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GROUNDWATER TECHNOLOGY, INC.

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FAX: (415) 685-9148

October 6, 1993

Project No. 020203392

Mr. Thomas Peacock
Alameda County Health Care Services Agency
80 Swan Way, Room 200
Oakland, CA 94621

SUBJECT: *Work Plan for Additional Soil and Groundwater Assessment*
Former Sears Automotive Center
2633 Telegraph Avenue
Oakland, CA 94612

Dear Mr. Peacock:

On behalf of Sears, Roebuck and Co., Groundwater Technology, Inc. has prepared this *Work Plan for Additional Soil and Groundwater Assessment* at the former Oakland Automotive Center located at 2633 Telegraph Avenue in Oakland, California (Attachment 1, Figure 1). The previous site investigation, conducted in December, 1992, did not fully assess the hydrocarbon distribution in the subsurface at this site. The purpose of this investigation is to further evaluate the lateral and vertical distribution of hydrocarbons in the soil and the lateral distribution of hydrocarbons in groundwater.

INTRODUCTION

Background

Seven underground storage tanks were located on site for storage of motor oil and used oil. Five of the seven tanks were 1,000-gallon, steel motor-oil tanks; one was a 2,000-gallon steel motor-oil tank; and one was a 1,000-gallon steel used-oil tank. Two 10,000-gallon steel gasoline tanks were also located on site. The motor-oil and used-oil tanks were removed in 1990. The report on tank removal activities is provided in the American Environmental Management Corporation (AEMC) letter report dated October 12, 1990. Total oil and grease (TOG) and total petroleum hydrocarbons-as-diesel fuel (TPH-D) in soil from the motor-oil tank pit have been reported by AEMC. In the area of the former used-oil tank, total petroleum hydrocarbons-as-gasoline (TPH-G), TPH-D, TOG, and benzene, toluene, ethylbenzene, and xylenes (BTEX) compounds were detected.

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In February 1991, an electronic cone penetrometer survey was conducted in conjunction with soil and groundwater sampling by AEMC. This work was initiated to determine the general soil lithology of the area as well as to provide an initial screening for possible contamination.

In December 1992, Groundwater Technology conducted a subsurface assessment which included drilling five soil borings, sampling soil, installing monitoring wells in the five borings, and monitoring and sampling groundwater. The results of this investigation indicated residual petroleum hydrocarbons present in soil, predominately in the capillary fringe, and in the shallow groundwater downgradient of the former used-oil tank (*Phase II Assessment Report*, dated March 24, 1993). The highest concentrations of total petroleum hydrocarbons in the groundwater were found in well MW-3, the furthest downgradient well.

At the request of Alameda County Health Care Services (ACHCS), a groundwater monitoring and sampling program was initiated in February 1993. Groundwater monitoring and sampling data are summarized in Attachment 2 (Tables 1 and 2).

Objectives

The objective of this proposed additional site assessment is to further evaluate the lateral and vertical distribution of hydrocarbons in the soil and the lateral distribution of hydrocarbons in groundwater. The focus of this proposed investigation will be on the west side of the Automotive Repair Building.

SCOPE OF WORK

The scope of work is outlined below. A description of the methods and strategy of the field investigation follow.

- Obtain permits for drilling the soil borings and monitoring wells from Zone 7, Alameda County Flood Control and Water Conservation District.
- Conduct an underground utility survey before drilling.
- Drill two to four soil borings, and collect soil and grab groundwater samples (Phase I).
- Install one or two groundwater monitoring wells and collect soil and groundwater samples (Phase II). (The locations of the monitoring wells will be selected based on the Phase I soil boring data.)
- Prepare a report on the results and findings of the field investigation.

