.100	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1
Trichlorofluoromethane			< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1
Vinyl Chloride			< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1
Methyl Ethyl Ketone	< 0.100	< 0.100								
Methyl Isobutyl Ketone	< 0.050	< 0.050								
Xylenes	0.87	3.9								
Total Volatiles Detected	10.70	5.23	11.90	0.00	54.00	5.40	16.80	0.00	2.40	0.00

Notes: All values —
/
[1]

Data Source:

Table B-2 Previously Collected VOC Data for Chemsol Soils

Consultant	AGES	AGES	AGES	AGES	AGES	AGES
ID # [1]	#20(12-18)	#21(12-18)	#22(12-18)	#26(12-18)	#30(12-18)	#31(12-18)
Sampling Date	10/87	10/87	10/87	10/87	10/87	10/87
Benzene	< 1	< 1	< 1	< 1	< 1	< 1
Bromoform	< 1	< 1	< 1	< 1	< 1	< 1
Bromomethane	< 1	< 1	< 1	< 1	< 1	< 1
Carbon Tetrachloride	< 1	< 1	< 1	< 1	< 1	< 1
Chlorobenzene	< 1	< 1	< 1	< 1	< 1	< 1
Chlorodibromomethane	< 1	< 1	< 1	< 1	< 1	< 1
Chloroethane	< 1	< 1	< 1	< 1	< 1	< 1
2-Chloroethylvinyl Ether	< 1	< 1	< 1	< 1	< 1	< 1
Chloroform	< 1	< 1	< 1	< 1	< 1	< 1
Chloromethane	< 1	< 1	< 1	< 1	< 1	< 1
Dichlorobromomethane	< 1	< 1	< 1	< 1	< 1	< 1
1,1-Dichloroethane	< 1	< 1	< 1	< 1	< 1	< 1
1,2-Dichloroethane	< 1	< 1	< 1	< 1	< 1	< 1
1,1-Dichloroethylene	< 1	< 1	< 1	< 1	< 1	< 1
1,2-trans-Dichloroethylene	< 1	< 1	< 1	< 1	< 1	1.2
1,2-Dichloropropane	< 1	< 1	< 1	< 1	< 1	< 1
Dichlorodifluoromethane	< 1	< 1	< 1	< 1	< 1	< 1
1,2-Dichlorobenzene	< 1	< 1	< 1	< 1	< 1	< 1
1,3-Dichlorobenzene	< 1	< 1	< 1	< 1	< 1	< 1
1,4-Dichlorobenzene	< 1	< 1	< 1	< 1	< 1	< 1
Ethylbenzene	< 1	< 1	< 1	< 1	< 1	< 1
Methylene Chloride	< 1	< 1	< 1	< 1	< 1	< 1
Trans-1,3-Dichloropropene	< 1	< 1	< 1	< 1	< 1	< 1
Cis-1,3-Dichloropropene	< 1	< 1	< 1	< 1	< 1	< 1
Tetrachloroethylene	< 1	< 1	< 1	< 1	< 1	< 1
Toluene	< 1	< 1	< 1	< 1	< 1	< 1
1,1,1-Trichloroethane	< 1	< 1	< 1	< 1	< 1	< 1
1,1,2-Trichloroethane	< 1	< 1	< 1	< 1	< 1	< 1
1,1,2,2-Tetrachloroethane	< 1	< 1	< 1	< 1	< 1	< 1
Trichloroethylene	< 1	< 1	< 1	< 1	< 1	< 1
Trichlorofluoromethane	< 1	< 1	< 1	< 1	< 1	< 1
Vinyl Chloride	< 1	< 1	< 1	< 1	< 1	< 1
Methyl Ethyl Ketone						
Methyl Isobutyl Ketone						
Xylenes						
Total Volatiles Detected	0.00	0.00	0.00	0.00	0.00	1.20

Notes:
All values given in mg/kg soil.
A blank space indicates that no value was reported for that compound.
[1] Numbers in parentheses are depths of samples (if known).

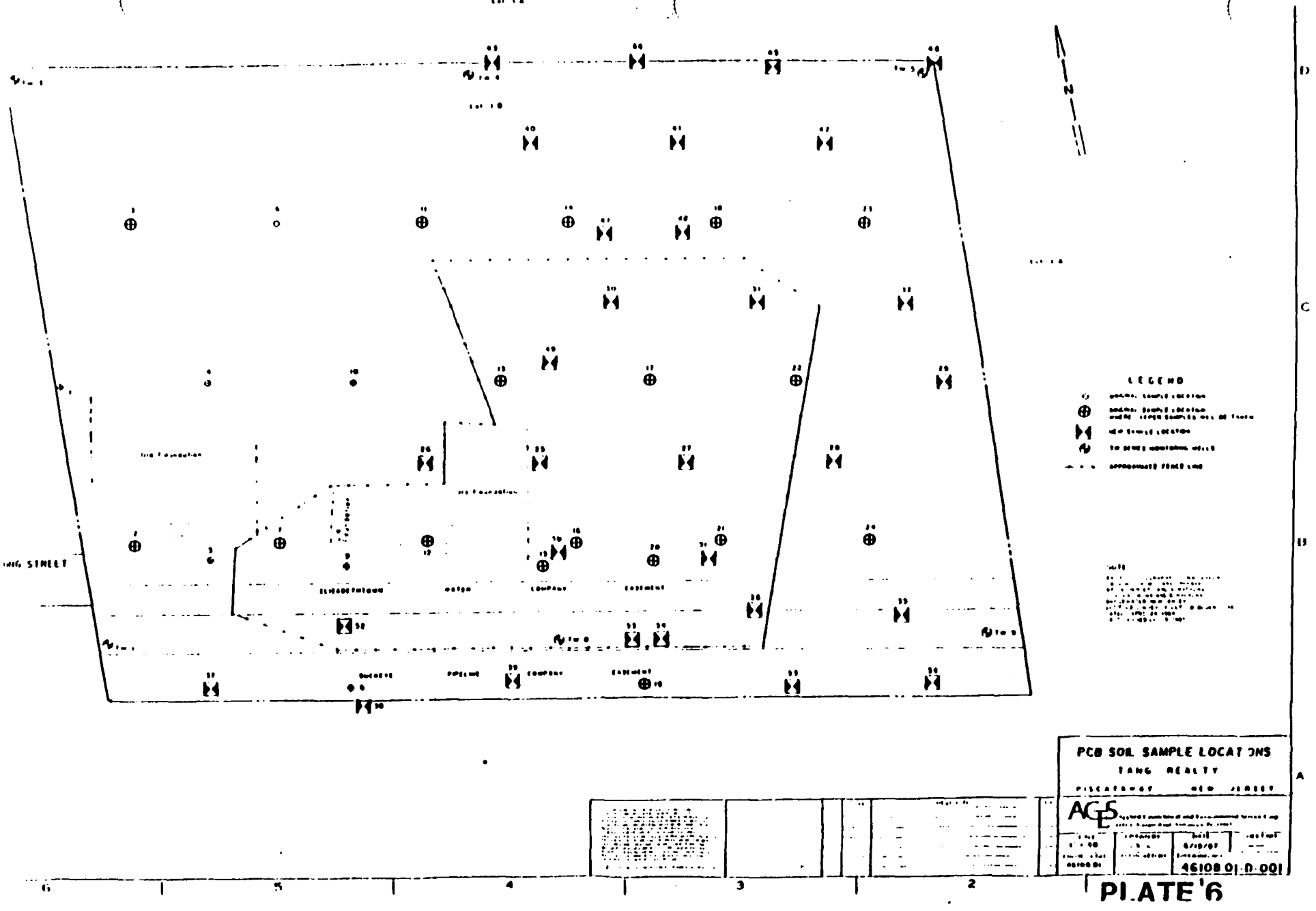
Data Source:
Phase II Hydrogeologic Investigation Phase. Lancy 1985.
Lancy Labs Nov. 1983.
Third Revision to the Work Plan. HLA July 1990.

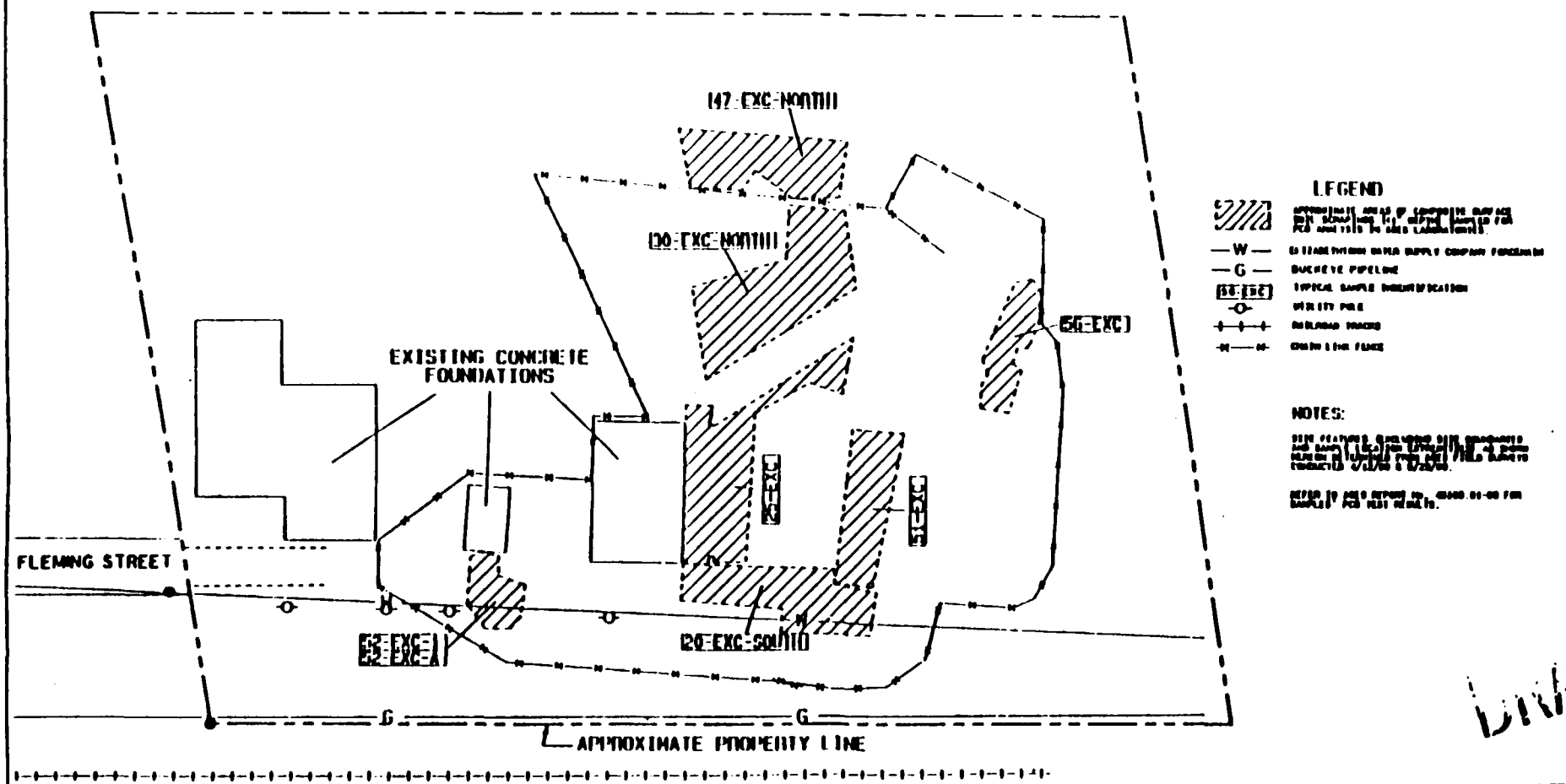
TABLE B-3
CONCENTRATION OF METALS IN SOILS

CHEMICAL	7/26/88*	7/26/88	7/26/88	7/26/88	7/26/88	7/26/88	7/26/88
LOCATION	20-2 Pile	16-2A Pile	28-2B	27-2B	20-2	54-2 Pile	51-2 Pile
Arsenic	7.26	4.55	4.89	2.07	6.64	5.19	4.26
Barium	68.2	126.88	77.65	13.0	62.77	55.14	75.18
Cadmium	4.85	3.72	0.72	0.44	0.75	1.30	1.5
Chromium	120.6	64.28	62.29	42.1	36.69	68.57	54.42
Lead	15.9	1126.06	327.1	69.55	46.16	129.28	218.86
Mercury	1.11	0.45	0.7	0.45	0.98	0.22	0.21
Selenium	10.87	0.04	<.02	<.04	<.034	<.04	2.92
Silver	1.7	0.83	3.83	.34	0.85	7.12	1.27
Zinc	NS	NS	NS	NS	NS	NS	NS

* Copy not legible, conc est
NS = Not Sampled
All units are in mg/kg

CHM 001 0853


N
LEGEND
PCB SOIL SAMPLE LOCATIONS
TANG REALTY
46108.01.D.001
PLATE 6



DRAFT

SURFACE SOIL SAMPLE LOCATION PLAN I

TANG REALTY, INC.

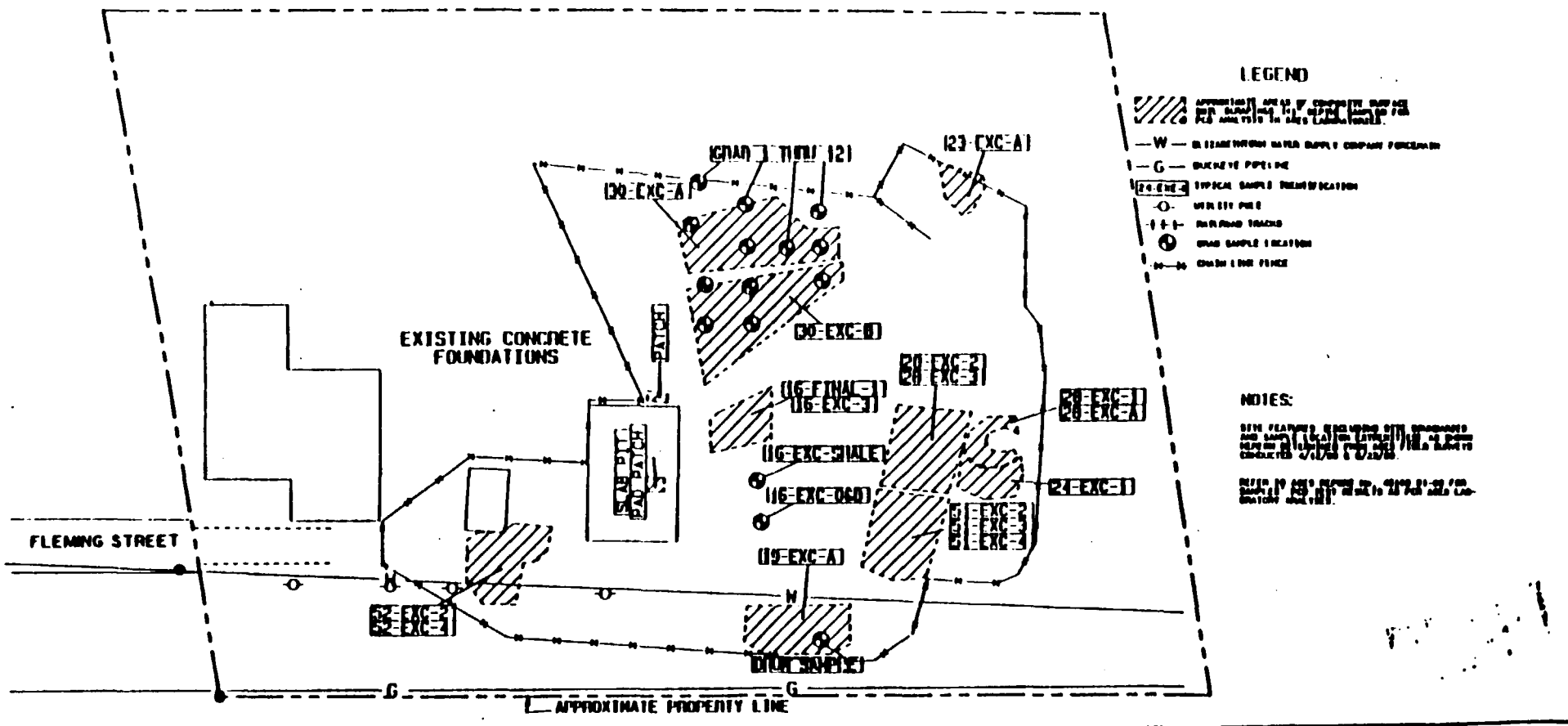
PISCATAWAY, TWP., MIDDLESEX COUNTY, N.J.

