

A Report Prepared for

California Regional Water Quality Control Board
San Francisco Bay Region
1111 Jackson Street, Room 6000
Oakland, California 94607

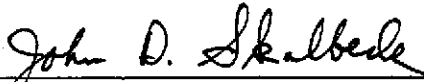
**REPORT OF SYSTEM MONITORING
JULY 1989
SOIL TREATMENT SYSTEM
PACIFIC RENAISSANCE PLAZA
OAKLAND, CALIFORNIA**

HLA Job No. 9382,040.02

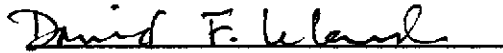
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1.0 INTRODUCTION AND BACKGROUND

1.1 Introduction

This report discusses the operation and monitoring of the in situ soil treatment system at the Pacific Renaissance Plaza (PRP) site in Oakland, California, for the period from July 6 to August 3, 1989. The PRP site, bounded by 9th, Franklin, and Webster streets and the East Bay Municipal Utilities District (EBMUD) property line approximately 100 feet north of the centerline of 10th Street, is part of the Oakland Chinatown Redevelopment Project Area (Plate I). The soil treatment system is designed to remove petroleum hydrocarbons from soil within the site boundaries before it is excavated during construction of the complex. Recent discussions with Pacific Renaissance Associates, the developer of the project, indicate that construction is scheduled to begin in February 1990.

This report has been prepared by Harding Lawson Associates (HLA) on behalf of the City of Oakland Redevelopment Agency (Agency). It is submitted in accordance with monitoring and reporting requirements originally set forth by the California Regional Water Quality Control Board, San Francisco Bay Region (RWQCB), in a letter to the City of Oakland dated February 22, 1989, and clarified in a letter dated March 17, 1989, from HLA to the RWQCB.

1.2 Previous Reports

Site history and characterization activities completed by HLA in 1988 are reported in *Site Characterization, Pacific Renaissance Plaza, Chinatown Redevelopment Project Area, Oakland, California (HLA, 1988)*. The site characterization report also presents a preliminary screening of soil treatment alternatives and an evaluation of the potential for biodegradation to effectively remove hydrocarbons from soil at the site.

The Report of Waste Discharge, Pacific Renaissance Plaza, Chinatown Redevelopment Project Area, Oakland, California (HLA, 1989a) discusses soil treatment system design and presents the results of the biodegradation treatability study and the proposed operations and monitoring plan for the system. Site background, environmental setting, and previous investigations are also described in the report.

Characterization of the extent of soil contamination at the PRP site was updated in the *Report of System Monitoring: March 1989, Soil Treatment System, Pacific Renaissance Plaza, Oakland, California (HLA, 1989b)* using results of analyses of soil samples collected during treatment system well installation activities. System operation and monitoring during the period March through June are described in *HLA (1989b through e)*. The objective of the system and a description of the process are presented in *HLA (1989e)*. The system began operation on March 4, 1989.

2.0 TREATMENT SYSTEM OPERATIONS

System operational activities and adjustments made in July are summarized

below:

- o Pumps in Extraction Wells EW-5, EW-6, EW-7, EW-12, EW-13, EW-14, and EW-16 through EW-19 were reconditioned by removing the pumps from the wells and running them in a chlorine/soap bath. Flowmeters for each of these wells were also cleaned.
- o Injection Wells IW-1, IW-2, IW-4, IW-6, IW-8, IW-10, and IW-11 were redeveloped by swabbing, bailing and pumping to increase flow. Wells EW-6 and EW-7 were also redeveloped.
- o Baker tanks were treated with chlorine and hydrogen peroxide to reduce accumulated biomass.
- o At the east end of the system, as shown on Plate 1, five infiltration basins, designated BA-2, BA-4, BA-5, BA-6, and BA-7 were constructed and filled between June 30 and July 13. Initially, hydrant water was used to fill the basins, and nutrients were added manually. Infiltration of recycled water with nutrients began July 19.

3.0 TREATMENT SYSTEM MONITORING

3.1 Flow-Rate, Water-Level, and Water-Chemistry Monitoring

Flow rates, water levels, and water chemistry were monitored using procedures described in *HLA, 1989e*. Water samples were collected from selected extraction wells, injection wells, and monitoring wells and analyzed for inorganic and organic constituents and microbial populations. For each well, the frequency of sampling during the reporting period, analytical parameters, and EPA Test Methods used (for organic constituents) are presented in Table 1.

The sampling schedule may be modified in subsequent months in response to the operation and performance of the system.

3.2 Numerical Modeling of Ground-Water Flow

A numerical model of ground-water flow at the site, developed during the design phase of the project, is described in the *Report of Waste Discharge (HLA, 1989a)*. The model is based on the USGS ground-water flow computer code MODFLOW (*McDonald and Harbaugh, 1984*). Individual injection well, extraction well, and infiltration basin flow rates are averaged over the period July 6 to August 1 for use as model input (Tables 2 and 3).

3.3 Confirmation Borings - Soil Sampling and Analysis

Soil samples were collected and analyzed for petroleum hydrocarbons and volatile organic constituents to assess the progress of soil treatment and to further characterize chemicals in site soils. Between July 17 and 19, 1989, eight confirmation borings, designated BC-1 through BC-8, were drilled and sampled (Plate 2). Drilling was performed by Spectrum Drilling, Inc., of Stockton, California, using a Mobile B-53 hollow-stem auger rig. An HLA geologist supervised the drilling, performed health and safety monitoring, and collected samples for lithologic characterization, for field

screening of volatile organic compounds (VOCs), and for chemical analyses. Soils were logged using the Unified Classification System (USCS), and Munsell Color Index Chart. Field screening for VOCs was performed using a portable Century organic vapor analyzer (OVA).

Soil samples were collected at 2-foot intervals from approximately 20 feet below ground surface (bgs) to the total depth of the boring (30 to 35 feet bgs). Samples were collected using a 2-foot long Modified California split-barrel sampler lined with four (6-inch long) 2.5-inch-diameter stainless steel tubes. This sampling scheme provided a 10- to 15-foot continuous sample core through the target zone of suspected soil contamination. The bottom tube of each sample drive was sealed on both ends with aluminum foil, plastic end caps, and electrician's tape. Soil in the second tube was screened in the field for VOCs using an OVA and checked for the presence of hydrocarbon odors and evidence of staining. The remaining tubes of soil were used for lithologic logging. One to three soil samples from each boring were selected for chemical analysis on the basis of results of initial field screening. In all, thirteen soil samples were analyzed.

All soil samples were stored on ice until delivery with completed chain of custody forms to state-certified laboratories. Ten samples were submitted to Pace Laboratories, Inc. (Pace), of Novato, California, and three samples were submitted to ChemWest Laboratories, Inc., of Sacramento, California. Soil samples were analyzed for total petroleum hydrocarbon (TPH) as gasoline by EPA Test Method 3550/8015 and for purgeable aromatics by EPA Test Method 8020. A discussion of the results of the confirmation boring soil samples is found in Section 4.4.

Three sample pairs of adjacent liner tubes collected from Borings BC-1 and BC-4 were submitted to each laboratory to assess the precision of chemical results

from different laboratories on samples collected in similar soil conditions. Both laboratories were instructed to analyze the soil from the end of the tube that was adjacent to its partner tube. However, ChemWest used the standard method of compositing aliquots from both ends of the tube, weakening the precision test.

To assess the variability of chemical characteristics of soil within a single sample tube, Pace was instructed to analyze two soil aliquots from samples from BC-1 and BC-8, taken from the opposite ends of the tubes.

4.0 RESULTS

4.1 Hydraulic Analysis

Flow rates for wells and basins installed by HLA were calculated based on readings from the flowmeters on the wellheads. Average injection and extraction rates for July are presented in Tables 2 and 3. From July 5 to August 1, the total flow rate for all injection wells was 32.80 gallons per minute (gpm)(Table 3). The flow rate for injection wells located south of 10th Street, Wells IW-1 to IW-9, was 30.73 gpm (Table 2). The average flow rate into Basins BA-1 to BA-7 was 5.68 gpm for the period July 16 to August 1; all the discharge to these covered basins is assumed to infiltrate. During the period, the total flow rate for all extraction wells was 31.29 gpm. The flow rate for Wells EW-1 to EW-20 was 30.92 gpm, and for Well EW-21 was 0.38 gpm. Extraction Well EW-22 was operational, but is not equipped with a separate totalizing flowmeter. The total flow rate for all dewatering wells still in operation at the EBMUD site is estimated to be 5 gpm.

Table 4 presents measurements of depth to water in monitoring wells and calculated water-level elevations from January 3 to August 1, 1989. Ground-water elevations on August 1, 1989, are shown on Plate 3. August 1 elevations describe conditions approximately 150 days after system startup. Contours of ground-water elevations simulated using the numerical model are also presented on Plate 3. In some cases, locations of injection and extraction points used in the model differ slightly from actual well locations because of the nature of discretization of the modeled area. Flow rates for the infiltration basins were input to the model for the August 1 simulation.