Phase I: Soil Borings

The first phase of drilling will consist of two to four soil borings drilled using a portable pneumatic hammer rig. The boring locations are shown in Figure 2, downgradient of the former tank pit. Borings 3 and 4 will be drilled if the mobile laboratory results indicate the presence of hydrocarbons in the groundwater from borings 1 and 2. The borings will be advanced to approximately 20 feet below surface grade. The purpose of the soil borings is to collect soil samples to evaluate the lateral and vertical extent of hydrocarbons in the soil and groundwater, and to optimize the location for subsequent groundwater monitoring wells.

The drilling will be supervised by an on-site geologist who will maintain a log detailing geologic information. Soil will be classified according to the Unified Soil Classification System. Moisture content will be noted in the field along with initial and static water levels and physical observations regarding the presence of contamination. Photo-ionization detector (PID) measurements also will be recorded at approximately 5-foot intervals, or more often if necessary, based on field observations.

Up to two soil samples and one grab groundwater sample will be collected from each borehole. Soil samples will be selected for laboratory analyses based on field observations and PID measurements. Soil samples will be collected in 2-inch-diameter by 6-inch-long brass tubes, sealed with aluminum foil, capped, taped, labeled and refrigerated pending analyses. Grab groundwater samples will be collected, placed in appropriate containers, labeled, and refrigerated pending analyses.

The samples will be analyzed onsite using a GTEL Environmental Laboratories mobile lab. The samples will be analyzed for total recoverable petroleum hydrocarbons (TRPH) using U.S. Environmental Protection Agency (EPA) Method 418.1 (SM 5520) and for BTEX and TPH-G using EPA Methods 8020/8015.

Phase II: Monitoring Wells

One or two additional groundwater monitoring wells will be installed downgradient of wells MW-3 and MW-4. The number and locations of the additional wells will depend on the results obtained from the first phase of drilling. The soil borings for the wells will be drilled using a rig equipped with hollow-stem augers. Core barrels will be placed inside the augers during drilling to collect continuous soil core samples. Up to 2 soil samples will be collected from each borehole. Soil samples will be selected for laboratory analyses based on field observations and PID measurements. Soil samples will be collected in 2-inch-diameter by 6-inch-long brass tubes, sealed with aluminum foil, capped, taped, labeled, and placed on ice for transport under chain-of-custody protocol to a California-certified laboratory for analyses. The soil samples will be analyzed for TRPH using EPA

Method 418.1 (SM 5520), BTEX and TPH-G using EPA Methods 8020/8015, total petroleum hydrocarbons-as-motor oil (TPH-MO) using gas chromatography/flame ionization detector GC/FID (8015), and total lead by Atomic Adsorption (AA) or Inductively Coupled Plasma (ICP).

A groundwater monitoring well will be installed in each of the soil borings drilled during Phase II. The wells will be completed with 15 feet of 2-inch-diameter 0.020-inch slotted polyvinylchloride (PVC) screen and finished to the surface with 2-inch-diameter PVC casing. The annular space between the borehole and casing will be backfilled with No. 3 Lonestar Sand from the well completion depth to 1.5 to 2 feet above the well screen. A sanitary seal of 1 to 2 feet of bentonite will be installed, followed by cement grout to the surface. The wells will be finished with a water-tight locking cap inside a traffic-rated street box.

The wells will be developed to improve hydraulic communication with the surrounding aquifer. Suspended sediment will be removed from the wells using a surge and bail technique. The wells will be sampled at least 72 hours after development.

Before purging and sampling, the depth to groundwater will be measured in the monitoring wells using an INTERFACE PROBE™ Well Monitoring System, which can detect both water and separate-phase product levels. Before sampling, the wells will be purged of approximately 4 well volumes. The temperature, conductivity, and pH of the purge water will be measured during purging. The wells will be allowed to recharge to a least 80 percent of their initial water level before sampling. Groundwater samples will be collected using a Teflon® bailer and placed in appropriate containers. The sample containers will be labeled and placed in an ice-chilled, insulated cooler for transport under chain-of-custody protocol to a California-certified laboratory and analyzed for TRPH using EPA Method 418.1 (SM 5520), BTEX and TPH-G using EPA Methods 8020/8015, TPH-MO using GC/FID (8015), and total lead by AA or ICP.