AGES Applied Geotechnical and Environmental Service Corp
1515 S Trooper Road, Norristown, Pa 19403

SCALE	DRAWN BY	DATE	SHEET NO
1" = 100'	KC	11/16/89	1 of 6
PROJECT NO	APPROVED BY	DRAWING NO	
46108.01		46108-B-101	

CHM 001 0855

PLATE 7



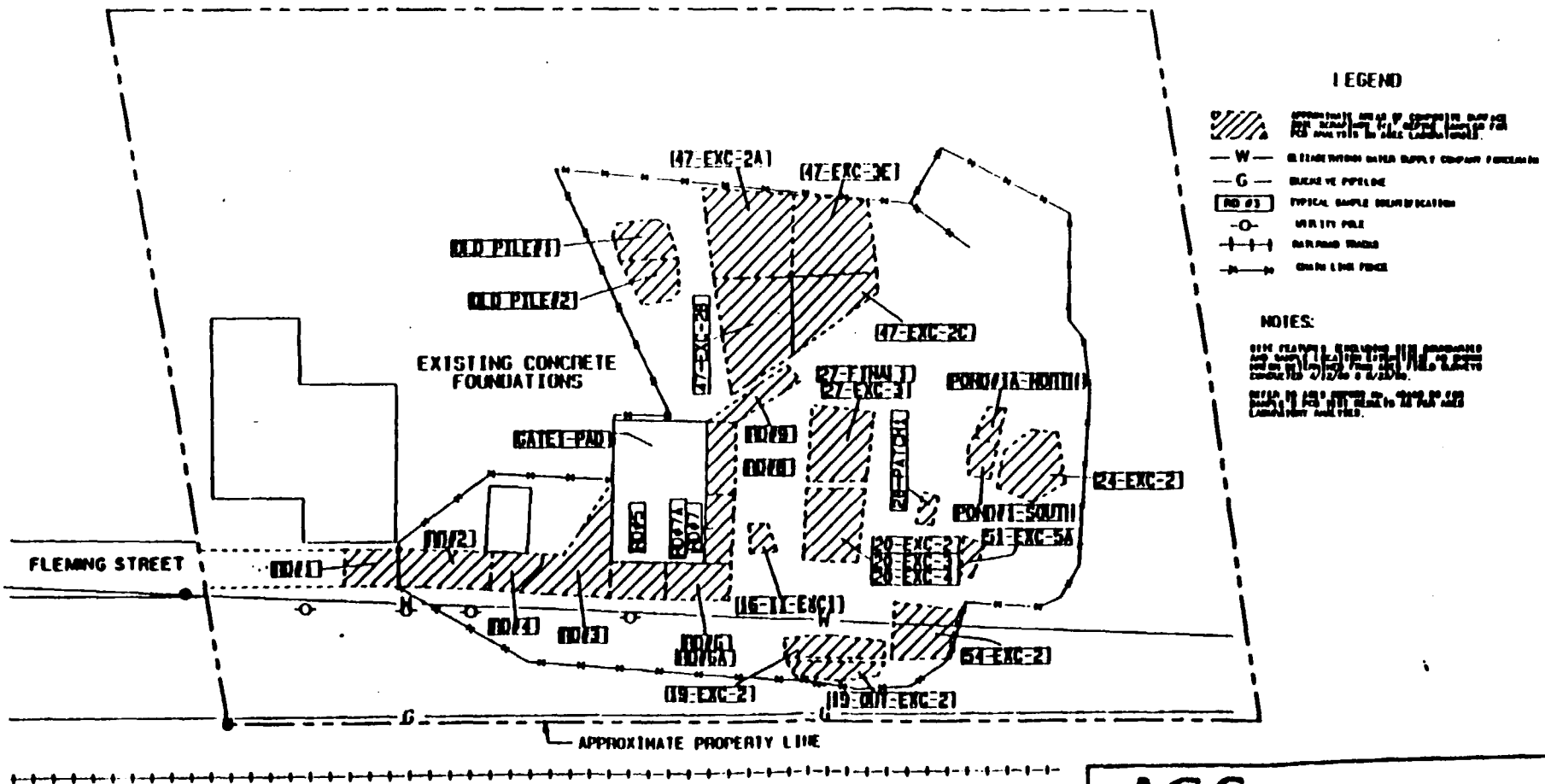
SURFACE SOIL SAMPLE LOCATION PLAN II
TANG REALTY, INC.
PISCATAWAY, TWP., MIDDLESEX COUNTY, N.J.

AGES Applied Geotechnical and Environmental Services Corp
1115 S Trooper Road, Norristown, Pa 19403

SCALE	DRAWN BY	DATE	SHEET NO
1" = 100'	(RS)	11/16/89	2 of 6
PROJECT NO 46108.01	APPROVED BY	DRAWING NO 46108-B-102	

PLATE 8

9580 001 WHO



SURFACE SOIL SAMPLE LOCATION PLAN III

TANG REALTY, INC.

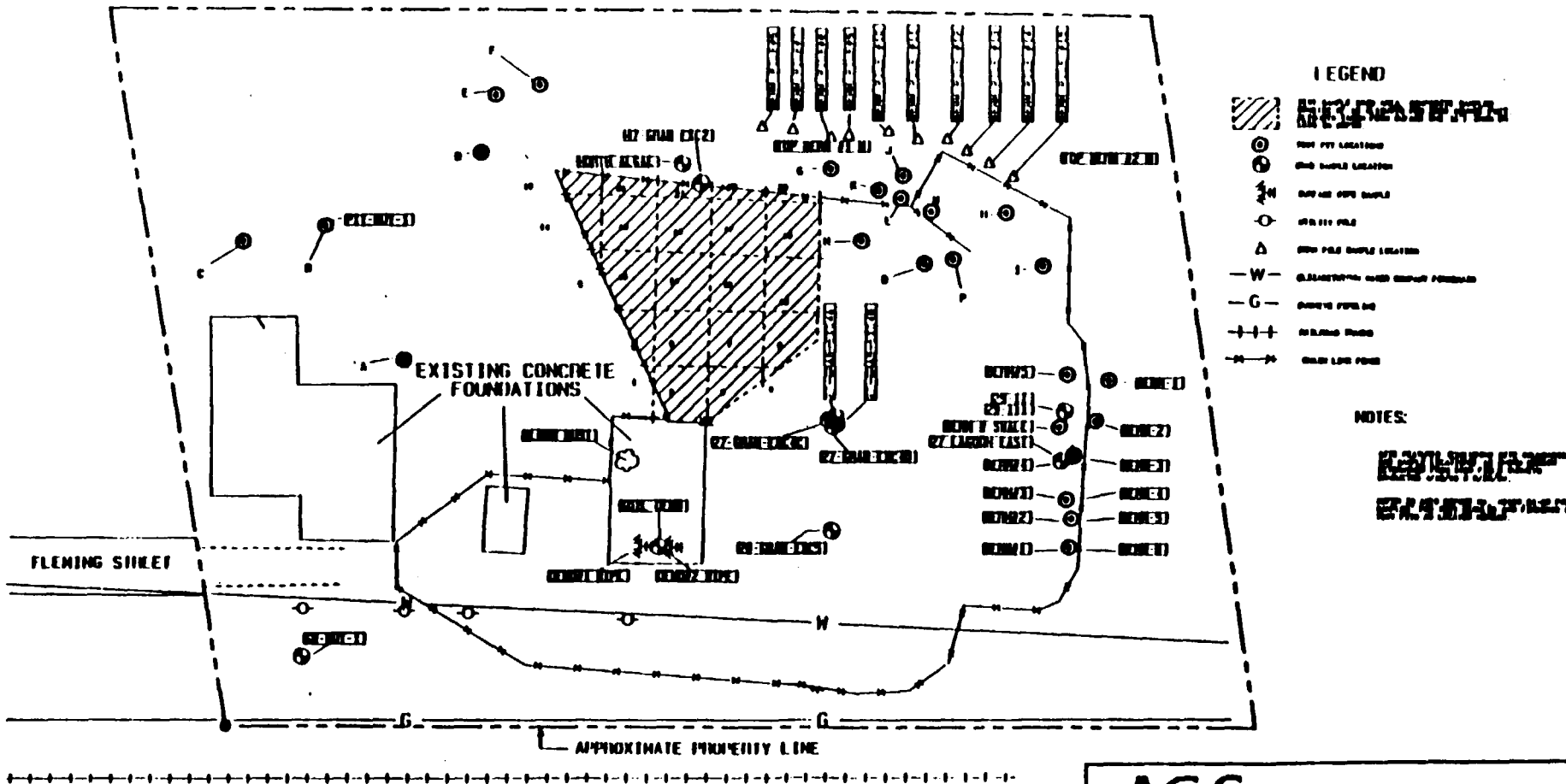
PISCATAWAY, TWP., MIDDLESEX COUNTY, N.J.

ACES Applied Geotechnical and Environmental Services Corp

SCALE	DRAWN BY	DATE	SHEET NO
1" = 100'	NC	11/16/89	3 of 6
PROJECT NO 46108.01	APPROVED BY	DRAWING NO 46108-8-103	

PLATE 9

CHM 001 0857



TEST PIT & SAMPLE GRID LOCATION PLAN

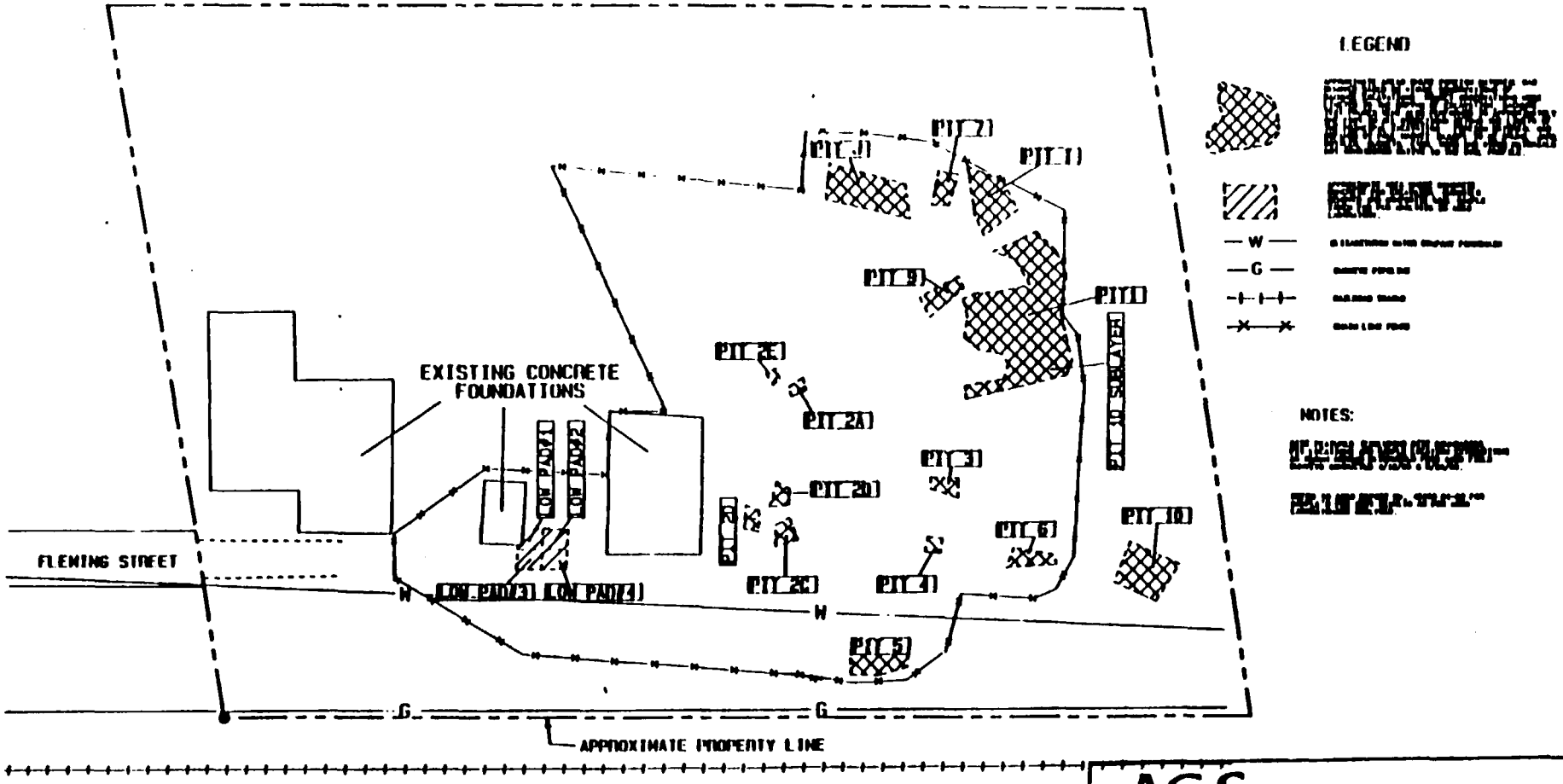
TANG REALTY, INC.

PISCATAWAY TWP., MIDDLESEX COUNTY, N.J.

AGES Applied Geotechnical and Environmental Service Corp
11515 Trooper Road, Norristown, Pa 19403

SCALE	DRAWN BY	DATE	SHEET NO
1" = 100'	AE	11/16/89	6 of 6
PROJECT NO 46108.01	APPROVED BY	DRAWING NO 46108-B-106	

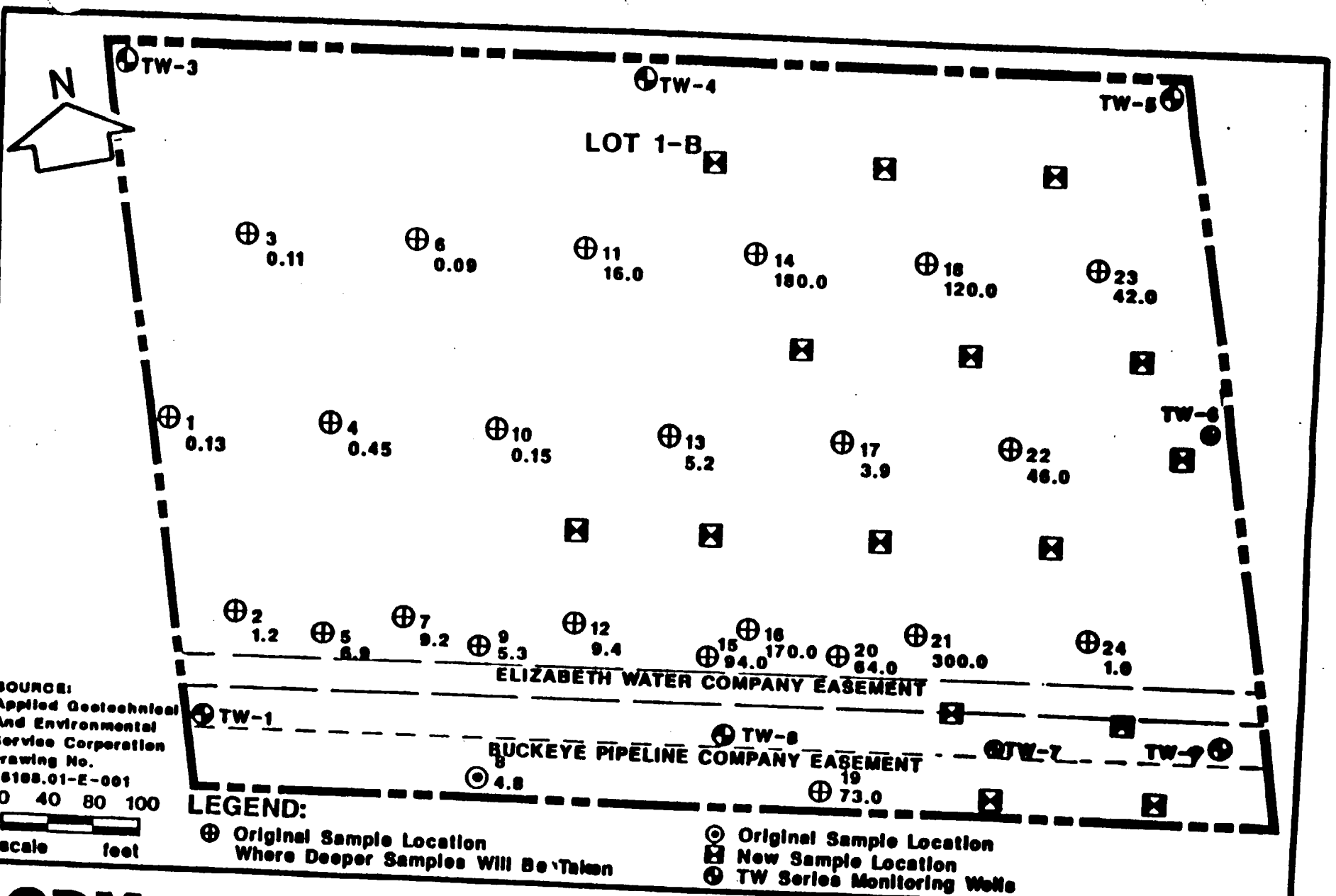
PLATE 10



PIT EXCAVATION LOCATION PLAN
TANG REALTY, INC.
PISCATAWAY TWP., MIDDLESEX COUNTY, N.J.