In general, the simulated water-levels show good agreement with water-level elevations measured at monitoring wells. For August 1, differences between observed and simulated elevations are generally less than 1/2 foot for wells outside the treatment area, with the exception of MW-5 and MW-18, which show differences of

approximately 1 foot. Differences between simulated and observed ground-water elevations from the transect of wells within the treatment area (MW-15, MW-16, MW-17) were less than 1/2 foot. For the other wells within the treatment area, differences are generally less than 1 foot, with the exception of Well MW-9 which differs by less than two feet.

Water-level contours calculated using the site model can be used to assess the hydraulic control of injected water. Simulated contours for July and August indicate overall hydraulic control of injected water. Most injected water is recovered by the extraction wells without traveling off site. At the eastern and western end of the site, a small portion of the injected water may travel off site as it moves toward the extraction wells. This appears to be the case along 9th Street where simulations show that the capture zone of Well EW-16 extends off site. A similar situation occurs along the Franklin Street site boundary, where extraction well capture zones also extend off site.

On the northern side of the site, simulated contours indicate that a portion of injected water is drawn to the EBMUD dewatering wells. These wells have been operating continuously during soil treatment system operations with pumping levels set to maintain a water level in the EBMUD excavation at approximately -1 foot mean sea level (MSL), substantially lower than pumping levels in PRP extraction wells. These lower pumping levels induce movement of some injected water to the EBMUD wells. The discharge from these wells is collected and treated by the carbon adsorption system at the site. Because they are functioning as part of the soil treatment system, the area of treatment effectively extends to the northern boundary of the site.

4.2 Distribution of Inorganic Constituents and Microbial Populations in Ground Water

Tables 5 and 6 present the inorganic chemical and microbiological analysis results for the bioremediation treatment system from startup through August 3, 1989. Nitrate and phosphate concentrations in ground water at the site for the August 3 sampling rounds are presented on Plates 4 and 5, respectively. The average nitrate and phosphate concentrations within the treatment zone are considerably higher than those outside the treatment zone, suggesting hydraulic control of injected water. Microbial populations within the treatment area have remained stable during the reporting period.

4.3 Distribution of Petroleum Hydrocarbons in Ground Water

Results of organic analysis of ground-water samples are presented in Table 7. Laboratory data sheets are presented in Appendix A. TPH values for the August sampling round are presented on Plate 6.

Reported TPH values from monitoring wells within the treatment area are generally higher for the August round than for the July sampling round results. Reported TPH values for wells outside the treatment area are similar for July and August. Petroleum hydrocarbons as TPH were not detected at Monitoring Wells MW-12 and MW-18, located west of the treatment system wells.

TPH values in ground-water samples from Extraction Wells EW-4, EW-8, and EW-19 increased between the July and August rounds, while values in samples from EW-1, EW-12, EW-15 and EW-16 remained stable or decreased. During maintenance activities at Well EW-15 on July 25, a separate floating liquid phase was observed in the well. Wells in the vicinity of EW-15 were also checked for the presence of a separate liquid phase. No other occurrences of separate liquid phases were observed.

4.4 Confirmation Borings

Lithologic characterization of soils from confirmation borings indicate geologic materials similar to those observed and characterized during previous soil boring and well installation activities at the site, as described in *HLA. 1988 and 1989b*.

Predominantly yellowish brown and olive-brown silty sands (SM), poorly graded sands (SP), and clayey sands (SC) were encountered to the total depths of the borings.

Results of OVA headspace and laboratory analysis of soil samples from the confirmation borings are presented in Table 8. Locations of confirmation borings and previous HLA borings are presented on Plate 2. Laboratory data sheets are presented in Appendix B.

Petroleum hydrocarbons were detected in 11 of the 13 soil samples from confirmation borings. Highest measured TPH concentrations (as gasoline) were in the 25-25.5 foot sample from Confirmation Boring BC-2, measured at 5,200 and 4,600 milligrams per kilogram (mg/kg), and in the 24-24.5 foot sample from BC-4 (7,700 and 2,200 mg/kg). Six of the confirmation boring samples had TPH concentrations greater than 1,000 mg/kg. All 6 samples were collected from borings within the treatment area from 23.5 to 25.5 feet bgs. Analysis of two samples collected from between 19.5 and 21 feet bgs at BC-4 and BC-8 indicated no detectable TPH as gasoline and 7.3 mg/kg TPH as gasoline, respectively. Results of soil analysis also indicate that within the zone of highest levels of petroleum hydrocarbons, there is significant variability in hydrocarbon concentrations.

The following EPA Test Method 8020 compounds were detected in confirmation boring soil samples: benzene, toluene, ethylbenzene, and xylenes (BTEX). The maximum concentration of these compounds were measured in the 23.5-24 sample from Boring BC-8 at 110 mg/kg benzene, 1,000 mg/kg toluene, 260 mg/kg ethylbenzene, and

1,600 mg/kg xylenes. In general, high concentrations of BTEX compounds correlate with high TPH values. The results of the confirmation borings indicate that the distribution of petroleum hydrocarbons is within the effective area of treatment at depths greater than about 20 feet bgs.

5.0 SHALLOW SOIL CHARACTERIZATION

5.1 Soil Sampling and Analysis

Nine test pits were excavated in the eastern portion of the site between June 27 and July 29, 1989, at locations shown on Plate 7. Discussions with the Agency indicated that an underground waste oil tank associated with the former gas station near the east corner of the site may not have been removed during demolition of the gas station. Several test pits were excavated in an attempt to locate this tank. Although the tank was not found during the test pit investigation, the shallow soils at the site were further characterized. Additional test pits were excavated to assess the lateral extent of near-surface (less than 4 feet bgs) stained soils observed during construction of infiltration Basin BA-1. Soil samples for laboratory analysis were collected from the test pits and from Basin BA-1. In all, nine soils samples were submitted for laboratory analysis.

Test pit excavation was performed by Layne Western of Woodland, California, using a backhoe. An HLA engineering technician supervised the excavations, performed health and safety monitoring, and collected samples for lithologic characterization and chemical analysis. Soil samples were collected from the bottom of each test pit excavation using the bucket of the backhoe. These samples were hand packed into 6-inch long, 2.5-inch-diameter stainless steel tubes and sealed with aluminum foil lined plastic caps taped to the ends.

All soil samples were stored on ice until delivery with completed chain of custody forms to Pace. All nine samples were analyzed for TPH as gasoline and as diesel (EPA Test Method 3550/8015). Seven were analyzed for purgeable aromatics (EPA Test Method 8020).

5.2 Results

Results of laboratory analysis of soil samples from test pits and infiltration basins are presented in Table 8. Laboratory data sheets are presented in Appendix B. TPH as diesel was detected in samples from Test Pits T2, T6, and T7 at concentrations of 15, 24, and 13 mg/kg, respectively. The maximum TPH (diesel) concentration of 210 mg/kg was detected Sample P4 from infiltration basin BA-1 and TPH as gasoline was also measured in this sample at 790 mg/kg. Toluene and xylenes were found in low concentrations in samples from T2, T4, T6, and T7 and P4. The results of analyses of samples from test pits and infiltration basins indicate that TPH and BTEX are not widespread in the surface soils.

6.0 ACTIVITIES PLANNED FOR AUGUST 1989

On the basis of observed performance, selected injection wells will be redeveloped to improve the injection rate efficiency. Wells will be swabbed over the entire screen interval to remove silt from the slotted sections. The wells will be bailed to remove the silt and then pumped until the water is clear.

Additional confirmation soil samples will be collected to assess the progress of soil treatment. Borings will be drilled and samples collected, screened in the field for volatile organic compounds, and submitted to a state-certified laboratory for TPH and BTEX analyses.

Infiltration Basins BA-8 and BA-9, as shown on Plate 1, will be constructed and filled in August.

To control clogging of bag filters as a result of accumulation of microorganisms, a sand filter equipped with backwash capability will be installed at the influent to the carbon treatment system.

Monitoring of water levels, flow rates, and inorganic and organic constituent concentrations will continue.