The wellhead and surface elevations will be professionally surveyed relative to the elevations of the other site wells.

Equipment Decontamination/Disposal Procedures

Drilling equipment will be steam cleaned after drilling each boring. The soil and groundwater sampling and monitoring equipment will be either steam cleaned or cleaned in a solution of Alconox and rinsed with distilled water prior to use at each sampling location.

Soil cuttings, and well development and purge water will be placed in 55-gallon drums, labeled, and stored on site pending laboratory analyses to select a proper disposal method.

Reporting

When the data from this proposed soil and groundwater investigation have been collected, they will be analyzed and presented in tabular and graphic form in a summary report. Recommendations for further investigation will be delineated if necessary.

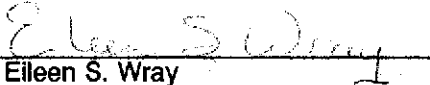
The following tables and maps will be provided in the summary report:


- Drilling Logs/Well Construction Details
- Soil Analytical Results Summary
- Groundwater Analytical Results Summary
- Water Level Measurements
- Site Vicinity Map
- Site Map
- Potentiometric Surface Map
- Groundwater Concentration Map
- Recommendations for additional characterization or remediation, as appropriate.

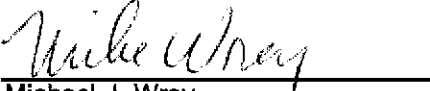
If you have any questions or comments, please call our Concord office at (510) 671-2387.

Sincerely,
Groundwater Technology
Written/Submitted by

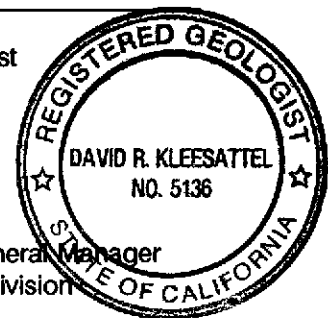
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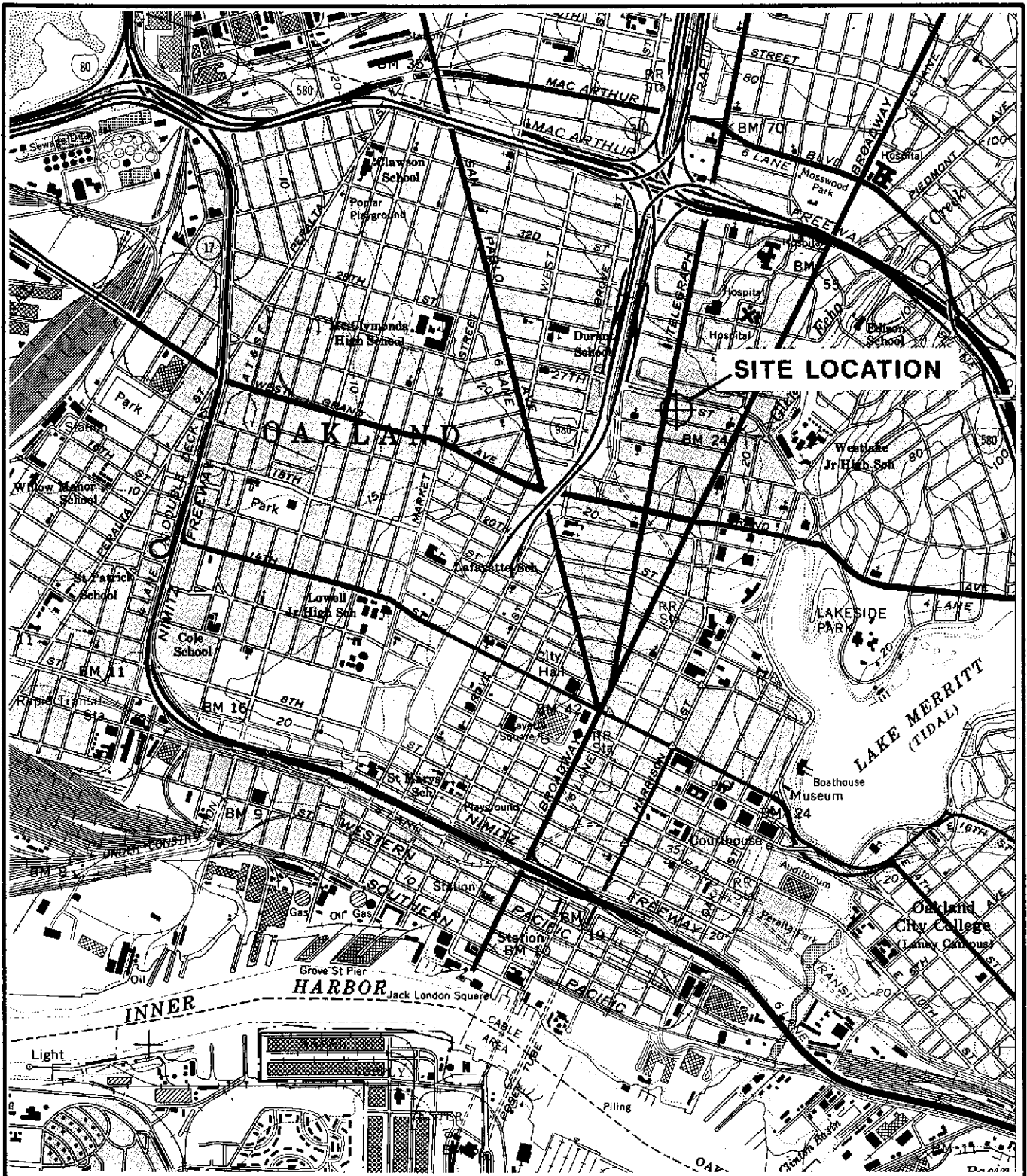