ACES Applied Geotechnical and Environmental Service Corp 1111 S. Trooper Road, Norristown, Pa 19403			
SCALE 1" = 100'	DRAWN BY	DATE 11/16/89	SHEET NO 5 of 6
PROJECT NO 46108.01	APPROVED BY	DRAWING NO 46108-B-105	

PLATE 13



CDM

environmental engineers, scientists
planners & management consultants

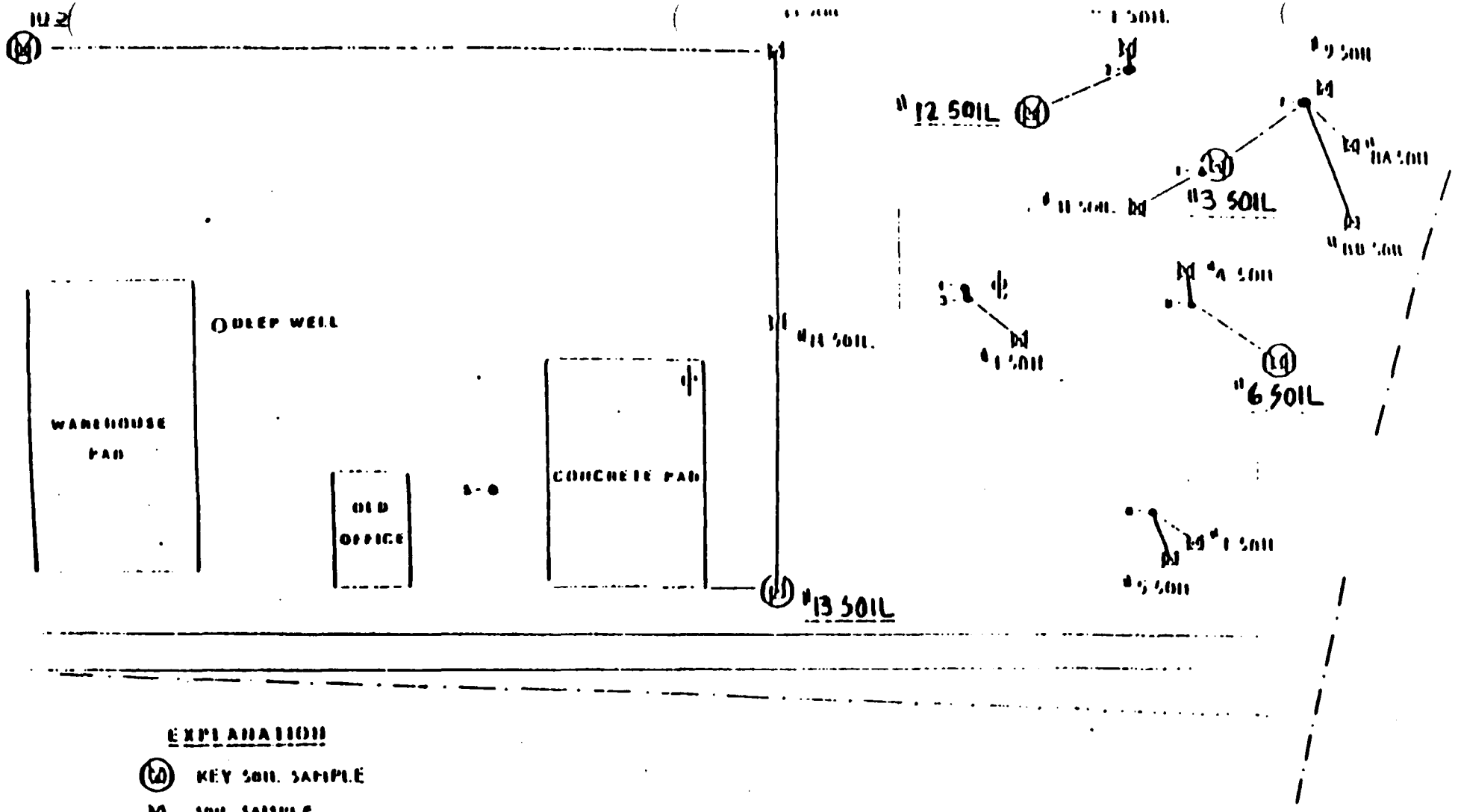
Figure 5

PCB Soil Sample Locations

Chemsol, Incorporated
Piscataway Township, Middlesex County, New Jersey

-22-

0980 I00 WH3



EXPLANATION

- KEY SOIL SAMPLE
- SOIL SAMPLE
- CHEMSOL MONITORING WELL
- DEEP CHEMSOL WATER SUPPLY WELL
- WELL SURVEY MEASURING POINT
- DIRT ROAD
- DRAINAGE DITCH

0 30 60 90 120
SCALE
FEET

LANCY LABORATORIES
Division, Lancy International, Inc.

LOCATION OF WELLS &
SOIL SAMPLE LOCATIONS
IN RELATION TO THE WELLS

FAIR REALTY SITE
PISCATAWAY TOWNSHIP, N.J.

CHM 001 0861

APPENDIX C

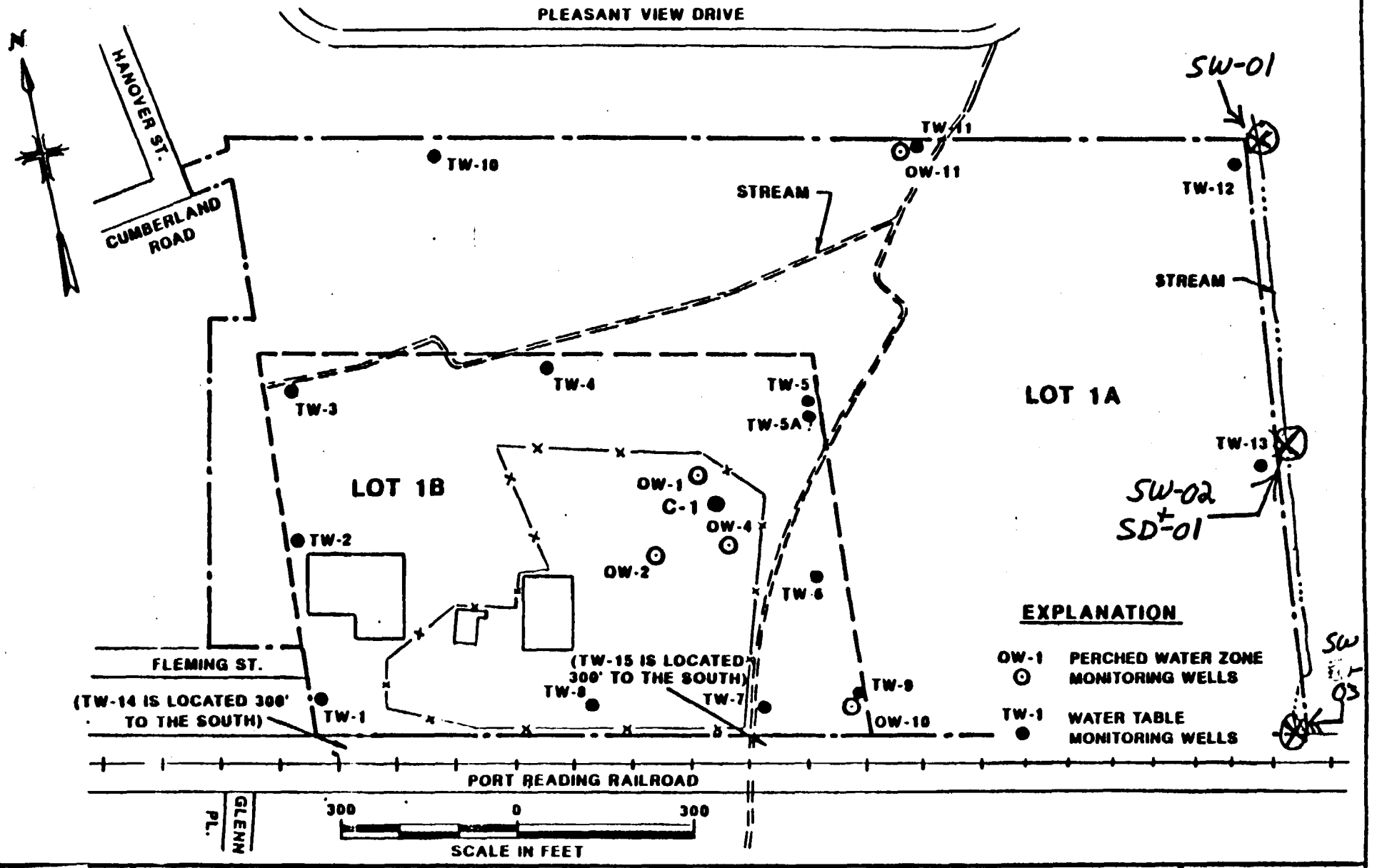
SURFACE WATER SAMPLING DATA

NOTES

SAMPLE WEEK	SAMPLE DATE
1	8/6/91
2	8/13/91
3	8/20/91
4	8/27/91
5	9/5/91
6	9/10/91
7	9/17/91
8	9/24/91

"SW" = Surface Water
"SD" = Sediment
"TB" = Trip Blank
"PEM" = Performance Evaluation (QA) Sample
"FB" = Field Blank
"FD" = Field Duplicate
SW-03: Upstream Sampling Location
SW-02 + SD-01: Sampling Location at Site of Proposed Discharge
SW-01: Downstream Sampling Location

In weeks 6,7 and 8, only one location was sampled due to no flow conditions in the stream. This location was situated downstream from the site.



CHEMSOL, INC.
PISCATAWAY TWP., N.J.

SAMPLING LOCATIONS (SURFACE WATER + SEDIMENT)

WEEKS 1-5

CHEMSOL, INC.
SUMMARY OF ANALYTICAL RESULTS
SAMPLING DATES: 8/6/91-9/24/91
LAB NAME: ENVSYS

	CASE#: 16925 SAMPLED: 8/6/91				CASE#: 16962 SAMPLED: 8/13/91			
VOLATILES								
Sample ID No.	CI-SW-01-1	CI-SW-02-1	CI-SW-03-1	CI-SW-TB-1	CI-SW-01-2	CI-SW-02-2	CI-SW-03-2	CI-SW-TB-2
Traffic Report No.	BKA01	BKA02	BKA03	BKA05	BKA06	BKA07	BKA08	BKA09
Matrix	WATER	WATER	WATER	WATER	WATER	WATER	WATER	WATER
Units	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L
Dilution Factor	1	1	1	1	1	1	1	1
Percent Moisture	--	--	--	--	--	--	--	--
Chloromethane	ND	ND	ND	ND	ND	ND	ND	ND
Bromomethane	ND	ND	ND	ND	ND	ND	ND	ND
Vinyl Chloride	ND	ND	ND	ND	ND	ND	ND	ND
Chloroethane	ND	ND	ND	ND	ND	ND	ND	ND
Methylene Chloride	ND	ND	ND	ND	ND	ND	ND	ND
Acetone	ND	ND	ND	ND	ND	ND	ND	ND
Carbon Disulfide	ND	ND	ND	ND	ND	ND	ND	ND
1,1-Dichloroethene	ND	ND	ND	ND	ND	ND	ND	ND
1,1-Dichloroethane	ND	ND	ND	ND	ND	ND	ND	ND
1,2-Dichloroethene (total)	ND	ND	ND	ND	ND	ND	ND	ND
Chloroform	ND	ND	ND	ND	ND	ND	ND	ND
1,2-Dichloroethane	ND	ND	ND	ND	ND	ND	ND	ND
2-Butanone	ND	ND	ND	ND	ND	ND	ND	ND
1,1,1-Trichloroethane	ND	ND	ND	ND	ND	ND	ND	ND
Carbon Tetrachloride	ND	ND	ND	ND	ND	ND	ND	ND
Bromodichloromethane	ND	ND	ND	ND	ND	ND	ND	ND
1,2-Dichloropropane	ND	ND	ND	ND	ND	ND	ND	ND
cis-1,3-Dichloropropene	ND	ND	ND	ND	ND	ND	ND	ND
Trichloroethene	ND	ND	ND	ND	ND	ND	ND	ND
Dibromochloromethane	ND	ND	ND	ND	ND	ND	ND	ND
1,1,2-Trichloroethane	ND	ND	ND	ND	ND	ND	ND	ND
Benzene	ND	ND	ND	ND	ND	ND	ND	ND
trans-1,3-Dichloropropene	ND	ND	ND	ND	ND	ND	ND	ND
Bromoform	ND	ND	ND	ND	ND	ND	ND	ND
4-Methyl-2-Pentanone	ND	ND	ND	ND	ND	ND	ND	ND
2-Hexanone	ND	ND	ND	ND	ND	ND	ND	ND
Tetrachloroethene	ND	ND	ND	ND	ND	ND	ND	ND
Toluene	ND	ND	ND	ND	ND	ND	ND	ND
1,1,2,2-Tetrachloroethane	ND	ND	ND	ND	ND	ND	ND	ND
Chlorobenzene	ND	ND	ND	ND	ND	ND	ND	ND
Ethylbenzene	ND	ND	ND	ND	ND	ND	ND	ND
Styrene	ND	ND	ND	3 J	ND	ND	ND	5 J
Xylenes (Total)	ND	ND	ND	ND	ND	ND	ND	ND

NOTES:
ND - compound analyzed for but not detected
B - compound found in lab blank as well as sample, indicates possible/probable blank contamination
E - estimated value
J - estimated value, compound present below CRQL but above IDL
R - analysis did not pass EPA QA/QC
N - Presumptive evidence of the presence of the material
NR - analysis not required
Detection limits elevated if Dilution Factor >1 and/or percent moisture >0%

CHEMSOL, INC.
SUMMARY OF ANALYTICAL RESULTS
SAMPLING DATES: 8/6/91-9/24/91
LAB NAME: ENVSYS

SEMI-VOLATILES	CASE#: 16925 SAMPLED: 8/6/91				CASE#: 16962 SAMPLED: 8/13/91			
Sample ID No.	CI-SW-01-1	CI-SW-02-1	CI-SW-03-1	CI-SW-TB-1	CI-SW-01-2	CI-SW-02-2	CI-SW-03-2	CI-SW-TB-2
Traffic Report No.	BKA01	BKA02	BKA03	BKA05	BKA06	BKA07	BKA08	BKA09
Matrix	WATER	WATER	WATER	WATER	WATER	WATER	WATER	WATER
Units	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L
Dilution Factor/GPC Cleanup (Y)	1	1	1	NA	1	1	1	NA
Percent Moisture	--	--	--	--	--	--	--	--
Phenol	ND	ND	ND	NR	ND	ND	ND	NR
bis(2-Chloroethyl)ether	ND	ND	ND	NR	ND	ND	ND	NR
2-Chlorophenol	ND	ND	ND	NR	ND	ND	ND	NR
1,3-Dichlorobenzene	ND	ND	ND	NR	ND	ND	ND	NR
1,4-Dichlorobenzene	ND	ND	ND	NR	ND	ND	ND	NR
1,2-Dichlorobenzene	ND	ND	ND	NR	ND	ND	ND	NR
2-Methylphenol	ND	ND	ND	NR	ND	ND	ND	NR
2,2'-oxybis(1-Chloropropane)	ND	ND	ND	NR	ND	ND	ND	NR
4-Methylphenol	ND	ND	ND	NR	ND	ND	ND	NR
N-Nitroso-di-n-dipropylamine	ND	ND	ND	NR	ND	ND	ND	NR
Hexachloroethane	ND	ND	ND	NR	ND	ND	ND	NR
Nitrobenzene	ND	ND	ND	NR	ND	ND	ND	NR
Isophorone	ND	ND	ND	NR	ND	ND	ND	NR
2-Nitrophenol	ND	ND	ND	NR	ND	ND	ND	NR
2,4-Dimethylphenol	ND	ND	ND	NR	ND	ND	ND	NR
bis(2-Chloroethoxy)methane	ND	ND	ND	NR	ND	ND	ND	NR
2,4-Dichlorophenol	ND	ND	ND	NR	ND	ND	ND	NR
Carbazole	ND	ND	ND	NR	ND	ND	ND	NR
1,2,4-Trichlorobenzene	ND	ND	ND	NR	ND	ND	ND	NR
Naphthalene	ND	ND	ND	NR	ND	ND	ND	NR
4-Chloroaniline	ND	ND	ND	NR	ND	ND	ND	NR
Hexachlorobutadiene	ND	ND	ND	NR	ND	ND	ND	NR
4-Chloro-3-Methylphenol	ND	ND	ND	NR	ND	ND	ND	NR
2-Methylnaphthalene	ND	ND	ND	NR	ND	ND	ND	NR
Hexachlorocyclopentadiene	ND	ND	ND	NR	ND	ND	ND	NR
2,4,6-Trichlorophenol	ND	ND	ND	NR	ND	ND	ND	NR
2,4,5-Trichlorophenol	ND	ND	ND	NR	ND	ND	ND	NR
2-Chloronaphthalene	ND	ND	ND	NR	ND	ND	ND	NR
2-Nitroaniline	ND	ND	ND	NR	ND	ND	ND	NR
Dimethylphthalate	ND	ND	ND	NR	ND	ND	ND	NR
Acenaphthylene	ND	ND	ND	NR	ND	ND	ND	NR
2,6-Dinitrotoluene	ND	ND	ND	NR	ND	ND	ND	NR
3-Nitroaniline	ND	ND	ND	NR	ND	R	R	NR
Acenaphthene	ND	ND	ND	NR	ND	ND	ND	NR
2,4-Dinitrophenol	ND	ND	ND	NR	ND	ND	ND	NR
4-Nitrophenol	ND	ND	ND	NR	ND	ND	ND	NR
Dibenzofuran	ND	ND	ND	NR	ND	ND	ND	NR
2,4-Dinitrotoluene	ND	ND	ND	NR	ND	ND	ND	NR
Diethylphthalate	ND	ND	ND	NR	ND	ND	ND	NR
4-Chlorophenyl-phenyl ether	ND	ND	ND	NR	ND	ND	ND	NR
Fluorene	ND	ND	ND	NR	ND	ND	ND	NR
4-Nitroaniline	ND	ND	ND	NR	ND	ND	ND	NR
4,6-Dinitro-2-methylphenol	ND	ND	ND	NR	ND	ND	ND	NR
N-nitrosodiphenylamine	ND	ND	ND	NR	ND	ND	ND	NR
4-Bromophenyl-phenyl ether	ND	ND	ND	NR	ND	ND	ND	NR
Hexachlorobenzene	ND	ND	ND	NR	ND	ND	ND	NR
Pentachlorophenol	ND	ND	ND	NR	ND	ND	ND	NR
Phenanthrene	ND	ND	ND	NR	ND	ND	ND	NR
Anthracene	ND	ND	ND	NR	ND	ND	ND	NR