7.0 REFERENCES

- Harding Lawson Associates, 1988. *Site Characterization. Pacific Renaissance Plaza. Chinatown Redevelopment Project Area. Oakland, California. December.*
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- Harding Lawson Associates, 1989b. *Report of System Monitoring: March 1989. Soil Treatment System. Pacific Renaissance Plaza. Oakland, California. May 4.*
- Harding Lawson Associates, 1989c. *Report of System Monitoring: April 1989. Soil Treatment System. Pacific Renaissance Plaza. Oakland, California. May 31.*
- Harding Lawson Associates, 1989d. *Report of System Monitoring: March through May 1989. Soil Treatment System. Pacific Renaissance Plaza. Oakland, California. July 10.*
- Harding Lawson Associates, 1989e. *Report of System Monitoring: June 1989. Soil Treatment System. Pacific Renaissance Plaza. Oakland, California. August 2.*
- McDonald, D.G., and A.W. Harbaugh, 1984. *A Modular Three-Dimensional Finite Difference Ground-Water Flow Model. U.S. Geological Survey, Open-File Report 83-875.*

Table 1. Schedule for Sampling, Measurement, and Analysis
 Soil Treatment System
 Pacific Renaissance Plaza

Harding Lawson Associates

Sampling Station	Flow/Water Levels	Measurement/Analysis								
		Nitrate	Ammonia	Phosphate	Microbial Enumeration	Dissolved Iron	Dissolved Oxygen	EPA 8015 (TPH)	EPA 8010	EPA 8020 (BTEX)
Injection Wells										
Composite	D	W	W	W	--	--	--	--	--	--
IW-1	D	--	--	--	--	--	--	--	--	--
IW-2	D	--	--	--	--	--	--	--	--	--
IW-3	D	--	--	--	--	--	--	--	--	--
IW-4	D	--	--	--	--	--	--	--	--	--
IW-5	D	--	--	--	--	--	--	--	--	--
IW-6	D	--	--	--	--	--	--	--	--	--
IW-7	D	--	--	--	--	--	--	--	--	--
IW-8	D	--	--	--	--	--	--	--	--	--
IW-9	D	--	--	--	--	--	--	--	--	--
IW-10	D	--	--	--	--	--	--	--	--	--
IW-11	D	--	--	--	--	--	--	--	--	--
Extraction Wells										
Composite	D	W	W	W	--	--	--	M	M	M
EW-1	D	W	W	W	W	--	W	M	--	N
EW-2	D	--	--	--	--	--	W	--	--	--
EW-3	D	--	--	--	--	--	W	--	--	--
EW-4	D	W	W	W	W	--	W	M	--	N
EW-5	D	--	--	--	--	--	W	--	--	--

Table 1. Schedule for Sampling, Measurement, and Analysis
 Soil Treatment System
 Pacific Renaissance Plaza

Harding Lawson Associates

Sampling Station	Flow/Water Levels	Measurement/Analysis								
		Nitrate	Ammonia	Phosphate	Microbial Enumeration	Dissolved Iron	Dissolved Oxygen	EPA 8015 (TPH)	EPA 8010	EPA 8020 (BTEX)
EW-6	D	--	--	--	--	--	W	--	--	--
EW-7	D	--	--	--	--	--	W	M	--	M
EW-8	D	W	W	W	W	--	W	M	--	M
EW-9	D	--	--	--	--	--	W	--	--	--
EW-10	D	--	--	--	--	--	W	--	--	--
EW-11	D	--	--	--	--	--	W	--	--	--
EW-12	D	W	W	W	W	--	W	M	--	M
EW-13	D	--	--	--	--	--	W	--	--	--
EW-14	D	B	B	B	B	--	W	M	--	M
EW-15	D	B	B	B	B	--	W	M	--	M
EW-16	D	W	W	W	W	B	B	M	--	M
EW-17	D	M	M	M	W	--	W	--	--	--
EW-18	D	M	M	M	M	--	W	--	--	--
EW-19	D	M	M	M	M	--	W	M	--	M
EW-20	D	--	--	--	--	--	W	--	--	--
EW-21	D	W	W	W	W	--	--	M	--	M
EW-22	D	--	--	--	--	--	--	--	--	--
Monitoring Wells										
MW-2	W	--	--	--	--	--	--	--	Q	Q
MW-3	W	--	--	--	--	--	--	--	Q	Q

Table 1. Schedule for Sampling, Measurement, and Analysis
Soil Treatment System
Pacific Renaissance Plaza

Harding Lawson Associates

Sampling Station	Flow/Water Levels	Measurement/Analysis								
		Nitrate	Ammonia	Phosphate	Microbial Enumeration	Dissolved Iron	Dissolved Oxygen	EPA 8015 (TPH)	EPA 8010	EPA 8020 (BTEX)
MW-5	W	M	M	M	--	--	--	M	Q	M
MW-6	W	--	--	--	--	--	--	--	Q	Q
MW-7	W	M	M	M	--	--	--	M	Q	M
MW-8	W	--	--	--	--	--	--	--	Q	Q
MW-9	W	B	B	B	B	--	W	M	Q	M
MW-10	W	B	M	B	--	--	W	M	Q	M
MW-11	W	W	W	W	M	--	W	M	Q	M
MW-12	W	W	W	W	B	--	M	M	Q	M
MW-13	W	W	W	W	B	--	B	M	Q	M
MW-14	W	B	B	B	W	--	M	M	Q	M
MW-15	D	M	M	M	M	W	--	M	--	M
MW-16	D	B	B	B	B	W	B	M	Q	M
MW-17	D	W	W	W	W	W	M	M	--	M
MW-18	W	B	B	B	B	--	--	M	Q	M

Notes:

- D = daily
- W = weekly
- B = biweekly
- M = monthly
- = no analysis or measurement

Table 2. Injection Well and Infiltration Basin Flow Rates - July 1989

Injection Well Flow Rates - July 1989

Meter No.	01-Aug-89 Totalizer Reading	05-Jul-89 Totalizer Reading	Elapsed Time (min)	Average Flow Rate (gpm)
IW-1	820225	602280	38915	5.60
IW-2	789676	605917	38915	4.72
IW-3	628936	513995	38915	2.95
IW-4	686765	491939	38915	5.01
IW-5	224970	162295	38915	1.61
IW-6	461247	371056	38915	2.32
IW-7	928019	771313	38915	4.03
IW-8	352349	268101	38915	2.16
IW-9	509705	419045	38915	2.33
IW-10	94359	89688	38915	0.12
IW-11	276527	200658	38915	1.95
Total (1-9)	5401892	4205941	38915	30.73
Total (10,11)	370886	290346	38915	2.07
Total (1-11)	5772778	4496287	38915	32.80

Note: Totalizer readings in gallons.

Infiltration Basin Flow Rates - July 1989

Meter No.	01-Aug-89 Totalizer Reading	16-Jul-89 Totalizer Reading	Elapsed Time (min)	Average Flow Rate (gpm)
BA-1	54060	31804	22400	0.99
BA-2	19527	4042	22400	0.69
BA-3	50084	32754	22400	0.77
BA-4	22603	3748	22400	0.84
BA-5	39687	5315	22400	1.53
BA-6	2909	2895	22400	0.00
BA-7	25307	6491	22400	0.84
Total (1-7)	214177	87049	22400	5.68

Note: Totalizer readings in gallons.

Table 3. Extraction Well Flow Rates: July 1989

Harding Lawson Associates

Meter No.	01-Aug-89 Totalizer Reading	05-Jul-89 Totalizer Reading	Elapsed Time (min)	Average Flow Rate (gpm)
EW-1	171502	125818	38910	1.17
EW-2	194644	147709	38910	1.21
EW-3	271055	197949	38910	1.88
EW-4	225571	162934	38910	1.61
EW-5	280615	215389	38910	1.68
EW-6	113935	92080	38910	0.56
EW-7	106593	90634	38910	0.41
EW-8	190083	133649	38910	1.45
EW-9	198026	156017	38910	1.08
EW-10	189951	135601	38910	1.40
EW-11	174149	129544	38910	1.15
EW-12	148233	116032	38910	0.83
EW-13	174296	135566	38910	1.00
EW-14	168168	115978	38910	1.34
EW-15	255930	159570	38910	2.48
EW-16	528095	396415	38910	3.38
EW-17	413837	314573	38910	2.55
EW-18	486105	384150	38910	2.62
EW-19	301059	224785	38910	1.96
EW-20	153293	107795	38910	1.17
EW-21	34151	19550	38910	0.38
EW-22 *			38910	0.00
Total (1-20)	4745140	3542188	38910	30.92
Total (21-22) *	34151	19550	38910	0.38
Total (1-22)	4779291	3561738	38910	31.29

Note: Totalizer readings in gallons.

* Well EW-22 is not equipped with a totalizer flow meter.