cc: Ms. Bernadine Palka

Attachment 1 Figures
Attachment 2 Tables

ATTACHMENT 1

Figures



**GROUNDWATER
TECHNOLOGY**

4057 PORT CHICAGO HWY
CONCORD, CA 94520
(510) 671-2387



SCALE:

0 FEET 2000

SITE LOCATION MAP

CLIENT:

SEARS, ROEBUCK AND CO.
SITE No. 1058

DATE:

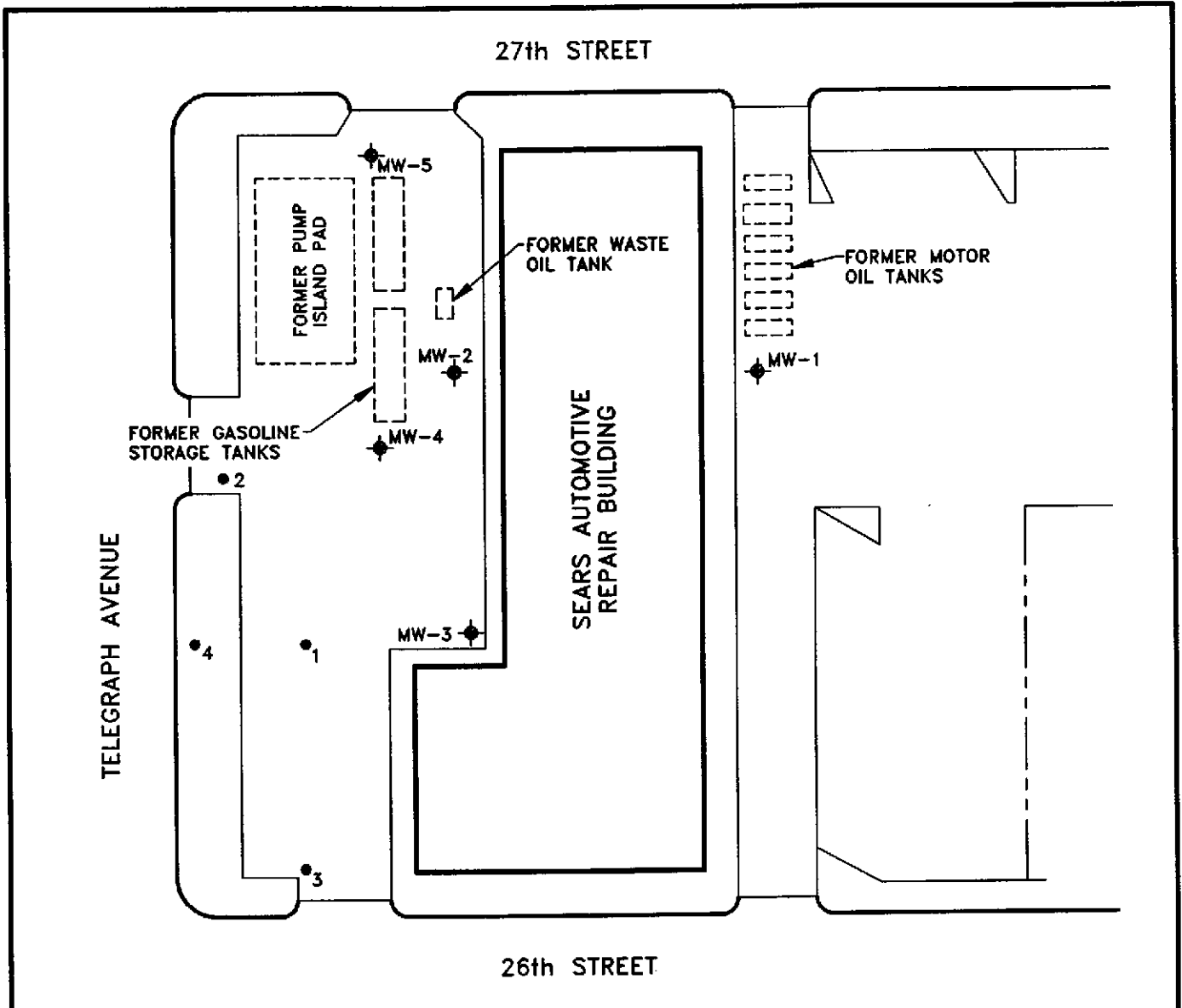
8/18/92

LOCATION:

2633 TELEGRAPH AVE.
OAKLAND, CALIFORNIA

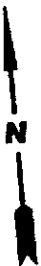
FIGURE:

1



LEGEND

- ⊕ MONITORING WELL
- PROPOSED SOIL BORING



GROUNDWATER TECHNOLOGY

4057 PORT CHICAGO HWY.
CONCORD, CA 94520
(510) 671-2387

SITE PLAN

CLIENT: SEARS, ROEBUCK AND CO. SITE No. 1058			LOCATION: 2633 TELEGRAPH AVE. OAKLAND, CALIFORNIA			REV. NO.: 0	DATE: 6/16/93
PM <i>[Signature]</i>	PE/RG	DESIGNED DH	DETAILED ML	ACAD FILE: PBORLOC/SP193	PROJECT NO.: 020203392	FIGURE: 2	