CHEMSOL, INC.
SUMMARY OF ANALYTICAL RESULTS
SAMPLING DATES: 8/6/91-9/24/91
LAB NAME: ENVSYS

SEMI-VOLATILES	CASE#: 16925 SAMPLED: 8/6/91				CASE#: 16962 SAMPLED: 8/13/91			
Sample ID No.	CI-SW-01-1	CI-SW-02-1	CI-SW-03-1	CI-SW-TB-1	CI-SW-01-2	CI-SW-02-2	CI-SW-03-2	CI-SW-TB-2
Traffic Report No.	BKA01	BKA02	BKA03	BKA05	BKA06	BKA07	BKA08	BKA09
Matrix	WATER	WATER	WATER	WATER	WATER	WATER	WATER	WATER
Units	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L
Dilution Factor/GPC Cleanup (Y)	1	1	1	NA	1	1	1	NA
Percent Moisture	--	--	--	--	--	--	--	--
Di-n-butylphthalate	ND	ND	ND	NR	ND	ND	ND	NR
Fluoranthene	ND	ND	ND	NR	ND	ND	ND	NR
Pyrene	ND	ND	ND	NR	ND	ND	ND	NR
Butylbenzylphthalate	ND	ND	ND	NR	ND	ND	ND	NR
3,3'-Dichlorobenzidine	ND	ND	ND	NR	ND	ND	ND	NR
Benzo(a)anthracene	ND	ND	ND	NR	ND	ND	ND	NR
Chrysene	ND	ND	ND	NR	ND	ND	ND	NR
bis(2-Ethylhexyl)phthalate	ND	ND	ND	NR	ND	ND	ND	NR
Di-n-octylphthalate	ND	ND	ND	NR	ND	ND	ND	NR
Benzo(b)fluoranthene	ND	ND	ND	NR	ND	ND	ND	NR
Benzo(k)fluoranthene	ND	ND	ND	NR	ND	ND	ND	NR
Benzo(a)pyrene	ND	ND	ND	NR	ND	ND	ND	NR
Indeno(1,2,3-cd)pyrene	ND	ND	ND	NR	ND	ND	ND	NR
Dibenz(a,h)anthracene	ND	ND	ND	NR	ND	ND	ND	NR
Benzo(g,h,i)perylene	ND	ND	ND	NR	ND	ND	ND	NR

NOTES:
ND - compound analyzed for but not detected
B - compound found in lab blank as well as sample, indicates possible/probable blank contamination
E - estimated value
J - estimated value, compound present below CRQL but above IDL
R - analysis did not pass EPA QA/QC
N - Presumptive evidence of the presence of the material
NR - analysis not required
Detection limits elevated if Dilution Factor >1 and/or percent moisture >0%

CHEMSOL, INC.
SUMMARY OF ANALYTICAL RESULTS
SAMPLING DATES: 8/6/91-9/24/91
LAB NAME: ENVSYS

	CASE#: 16925 SAMPLED: 8/6/91				CASE#: 16962 SAMPLED: 8/13/91			
PESTICIDES								
Sample ID No.	CI-SW-01-1	CI-SW-02-1	CI-SW-03-1	CI-SW-TB-1	CI-SW-01-2	CI-SW-02-2	CI-SW-03-2	CI-SW-TB-2
Traffic Report No.	BKA01	BKA02	BKA03	BKA05	BKA06	BKA07	BKA08	BKA09
Matrix	WATER	WATER	WATER	WATER	WATER	WATER	WATER	WATER
Units	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L
Dilution Factor/GPC Cleanup (Y)	1	1	1	NA	1	1	1	NA
Percent Moisture	--	--	--	--	--	--	--	--
alpha-BHC	ND	ND	ND	NR	ND	ND	ND	NR
beta-BHC	ND	ND	ND	NR	ND	ND	ND	NR
delta-BHC	ND	ND	ND	NR	ND	ND	ND	NR
gamma-BHC (Lindane)	ND	ND	ND	NR	ND	ND	ND	NR
Heptachlor	ND	ND	ND	NR	ND	ND	ND	NR
Aldrin	ND	ND	ND	NR	ND	ND	ND	NR
Heptachlor epoxide	ND	ND	ND	NR	ND	ND	ND	NR
Endosulfan I	ND	ND	ND	NR	ND	ND	ND	NR
Dieldrin	ND	ND	ND	NR	ND	ND	ND	NR
4,4'-DDE	ND	ND	ND	NR	ND	ND	ND	NR
Endrin	ND	ND	ND	NR	ND	ND	ND	NR
Endosulfan II	ND	ND	ND	NR	ND	ND	ND	NR
4,4'-DDD	ND	ND	ND	NR	ND	ND	ND	NR
Endosulfan sulfate	ND	ND	ND	NR	ND	ND	ND	NR
4,4'-DDT	ND	ND	ND	NR	ND	ND	ND	NR
Methoxychlor	ND	ND	ND	NR	ND	ND	ND	NR
Endrin ketone	ND	ND	ND	NR	ND	ND	ND	NR
alpha-Chlordane	ND	ND	ND	NR	ND	ND	ND	NR
gamma-Chlordane	ND	ND	ND	NR	ND	ND	ND	NR
Toxaphene	ND	ND	ND	NR	ND	ND	ND	NR
Aroclor-1016	ND	ND	ND	NR	ND	ND	ND	NR
Aroclor-1221	ND	ND	ND	NR	ND	ND	ND	NR
Aroclor-1232	ND	ND	ND	NR	ND	ND	ND	NR
Aroclor-1242	ND	ND	ND	NR	ND	ND	ND	NR
Aroclor-1248	ND	ND	ND	NR	ND	ND	ND	NR
Aroclor-1254	ND	ND	ND	NR	ND	ND	ND	NR
Aroclor-1260	ND	ND	ND	NR	ND	ND	ND	NR

NOTES:
ND - compound analyzed for but not detected
B - compound found in lab blank as well as sample, indicates possible/probable blank contamination
E - estimated value
J - estimated value, compound present below CRQL but above IDL
R - analysis did not pass EPA QA/QC
N - Presumptive evidence of the presence of the material
NR - analysis not required
Detection limits elevated if Dilution Factor >1 and/or percent moisture >0%

SITE NAME: CHEMSOL, INC.
SUMMARY OF ANALYTICAL RESULTS
SAMPLING DATES: 8/6/91-9/25/91
EPA CASE NO.: 6438B-01
LAB NAME: RECNY

NON-ICL VOLATILES & SEMI-VOLATILES	SAMPLED: 8/6/91				SAMPLED: 8/13/91			
Sample ID No.	CI-SW-01-1	CI-SW-02-1	CI-SW-03-1	CI-SW-TB-1	CI-SW-01-2	CI-SW-02-2	CI-SW-03-2	CI-SW-TB-2
Traffic Report No.	6438B-01-01	6438B-01-02	6438B-01-03	6438B-01-05	6438B-01-06	6438B-01-07	6438B-01-08	6438B-01-09
Matrix	WATER	WATER	WATER	WATER	WATER	WATER	WATER	WATER
Units	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L
Acrolein	ND	ND	ND	ND	ND	R	ND	ND
Acrylonitrile	ND	ND	ND	ND	ND	R	ND	ND
Benzidine	ND	R	ND	NR	R	ND	ND	NR
Azobenzene	ND	ND	ND	NR	ND	ND	ND	NR
n-Nitrosodimethylamine	ND	ND	ND	NR	ND	ND	ND	NR

NOTES:
ND - compound analyzed for but not detected
R - analysis did not pass EPA QA/QC
NR - analysis not required

CHEMSOL, INC.
SUMMARY OF ANALYTICAL RESULTS
SAMPLING DATES: 8/6/91-9/24/91
EPA CASE NO.: 6330B-01
LAB NAME: SWRI

DIOXIN	SAMPLED: 8/6/91			SAMPLED: 8/13/91		
Sample ID No.	CI-SW-01-1	CI-SW-02-1	CI-SW-03-1	CI-SW-01-2	CI-SW-02-2	CI-SW-03-2
Traffic Report No.	6330B-01-01	6330B-01-02	6330B-01-03	6330B-01-06	6330B-01-07	6330B-01-08
Matrix	WATER	WATER	WATER	WATER	WATER	WATER
Units	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L
2,3,7,8-TCDD	ND	ND	ND	ND	ND	ND

NOTES:
ND - compound analyzed for but not detected

SITE NAME: CHEMSOL, INC.
SUMMARY OF ANALYTICAL RESULTS
SAMPLING DATES: 8/6/91-9/25/91
EPA CASE NO.: 6526B-01
LAB NAME: EAENG

WATER QUALITY PARAMETERS	SAMPLED: 8/6/91			SAMPLED: 8/13/91		
Sample ID No.	CI-SW-01-1	CI-SW-02-1	CI-SW-03-1	CI-SW-01-2	CI-SW-02-2	CI-SW-03-2
Traffic Report No.	6526B-01	6526B-02	6526B-03	6526B-06	6526B-07	6526B-08
Matrix	WATER	WATER	WATER	WATER	WATER	WATER
Hardness (mg Ca/CO3/L)	144	149	152	134	159	144
Total Dissolved Solids (mg/L)	221	234	219	213 E	203 E	234
Total Suspended Solids (mg/L)	38 E	50 E	20 E	15 E	ND	50 E
Sulfate (mg/L)	13.2	10.6	18.3	17.2	18.9	18.3
Bromide (mg/L)	ND	ND	ND	2.58	ND	ND
Total Phosphorous (mg P/L)	0.06 E	0.38	0.31 E	ND	0.16	0.22
Alkalinity (mg CaCO3/L)	121	125	129	119	121	146
Ammonia (mg N/L)	ND	ND	ND	ND	ND	ND
Biochemical Oxygen Demand (mg/L)	ND	ND	ND	ND	ND	ND
Chemical Oxygen Demand (mg/L)	10.6 E	33 E	27.7 E	69 E	ND	ND
Chloride (mg/L)	13.5 E	13.4 E	11.7 E	13.9 E	14.1 E	12.8 E
Methyl Blue Active Substance (mg/L)	0.12	ND	0.14	ND	ND	ND
Oil & Grease (mg/L)	5.2 E	0.6 E	0.74 E	28 E	0.55 E	0.43 E
Total Petroleum Hydrocarbons (mg/L)	1.4 E	0.41 E	0.43 E	5.9 E	0.58 E	3.1 E
Total Organic Carbon (mg/L)	7	7.1	5.5	5 E	5.8 E	6 E

NOTES:
ND - compound analyzed for but not detected
E - estimated value
J - estimated value, compound present below CRDL but above IDL
R - analysis did not pass EPA QA/QC
NR - analysis not required

CHM 001 0871

CHEMSOL, INC.
SUMMARY OF ANALYTICAL RESULTS
SAMPLING DATES: 8/6/91-9/24/91
LAB NAME: ENVSYS

	CASE#: 16985 SAMPLED: 8/20/91				CASE#: 17021 SAMPLED: 8/27/91			
VOLATILES								
Sample ID No.	CI-SW-01-3	CI-SW-02-3	CI-SW-03-3	CI-SW-TB-3	CI-SW-01-4	CI-SW-02-4	CI-SW-03-4	CI-SW-TB-4
Traffic Report No.	BKA10	BKA11	BKA12	BKA13	BKA14	BKA15	BKA16	BKA17
Matrix	WATER	WATER	WATER	WATER	WATER	WATER	WATER	WATER
Units	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L
Dilution Factor	1	1	1	1	1	1	1	1
Percent Moisture	--	--	--	--	--	--	--	--
Chloromethane	ND	ND	ND	ND	ND	ND	ND	ND
Bromomethane	ND	ND	ND	ND	ND	ND	ND	ND
Vinyl Chloride	ND	ND	ND	ND	ND	ND	ND	ND
Chloroethane	ND	ND	ND	ND	ND	ND	ND	ND
Methylene Chloride	ND	ND	ND	ND	3 J	2 J	4 J	ND
Acetone	ND	ND	ND	ND	ND	ND	ND	ND
Carbon Disulfide	ND	ND	ND	ND	ND	ND	ND	ND
1,1-Dichloroethene	ND	ND	ND	ND	ND	ND	ND	ND
1,1-Dichloroethane	ND	ND	ND	ND	ND	ND	ND	ND
1,2-Dichloroethene (total)	ND	ND	ND	ND	ND	ND	ND	ND
Chloroform	ND	ND	ND	ND	ND	ND	ND	ND
1,2-Dichloroethane	ND	ND	ND	ND	ND	ND	ND	ND
2-Butanone	ND	ND	ND	ND	ND	ND	ND	ND
1,1,1-Trichloroethane	ND	ND	ND	ND	ND	ND	ND	ND
Carbon Tetrachloride	ND	ND	ND	ND	ND	ND	ND	ND
Bromodichloromethane	ND	ND	ND	ND	ND	ND	ND	ND
1,2-Dichloropropane	ND	ND	ND	ND	ND	ND	ND	ND
cis-1,3-Dichloropropene	ND	ND	ND	ND	ND	ND	ND	ND
Trichloroethene	ND	ND	ND	ND	ND	ND	ND	ND
Dibromochloromethane	ND	ND	ND	ND	ND	ND	ND	ND
1,1,2-Trichloroethane	ND	ND	ND	ND	ND	ND	ND	ND
Benzene	ND	ND	ND	ND	ND	ND	ND	ND
trans-1,3-Dichloropropene	ND	ND	ND	ND	ND	ND	ND	ND
Bromoform	ND	ND	ND	ND	ND	ND	ND	ND
4-Methyl-2-Pentanone	ND	ND	ND	ND	ND	ND	ND	ND
2-Hexanone	ND	ND	ND	ND	ND	ND	ND	ND
Tetrachloroethene	ND	ND	ND	ND	ND	ND	ND	ND
Toluene	ND	ND	ND	ND	ND	ND	ND	ND
1,1,2,2-Tetrachloroethane	ND	ND	ND	ND	ND	ND	ND	ND
Chlorobenzene	ND	ND	ND	ND	ND	ND	ND	ND
Ethylbenzene	ND	ND	ND	ND	ND	ND	ND	ND
Styrene	ND	ND	ND	ND	ND	ND	ND	ND
Xylenes (Total)	ND	ND	ND	ND	ND	ND	ND	ND

NOTES:
ND - compound analyzed for but not detected
B - compound found in lab blank as well as sample, indicates possible/probable blank contamination
E - estimated value
J - estimated value, compound present below CRQL but above IDL
R - analysis did not pass EPA QA/QC
N - Presumptive evidence of the presence of the material
NR - analysis not required
Detection limits elevated if Dilution Factor >1 and/or percent moisture >0%