Table 4. Water-Level Elevations: January through July, 1989

Harding Lawson Associates

Well No.	MW-2		MW-3		MW-5		MW-6		MW-7		MW-8		MW-9	
	GROUND SURFACE 40.05	TOP OF CASING 39.55	GROUND SURFACE 39.02	TOP OF CASING 38.35	GROUND SURFACE 38.45	TOP OF CASING 37.86	GROUND SURFACE 39.95	TOP OF CASING 39.59	GROUND SURFACE 39.35	TOP OF CASING 39.10	GROUND SURFACE 40.63	TOP OF CASING 40.47	GROUND SURFACE 38.65	TOP OF CASING 38.50
DATE	Depth to Water	Elevation	Depth to Water	Elevation	Depth to Water	Elevation	Depth to Water	Elevation	Depth to Water	Elevation	Depth to Water	Elevation	Depth to Water	Elevation
03-Jan-89	33.10	6.45	32.35	6.00	33.00	4.86	30.22	9.37	31.15	7.95	32.78	7.69	30.58	7.92
05-Jan-89	-	-	32.35	6.00	33.00	4.86	30.22	9.37	31.15	7.95	32.78	7.69	30.58	7.92
02-Feb-89	33.05	6.50	33.01	5.34	31.82	6.04	30.23	9.36	30.51	8.59	32.62	7.85	31.67	6.83
08-Feb-89	33.83	5.72	32.21	6.14	32.02	5.84	31.05	8.54	31.44	7.66	33.03	7.44	30.65	7.85
15-Feb-89	-	-	-	-	-	-	-	-	-	-	-	-	-	-
18-Feb-89	30.59	8.96	29.26	9.09	31.90	5.96	30.05	9.54	30.21	8.89	31.96	8.51	30.16	8.34
25-Feb-89	29.85	9.70	28.68	9.67	30.32	7.54	30.57	9.02	31.10	8.00	31.90	8.57	30.80	7.70
02-Mar-89	-	-	-	-	-	-	-	-	-	-	-	-	30.05	8.45
11-Mar-89	-	-	-	-	-	-	-	-	-	-	-	-	23.06	15.44
18-Mar-89	-	-	32.20	6.15	32.01	5.85	-	-	31.52	7.58	-	-	22.45	16.05
25-Mar-89	-	-	27.76	10.59	27.53	10.33	-	-	30.08	9.02	-	-	22.62	15.88
30-Mar-89	-	-	-	-	-	-	-	-	-	-	-	-	23.00	15.50
04-Apr-89	28.52	11.03	27.56	10.79	-	-	28.00	11.59	29.00	10.10	30.45	10.02	22.61	15.89
08-Apr-89	-	-	-	-	-	-	-	-	-	-	-	-	23.12	15.38
11-Apr-89	-	-	-	-	-	-	-	-	-	-	-	-	23.37	15.13
12-Apr-89	28.59	10.96	27.63	10.72	-	-	27.17	12.42	28.96	10.14	30.45	10.02	-	-
18-Apr-89	-	-	-	-	-	-	-	-	-	-	-	-	-	-
19-Apr-89	-	-	-	-	-	-	-	-	28.13	10.97	-	-	23.36	15.14
25-Apr-89	-	-	-	-	-	-	-	-	-	-	-	-	22.80	15.70
02-May-89	28.71	10.84	26.84	11.51	-	-	27.49	12.10	28.54	10.56	29.80	10.67	22.73	15.77
09-May-89	27.99	11.56	26.58	11.77	26.11	11.75	27.34	12.25	28.34	10.76	29.68	10.79	23.04	15.46
17-May-89	27.80	11.75	26.62	11.73	-	-	27.11	12.48	28.16	10.94	29.27	11.20	23.33	15.17
22-May-89	27.52	12.03	28.17	10.18	25.98	11.88	26.89	12.70	27.69	11.41	28.68	11.79	23.94	14.56
31-May-89	27.99	11.56	26.28	12.07	-	-	27.11	12.48	28.28	10.82	29.31	11.16	24.17	14.33
05-Jun-89	27.60	11.95	25.83	12.52	24.96	12.90	27.00	12.59	28.18	10.92	29.41	11.06	19.72	18.78
14-Jun-89	27.58	11.97	26.00	12.35	25.52	12.34	26.88	12.71	28.09	11.01	29.20	11.27	20.53	17.97
19-Jun-89	-	-	-	-	-	-	-	-	-	-	-	-	20.31	18.19
28-Jun-89	-	-	27.88	10.47	25.39	12.47	-	-	-	-	-	-	21.26	17.24
05-Jul-89	27.34	12.21	25.92	12.43	25.50	12.36	26.66	12.93	27.68	11.42	28.99	11.48	21.88	16.62
21-Jul-89	-	-	24.73	13.62	25.44	12.42	-	-	27.60	11.50	-	-	21.39	17.11
28-Jul-89	-	-	-	-	-	-	-	-	-	-	-	-	21.36	17.14
01-Aug-89	27.22	12.33	26.67	11.68	25.36	12.50	26.61	12.74	27.44	11.66	28.79	11.68	21.60	16.90

Notes:

Elevations are in feet above Mean Sea Level (MSL).
 Depth to water in feet measured from top of casing.

Table 4. Water-Level Elevations: January through July, 1989

Harding Lawson Associates

Well No.	MW-10		MW-11		MW-12		MW-13		MW-14		MW-15		MW-16	
	GROUND SURFACE	TOP OF CASING	GROUND SURFACE	TOP OF CASING	GROUND SURFACE	TOP OF CASING	GROUND SURFACE	TOP OF CASING	GROUND SURFACE	TOP OF CASING	GROUND SURFACE	TOP OF CASING	GROUND SURFACE	TOP OF CASING
	36.74	36.35	37.98	37.55	37.70	37.00	39.79	40.77	39.27	40.26	39.69	40.73	39.55	40.53
DATE	Depth to Water	Elevation	Depth to Water	Elevation	Depth to Water	Elevation	Depth to Water	Elevation	Depth to Water	Elevation	Depth to Water	Elevation	Depth to Water	Elevation
03-Jan-89	27.34	9.01	30.30	7.25	-	-	-	-	-	-	-	-	-	-
05-Jan-89	27.34	9.01	30.30	7.25	-	-	-	-	-	-	-	-	-	-
02-Feb-89	28.11	8.24	30.03	7.52	-	-	-	-	-	-	-	-	-	-
08-Feb-89	27.65	8.70	29.52	8.03	-	-	-	-	-	-	-	-	-	-
15-Feb-89	-	-	-	-	28.89	8.11	-	-	-	-	-	-	-	-
18-Feb-89	27.65	8.70	28.02	9.53	-	-	-	-	-	-	-	-	-	-
25-Feb-89	27.12	9.23	29.05	8.50	30.87	6.13	32.63	8.14	31.07	9.19	32.83	7.90	32.43	8.10
02-Mar-89	27.23	9.12	28.98	8.57	28.46	8.54	32.79	7.98	32.28	7.98	32.40	8.33	32.50	8.03
11-Mar-89	23.59	12.76	28.93	8.62	28.22	8.78	30.12	10.65	28.64	11.62	27.10	13.63	25.64	14.89
18-Mar-89	23.17	13.18	27.79	9.76	27.85	9.15	30.29	10.48	28.20	12.06	26.62	14.11	24.74	15.79
25-Mar-89	23.19	13.16	28.10	9.45	27.47	9.53	29.76	11.01	27.79	12.47	26.28	14.45	24.88	15.65
30-Mar-89	23.56	12.79	28.48	9.07	27.43	9.57	30.12	10.65	27.99	12.27	26.50	14.23	25.48	15.05
04-Apr-89	23.34	13.01	28.61	8.94	28.44	8.56	29.60	11.17	27.84	12.42	26.84	13.89	25.53	15.00
08-Apr-89	23.50	12.85	29.31	8.24	-	-	30.49	10.28	27.81	12.45	26.81	13.92	25.74	14.79
11-Apr-89	23.64	12.71	29.45	8.10	-	-	30.62	10.15	28.04	12.22	27.21	13.52	26.24	14.29
12-Apr-89	-	-	-	-	28.64	8.36	-	-	-	-	-	-	-	-
18-Apr-89	-	-	-	-	-	-	-	-	-	-	27.08	13.65	26.02	14.51
19-Apr-89	23.41	12.94	26.77	10.78	26.98	10.02	30.19	10.58	27.13	13.13	-	-	-	-
25-Apr-89	23.39	12.96	29.18	8.37	27.47	9.53	30.40	10.37	27.75	12.51	27.01	13.72	25.97	14.56
02-May-89	23.54	12.81	28.44	9.11	27.36	9.64	29.42	11.35	27.50	12.76	25.91	14.82	24.42	16.11
09-May-89	23.86	12.49	27.09	10.46	26.85	10.15	29.86	10.91	27.38	12.88	26.63	14.10	25.37	15.16
17-May-89	23.63	12.72	28.88	8.67	27.63	9.37	29.10	11.67	27.73	12.53	27.25	13.48	26.23	14.30
22-May-89	23.54	12.81	28.56	8.99	27.62	9.38	30.24	10.53	27.95	12.31	27.25	13.48	26.34	14.19
31-May-89	24.54	11.81	29.18	8.37	28.16	8.84	30.34	10.43	27.99	12.27	27.42	13.31	26.31	14.22
05-Jun-89	23.22	13.13	28.92	8.63	28.08	8.92	29.88	10.89	26.18	14.08	25.83	14.90	24.67	15.86
14-Jun-89	22.66	13.69	28.66	8.89	27.97	9.03	29.31	11.46	26.54	13.72	24.54	16.19	24.73	15.80
19-Jun-89	22.74	13.61	28.20	9.35	27.47	9.53	29.06	11.71	26.21	14.05	24.11	16.62	22.06	18.47
28-Jun-89	22.66	13.69	28.57	8.98	27.83	9.17	29.47	11.30	26.65	13.61	24.97	15.76	23.01	17.52
05-Jul-89	23.41	12.94	27.61	9.94	27.10	9.90	29.15	11.62	26.78	13.48	25.23	15.50	23.52	17.01
21-Jul-89	23.04	13.31	27.58	9.97	27.03	9.97	28.71	12.06	26.62	13.64	25.19	15.54	23.42	17.11
28-Jul-89	23.03	13.32	27.48	10.07	-	-	28.61	12.16	26.38	13.88	24.32	16.41	22.29	18.24
01-Aug-89	23.19	13.16	26.64	10.91	26.35	10.65	28.74	12.03	26.43	13.83	24.78	15.95	22.94	17.59

Notes:

Elevations are in feet above Mean Sea Level (MSL).
Depth to water in feet measured from top of casing.