ATTACHMENT 2

Tables

**TABLE 1
SUMMARY OF HISTORICAL MONITORING DATA**

Well No.	Casing Elev	Date	DTW	DTP	PT	Groundwater Elev
MW-1	26.20	12/30/92	10.60	--	--	15.60
		02/26/93	10.14	--	--	16.06
		03/24/93	10.48	--	--	15.72
		04/27/93	11.30	--	--	14.90
MW-2	26.50	12/30/92	10.65	--	*	15.85
		02/26/93	10.56	--	--	15.94
		03/24/93	10.52	--	--	15.98
		04/27/93	11.17	--	--	15.33
MW-3	26.34	12/30/92	12.43	--	*	13.91
		02/26/93	12.21	--	--	14.13
		03/24/93	12.36	--	--	13.98
		04/27/93	12.70	--	--	13.64
MW-4	26.17	12/30/92	11.53	--	--	14.64
		02/26/93	11.35	--	--	14.82
		03/24/93	11.46	--	--	14.71
		04/27/93	11.74	--	--	14.43
MW-5	26.98	12/30/92	10.50	--	--	16.48
		02/26/93	10.12	--	--	16.86
		03/24/93	10.31	--	--	16.67
		04/27/93	10.75	--	--	16.23

Elev = Elevation in feet above mean sea level
 DTW = Depth to water (in feet)
 DTP = Depth to product (in feet)
 PT = Product thickness (in feet)
 * = Sheen observed (<0.01 foot)
 -- = Product not detected

TABLE 2
SUMMARY OF HISTORICAL GROUNDWATER SAMPLE ANALYTICAL RESULTS
(Compounds micrograms per liter [$\mu\text{g/l}$] except where noted otherwise)

Well ID	Date	B	T	E	X	TPH-G	TPH-D	VOCs	SVOCs	TPH (mg/l)	Total Lead
MW-1	12/30/92	1	1	2	2	-	ND	-	-	1	-
	03/24/93	0.4	1	ND	10	-	ND*	-	-	1	-
MW-2	12/30/92	0.7	ND	ND	3	190	ND	ND	ND	1	ND
	03/24/93	0.6	ND	ND	2	120	ND*	ND	ND	ND	ND
MW-3	12/30/92	11	0.9	ND	2	910	ND	^c ND	^a 14	20	ND
	03/24/93	28	0.7	1	8	3,300	ND*	ND	^a 26	28	15**
MW-4	12/30/92	2	ND	1	ND	1,200	ND	ND	ND	ND	ND
	03/24/93	ND	ND	ND	ND	750	ND*	ND	ND	2	7**
MW-5	12/30/92	ND	ND	ND	ND	37	ND	ND	ND	ND	^b 5
	03/24/93	ND	ND	ND	0.5	19	ND	ND	ND	2	^d 15**

- BTEX = Benzene, toluene, ethylbenzene, and total xylenes (EPA Methods 5030, 8020)
TPH-G = Total petroleum hydrocarbons-as-gasoline (EPA Methods 5030 and modified EPA Method 8015)
TPH-D = Total petroleum hydrocarbons-as-diesel fuel (EPA Methods 3510, 8015)
VOCs = Volatile organic compounds (EPA Method 601)
SVOCs = Semi-volatile organic compounds (EPA Method 8270/625)
TPH = Total petroleum hydrocarbons (EPA Method 418.1 [SM 5520 FC])
mg/l = Milligrams per liter
- = Not analyzed
ND = Nondetectable (Detection limits for each compound are listed in laboratory reports, which are included in Appendix D.)
* = Hydrocarbons present that are not indicative of diesel fuel
** = Water samples were not filtered, analytical results represent total metals present, not dissolved concentrations.
a = 2-Methylnaphthalene detected
b = Cadmium, chromium, nickel, and zinc were also analyzed but were nondetectable.
c = Duplicate sample was also analyzed and reported nondetectable concentrations.
d = Additional metals analyzed were: Cadmium, detected at 15 $\mu\text{g/l}$; total chromium, detected at 97 $\mu\text{g/l}$; nickel, detected at 110 $\mu\text{g/l}$; and zinc, detected at 104 $\mu\text{g/l}$ **. Note: These samples were not filtered before preservation and analysis.