CHM 001 0872

CHEMSOL, INC.
SUMMARY OF ANALYTICAL RESULTS
SAMPLING DATES: 8/6/91-9/24/91
LAB NAME: ENVSYS

	CASE#: 16985 SAMPLED: 8/20/91				CASE#: 17021 SAMPLED: 8/27/91			
SEMI-VOLATILES								
Sample ID No.	CI-SW-01-3	CI-SW-02-3	CI-SW-03-3	CI-SW-TB-3	CI-SW-01-4	CI-SW-02-4	CI-SW-03-4	CI-SW-TB-4
Traffic Report No.	BKA10	BKA11	BKA12	BKA13	BKA14	BKA15	BKA16	BKA17
Matrix	WATER	WATER	WATER	WATER	WATER	WATER	WATER	WATER
Units	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L
Dilution Factor/GPC Cleanup (Y)	1	1	1	NA	1	1	1	NA
Percent Moisture	--	--	--	--	--	--	--	--
Phenol	ND	ND	ND	NR	ND	ND	ND	NR
bis(2-Chloroethyl)ether	ND	ND	ND	NR	ND	ND	ND	NR
2-Chlorophenol	ND	ND	ND	NR	ND	ND	ND	NR
1,3-Dichlorobenzene	ND	ND	ND	NR	ND	ND	ND	NR
1,4-Dichlorobenzene	ND	ND	ND	NR	ND	ND	ND	NR
1,2-Dichlorobenzene	ND	ND	ND	NR	ND	ND	ND	NR
2-Methylphenol	ND	ND	ND	NR	ND	ND	ND	NR
2,2'-oxybis(1-Chloropropane)	ND	ND	ND	NR	ND	ND	ND	NR
4-Methylphenol	ND	ND	ND	NR	ND	ND	ND	NR
N-Nitroso-di-n-dipropylamine	ND	ND	ND	NR	ND	ND	ND	NR
Hexachloroethane	ND	ND	ND	NR	ND	ND	ND	NR
Nitrobenzene	ND	ND	ND	NR	ND	ND	ND	NR
Isophorone	ND	ND	ND	NR	ND	ND	ND	NR
2-Nitrophenol	ND	ND	ND	NR	ND	ND	ND	NR
2,4-Dimethylphenol	ND	ND	ND	NR	ND	ND	ND	NR
bis(2-Chloroethoxy)methane	ND	ND	ND	NR	ND	ND	ND	NR
2,4-Dichlorophenol	ND	ND	ND	NR	ND	ND	ND	NR
Carbazole	ND	ND	ND	NR	ND	ND	ND	NR
1,2,4-Trichlorobenzene	ND	ND	ND	NR	ND	ND	ND	NR
Naphthalene	ND	ND	ND	NR	ND	ND	ND	NR
4-Chloroaniline	ND	ND	ND	NR	ND	ND	ND	NR
Hexachlorobutadiene	ND	ND	ND	NR	ND	ND	ND	NR
4-Chloro-3-Methylphenol	ND	ND	ND	NR	ND	ND	ND	NR
2-Methylnaphthalene	ND	ND	ND	NR	ND	ND	ND	NR
Hexachlorocyclopentadiene	ND	ND	ND	NR	ND	ND	ND	NR
2,4,6-Trichlorophenol	ND	ND	ND	NR	ND	ND	ND	NR
2,4,5-Trichlorophenol	ND	ND	ND	NR	ND	ND	ND	NR
2-Chloronaphthalene	ND	ND	ND	NR	ND	ND	ND	NR
2-Nitroaniline	ND	ND	ND	NR	ND	ND	ND	NR
Dimethylphthalate	ND	ND	ND	NR	ND	ND	ND	NR
Acenaphthylene	ND	ND	ND	NR	ND	ND	ND	NR
2,6-Dinitrotoluene	ND	ND	ND	NR	ND	ND	ND	NR
3-Nitroaniline	ND	ND	ND	NR	R	R	R	NR
Acenaphthene	ND	ND	ND	NR	ND	ND	ND	NR
2,4-Dinitrophenol	ND	ND	ND	NR	ND	ND	ND	NR
4-Nitrophenol	ND	ND	ND	NR	ND	ND	ND	NR
Dibenzofuran	ND	ND	ND	NR	ND	ND	ND	NR
2,4-Dinitrotoluene	ND	ND	ND	NR	ND	ND	ND	NR
Diethylphthalate	ND	ND	ND	NR	ND	ND	ND	NR
4-Chlorophenyl-phenyl ether	ND	ND	ND	NR	ND	ND	ND	NR
Fluorene	ND	ND	ND	NR	ND	ND	ND	NR
4-Nitroaniline	ND	ND	ND	NR	ND	ND	ND	NR
4,6-Dinitro-2-methylphenol	ND	ND	ND	NR	ND	ND	ND	NR
N-nitrosodiphenylamine	ND	ND	ND	NR	ND	ND	ND	NR
4-Bromophenyl-phenyl ether	ND	ND	ND	NR	ND	ND	ND	NR
Hexachlorobenzene	ND	ND	ND	NR	ND	ND	ND	NR
Pentachlorophenol	ND	ND	ND	NR	ND	ND	ND	NR
Phenanthrene	ND	ND	ND	NR	ND	ND	ND	NR
Anthracene	ND	ND	ND	NR	ND	ND	ND	NR

CHEMSOL, INC.
SUMMARY OF ANALYTICAL RESULTS
SAMPLING DATES: 8/6/91-9/24/91
LAB NAME: ENVSYS

	CASE#: 16985 SAMPLED: 8/20/91				CASE#: 17021 SAMPLED: 8/27/91			
SEMI-VOLATILES								
Sample ID No.	CI-SW-01-3	CI-SW-02-3	CI-SW-03-3	CI-SW-TB-3	CI-SW-01-4	CI-SW-02-4	CI-SW-03-4	CI-SW-TB-4
Traffic Report No.	BKA10	BKA11	BKA12	BKA13	BKA14	BKA15	BKA16	BKA17
Matrix	WATER	WATER	WATER	WATER	WATER	WATER	WATER	WATER
Units	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L
Dilution Factor/GPC Cleanup (Y)	1	1	1	NA	1	1	1	NA
Percent Moisture	--	--	--	--	--	--	--	--
Di-n-butylphthalate	ND	ND	ND	NR	ND	ND	ND	NR
Fluoranthene	ND	ND	ND	NR	ND	ND	ND	NR
Pyrene	ND	ND	ND	NR	ND	ND	ND	NR
Butylbenzylphthalate	ND	ND	ND	NR	ND	ND	ND	NR
3,3'-Dichlorobenzidine	ND	ND	ND	NR	ND	ND	ND	NR
Benzo(a)anthracene	ND	ND	ND	NR	ND	ND	ND	NR
Chrysene	ND	ND	ND	NR	ND	ND	ND	NR
bis(2-Ethylhexyl)phthalate	ND	ND	ND	NR	ND	6 J	ND	NR
Di-n-octylphthalate	ND	ND	ND	NR	ND	ND	ND	NR
Benzo(b)fluoranthene	ND	ND	ND	NR	ND	ND	ND	NR
Benzo(k)fluoranthene	ND	ND	ND	NR	ND	ND	ND	NR
Benzo(a)pyrene	ND	ND	ND	NR	ND	ND	ND	NR
Indeno(1,2,3-cd)pyrene	ND	ND	ND	NR	ND	ND	ND	NR
Dibenz(a,h)anthracene	ND	ND	ND	NR	ND	ND	ND	NR
Benzo(g,h,i)perylene	ND	ND	ND	NR	ND	ND	ND	NR

NOTES:
ND - compound analyzed for but not detected
B - compound found in lab blank as well as sample, indicates possible/probable blank contamination
E - estimated value
J - estimated value, compound present below CRQL but above IDL
R - analysis did not pass EPA QA/QC
N - Presumptive evidence of the presence of the material
NR - analysis not required
Detection limits elevated if Dilution Factor >1 and/or percent moisture >0%

CHM 001 0874

CHEMSOL, INC.
SUMMARY OF ANALYTICAL RESULTS
SAMPLING DATES: 8/6/91-9/24/91
LAB NAME: ENVSYS

	CASE#: 16985 SAMPLED: 8/20/91				CASE#: 17021 SAMPLED: 8/27/91			
PESTICIDES Sample ID No.	CI-SW-01-3	CI-SW-02-3	CI-SW-03-3	CI-SW-TB-3	CI-SW-01-4	CI-SW-02-4	CI-SW-03-4	CI-SW-TB-4
Traffic Report No.	BKA10	BKA11	BKA12	BKA13	BKA14	BKA15	BKA16	BKA17
Matrix	WATER	WATER	WATER	WATER	WATER	WATER	WATER	WATER
Units	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L
Dilution Factor/GPC Cleanup (Y)	1	1	1	NA	1	1	1	NA
Percent Moisture	--	--	--	--	--	--	--	--
alpha-BHC	ND	ND	ND	NR	ND	ND	ND	NR
beta-BHC	ND	ND	ND	NR	ND	ND	ND	NR
delta-BHC	ND	ND	ND	NR	ND	ND	ND	NR
gamma-BHC (Lindane)	ND	ND	ND	NR	ND	ND	ND	NR
Heptachlor	ND	ND	ND	NR	ND	ND	ND	NR
Aldrin	ND	ND	ND	NR	ND	ND	ND	NR
Heptachlor epoxide	ND	ND	ND	NR	ND	ND	ND	NR
Endosulfan I	ND	ND	ND	NR	ND	ND	ND	NR
Dieldrin	ND	ND	ND	NR	ND	ND	ND	NR
4,4'-DDE	ND	ND	ND	NR	ND	ND	ND	NR
Endrin	ND	ND	ND	NR	ND	ND	ND	NR
Endosulfan II	ND	ND	ND	NR	ND	ND	ND	NR
4,4'-DDD	ND	ND	ND	NR	ND	ND	ND	NR
Endosulfan sulfate	ND	ND	ND	NR	ND	ND	ND	NR
4,4'-DDT	ND	ND	ND	NR	ND	ND	ND	NR
Methoxychlor	ND	ND	ND	NR	ND	ND	ND	NR
Endrin ketone	ND	ND	ND	NR	ND	ND	ND	NR
alpha-Chlordane	ND	ND	ND	NR	ND	ND	ND	NR
gamma-Chlordane	ND	ND	ND	NR	ND	ND	ND	NR
Toxaphene	ND	ND	ND	NR	ND	ND	ND	NR
Aroclor-1016	ND	ND	ND	NR	ND	ND	ND	NR
Aroclor-1221	ND	ND	ND	NR	ND	ND	ND	NR
Aroclor-1232	ND	ND	ND	NR	ND	ND	ND	NR
Aroclor-1242	ND	ND	ND	NR	ND	ND	ND	NR
Aroclor-1248	ND	ND	ND	NR	ND	ND	ND	NR
Aroclor-1254	ND	ND	ND	NR	ND	ND	ND	NR
Aroclor-1260	ND	ND	ND	NR	ND	ND	ND	NR

NOTES:
ND - compound analyzed for but not detected
B - compound found in lab blank as well as sample, indicates possible/probable blank contamination
E - estimated value
J - estimated value, compound present below CRQL but above IDL
R - analysis did not pass EPA QA/QC
N - Presumptive evidence of the presence of the material
NR - analysis not required
Detection limits elevated if Dilution Factor >1 and/or percent moisture >0%

CHM 001 0875

SITE NAME: CHEMSOL, INC.
SUMMARY OF ANALYTICAL RESULTS
SAMPLING DATES: 8/6/91-9/25/91
EPA CASE NO.: 6438B-01
LAB NAME: RECNY

NON-TCL VOLATILES & SEMI-VOLATILES	SAMPLED: 8/20/91				SAMPLED: 8/27/91			
Sample ID No.	CI-SW-01-3	CI-SW-02-3	CI-SW-03-3	CI-SW-TB-3	CI-SW-01-4	CI-SW-02-4	CI-SW-03-4	CI-SW-TB-4
Traffic Report No.	6438B-01-10	6438B-01-11	6438B-01-12	6438B-01-13	6438B-01-14	6438B-01-15	6438B-01-16	6438B-01-17
Matrix	WATER	WATER	WATER	WATER	WATER	WATER	WATER	WATER
Units	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L
Acrolein	ND	ND	ND	ND	ND	ND	ND	ND
Acrylonitrile	ND	ND	ND	ND	ND	ND	ND	ND
Benzidine	R	ND	ND	NR	R	ND	ND	NR
Azobenzene	ND	ND	ND	NR	ND	ND	ND	NR
n-Nitrosodimethylamine	ND	ND	ND	NR	ND	ND	ND	NR

NOTES:
ND - compound analyzed for but not detected
R - analysis did not pass EPA QA/QC
NR - analysis not required

CHEMSOL, INC.
SUMMARY OF ANALYTICAL RESULTS
SAMPLING DATES: 8/6/91-9/24/91
EPA CASE NO.: 6330B-01
LAB NAME: SWRI

DIOXIN	SAMPLED: 8/20/91							SAMPLED: 8/27/91		
Sample ID No.	CI-SW-01-3	CI-SW-02-3	CI-SW-03-3	FORTIFIED PEM	FORTIFIED PEM	BLIND BLANK	KNOWN BLANK	CI-SW-01-4	CI-SW-02-4	CI-SW-03-4
Traffic Report No.	6330B-01-10	6330B-01-11	6330B-01-12	6330B-01-39	6330B-01-40	6330B-01-41	6330B-01-42	6330B-01-14	6330B-01-15	6330B-01-16
Matrix	WATER	WATER	WATER	SOIL	SOIL	SOIL	SOIL	WATER	WATER	WATER
Units	ug/L	ug/L	ug/L	mg/kg	mg/kg	mg/kg	mg/kg	ug/L	ug/L	ug/L
2,3,7,8-TCDD	ND	ND	ND	0.9	0.86	ND	ND	ND	ND	ND

NOTES:
ND - compound analyzed for but not detected

SITE NAME: CHEMSOL, INC.
SUMMARY OF ANALYTICAL RESULTS
SAMPLING DATES: 8/6/91-9/25/91
EPA CASE NO.: 6526B-01
LAB NAME: EAENG

WATER QUALITY PARAMETERS	SAMPLED: 8/20/91			SAMPLED: 8/27/91		
Sample ID No.	CI-SW-01-3	CI-SW-02-3	CI-SW-03-3	CI-SW-01-4	CI-SW-02-4	CI-SW-03-4
Traffic Report No.	6526B-10	6526B-11	6526B-12	6526B-14	6526B-15	6526B-16
Matrix	WATER	WATER	WATER	WATER	WATER	WATER
Hardness (mg Ca/CO3/L)	93.7	142	114	139	149	154
Total Dissolved Solids (mg/L)	128	142	157	208	207	206
Total Suspended Solids (mg/L)	19	9	9	ND	8	36
Sulfate (mg/L)	17.3	19.7	18.4	12.6	11.6	16
Bromide (mg/L)	2.2 E	2.4	2.9	2.7	2.3	2.2
Total Phosphorous (mg P/L)	0.083	0.13	0.14	0.11	0.13	0.26
Alkalinity (mg CaCO3/L)	87.4	87.4	97.8	137	148	141
Ammonia (mg N/L)	ND	ND	ND	ND	0.056	0.16
Biochemical Oxygen Demand (mg/L)	ND	ND	ND	ND	ND	2.6 E
Chemical Oxygen Demand (mg/L)	ND	ND	ND	ND	ND	ND
Chloride (mg/L)	8.2	8.2	8.8	16.2 E	18.5 E	13.8 E
Methyl Blue Active Substance (mg/L)	ND	ND	ND	0.054	0.07	0.07
Oil & Grease (mg/L)	0.75 E	1 E	1 E	1.9 E	3 E	1.4 E
Total Petroleum Hydrocarbons (mg/L)	0.99 E	1 E	0.18 E	ND	1.1 E	ND
Total Organic Carbon (mg/L)	6.4 E	5.9	6.9	5.1	5.2	5.8

NOTES:
ND - compound analyzed for but not detected
E - estimated value
J - estimated value, compound present below CRDL but above IDL
R - analysis did not pass EPA QA/QC
NR - analysis not required

CHEMSOL, INC.
SUMMARY OF ANALYTICAL RESULTS
SAMPLING DATES: 8/6/91-9/24/91
LAB NAME: ENVSYS

CASE#: 17053
SAMPLED: 9/5/91

VOLATILES									
Sample ID No.	CI-SW-01-5	CI-SW-02-5	CI-SW-03-5	CI-SW-TB-5	CI-SW-FD-5	CI-SW-FB-5	CI-SD-01-5	CI-SD-FD-5	CI-SD-FB-5
Traffic Report No.	BKA18	BKA19	BKA20	BKA21	BKA04	BKA29	BKA22	BKA24	BKA23
Matrix	WATER	WATER	WATER	WATER	WATER	WATER	SEDIMENT	SEDIMENT	WATER
Units	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/kg	ug/kg	ug/L
Dilution Factor	1	1	1	1	1	1	1	1	1
Percent Moisture	--	--	--	--	--	--	18	14	--
Chloromethane	ND	ND	ND	ND	ND	ND	ND	ND	ND
Bromomethane	ND	ND	ND	ND	ND	ND	ND	ND	ND
Vinyl Chloride	ND	ND	ND	ND	ND	ND	ND	ND	ND
Chloroethane	ND	ND	ND	ND	ND	ND	ND	ND	ND
Methylene Chloride	ND	ND	ND	ND	ND	ND	4 J	4 J	ND
Acetone	ND	ND	ND	ND	ND	ND	ND	15 E	ND
Carbon Disulfide	ND	ND	ND	ND	ND	ND	ND	ND	11
1,1-Dichloroethene	ND	ND	ND	ND	ND	ND	ND	ND	ND
1,1-Dichloroethane	ND	ND	ND	ND	ND	ND	ND	ND	ND
1,2-Dichloroethene (total)	ND	ND	ND	ND	ND	ND	ND	ND	ND
Chloroform	ND	ND	ND	ND	ND	ND	ND	ND	ND
1,2-Dichloroethane	ND	ND	ND	ND	ND	ND	ND	ND	ND
2-Butanone	ND	ND	ND	ND	ND	ND	ND	ND	ND
1,1,1-Trichloroethane	ND	ND	ND	ND	ND	ND	3 J	3 J	ND
Carbon Tetrachloride	ND	ND	ND	ND	ND	ND	ND	ND	ND
Bromodichloromethane	ND	ND	ND	ND	ND	ND	ND	ND	ND
1,2-Dichloropropane	ND	ND	ND	ND	ND	ND	ND	ND	ND
cis-1,3-Dichloropropene	ND	ND	ND	ND	ND	ND	ND	ND	ND
Trichloroethene	ND	ND	ND	ND	ND	ND	ND	ND	ND
Dibromochloromethane	ND	ND	ND	ND	ND	ND	ND	ND	ND
1,1,2-Trichloroethane	ND	ND	ND	ND	ND	ND	ND	ND	ND
Benzene	ND	ND	ND	ND	ND	ND	ND	ND	ND
trans-1,3-Dichloropropene	ND	ND	ND	ND	ND	ND	ND	ND	ND
Bromoform	ND	ND	ND	ND	ND	ND	ND	ND	ND
4-Methyl-2-Pentanone	ND	ND	ND	ND	ND	ND	ND	ND	ND
2-Hexanone	ND	ND	ND	ND	ND	ND	ND	ND	ND
Tetrachloroethene	ND	ND	ND	ND	ND	ND	ND	ND	ND
Toluene	ND	ND	ND	ND	ND	ND	ND	ND	ND
1,1,2,2-Tetrachloroethane	ND	ND	ND	ND	ND	ND	ND	ND	ND
Chlorobenzene	ND	ND	ND	ND	ND	ND	ND	ND	ND
Ethylbenzene	ND	ND	ND	ND	ND	ND	ND	ND	ND
Styrene	ND	ND	ND	ND	ND	ND	ND	ND	ND
Xylenes (Total)	ND	ND	ND	ND	ND	ND	ND	ND	ND