Table 4. Water-Level Elevations: January through July, 1989

Harding Lawson Associates

Well No.	MW-17		MW-18	
	GROUND SURFACE	TOP OF CASING	GROUND SURFACE	TOP OF CASING
	39.16	40.16	36.56	35.88
	-----		-----	
DATE	Depth to Water	Elevation	Depth to Water	Elevation
	-----		-----	
03-Jan-89	-	-	-	-
05-Jan-89	-	-	-	-
02-Feb-89	-	-	-	-
08-Feb-89	-	-	-	-
15-Feb-89	-	-	26.89	8.99
18-Feb-89	-	-	-	-
25-Feb-89	32.02	8.14	26.90	8.98
02-Mar-89	-	-	26.66	9.22
11-Mar-89	23.45	16.71	26.28	9.60
18-Mar-89	23.35	16.81	26.18	9.70
25-Mar-89	23.35	16.81	25.70	10.18
30-Mar-89	-	-	-	-
04-Apr-89	24.18	15.98	26.10	9.78
08-Apr-89	24.28	15.88	25.82	10.06
11-Apr-89	24.83	15.33	-	-
12-Apr-89	-	-	26.16	9.72
18-Apr-89	24.64	15.52	-	-
19-Apr-89	-	-	25.89	9.99
25-Apr-89	24.57	15.59	27.91	7.97
02-May-89	22.71	17.45	25.76	10.12
09-May-89	23.89	16.27	25.38	10.50
17-May-89	24.85	15.31	25.59	10.29
22-May-89	25.28	14.88	25.27	10.61
31-May-89	24.91	15.25	26.04	9.84
05-Jun-89	22.62	17.54	25.98	9.90
14-Jun-89	20.44	19.72	25.89	9.99
19-Jun-89	19.72	20.44	25.91	9.97
28-Jun-89	20.89	19.27	25.76	10.12
05-Jul-89	21.56	18.60	25.68	10.20
21-Jul-89	21.52	18.64	25.58	10.30
28-Jul-89	20.25	19.91	-	-
01-Aug-89	21.15	19.01	25.32	10.56

Notes:

Elevations are in feet above Mean Sea Level (MSL).
 Depth to water in feet measured from top of casing.

Table 5. Results of Inorganic Chemical and Microbial Analyses of Ground-Water Samples from System Wells

WELL	DATE	NITRATE	PHOSPHATE	DISSOLVED	DISSOLVED	AMMONIA	MICROBIAL	
				OXYGEN	IRON		TC	NCU
LOD		0.5(ppm)	0.5(ppm)	0.1(ppm)	0.1(ppm)	0.5(ppm)	NA (CFU/ml)	NA (CFU/ml)
EW-1								
	15-Mar-89	17.6	ND	NT	ND	ND	7.8E+6	1.2E+2
	29-Mar-89	9.7	3.5	NT	NT	ND	1.8E+6	3.8E+2
	04-Apr-89	13.2	3.8	NT	ND	ND	3.3E+5	2.2E+2
	11-Apr-89	24.6	2.8	NT	NT	ND	NT	NT
	18-Apr-89	30.8	1.0	4.1	ND	ND	3.3E+5	7.8E+1
	25-Apr-89	33.4	3.0	4.8	NT	ND	6.8E+4	2.1E+1
	02-May-89	37.0	5.0	4.9	NT	ND	4.5E+5	9.5E+1
	09-May-89	22.9	2.5	9.8*	NT	ND	5.2E+5	7.0E+2
	17-May-89	37.0	1.5	7.5	NT	ND	2.6E+5	1.4E+2
	23-May-89	15.8	5.3	11.1	NT	ND	NT	NT
	31-May-89	52.8	2.8	5.9	NT	ND	7.6E+5	4.6E+2
	05-Jun-89	25.9	ND	14.5	NT	ND	NT	NT
	14-Jun-89	17.6	2.3	12.6	NT	ND	NT	NT
	20-Jun-89	NT	NT	19.3	NT	NT	NT	NT
	27-Jun-89	52.8	NT	16.5	NT	NT	NT	NT
	06-Jul-89	47.3	4.0	13.3	NT	ND	9.3E+5	7.0E+3
	22-Jul-89	33.0	6.7	NT	NT	ND	NT	NT
	03-Aug-89	46.2	7.8	NT	NT	ND	--	--
EW-2								
	23-May-89	NT	NT	15.8	NT	NT	NT	NT
	31-May-89	NT	NT	12.7	NT	NT	NT	NT
	05-Jun-89	NT	NT	16.3	NT	NT	NT	NT
	14-Jun-89	NT	NT	15.6	NT	NT	NT	NT
	20-Jun-89	NT	NT	19.6	NT	NT	NT	NT
	27-Jun-89	NT	NT	18.9	NT	NT	NT	NT
	06-Jul-89	NT	NT	16.5	NT	NT	NT	NT
EW-3								
	23-May-89	NT	NT	20.0	NT	NT	NT	NT
	31-May-89	NT	NT	18.3	NT	NT	NT	NT
	05-Jun-89	NT	NT	>20.0	NT	NT	NT	NT
	14-Jun-89	NT	NT	>20.0	NT	NT	NT	NT
	20-Jun-89	NT	NT	19.7	NT	NT	NT	NT
	27-Jun-89	NT	NT	NT	NT	NT	NT	NT
	06-Jul-89	NT	NT	14.0	NT	NT	NT	NT
EW-4								
	15-Mar-89	16.7	0.6	NT	ND	ND	5.1E+6	9.5E+1
	29-Mar-89	25.5	2.8	NT	NT	ND	5.3E+5	1.7E+2
	04-Apr-89	31.7	4.0	NT	ND	ND	2.5E+5	6.8E+1

Table 5. Results of Inorganic Chemical and Microbial Analyses of Ground-Water Samples from System Wells

WELL	DATE	NITRATE	PHOSPHATE	DISSOLVED	DISSOLVED	AMMONIA	MICROBIAL ENUMERATION	
				OXYGEN	IRON		TC	HCU
LOD		0.5(ppm)	0.5(ppm)	0.1(ppm)	0.1(ppm)	0.5(ppm)	NA (CFU/ml)	NA (CFU/ml)
	11-Apr-89	34.1	3.3	NT	NT	ND	4.3E+4	4.5E+1
	18-Apr-89	43.6	5.3	7.9	ND	ND	4.3E+4	1.1E+2
	25-Apr-89	49.3	5.0	4.8	NT	ND	9.0E+4	1.7E+2
	02-May-89	48.4	9.0	4.9	NT	ND	2.5E+5	2.0E+3
	09-May-89	70.4	11.8	9.8*	NT	ND	NT	NT
	17-May-89	50.6	16.0	7.5	NT	ND	NT	NT
	23-May-89	52.8	17.0	NT	NT	ND	5.8E+6	7.8E+1
	31-May-89	47.9	17.0	18.9	NT	ND	NT	NT
	05-Jun-89	49.1	16.6	>20.0	NT	ND	1.3E+5	4.9E+2
	14-Jun-89	27.1	17.0	14.5	NT	ND	6.1E+5	2.4E+5
	20-Jun-89	48.4	17.0	18.5	NT	ND	2.3E+6	2.2E+4
	27-Jun-89	NT	18.0	16.8	NT	ND	8.0E+5	1.4E+4
	06-Jul-89	48.4	17.0	13.9	NT	ND	NT	NT
	22-Jul-89	45.1	20.5	NT	NT	ND	NT	NT
	03-Aug-89	57.2	20.5	NT	NT	ND	--	--
EW-5	29-Mar-89	28.0	3.8	NT	NT	ND	NT	NT
	18-Apr-89	NT	NT	8.6	NT	NT	NT	NT
	25-Apr-89	NT	NT	12.8	NT	NT	NT	NT
	02-May-89	NT	NT	NT	NT	NT	NT	NT
	09-May-89	NT	NT	15.0*	NT	NT	NT	NT
	17-May-89	NT	NT	NT	NT	NT	NT	NT
	23-May-89	NT	NT	>20.0	NT	NT	NT	NT
	31-May-89	NT	NT	17.8	NT	NT	NT	NT
	05-Jun-89	NT	NT	>20.0	NT	NT	NT	NT
	14-Jun-89	NT	NT	>20.0	NT	NT	NT	NT
	20-Jun-89	NT	NT	19.9	NT	NT	NT	NT
	27-Jun-89	NT	NT	19.6	NT	NT	NT	NT
	06-Jul-89	NT	NT	19.0	NT	NT	NT	NT
EW-6	23-May-89	NT	NT	7.6	NT	NT	NT	NT
	31-May-89	NT	NT	17.5	NT	NT	NT	NT
	05-Jun-89	NT	NT	14.5	NT	NT	NT	NT
	14-Jun-89	NT	NT	12.3	NT	NT	NT	NT
	20-Jun-89	NT	NT	19.5	NT	NT	NT	NT
	27-Jun-89	NT	NT	12.0	NT	NT	NT	NT
	06-Jul-89	NT	NT	8.2	NT	NT	NT	NT
EW-7	23-May-89	NT	NT	1.8	NT	NT	NT	NT