NOTES:
ND - compound analyzed for but not detected
B - compound found in lab blank as well as sample, indicates possible/probable blank contamination
E - estimated value
J - estimated value, compound present below CRQL but above IDL
R - analysis did not pass EPA QA/QC
N - Presumptive evidence of the presence of the material
NR - analysis not required
Detection limits elevated if Dilution Factor >1 and/or percent moisture >0%

CHEMSOL, INC.
SUMMARY OF ANALYTICAL RESULTS
SAMPLING DATES: 8/6/91-9/24/91
LAB NAME: ENVSYS

CASE#: 17053
SAMPLED: 9/5/91

SEMI-VOLATILES									
Sample ID No.	CI-SW-01-5	CI-SW-02-5	CI-SW-03-5	CI-SW-TB-5	CI-SW-FD-5	CI-SW-FB-5	CI-SD-01-5	CI-SD-FD-5	CI-SD-FB-5
Traffic Report No.	BKA18	BKA19	BKA20	BKA21	BKA04	BKA29	BKA22	BKA24	BKA23
Matrix	WATER	WATER	WATER	WATER	WATER	WATER	SEDIMENT	SEDIMENT	WATER
Units	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/kg	ug/kg	ug/L
Dilution Factor/GPC Cleanup (Y)	1	1	1	NA	1	1	1	1	1
Percent Moisture	--	--	--	--	--	--	18	14	--
Phenol	ND	ND	ND	NR	ND	ND	R	R	ND
bis(2-Chloroethyl)ether	ND	ND	ND	NR	ND	ND	R	R	ND
2-Chlorophenol	ND	ND	ND	NR	ND	ND	R	R	ND
1,3-Dichlorobenzene	ND	ND	ND	NR	ND	ND	R	R	ND
1,4-Dichlorobenzene	ND	ND	ND	NR	ND	ND	R	R	ND
1,2-Dichlorobenzene	ND	ND	ND	NR	ND	ND	R	R	ND
2-Methylphenol	ND	ND	ND	NR	ND	ND	R	R	ND
2,2'-oxybis(1-Chloropropane)	ND	ND	ND	NR	ND	ND	R	R	R
4-Methylphenol	ND	ND	ND	NR	ND	ND	R	R	ND
N-Nitroso-di-n-dipropylamine	ND	ND	ND	NR	ND	ND	R	R	ND
Hexachloroethane	ND	ND	ND	NR	ND	ND	R	R	ND
Nitrobenzene	ND	ND	ND	NR	ND	ND	R	R	ND
Isophorone	ND	ND	ND	NR	ND	ND	R	R	ND
2-Nitrophenol	ND	ND	ND	NR	ND	ND	R	R	ND
2,4-Dimethylphenol	ND	ND	ND	NR	ND	ND	R	R	ND
bis(2-Chloroethoxy)methane	ND	ND	ND	NR	ND	ND	R	R	ND
2,4-Dichlorophenol	ND	ND	ND	NR	ND	ND	R	R	ND
Carbazole	ND	ND	ND	NR	ND	ND	R	R	ND
1,2,4-Trichlorobenzene	ND	ND	ND	NR	ND	ND	R	R	ND
Naphthalene	ND	ND	ND	NR	ND	ND	R	R	ND
4-Chloroaniline	ND	ND	ND	NR	ND	ND	R	R	ND
Hexachlorobutadiene	ND	ND	ND	NR	ND	ND	R	R	ND
4-Chloro-3-Methylphenol	ND	ND	ND	NR	ND	ND	R	R	ND
2-Methylnaphthalene	ND	ND	ND	NR	ND	ND	R	R	ND
Hexachlorocyclopentadiene	ND	ND	ND	NR	ND	ND	R	R	ND
2,4,6-Trichlorophenol	ND	ND	ND	NR	ND	ND	R	R	ND
2,4,5-Trichlorophenol	ND	ND	ND	NR	ND	ND	R	R	ND
2-Chloronaphthalene	ND	ND	ND	NR	ND	ND	R	R	ND
2-Nitroaniline	ND	ND	ND	NR	ND	ND	R	R	ND
Dimethylphthalate	ND	ND	ND	NR	ND	ND	R	R	ND
Acenaphthylene	ND	ND	ND	NR	ND	ND	R	R	ND
2,6-Dinitrotoluene	ND	ND	ND	NR	ND	ND	R	R	ND
3-Nitroaniline	ND	ND	ND	NR	ND	ND	R	R	ND
Acenaphthene	ND	ND	ND	NR	ND	ND	R	R	ND
2,4-Dinitrophenol	ND	ND	ND	NR	ND	ND	R	R	ND
4-Nitrophenol	ND	ND	ND	NR	ND	ND	R	R	ND
Dibenzofuran	ND	ND	ND	NR	ND	ND	R	R	ND
2,4-Dinitrotoluene	ND	ND	ND	NR	ND	ND	R	R	ND
Diethylphthalate	ND	ND	ND	NR	ND	ND	R	R	ND
4-Chlorophenyl-phenyl ether	ND	ND	ND	NR	ND	ND	R	R	ND
Fluorene	ND	ND	ND	NR	ND	ND	R	R	ND
4-Nitroaniline	R	ND	ND	NR	ND	ND	R	R	ND
4,6-Dinitro-2-methylphenol	ND	ND	ND	NR	ND	ND	R	R	ND
N-nitrosodiphenylamine	ND	ND	ND	NR	ND	ND	R	R	ND
4-Bromophenyl-phenyl ether	ND	ND	ND	NR	ND	ND	R	R	ND
Hexachlorobenzene	ND	ND	ND	NR	ND	ND	R	R	ND
Pentachlorophenol	ND	ND	ND	NR	ND	ND	R	R	ND
Phenanthrene	ND	ND	ND	NR	ND	ND	190 J	R	ND
Anthracene	ND	ND	ND	NR	ND	ND	R	R	ND

CHEMSOL, INC.
SUMMARY OF ANALYTICAL RESULTS
SAMPLING DATES: 8/6/91-9/24/91
LAB NAME: ENVSYS

CASE#: 17053
SAMPLED: 9/5/91

SEMI-VOLATILES	CI-SW-01-5	CI-SW-02-5	CI-SW-03-5	CI-SW-TB-5	CI-SW-FD-5	CI-SW-FB-5	CI-SD-01-5	CI-SD-FD-5	CI-SD-FB-5
Sample ID No.	BKA18	BKA19	BKA20	BKA21	BKA04	BKA29	BKA22	BKA24	BKA23
Traffic Report No.	WATER	WATER	WATER	WATER	WATER	WATER	SEDIMENT	SEDIMENT	WATER
Matrix	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/kg	ug/kg	ug/L
Units	1	1	1	NA	1	1	1	1	1
Dilution Factor/GPC Cleanup (Y)	--	--	--	--	--	--	18	14	--
Percent Moisture									
Di-n-butylphthalate	ND	ND	ND	NR	ND	ND	R	R	ND
Fluoranthene	ND	ND	ND	NR	ND	ND	300 J	R	ND
Pyrene	ND	ND	ND	NR	ND	ND	180 J	R	ND
Butylbenzylphthalate	ND	ND	ND	NR	ND	ND	R	320 J	ND
3,3'-Dichlorobenzidine	ND	ND	ND	NR	ND	ND	R	R	ND
Benzo(a)anthracene	ND	ND	ND	NR	ND	ND	R	R	ND
Chrysene	ND	ND	ND	NR	ND	ND	R	R	ND
bis(2-Ethylhexyl)phthalate	ND	ND	ND	NR	ND	22	R	R	120 E
Di-n-octylphthalate	ND	ND	ND	NR	ND	ND	R	R	ND
Benzo(b)fluoranthene	ND	ND	ND	NR	ND	ND	180 J	R	ND
Benzo(k)fluoranthene	ND	ND	ND	NR	ND	ND	R	R	ND
Benzo(a)pyrene	ND	ND	ND	NR	ND	ND	R	R	ND
Indeno(1,2,3-cd)pyrene	ND	ND	ND	NR	ND	ND	R	R	ND
Dibenz(a,h)anthracene	ND	ND	ND	NR	ND	ND	R	R	ND
Benzo(g,h,i)perylene	ND	ND	ND	NR	ND	ND	R	R	ND

NOTES:
ND - compound analyzed for but not detected
B - compound found in lab blank as well as sample, indicates possible/probable blank contamination
E - estimated value
J - estimated value, compound present below CRQL but above IDL
R - analysis did not pass EPA QA/QC
N - Presumptive evidence of the presence of the material
NR - analysis not required
Detection limits elevated if Dilution Factor >1 and/or percent moisture >0%

CHEMSOL, INC.
SUMMARY OF ANALYTICAL RESULTS
SAMPLING DATES: 8/6/91-9/24/91
LAB NAME: ENVSYS

CASE#: 17053
SAMPLED: 9/5/91

PESTICIDES	CI-SW-01-5	CI-SW-02-5	CI-SW-03-5	CI-SW-TB-5	CI-SW-FD-5	CI-SW-FB-5	CI-SD-01-5	CI-SD-FD-5	CI-SD-FB-5
Sample ID No.	BKA18	BKA19	BKA20	BKA21	BKA04	BKA29	BKA22	BKA24	BKA23
Traffic Report No.	WATER	WATER	WATER	WATER	WATER	WATER	SEDIMENT	SEDIMENT	WATER
Matrix	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/kg	ug/kg	ug/L
Units	1	1	1	NA	1	1	1	1	1
Dilution Factor/GPC Cleanup (Y)	--	--	--	--	--	--	18	14	--
Percent Moisture									
alpha-BHC	ND	ND	ND	NR	ND	ND	ND	ND	ND
beta-BHC	ND	ND	ND	NR	ND	ND	ND	ND	ND
delta-BHC	ND	ND	ND	NR	ND	ND	ND	ND	ND
gamma-BHC (Lindane)	ND	ND	ND	NR	ND	ND	ND	ND	ND
Heptachlor	ND	ND	ND	NR	ND	ND	ND	ND	ND
Aldrin	ND	ND	ND	NR	ND	ND	ND	ND	ND
Heptachlor epoxide	ND	ND	ND	NR	ND	ND	ND	ND	ND
Endosulfan I	ND	ND	ND	NR	ND	ND	ND	ND	ND
Dieldrin	ND	ND	ND	NR	ND	ND	ND	ND	ND
4,4'-DDE	ND	ND	ND	NR	ND	ND	ND	ND	ND
Endrin	ND	ND	ND	NR	ND	ND	ND	ND	ND
Endosulfan II	ND	ND	ND	NR	ND	ND	ND	ND	ND
4,4'-DDD	ND	ND	ND	NR	ND	ND	ND	ND	ND
Endosulfan sulfate	ND	ND	ND	NR	ND	ND	ND	ND	ND
4,4'-DDT	ND	ND	ND	NR	ND	ND	ND	ND	ND
Methoxychlor	ND	ND	ND	NR	ND	ND	ND	ND	ND
Endrin ketone	ND	ND	ND	NR	ND	ND	ND	ND	ND
alpha-Chlordane	ND	ND	ND	NR	ND	ND	ND	ND	ND
gamma-Chlordane	ND	ND	ND	NR	ND	ND	ND	ND	ND
Toxaphene	ND	ND	ND	NR	ND	ND	ND	ND	ND
Aroclor-1016	ND	ND	ND	NR	ND	ND	ND	ND	ND
Aroclor-1221	ND	ND	ND	NR	ND	ND	ND	ND	ND
Aroclor-1232	ND	ND	ND	NR	ND	ND	ND	ND	ND
Aroclor-1242	ND	ND	ND	NR	ND	ND	ND	ND	ND
Aroclor-1248	ND	ND	ND	NR	ND	ND	ND	ND	ND
Aroclor-1254	ND	ND	ND	NR	ND	ND	ND	ND	ND
Aroclor-1260	ND	ND	ND	NR	ND	ND	ND	ND	ND

NOTES:
ND - compound analyzed for but not detected
B - compound found in lab blank as well as sample, indicates possible/probable blank contamination
E - estimated value
J - estimated value, compound present below CRQL but above IDL
R - analysis did not pass EPA QA/QC
N - Presumptive evidence of the presence of the material
NR - analysis not required
Detection limits elevated if Dilution Factor >1 and/or percent moisture >0%

CHM 001 0882

SITE NAME: CHEMSOL, INC
SUMMARY OF ANALYTICAL RESULTS
SAMPLING DATES: 8/6/91-9/25/91
EPA CASE NO.: 6438B-01
LAB NAME: RECNY

NON-TCL VOLATILES & SEMI-VOLATILES	SAMPLED: 9/5/91								
Sample ID No.	CI-SW-01-5	CI-SW-02-5	CI-SW-03-5	CI-SW-TB-5	CI-SW-FD-5	CI-SW-FB-5	CI-SD-01-5	CI-SD-FD-5	CI-SD-FB-5
Traffic Report No.	6438B-01-18	6438B-01-19	6438B-01-20	6438B-01-21	6438B-01-04	6438B-01-29	6438B-01-22	6438B-01-24	6438B-01-23
Matrix	WATER	WATER	WATER	WATER	WATER	WATER	SEDIMENT	SEDIMENT	WATER
Units	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	mg/kg	mg/kg	ug/L
Acrolein	ND	ND	ND	ND	ND	ND	ND	ND	ND
Acrylonitrile	ND	ND	ND	ND	ND	ND	ND	ND	ND
Benzidine	R	ND	ND	NR	NR	ND	R	ND	ND
Azobenzene	ND	ND	ND	NR	NR	ND	ND	ND	ND
n-Nitrosodimethylamine	ND	ND	ND	NR	NR	ND	ND	ND	ND

NOTES:
ND - compound analyzed for but not detected
R - analysis did not pass EPA QA/QC
NR - analysis not required

CHEMSOL, INC.
SUMMARY OF ANALYTICAL RESULTS
SAMPLING DATES: 8/6/91-9/24/91
EPA CASE NO.: 6330B-01
LAB NAME: SWRI

DIOXIN	SAMPLED: 9/5/91							
Sample ID No.	CI-SW-01-5	CI-SW-02-5	CI-SW-03-5	CI-SW-FD-5	CI-SW-FB-5	CI-SD-01-5	CI-SD-FD-5	CI-SD-FB-5
Traffic Report No.	6330B-01-18	6330B-01-19	6330B-01-20	6330B-01-04	6330B-01-29	6330B-01-22	6330B-01-24	6330B-01-23
Matrix	WATER	WATER	WATER	WATER	WATER	SEDIMENT	SEDIMENT	WATER
Units	ug/L	ug/L	ug/L	ug/L	ug/L	mg/kg	mg/kg	ug/L
2,3,7,8-TCDD	ND	ND	ND	ND	ND	ND	ND	ND

NOTES:
ND - compound analyzed for but
not detected

SITE NAME: CHEMSOL, INC.
SUMMARY OF ANALYTICAL RESULTS
SAMPLING DATES: 8/6/91-9/25/91
EPA CASE NO.: 6526B-01
LAB NAME: EAENG

WATER QUALITY PARAMETERS	SAMPLED: 9/5/91							
Sample ID No.	CI-SW-01-5	CI-SW-02-5	CI-SW-03-5	CI-SW-FD-5	CI-SW-FB-5	CI-SD-01-5	CI-SD-FD-5	CI-SD-FB-5
Traffic Report No.	6526B-18	6526B-19	6526B-20	6526B-04	6526B-29	6526B-22	6526B-24	6526B-23
Matrix	WATER	WATER	WATER	WATER	WATER	SEDIMENT	SEDIMENT	WATER
Hardness (mg Ca/CO3/L)	57.1	59.7	117	137	ND	NR	NR	NR
Total Dissolved Solids (mg/L)	134	R	242	234	26	NR	NR	NR
Total Suspended Solids (mg/L)	43	61	40 E	9 E	ND	NR	NR	NR
Sulfate (mg/L)	22.6	29.4	34.9	36.1	ND	ND	ND	ND
Bromide (mg/L)	3.4	2.1	ND	ND	ND	NR	NR	NR
Total Phosphorous (mg P/L)	0.26 E	0.26 E	0.17 E	0.18 E	ND	NR	NR	NR
Alkalinity (mg CaCO3/L)	33.8 E	50.6 E	92.8 E	97.1 E	ND	NR	NR	NR
Ammonia (mg N/L)	0.094	0.068	0.29	0.29	ND	ND	2.87 E	ND
Biochemical Oxygen Demand (mg/L)	5 E	4.3 E	2.9 E	3.6 E	ND	NR	NR	NR
Chemical Oxygen Demand (mg/L)	69.4 E	40.9 E	73.5 E	20.5 E	ND	NR	NR	NR
Chloride (mg/L)	6.2	7.9	11.4	12.1	ND	28.5	32.9	ND
Methyl Blue Active Substance (mg/L)	0.32	0.32	0.2	0.21	ND	NR	NR	NR
Oil & Grease (mg/L)	4.5	R	R	R	0.86	135	216	0.64
Total Petroleum Hydrocarbons (mg/L)	ND	ND	ND	ND	ND	105	139	ND
Total Organic Carbon (mg/L)	15	15.6	10.2	10.5	ND	2420	2380	ND

NOTES:
ND - compound analyzed for but not detected
E - estimated value
J - estimated value, compound present below CRDL but above IDL
R - analysis did not pass EPA QA/QC
NR - analysis not required

CHEMSOL, INC.
SUMMARY OF ANALYTICAL RESULTS
SAMPLING DATES: 8/6/91-9/24/91
LAB NAME: ENVSYS

	CASE#: 17082 SAMPLED: 9/10/91		CASE#: 17098 SAMPLED: 9/17/91			CASE#: 17148 SAMPLED: 9/24/91	
VOLATILES							
Sample ID No.	CI-SW-01-6	CI-SW-TB-6	CI-SW-01-7	CI-SW-FD-7	CI-SW-TB-7	CI-SW-01-8	CI-SW-TB-8
Traffic Report No.	BKA25	BKA28	BKA30	BKA34	BKA33	BKA35	BKA38
Matrix	WATER	WATER	WATER	WATER	WATER	WATER	WATER
Units	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L
Dilution Factor	1	1	1	1	1	1	1
Percent Moisture	--	--	--	--	--	--	--
Chloromethane	ND	ND	ND	ND	ND	ND	ND
Bromomethane	ND	ND	ND	ND	ND	ND	ND
Vinyl Chloride	ND	ND	ND	ND	ND	ND	ND
Chloroethane	ND	ND	ND	ND	ND	ND	ND
Methylene Chloride	ND	ND	ND	ND	ND	ND	ND
Acetone	ND	ND	ND	ND	10	10	ND
Carbon Disulfide	ND	ND	ND	ND	ND	ND	ND
1,1-Dichloroethene	ND	ND	ND	ND	ND	ND	ND
1,1-Dichloroethane	ND	ND	ND	ND	ND	ND	ND
1,2-Dichloroethene (total)	ND	ND	ND	ND	ND	ND	ND
Chloroform	ND	ND	ND	ND	ND	ND	ND
1,2-Dichloroethane	ND	ND	ND	ND	ND	ND	ND
2-Butanone	ND	ND	ND	ND	ND	ND	ND
1,1,1-Trichloroethane	ND	ND	ND	ND	ND	ND	ND
Carbon Tetrachloride	ND	ND	ND	ND	ND	ND	ND
Bromodichloromethane	ND	ND	ND	ND	ND	ND	ND
1,2-Dichloropropane	ND	ND	ND	ND	ND	ND	ND
cis-1,3-Dichloropropene	ND	ND	ND	ND	ND	ND	ND
Trichloroethene	ND	ND	ND	ND	ND	ND	ND
Dibromochloromethane	ND	ND	ND	ND	ND	ND	ND
1,1,2-Trichloroethane	ND	ND	ND	ND	ND	ND	ND
Benzene	ND	ND	ND	ND	ND	ND	ND
trans-1,3-Dichloropropene	ND	ND	ND	ND	ND	ND	ND
Bromoform	ND	ND	ND	ND	ND	ND	ND
4-Methyl-2-Pentanone	ND	ND	ND	ND	ND	ND	ND
2-Hexanone	ND	ND	ND	ND	ND	ND	ND
Tetrachloroethene	ND	ND	ND	ND	ND	ND	ND
Toluene	ND	ND	ND	ND	ND	ND	ND
1,1,2,2-Tetrachloroethane	ND	ND	ND	ND	ND	ND	ND
Chlorobenzene	ND	ND	ND	ND	ND	ND	ND
Ethylbenzene	ND	ND	ND	ND	ND	ND	ND
Styrene	ND	ND	ND	ND	ND	ND	ND
Xylenes (Total)	ND	ND	ND	ND	ND	ND	ND

NOTES:
ND - compound analyzed for but not detected
B - compound found in lab blank as well as sample, indicates possible/probable blank contamination
E - estimated value
J - estimated value, compound present below CRQL but above IDL
R - analysis did not pass EPA QA/QC
N - Presumptive evidence of the presence of the material
NR - analysis not required
Detection limits elevated if Dilution Factor >1 and/or percent moisture >0%

CHEMSOL, INC.
SUMMARY OF ANALYTICAL RESULTS
SAMPLING DATES: 8/6/91-9/24/91
LAB NAME: ENVSYS

	CASE#: 17082 SAMPLED: 9/10/91		CASE#: 17098 SAMPLED: 9/17/91			CASE#: 17148 SAMPLED: 9/24/91	
SEMI-VOLATILES							
Sample ID No.	CI-SW-01-6	CI-SW-TB-6	CI-SW-01-7	CI-SW-FD-7	CI-SW-TB-7	CI-SW-01-8	CI-SW-TB-8
Traffic Report No.	BKA25	BKA28	BKA30	BKA34	BKA33	BKA35	BKA38
Matrix	WATER	WATER	WATER	WATER	WATER	WATER	WATER
Units	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L
Dilution Factor/GPC Cleanup (Y)	1	NA	1	1	NA	1	1
Percent Moisture	--	--	--	--	--	--	--
Phenol	ND	NR	ND	ND	NR	ND	NR
bis(2-Chloroethyl)ether	ND	NR	ND	ND	NR	ND	NR
2-Chlorophenol	ND	NR	ND	ND	NR	ND	NR
1,3-Dichlorobenzene	ND	NR	ND	ND	NR	ND	NR
1,4-Dichlorobenzene	ND	NR	ND	ND	NR	ND	NR
1,2-Dichlorobenzene	ND	NR	ND	ND	NR	ND	NR
2-Methylphenol	ND	NR	ND	ND	NR	ND	NR
2,2'-oxybis(1-Chloropropane)	R	NR	ND	ND	NR	ND	NR
4-Methylphenol	ND	NR	ND	ND	NR	ND	NR
N-Nitroso-di-n-dipropylamine	ND	NR	ND	ND	NR	ND	NR
Hexachloroethane	ND	NR	ND	ND	NR	ND	NR
Nitrobenzene	ND	NR	ND	ND	NR	ND	NR
Isophorone	ND	NR	ND	ND	NR	ND	NR
2-Nitrophenol	ND	NR	ND	ND	NR	ND	NR
2,4-Dimethylphenol	ND	NR	ND	ND	NR	ND	NR
bis(2-Chloroethoxy)methane	ND	NR	ND	ND	NR	ND	NR
2,4-Dichlorophenol	ND	NR	ND	ND	NR	ND	NR
Carbazole	ND	NR	ND	ND	NR	ND	NR
1,2,4-Trichlorobenzene	ND	NR	ND	ND	NR	ND	NR
Naphthalene	ND	NR	ND	ND	NR	ND	NR
4-Chloroaniline	ND	NR	ND	ND	NR	ND	NR
Hexachlorobutadiene	ND	NR	ND	ND	NR	ND	NR
4-Chloro-3-Methylphenol	ND	NR	ND	ND	NR	ND	NR
2-Methylnaphthalene	ND	NR	ND	ND	NR	ND	NR
Hexachlorocyclopentadiene	ND	NR	ND	ND	NR	ND	NR
2,4,6-Trichlorophenol	ND	NR	ND	ND	NR	ND	NR
2,4,5-Trichlorophenol	ND	NR	ND	ND	NR	ND	NR
2-Chloronaphthalene	ND	NR	ND	ND	NR	ND	NR
2-Nitroaniline	ND	NR	ND	ND	NR	ND	NR
Dimethylphthalate	ND	NR	ND	ND	NR	ND	NR
Acenaphthylene	ND	NR	ND	ND	NR	ND	NR
2,6-Dinitrotoluene	ND	NR	ND	ND	NR	ND	NR
3-Nitroaniline	ND	NR	ND	ND	NR	ND	NR
Acenaphthene	ND	NR	ND	ND	NR	ND	NR
2,4-Dinitrophenol	ND	NR	ND	ND	NR	ND	NR
4-Nitrophenol	ND	NR	ND	ND	NR	ND	NR
Dibenzofuran	ND	NR	ND	ND	NR	ND	NR
2,4-Dinitrotoluene	ND	NR	ND	ND	NR	ND	NR
Diethylphthalate	ND	NR	ND	ND	NR	ND	NR
4-Chlorophenyl-phenyl ether	ND	NR	ND	ND	NR	ND	NR
Fluorene	ND	NR	ND	ND	NR	ND	NR
4-Nitroaniline	ND	NR	ND	ND	NR	ND	NR
4,6-Dinitro-2-methylphenol	ND	NR	ND	ND	NR	ND	NR
N-nitrosodiphenylamine	ND	NR	ND	ND	NR	ND	NR
4-Bromophenyl-phenyl ether	ND	NR	ND	ND	NR	ND	NR
Hexachlorobenzene	ND	NR	ND	ND	NR	ND	NR
Pentachlorophenol	ND	NR	ND	ND	NR	ND	NR
Phenanthrene	ND	NR	ND	ND	NR	ND	NR
Anthracene	ND	NR	ND	ND	NR	ND	NR

CHEMSOL, INC.
SUMMARY OF ANALYTICAL RESULTS
SAMPLING DATES: 8/6/91-9/24/91
LAB NAME: ENVSYS

	CASE#: 17082 SAMPLED: 9/10/91		CASE#: 17098 SAMPLED: 9/17/91			CASE#: 17148 SAMPLED: 9/24/91	
SEMI-VOLATILES							
Sample ID No.	CI-SW-01-6	CI-SW-TB-6	CI-SW-01-7	CI-SW-FD-7	CI-SW-TB-7	CI-SW-01-8	CI-SW-TB-8
Traffic Report No.	BKA25	BKA28	BKA30	BKA34	BKA33	BKA35	BKA38
Matrix	WATER	WATER	WATER	WATER	WATER	WATER	WATER
Units	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L
Dilution Factor/GPC Cleanup (Y)	1	NA	1	1	NA	1	1
Percent Moisture	--	--	--	--	--	--	--
Di-n-butylphthalate	ND	NR	ND	ND	NR	ND	NR
Fluoranthene	ND	NR	ND	ND	NR	ND	NR
Pyrene	ND	NR	ND	ND	NR	ND	NR
Butylbenzylphthalate	ND	NR	ND	ND	NR	ND	NR
3,3'-Dichlorobenzidine	ND	NR	ND	ND	NR	ND	NR
Benzo(a)anthracene	ND	NR	ND	ND	NR	ND	NR
Chrysene	ND	NR	ND	ND	NR	ND	NR
bis(2-Ethylhexyl)phthalate	ND	NR	ND	ND	NR	ND	NR
Di-n-octylphthalate	ND	NR	ND	ND	NR	ND	NR
Benzo(b)fluoranthene	ND	NR	ND	ND	NR	ND	NR
Benzo(k)fluoranthene	ND	NR	ND	ND	NR	ND	NR
Benzo(a)pyrene	ND	NR	ND	ND	NR	ND	NR
Indeno(1,2,3-cd)pyrene	ND	NR	ND	ND	NR	ND	NR
Dibenz(a,h)anthracene	ND	NR	ND	ND	NR	ND	NR
Benzo(g,h,i)perylene	ND	NR	ND	ND	NR	ND	NR

NOTES:
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J - estimated value, compound present below CRQL but above IDL
R - analysis did not pass EPA QA/QC
N - Presumptive evidence of the presence of the material
NR - analysis not required
Detection limits elevated if Dilution Factor >1 and/or percent moisture >0%

CHEMSOL, INC.
SUMMARY OF ANALYTICAL RESULTS
SAMPLING DATES: 8/6/91-9/24/91
LAB NAME: ENVSYS

	CASE#: 17082 SAMPLED: 9/10/91		CASE#: 17098 SAMPLED: 9/17/91			CASE#: 17148 SAMPLED: 9/24/91	
PESTICIDES Sample ID No.	CI-SW-01-6	CI-SW-TB-6	CI-SW-01-7	CI-SW-FD-7	CI-SW-TB-7	CI-SW-01-8	CI-SW-TB-8
Traffic Report No.	BKA25	BKA28	BKA30	BKA34	BKA33	BKA35	BKA38
Matrix	WATER	WATER	WATER	WATER	WATER	WATER	WATER
Units	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L
Dilution Factor/GPC Cleanup (Y)	1	NA	1	1	N	1	1
Percent Moisture	--	--	--	--	--	--	--
alpha-BHC	ND	NR	ND	ND	NR	ND	NR
beta-BHC	ND	NR	ND	ND	NR	ND	NR
delta-BHC	ND	NR	ND	ND	NR	ND	NR
gamma-BHC (Lindane)	ND	NR	ND	ND	NR	ND	NR
Heptachlor	ND	NR	ND	ND	NR	ND	NR
Aldrin	ND	NR	ND	ND	NR	ND	NR
Heptachlor epoxide	ND	NR	ND	ND	NR	ND	NR
Endosulfan I	ND	NR	ND	ND	NR	ND	NR
Dieldrin	ND	NR	ND	ND	NR	ND	NR
4,4'-DDE	ND	NR	ND	ND	NR	ND	NR
Endrin	ND	NR	ND	ND	NR	ND	NR
Endosulfan II	ND	NR	ND	ND	NR	ND	NR
4,4'-DDD	ND	NR	ND	ND	NR	ND	NR
Endosulfan sulfate	ND	NR	ND	ND	NR	ND	NR
4,4'-DDT	ND	NR	ND	ND	NR	ND	NR
Methoxychlor	ND	NR	ND	ND	NR	ND	NR
Endrin ketone	ND	NR	ND	ND	NR	ND	NR
alpha-Chlordane	ND	NR	ND	ND	NR	ND	NR
gamma-Chlordane	ND	NR	ND	ND	NR	ND	NR
Toxaphene	ND	NR	ND	ND	NR	ND	NR
Aroclor-1016	ND	NR	ND	ND	NR	ND	NR
Aroclor-1221	ND	NR	ND	ND	NR	ND	NR
Aroclor-1232	ND	NR	ND	ND	NR	ND	NR
Aroclor-1242	ND	NR	ND	ND	NR	ND	NR
Aroclor-1248	ND	NR	ND	ND	NR	ND	NR
Aroclor-1254	ND	NR	ND	ND	NR	ND	NR
Aroclor-1260	ND	NR	ND	ND	NR	ND	NR

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R - analysis did not pass EPA QA/QC
N - Presumptive evidence of the presence of the material
NR - analysis not required
Detection limits elevated if Dilution Factor >1 and/or percent moisture >0%

SITE NAME: CHEMSOL, INC.
SUMMARY OF ANALYTICAL RESULTS
SAMPLING DATES: 8/6/91-9/25/91
EPA CASE NO.: 6438B-01
LAB NAME: RECNY

NON-TCL VOLATILES & SEMI-VOLATILES	SAMPLED: 9/10/91		SAMPLED: 9/17/91			SAMPLED: 9/24/91	
Sample ID No.	CI-SW-01-6	CI-SW-TB-6	CI-SW-01-7	CI-SW-FD-7	CI-SW-TB-7	CI-SW-01-8	CI-SW-TB-8
Traffic Report No.	6438B-01-25	6438B-01-28	6438B-01-30	6438B-01-34	6438B-01-33	6438B-01-35	6438B-01-38
Matrix	WATER	WATER	WATER	WATER	WATER	WATER	WATER
Units	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L
Acrolein	ND	ND	ND	ND	ND	ND	ND
Acrylonitrile	ND	ND	ND	ND	ND	ND	ND
Benzidine	R	NR	R	ND	NR	R	NR
Azobenzene	ND	NR	ND	ND	NR	ND	NR
n-Nitrosodimethylamine	ND	NR	ND	ND	NR	ND	NR

NOTES:
ND - compound analyzed for but not detected
R - analysis did not pass EPA QA/QC
NR - analysis not required

CHEMSOL, INC.
SUMMARY OF ANALYTICAL RESULTS
SAMPLING DATES: 8/6/91-9/24/91
EPA CASE NO.: 6330B-01
LAB NAME: SWRI

DIOXIN	SAMPLED: 9/10/91	SAMPLED: 9/17/91						SAMPLED: 9/24/91
Sample ID No.	CI-SW-01-6	CI-SW-01-7	CI-SW-FD-7	FORTIFIED PEM	FORTIFIED PEM	BLIND BLANK	KNOWN BLANK	CI-SW-01-8
Traffic Report No.	6330B-01-25	6330B-01-30	6330B-01-34	6330B-01-43	6330B-01-44	6330B-01-45	6330B-01-46	6330B-01-35
Matrix	WATER	WATER	WATER	SOIL	SOIL	SOIL	SOIL	WATER
Units	ug/L	ug/L	ug/L	mg/kg	mg/kg	mg/kg	mg/kg	ug/L
2,3,7,8-TCDD	ND	ND	ND	0.85	0.84	ND	ND	ND