Table 5. Results of Inorganic Chemical and Microbial Analyses of Ground-Water Samples from System Wells

WELL	DATE	NITRATE	PHOSPHATE	DISSOLVED	DISSOLVED	AMMONIA	MICROBIAL	
				OXYGEN	IRON		TC	HCU
		0.5(ppm)	0.5(ppm)	0.1(ppm)	0.1(ppm)	0.5(ppm)	NA (CFU/ml)	NA (CFU/ml)
EW-8	31-May-89	NT	NT	11.2	NT	NT	NT	NT
	05-Jun-89	NT	NT	5.3	NT	NT	NT	NT
	14-Jun-89	NT	NT	5.6	NT	NT	NT	NT
	20-Jun-89	NT	NT	1.9	NT	NT	NT	NT
	27-Jun-89	NT	NT	8.0	NT	NT	NT	NT
	06-Jul-89	37.4	3.3	6.2	NT	ND	NT	NT
	15-Mar-89	11.4	0.5	NT	ND	ND	NT	NT
	29-Mar-89	28.0	3.5	NT	NT	ND	NT	NT
	04-Apr-89	33.0	3.8	NT	ND	ND	3.1E+5	1.4E+2
	11-Apr-89	37.8	2.8	NT	NT	ND	2.0E+4	4.5E+1
	18-Apr-89	33.4	3.8	4.0	NT	ND	4.1E+5	1.4E+2
	25-Apr-89	47.5	8.0	10.9	NT	ND	3.4E+4	9.5E+1
	02-May-89	39.6	11.0	9.8	NT	ND	6.8E+4	5.6E+2
	09-May-89	39.6	15.5	12.1*	NT	ND	6.5E+5	1.8E+2
	17-May-89	57.2	14.3	6.9	NT	ND	NT	NT
	23-May-89	47.5	13.3	14.9	NT	ND	NT	NT
	31-May-89	57.2	13.0	NT	NT	ND	2.5E+5	3.8E+2
	05-Jun-89	57.2	15.8	15.9	NT	ND	NT	NT
	14-Jun-89	39.6	15.0	16.9	NT	ND	NT	NT
	20-Jun-89	NT	NT	>20.0	NT	NT	NT	NT
27-Jun-89	55.0	15.5	15.6	NT	0.5	NT	NT	
06-Jul-89	36.4	16.4	10.7	NT	0.6	2.3E+6	4.9E+4	
22-Jul-89	33.7	18.3	NT	NT	0.8	6.4E+5	4.9E+4	
03-Aug-89	46.2	25.5	NT	NT	3.1	--	--	
EW-9	23-May-89	NT	NT	11.9	NT	NT	NT	NT
	31-May-89	NT	NT	17.2	NT	NT	NT	NT
	05-Jun-89	NT	NT	12.7	NT	NT	NT	NT
	14-Jun-89	NT	NT	19.1	NT	NT	NT	NT
	20-Jun-89	NT	NT	NT	NT	NT	NT	NT
	27-Jun-89	NT	NT	15.3	NT	NT	NT	NT
	06-Jul-89	NT	NT	12.8	NT	NT	NT	NT
EW-10	23-May-89	NT	NT	10.7	NT	NT	NT	NT
	31-May-89	NT	NT	11.1	NT	NT	NT	NT
	05-Jun-89	NT	NT	13.0	NT	NT	NT	NT
	14-Jun-89	NT	NT	16.0	NT	NT	NT	NT
	20-Jun-89	NT	NT	NT	NT	NT	NT	NT

Table 5. Results of Inorganic Chemical and Microbial Analyses of Ground-Water Samples from System Wells

WELL	DATE	NITRATE	PHOSPHATE	DISSOLVED	DISSOLVED	AMMONIA	MICROBIAL	
				OXYGEN	IRON		TC	HCU
		0.5(ppm)	0.5(ppm)	0.1(ppm)	0.1(ppm)	0.5(ppm)	NA (CFU/ml)	NA (CFU/ml)
EW-11	27-Jun-89	NT	NT	16.4	NT	NT	NT	NT
	06-Jul-89	NT	NT	13.5	NT	NT	NT	NT
	23-May-89	NT	NT	11.9	NT	NT	NT	NT
	31-May-89	NT	NT	15.5	NT	NT	NT	NT
	05-Jun-89	NT	NT	16.5	NT	NT	NT	NT
	14-Jun-89	NT	NT	17.4	NT	NT	NT	NT
	20-Jun-89	NT	NT	15.9	NT	NT	NT	NT
	27-Jun-89	NT	NT	12.9	NT	NT	NT	NT
EW-12	06-Jul-89	NT	NT	14.8	NT	NT	NT	NT
	15-Mar-89	13.2	1.0	NT	ND	ND	NT	NT
	29-Mar-89	22.0	3.3	NT	NT	ND	NT	NT
	04-Apr-89	22.9	3.8	NT	ND	ND	NT	NT
	11-Apr-89	20.2	3.8	NT	NT	ND	NT	NT
	18-Apr-89	28.6	1.3	5.6	NT	ND	NT	NT
	25-Apr-89	39.2	2.8	2.6	NT	ND	NT	NT
	02-May-89	33.4	3.0	4.9	NT	ND	1.0E+6	3.5E+2
	09-May-89	31.7	2.3	5.1*	NT	ND	4.6E+5	2.4E+2
	17-May-89	52.0	1.0	3.5	NT	ND	NT	NT
	23-May-89	34.3	1.3	9.1	NT	ND	NT	NT
	31-May-89	30.3	2.5	11.3	NT	ND	NT	NT
	05-Jun-89	26.4	ND	13.6	NT	ND	NT	NT
	14-Jun-89	45.1	ND	14.1	NT	ND	5.3E+6	2.4E+5
	20-Jun-89	39.2	1.3	16.3	NT	ND	NT	NT
	27-Jun-89	11.0	2.8	NT	NT	ND	6.8E+6	1.7E+4
	06-Jul-89	41.8	3.8	NT	NT	ND	6.4E+5	4.9E+4
22-Jul-89	26.8	7.0	NT	NT	ND	NT	NT	
03-Aug-89	48.4	8.5	NT	NT	ND	--	--	
EW-13	23-May-89	NT	NT	14.6	NT	NT	NT	NT
	31-May-89	NT	NT	16.4	NT	NT	NT	NT
	05-Jun-89	NT	NT	17.9	NT	NT	NT	NT
	14-Jun-89	NT	NT	14.5	NT	NT	NT	NT
	20-Jun-89	NT	NT	>20.0	NT	NT	NT	NT
	27-Jun-89	NT	NT	14.5	NT	NT	NT	NT
	06-Jul-89	NT	NT	>20.0	NT	NT	NT	NT
	22-Jul-89	40.7	11.8	NT	NT	ND	4.1E+5	1.4E+4
EW-14								

Table 5. Results of Inorganic Chemical and Microbial Analyses of Ground-Water Samples from System Wells

WELL	DATE	NITRATE	PHOSPHATE	DISSOLVED	DISSOLVED	AMMONIA	MICROBIAL	
				OXYGEN	IRON		TC	HCU
LOD		0.5(ppm)	0.5(ppm)	0.1(ppm)	0.1(ppm)	0.5(ppm)	NA (CFU/ml)	NA (CFU/ml)
	18-Apr-89	NT	NT	NT	NT	NT	1.1E+7	1.4E+3
	25-Apr-89	NT	NT	4.9	NT	NT	NT	NT
	02-May-89	NT	NT	NT	NT	NT	NT	NT
	09-May-89	NT	NT	9.6*	NT	NT	NT	NT
	17-May-89	48.4	5.0	7.0	NT	ND	2.5E+5	1.1E+3
	23-May-89	39.2	5.8	14.6	NT	ND	3.3E+5	7.9E+2
	31-May-89	44.0	6.8	14.1	NT	ND	NT	NT
	05-Jun-89	46.2	4.8	14.3	NT	ND	3.4E+6	3.5E+4
	14-Jun-89	48.4	5.8	14.3	NT	ND	1.3E+7	1.6E+5
	20-Jun-89	NT	NT	12.9	NT	NT	NT	NT
	27-Jun-89	NT	NT	11.9	NT	NT	NT	NT
	06-Jul-89	63.8	8.0	14.9	NT	ND	8.9E+6	3.3E+4
	22-Jul-89	44.0	12.0	NT	NT	ND	--	--
EW-15	18-Apr-89	NT	NT	NT	NT	NT	1.1E+6	1.4E+2
	25-Apr-89	45.8	23.0	1.1	ND	NT	1.6E+5	4.7E+2
	02-May-89	NT	NT	NT	NT	NT	NT	NT
	09-May-89	58.1	26.5	>20.0*	NT	1.2	1.8E+6	1.6E+4
	17-May-89	45.4	22.4	8.9	NT	1.8	3.9E+6	3.5E+3
	23-May-89	41.0	19.1	>20.0	NT	2.7	1.3E+7	1.3E+4
	31-May-89	63.8	21.5	>20.0	NT	3.5	6.6E+6	2.4E+5
	05-Jun-89	43.6	28.1	>20.0	NT	3.7	6.4E+6	1.6E+5
	14-Jun-89	48.4	15.8	18.2	NT	2.0	9.2E+6	2.4E+5
	20-Jun-89	NT	NT	>20.0	NT	NT	NT	NT
	27-Jun-89	NT	NT	18.5	NT	NT	NT	NT
	06-Jul-89	52.8	25.7	19.3	NT	2.5	4.9E+6	1.7E+5
	22-Jul-89	30.4	33.8	NT	NT	3.4	2.4E+6	2.4E+4
	03-Aug-89	50.6	33.8	NT	NT	4.0	--	--
EW-16	15-Mar-89	1.8	0.5	NT	ND	ND	NT	NT
	29-Mar-89	18.4	3.0	NT	NT	ND	NT	NT
	04-Apr-89	31.7	5.0	NT	ND	ND	5.7E+5	3.9E+2
	11-Apr-89	28.6	4.8	NT	NT	ND	1.2E+5	2.2E+2
	18-Apr-89	37.8	14.0	1.0	ND	1.2	3.2E+6	1.4E+3
	25-Apr-89	47.5	11.0	NT	NT	ND	8.4E+5	7.0E+2
	02-May-89	46.2	15.0	9.3	NT	ND	3.5E+5	1.4E+4
	09-May-89	46.2	18.5	14.7*	NT	0.6	2.2E+6	1.3E+3
	17-May-89	36.3	13.3	3.7	NT	ND	4.4E+5	2.2E+3
	23-May-89	29.7	11.8	10.1	NT	ND	8.6E+5	1.4E+3

Table 5. Results of Inorganic Chemical and Microbial Analyses of Ground-Water Samples from System Wells

WELL	DATE	NITRATE	PHOSPHATE	DISSOLVED	DISSOLVED	AMMONIA	MICROBIAL	
				OXYGEN	IRON		TC	HCU
LOD		0.5(ppm)	0.5(ppm)	0.1(ppm)	0.1(ppm)	0.5(ppm)	NA (CFU/ml)	NA (CFU/ml)
	31-May-89	35.2	11.8	11.1	NT	0.7	5.9E+6	3.5E+3
	05-Jun-89	31.5	12.5	12.6	NT	ND	1.8E+6	2.2E+3
	14-Jun-89	29.7	13.3	11.8	NT	ND	3.7E+7	2.4E+5
	20-Jun-89	8.8	13.5	15.8	NT	ND	2.0E+7	3.5E+4
	27-Jun-89	42.9	13.3	19.7	NT	ND	9.5E+5	2.4E+5
	06-Jul-89	55.0	16.0	15.8	NT	ND	9.1E+6	1.1E+5
	22-Jul-89	23.8	18.3	NT	NT	1.4	NT	NT
	03-Aug-89	42.9	20.0	NT	NT	2.1	--	--
EW-17	18-Apr-89	NT	NT	16.8	NT	NT	NT	NT
	25-Apr-89	6.2	8.3	NT	ND	ND	NT	NT
	02-May-89	NT	NT	NT	NT	NT	NT	NT
	09-May-89	66.0	19.8	18.0*	NT	ND	1.2E+6	1.6E+4
	17-May-89	46.2	15.8	7.8	NT	ND	8.5E+5	3.5E+3
	23-May-89	44.0	14.2	18.0	NT	ND	6.5E+5	9.5E+2
	31-May-89	46.2	14.0	19.6	NT	ND	6.5E+5	2.8E+3
	05-Jun-89	52.8	13.2	18.2	NT	ND	NT	NT
	14-Jun-89	45.1	14.2	17.0	NT	ND	NT	NT
	20-Jun-89	NT	NT	18.5	NT	NT	NT	NT
	27-Jun-89	NT	NT	16.1	NT	NT	NT	NT
	06-Jul-89	NT	NT	16.4	NT	NT	NT	NT
EW-18	18-Apr-89	NT	NT	10.5	NT	NT	NT	NT
	25-Apr-89	6.2	NT	9.2	NT	NT	NT	NT
	02-May-89	NT	NT	NT	NT	NT	NT	NT
	09-May-89	NT	NT	18.2*	NT	NT	NT	NT
	17-May-89	38.4	NT	8.0	NT	ND	NT	NT
	23-May-89	37.0	NT	17.8	NT	ND	7.0E+5	NT
	31-May-89	46.2	NT	17.8	NT	ND	5.4E+6	1.7E+3
	05-Jun-89	NT	NT	19.1	NT	NT	NT	NT
	14-Jun-89	42.9	NT	14.5	NT	ND	NT	NT
	20-Jun-89	NT	NT	>20.0	NT	NT	NT	NT
	27-Jun-89	NT	NT	>20.0	NT	NT	NT	NT
	06-Jul-89	NT	NT	>20.0	NT	NT	NT	NT
EW-19	15-Mar-89	NT	NT	NT	NT	NT	NT	NT
	29-Mar-89	NT	NT	NT	NT	NT	NT	NT
	04-Apr-89	18.5	4.0	NT	ND	ND	NT	NT
	11-Apr-89	33.4	4.0	NT	NT	ND	NT	NT

Table 5. Results of Inorganic Chemical and Microbial Analyses of Ground-Water Samples from System Wells

WELL	DATE	NITRATE	PHOSPHATE	DISSOLVED	DISSOLVED	AMMONIA	MICROBIAL	
				OXYGEN	IRON		TC	HCU
LOD		0.5(ppm)	0.5(ppm)	0.1(ppm)	0.1(ppm)	0.5(ppm)	NA (CFU/ml)	NA (CFU/ml)
	18-Apr-89	41.8	7.0	9.0	NT	ND	NT	NT
	25-Apr-89	NT	NT	7.2	NT	NT	NT	NT
	02-May-89	50.6	2.5	7.2	NT	ND	NT	NT
	09-May-89	NT	6.8	13.5*	NT	NT	NT	NT
	17-May-89	38.4	3.3	8.3	NT	ND	1.1E+6	1.6E+4
	23-May-89	37.0	2.5	16.5	NT	ND	NT	NT
	31-May-89	NT	NT	>20.0	NT	NT	NT	NT
	05-Jun-89	46.2	3.5	18.5	NT	ND	7.9E+5	1.1E+4
	14-Jun-89	NT	NT	>20.0	NT	NT	NT	NT
	20-Jun-89	NT	NT	>20.0	NT	NT	NT	NT
	27-Jun-89	NT	NT	19.5	NT	NT	NT	NT
	06-Jul-89	56.8	8.5	>20.0	NT	ND	2.5E+6	1.6E+6
	22-Jul-89	44.0	11.0	NT	NT	ND	NT	NT
	03-Aug-89	46.9	16.0	NT	NT	ND	--	--
EW-20								
	14-Jun-89	NT	NT	19.1	NT	NT	NT	NT
	20-Jun-89	NT	NT	17.9	NT	NT	NT	NT
	27-Jun-89	NT	NT	17.5	NT	NT	NT	NT
	06-Jul-89	NT	NT	16.7	NT	NT	NT	NT
EW-21								
	23-May-89	NT	NT	NT	NT	NT	NT	NT
	31-May-89	17.6	5.0	NT	NT	ND	3.7E+4	2.4E+4
	05-Jun-89	17.6	1.3	NT	NT	ND	9.3E+4	7.9E+3
	14-Jun-89	26.0	1.0	NT	NT	ND	5.8E+4	2.4E+4
	20-Jun-89	29.0	0.8	NT	NT	ND	1.5E+5	7.0E+3
	27-Jun-89	27.1	0.8	NT	NT	ND	NT	NT
	06-Jul-89	43.6	0.5	NT	NT	ND	NT	NT
	22-Jul-89	26.8	0.5	NT	NT	ND	NT	NT
	03-Aug-89	26.8	0.5	NT	NT	ND	--	--
Injection Composite								
	21-Mar-89	26	42	NT	NT	15	NT	NT
	18-Apr-89	37.8	110	NT	NT	37.4	NT	NT
	24-Apr-89	24.6	45.0	NT	NT	22.0	NT	NT
	01-May-89	23.2	40.0	NT	NT	8.3	NT	NT
	09-May-89	29.9	13.5	NT	NT	1.5	NT	NT
	17-May-89	24.6	37.5	NT	NT	6.1	NT	NT

Table 5. Results of Inorganic Chemical and Microbial Analyses of Ground-Water Samples from System Wells

WELL	DATE	NITRATE	PHOSPHATE	DISSOLVED	DISSOLVED	AMMONIA	MICROBIAL	
				OXYGEN	IRON		TC	HCU
LOD		0.5(ppm)	0.5(ppm)	0.1(ppm)	0.1(ppm)	0.5(ppm)	NA (CFU/ml)	NA (CFU/ml)
	23-May-89	31.7	42.5	NT	NT	9.1	NT	NT
	31-May-89	45.1	50.0	NT	NT	14.5	NT	NT
	06-Jun-89	35.9	30.0	NT	NT	10.2	NT	NT
	20-Jun-89	35.9	35.0	NT	NT	8.8	NT	NT
	27-Jun-89	26.4	29.0	NT	NT	9.8	NT	NT
	06-Jul-89	34.8	42.5	NT	NT	9.4	NT	NT
	22-Jul-89	23.8	42.5	NT	NT	10.2	NT	NT
	03-Aug-89	23.8	38.5	--	--	10.2	--	--