NOTES:
ND - compound analyzed for but not detected

SITE NAME: CHEMSOL, INC.
SUMMARY OF ANALYTICAL RESULTS
SAMPLING DATES: 8/6/91-9/25/91
EPA CASE NO.: 6526B-01
LAB NAME: EAENG

WATER QUALITY PARAMETERS	SAMPLED: 9/10/91	SAMPLED: 9/17/91		SAMPLED: 9/24/91
Sample ID No.	CI-SW-01-6	CI-SW-01-7	CI-SW-FD-7	CI-SW-01-8
Traffic Report No.	6526B-25	6526B-30	6526B-34	6526B-35
Matrix	WATER	WATER	WATER	WATER
Hardness (mg Ca/CO3/L)	129	66	71.9	61.1
Total Dissolved Solids (mg/L)	338	163	149	181
Total Suspended Solids (mg/L)	25	42 E	6 E	163 E
Sulfate (mg/L)	43.1	35.6	34.2	36
Bromide (mg/L)	ND	ND	ND	ND
Total Phosphorous (mg P/L)	0.18	0.12 E	0.12 E	ND
Alkalinity (mg CaCO3/L)	31.2	39.5	45.8	37.4
Ammonia (mg N/L)	0.089	0.17	0.21	ND
Biochemical Oxygen Demand (mg/L)	ND	ND	2.31	ND
Chemical Oxygen Demand (mg/L)	ND	13 E	20.9 E	ND
Chloride (mg/L)	73.3	26.5	26.7	35.5 E
Methyl Blue Active Substance (mg/L)	0.13	0.1	0.11	0.12
Oil & Grease (mg/L)	0.7 E	1.3 E	4 E	9.2 E
Total Petroleum Hydrocarbons (mg/L)	ND	ND	ND	1.9 E
Total Organic Carbon (mg/L)	2.3	7.7	7.9	4.6

NOTES:
ND - compound analyzed for but not detected
E - estimated value
J - estimated value, compound present below CRDL but above IDL
R - analysis did not pass EPA QA/QC
NR - analysis not required

CHEMSOL, INC.
SUMMARY OF ANALYTICAL RESULTS
SAMPLING DATES: 8/6/91-9/24/91
LAB NAMES: SKINER, OLI, CEIMIC

	CASE#: 16925 SAMPLED: 8/6/91			CASE#: 16962 SAMPLED: 8/13/91			CASE#: 16985 SAMPLED: 8/20/91			CASE#: 17021 SAMPLED: 8/27/91		
INORGANICS												
Sample ID No.	CI-SW-01-1	CI-SW-02-1	CI-SW-03-1	CI-SW-01-2	CI-SW-02-2	CI-SW-03-2	CI-SW-01-3	CI-SW-02-3	CI-SW-03-3	CI-SW-01-4	CI-SW-02-4	CI-SW-03-4
Traffic Report No.	MBHJ01	MBHJ02	MBHJ03	MBHJ06	MBHJ07	MBHJ08	MBHJ10	MBHJ11	MBHJ12	MBHJ14	MBHJ15	MBHJ16
Matrix	WATER	WATER	WATER	WATER	WATER	WATER	WATER	WATER	WATER	WATER	WATER	WATER
Units	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L
Aluminum	320 E	1310 E	477 E	83 J	95 J	114 J	337 E	236 E	152 J	1040 E	710 E	672 E
Antimony	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Arsenic	ND	ND	ND	ND	ND	ND	1.2 J	1.9 J	1.4 J	ND	ND	ND
Barium	48 J	108 J	127 J	63 J	109 J	139 J	68.3 J	70.7 J	80 J	77.5 J	88.4 J	111 J
Beryllium	4 J	3 J	3 J	2 J	3 J	3 J	ND	ND	ND	ND	ND	ND
Cadmium	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Calcium	32700	43300	43500	39100	38600	43500	33900	34400	37000	43400	44400	42600
Chromium	ND	6 J	6 J	ND	ND	ND	8 J	7.7 J	8 J	ND	ND	ND
Cobalt	ND	ND	ND	ND	ND	ND	ND	ND	ND	6.8 J	5.1 J	ND
Copper	ND	ND	ND	ND	ND	ND	13.9 J	13.9 J	12.4 J	ND	ND	ND
Iron	499	4120	3050	137	291	1860	853	655	721	1350	1500	2990
Lead	3.1 E	19.6 E	9	1.5 J	2 J	2.1 J	5.4	3.4	3.4	7.2	7.6	9.2
Magnesium	4990 J	6820	6560	5820 E	5980 E	6930 E	5110	5190	5800	6650	6650	6630
Manganese	129	1170	559	127 E	298 E	1120 E	160.5	168.1	369	196	444	824
Mercury	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Nickel	ND	ND	ND	ND	ND	ND	ND	10.9 J	ND	R	R	R
Potassium	1520 J	1980 J	1760 J	1740 J	1810 J	1950 J	1740 J	2010 J	1860 J	1920 J	1780 J	1880 J
Selenium	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Silver	R	R	R	ND	ND	ND	ND	ND	ND	ND	ND	ND
Sodium	10400 E	12600 E	10400 E	14200	13800	14900	11900	12000	66900	17300	17400	15900
Thallium	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	R
Vanadium	ND	7 J	ND	ND	ND	ND	3.2 J	2.2 J	2.9 J	4.2 J	3.4 J	3.2 J
Zinc	ND	49	20	ND	12 J	14 J	39.3 E	34.2 E	47.1 E	16.8 J	16.8 J	15 J
Cyanide	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND

NOTES:
ND - compound analyzed for but not detected
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J - estimated value, compound present below CRDL but above IDL
R - analysis did not pass EPA QA/QC
NR - analysis not required

CHEMSOL, INC.
SUMMARY OF ANALYTICAL RESULTS
SAMPLING DATES: 8/6/91-9/24/91
LAB NAMES: SKINER, OLI, CEIMIC

INORGANICS	CASE#: 17053 SAMPLED: 9/5/91								CASE#: 17082 SAMPLED: 9/10/91	CASE#: 17098 SAMPLED: 9/17/91	
Sample ID No.	CI-SW-01-5	CI-SW-02-5	CI-SW-03-5	CI-SW-FD-5	CI-SW-FB-5	CI-SD-01-5	CI-SD-FD-5	CI-SD-FB-5	CI-SW-01-6	CI-SW-01-7	CI-SW-FD-7
Traffic Report No.	MBHJ18	MBHJ19	MBHJ20	MBHJ04	MBHJ29	MBHJ22	MBHJ24	MBHJ23	MBHJ25	MBHJ30	MBHJ34
Matrix	WATER	WATER	WATER	WATER	WATER	SEDIMENT	SEDIMENT	WATER	WATER	WATER	WATER
Units	ug/L	ug/L	ug/L	ug/L	ug/L	mg/kg	mg/kg	ug/L	ug/L	ug/L	ug/L
Aluminum	R	R	R	R	1090 E	4660	2370	12.5 J	66.1 J	39.5 J	76.5 J
Antimony	ND	ND	ND	ND	ND	3.1 J	ND	ND	ND	ND	ND
Arsenic	ND	ND	ND	ND	ND	3.6 E	0.82 J	ND	ND	3.1 J	ND
Barium	41.5 J	55.3 J	110 J	122 J	8 J	45.5 J	26.9 J	ND	94.8 J	66.1 J	66.1 J
Beryllium	ND	ND	ND	ND	ND	0.32 J	ND	ND	ND	ND	ND
Cadmium	ND	ND	ND	ND	ND	ND	0.67 J	ND	ND	ND	ND
Calcium	17400	22700	38400	40000	1330 J	904 J	508 J	54.9 J	29800	20600	20700
Chromium	ND	ND	ND	ND	ND	R	R	ND	ND	ND	ND
Cobalt	ND	ND	2.1 J	2.6 J	ND	6.4 J	2.6 J	ND	ND	ND	ND
Copper	16.5 J	24.3 J	17.2 J	22.3 J	4.3 J	22.3 E	13.6 E	ND	7.1 J	4.9 J	4.6 J
Iron	632	598	1410 E	2380 E	73.8 J	15500	5690	ND	109	126 E	154 E
Lead	7.8	6.4	10.4	13	2.4 J	34.2	27.3 E	ND	R	ND	2.2 J
Magnesium	2830 J	3710 J	6070	6430	127 J	2260	920 J	ND	9590	6090	6080
Manganese	R	R	685	730	55.9	165	89.6	ND	46.8 E	67.2	78
Mercury	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Nickel	R	R	R	R	R	R	R	R	ND	ND	5.6 J
Potassium	2040 J	2210 J	2020 J	2080 J	181 J	581 J	283 J	ND	2630 J	2570 J	2630 J
Selenium	ND	ND	ND	ND	ND	R	ND	ND	R	ND	ND
Silver	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Sodium	8370	10700	13900	14000	468 J	104 J	114 J	120 J	28200	16800	16900
Thallium	ND	ND	ND	ND	ND	R	R	ND	ND	ND	ND
Vanadium	3.9 J	4.7 J	ND	5.3 J	ND	19.7	10 J	ND	ND	ND	ND
Zinc	43 E	59 E	50.6 E	58.1 E	19.2 J	86.4	46.3	5.5 J	22.4	45.2	45.9
Cyanide	ND	ND	ND	ND	ND	ND	ND	ND	R	ND	ND

NOTES:
ND - compound analyzed for but not detected
E - estimated value
J - estimated value, compound present below CRDL but above IDL
R - analysis did not pass EPA QA/QC
NR - analysis not required

CHEMSOL, INC.
SUMMARY OF ANALYTICAL RESULTS
SAMPLING DATES: 8/6/91-9/24/91
LAB NAMES: SKINER, OLI, CEIMIC

	CASE#: 17148 SAMPLED: 9/24/91	
INORGANICS		
Sample ID No.	CI-SW-01-8	
Traffic Report No.	MBHJ35	
Matrix	WATER	
Units	ug/L	
Aluminum	139	J
Antimony	ND	
Arsenic	ND	
Barium	58.7	J
Beryllium	ND	
Cadmium	ND	
Calcium	22600	
Chromium	ND	
Cobalt	ND	
Copper	ND	
Iron	169	
Lead	5.6	E
Magnesium	6650	
Manganese	24.4	
Mercury	ND	
Nickel	ND	
Potassium	2470	J
Selenium	ND	
Silver	5	J
Sodium	20300	
Thallium	ND	
Vanadium	6.2	J
Zinc	24.7	
Cyanide	ND	

NOTES:
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J - estimated value, compound present below CRDL but above IDL
R - analysis did not pass EPA QA/QC
NR - analysis not required

SURFACE WATER FIELD PARAMETERS

Location		Week 1	Week 2	Week 3	Week 4	Week 5	Week 6	Week 7	Week 8
SW-01	pH	7.5	6.2	6.5	6.5	5.8	6.2	6.2	6.1
	DO	8.9	8.2	7.1	7.6	5.2	6.4	7.09	4.23
	SC	290	300	220	337	148	380	240	250
SW-02	pH	7.2	6.4	6.5	7.0	6.6			
	DO	8.8	6.3	6.4	5.4	4.1			
	SC	300	330	120	345	200			
SW-03	pH	7.3	7.0	6.4	7.0	6.7			
	DO	9.0	7.0	5.7	6.0	4.2			
	SC	400	330	290	360	310			

NOTES: DO = Dissolved Oxygen in parts per million
SC = Specific Conductivity in uMHOS
In weeks 6,7,8, only one location was sampled due to low flow conditions in the stream. This point was located downstream of the Chemsol site.

CHEMSOL INC. STREAM FLOW DATA

WEEK 1 - August 6th 1991

Mark (in)	Depth (in)	Surface Velocity (ft/s)	Bulk Velocity (ft/s)	Q (cu.ft./s)	Q (gpm)
1	0.25	0.10	0.09	1.49E-04	0.07
2	0.50	0.10	0.09	2.98E-04	0.13
3	0.75	0.10	0.09	4.47E-04	0.20
4	0.75	0.10	0.09	4.47E-04	0.20
5	0.56	0.10	0.09	3.35E-04	0.15
6	0.75	0.10	0.09	4.47E-04	0.20
7	0.75	0.10	0.09	4.47E-04	0.20
8	0.38	0.10	0.09	2.24E-04	0.10
9	0.25	0.10	0.09	1.49E-04	0.07
			Total Flow	2.94E-03	1.32

WEEK 2 - August 13th 1991

Mark (in)	Depth (in)	Surface Velocity (ft/s)	Bulk Velocity (ft/s)	Q (cu.ft./s)	Q (gpm)
1	0.25	0.32	0.28	4.79E-04	0.21
2	1.00	0.32	0.28	1.92E-03	0.86
3	1.50	0.32	0.28	2.87E-03	1.29
4	2.00	0.32	0.28	3.83E-03	1.72
5	2.13	0.32	0.28	4.07E-03	1.82
6	2.25	0.32	0.28	4.31E-03	1.93
7	2.75	0.32	0.28	5.27E-03	2.36
8	3.00	0.32	0.28	5.75E-03	2.58
9	3.50	0.32	0.28	6.71E-03	3.01
10	3.75	0.32	0.28	7.19E-03	3.22
11	3.75	0.32	0.28	7.19E-03	3.22
12	3.25	0.32	0.28	6.23E-03	2.79
13	3.13	0.32	0.28	5.99E-03	2.68
14	3.13	0.32	0.28	5.99E-03	2.68
15	2.75	0.32	0.28	5.27E-03	2.36
16	2.75	0.32	0.28	5.27E-03	2.36
17	2.50	0.32	0.28	4.79E-03	2.15
18	3.00	0.32	0.28	5.75E-03	2.58
19	2.75	0.32	0.28	5.27E-03	2.36
20	2.00	0.32	0.28	3.83E-03	1.72
21	1.00	0.32	0.28	1.92E-03	0.86
22	0.75	0.32	0.28	1.44E-03	0.64
23	0.25	0.32	0.28	4.79E-04	0.21
			Total Flow	0.1018	45.6

WEEK 3 - August 20th 1991

Mark (ft)	Depth (in)	Surface Velocity (ft/s)	Bulk Velocity (ft/s)	Q (cu.ft./s)	Q (gpm)
0.5	1.25	0	0	0	0.0
1	1.00	0	0	0	0.0
1.5	7.00	0.70	0.60	0.17	77.7
2	7.50	0.95	0.81	0.25	113.1
2.5	6.50	1.25	1.06	0.29	128.9
3	5.00	1.35	1.15	0.24	107.1
3.5	3.75	1.10	0.94	0.15	65.5
4	3.00	0.71	0.60	0.08	33.8
4.5	1.75	0.30	0.26	0.02	8.3
			Total Flow	1.19	534.4

WEEK 4 - August 27th 1991

Mark (in)	Depth (in)	Surface Velocity (ft/s)	Bulk Velocity (ft/s)	Q (cu.ft./s)	Q (gpm)
2	1.25	0.23	0.19	0.010	4.5
4	1.75	0.23	0.19	0.014	6.3
6	1.75	0.23	0.19	0.014	6.3
8	2.00	0.23	0.19	0.016	7.2
10	1.25	0.23	0.19	0.010	4.5
12	1.50	0.23	0.19	0.012	5.4
14	1.15	0.23	0.19	0.009	4.1
16	2.00	0.23	0.19	0.016	7.2
18	2.15	0.23	0.19	0.017	7.8
20	0.25	0.23	0.19	0.002	0.9
			Total Flow	0.121	54.3

WEEK 5 - Sept 5th, 1991

Mark (ft)	Depth (in)	Surface Velocity (ft/s)	Bulk Velocity (ft/s)	Q (cu.ft./s)	Q (gpm)
1	0.50	0.17	0.14	4.92E-04	0.22
2	1.00	0.17	0.14	9.84E-04	0.44
3	1.38	0.17	0.14	1.35E-03	0.61
4	1.50	0.17	0.14	1.48E-03	0.66
5	1.63	0.17	0.14	1.60E-03	0.72
6	1.75	0.17	0.14	1.72E-03	0.77
7	1.75	0.17	0.14	1.72E-03	0.77
8	1.88	0.17	0.14	1.84E-03	0.83
9	1.88	0.17	0.14	1.84E-03	0.83
10	1.88	0.17	0.14	1.84E-03	0.83
11	1.88	0.17	0.14	1.84E-03	0.83
12	1.94	0.17	0.14	1.91E-03	0.85
13	1.50	0.17	0.14	1.48E-03	0.66
14	1.38	0.17	0.14	1.35E-03	0.61
15	1.50	0.17	0.14	1.48E-03	0.66
16	2.00	0.17	0.14	1.97E-03	0.88
17	1.00	0.17	0.14	9.84E-04	0.44
18	0.25	0.17	0.14	2.46E-04	0.11
			Total Flow	2.61E-02	11.7

NOTES:

[1] All velocity measurements, except for Week 3, were performed with a floating object. A Marsh McBurney flow meter was used in Week 3. The measurements of Week 3 were taken after a storm.

[2] Bulk velocity was assumed to be .85 x surface velocity
Fluid Mechanics, Daugherty, Franzini and Finnemore, 1985

[3] Conversion factor from cubic feet per second to gallons per minute is 448.

[4] "Mark" refers to the distance from the bank of the stream where the depth of the stream was measured.