Extraction
Composite

	21-Mar-89	NT	NT	NT	NT	NT	NT	NT
	18-Apr-89	NT	NT	NT	NT	NT	NT	NT
	24-Apr-89	55	6.8	NT	NT	ND	NT	NT
	01-May-89	NT	NT	NT	NT	NT	NT	NT
	09-May-89	44.0	15.6	NT	NT	ND	NT	NT
	17-May-89	44.0	13.0	NT	NT	0.5	NT	NT
	23-May-89	45.4	15.5	NT	NT	ND	NT	NT
	31-May-89	48.4	11.0	NT	NT	ND	NT	NT
	06-Jun-89	38.5	12.0	NT	NT	ND	NT	NT
	20-Jun-89	27.1	14.0	NT	NT	ND	NT	NT
	27-Jun-89	50.6	13.6	NT	NT	ND	NT	NT
	06-Jul-89	66.0	16.6	NT	NT	0.5	NT	NT
	22-Jul-89	37.4	18.0	NT	NT	0.8	NT	NT
	03-Aug-89	48.4	21.4	NT	NT	1.4	--	--

NOTES:

HCU: Hydrocarbon Utilizers

TC: Total Count

LOD: Limit of Detection.

NA: Limit of Detection not applicable.

ND: Not detected at or above LOD.

NT: Not tested.

*: Dissolved oxygen samples collected on 5/12/89.

--: Results not available.

Inorganic constituents are reported in parts per million (ppm).

Microbial counts are reported in colony-forming units per milliliter of water (CFU/ml).

Analysis performed by HLA Laboratory.

Table 6. Results of Inorganic Chemical and Microbial Analyses of Ground-Water Monitoring Well Samples

WELL	DATE	NITRATE	PHOSPHATE	DISSOLVED			MICROBIAL	
				OXYGEN	IRON (Fe)	AMMONIA	ENUMERATION	HCU
LOD		0.5(ppm)	0.5(ppm)	0.5(mg/l)	0.1(ppm)	0.5(ppm)	NA (CFU/ml)	NA (CFU/ml)
MW-5	06-Jun-89	10.1	2.5	1.7	NT	ND	NT	NT
	06-Jul-89	NT	2.5	1.7	NT	ND	NT	NT
MW-7	06-Jun-89	ND	4.8	1.8	NT	ND	NT	NT
	06-Jul-89	ND	ND	1.8	NT	ND	NT	NT
	22-Jul-89	ND	0.5	NT	NT	ND	NT	NT
	03-Aug-89	ND	3.3	NT	NT	ND	--	--
MW-8	06-Jun-89	NT	NT	4.2	NT	NT	NT	NT
	06-Jul-89	NT	NT	4.2	NT	NT	NT	NT
MW-9	03-Mar-89	37.0/32.0*	1.5	1.0**	ND	ND	5.3E+5	9.5E+2
	15-Mar-89	6.0	6.0	NT	ND	ND	5.9E+6	1.8E+2
	29-Mar-89	37.0	32.0	NT	NT	ND	1.8E+6	2.1E+2
	04-Apr-89	41.8	36.0	NT	ND	ND	3.6E+5	1.1E+2
	11-Apr-89	42.1	60.0	NT	NT	ND	3.6E+5	1.4E+2
	18-Apr-89	56.3	60.0	8.4	ND	0.9	1.2E+6	2.2E+2
	25-Apr-89	88.0	50.0	>20.0	NT	2.9	9.9E+5	3.5E+3
	02-May-89	74.8	62.5	18.2	NT	4.8	3.5E+6	5.4E+3
	09-May-89	44.0	37.5	16.6	NT	6.2	NT	NT
	17-May-89	41.0	21.3	8.5	NT	5.6	NT	NT
	23-May-89	54.1	20.0	NT	NT	3.9	NT	NT
	31-May-89	NT	NT	NT	NT	NT	NT	NT
	06-Jun-89	46.2	34.0	NT	NT	10.8	NT	NT
	14-Jun-89	63.8	14.0	13.9	NT	3.3	NT	NT
	06-Jul-89	56.8	30.0	NT	NT	NT	NT	NT
	22-Jul-89	37.4	29.0	NT	NT	4.4	NT	NT
	03-Aug-89	38.5	25.0	NT	NT	5.5	--	--
MW-10	03-Mar-89	8.4/5.5*	1.0	4.0**	ND	ND	2.3E+5	3.5E+2
	15-Mar-89	5.5	1.2	NT	ND	ND	NT	NT
	29-Mar-89	11.4	4.5	NT	NT	ND	NT	NT
	04-Apr-89	15.0	1.3	NT	ND	ND	NT	NT
	11-Apr-89	16.5	2.3	NT	NT	ND	NT	NT
	18-Apr-89	16.0	5.3	5.0	NT	ND	NT	NT
	25-Apr-89	14.1	2.0	2.2	NT	ND	NT	NT
	02-May-89	19.4	6.5	2.6	NT	ND	NT	NT
	09-May-89	17.6	1.8	3.1	NT	ND	NT	NT
	17-May-89	21.1	1.5	1.9	NT	ND	NT	NT
	23-May-89	17.6	1.3	NT	NT	ND	NT	NT
	31-May-89	NT	NT	NT	NT	NT	NT	NT
	06-Jun-89	17.6	2.3	2.0	NT	ND	NT	NT

Table 6. Results of Inorganic Chemical and Microbial Analyses of Ground-Water Monitoring Well Samples

WELL	DATE	NITRATE	PHOSPHATE	DISSOLVED	DISSOLVED	AMMONIA	MICROBIAL	
				OXYGEN	IRON (Fe)		TC	HCU
LOD		0.5(ppm)	0.5(ppm)	0.5(mg/L)	0.1(ppm)	0.5(ppm)	NA (CFU/ml)	NA (CFU/ml)
MW-11	14-Jun-89	23.1	ND	2.1	NT	NT	NT	NT
	06-Jul-89	20.9	ND	NT	NT	NT	NT	NT
	22-Jul-89	17.6	0.5	NT	NT	ND	NT	NT
	03-Aug-89	23.8	ND	NT	NT	ND	--	--
	03-Mar-89	ND/ND*	0.8	2.0**	ND	ND	1.1E+6	2.8E+3
	15-Mar-89	ND	1.0	NT	ND	ND	NT	NT
	29-Mar-89	31.7	4.3	NT	NT	ND	NT	NT
	04-Apr-89	37.0	5.0	NT	ND	ND	NT	NT
	11-Apr-89	40.7	24.0	NT	NT	ND	3.8E+5	1.1E+2
	18-Apr-89	56.3	26.0	5.7	ND	ND	1.2E+6	1.7E+2
	25-Apr-89	44.0	29.7	11.8	NT	ND	4.7E+5	1.1E+3
	02-May-89	74.8	41.3	17.1	NT	ND	2.4E+6	5.4E+3
	09-May-89	57.2	29.7	12.5	NT	ND	1.4E+6	5.4E+3
	17-May-89	46.2	21.5	9.9	NT	ND	3.5E+6	1.6E+4
	23-May-89	52.8	15.8	NT	NT	ND	2.0E+6	3.3E+3
	31-May-89	58.3	29.7	>20.0	NT	ND	7.0E+5	2.4E+5
06-Jun-89	66.0	33.0	NT	NT	ND	5.0E+6	2.8E+4	
14-Jun-89	52.8	25.7	14.9	NT	0.5	1.2E+7	2.4E+5	
20-Jun-89	61.6	24.8	12.8	NT	0.9	7.1E+6	1.1E+4	
06-Jul-89	56.8	32.8	NT	NT	NT	8.5E+6	5.4E+5	
22-Jul-89	33.0	27.2	NT	NT	9.6	NT	NT	
03-Aug-89	52.8	19.1	NT	NT	4.3	--	--	
MW-12	03-Mar-89	11.4/6.2*	1.0	5.8**	ND	ND	7.1E+5	1.1E+1
	15-Mar-89	12.3	1.1	NT	ND	ND	NT	NT
	29-Mar-89	13.6	4.8	NT	NT	ND	NT	NT
	04-Apr-89	11.4	1.5	NT	ND	ND	NT	NT
	11-Apr-89	7.5	5.0	NT	NT	ND	NT	NT
	18-Apr-89	9.2	6.8	2.1	ND	ND	NT	NT
	25-Apr-89	3.5	1.8	1.4	NT	ND	NT	NT
	02-May-89	12.3	5.0	2.3	NT	ND	NT	NT
	09-May-89	9.7	2.5	2.2	NT	ND	NT	NT
	17-May-89	9.6	2.5	3.5	NT	ND	NT	NT
	23-May-89	8.3	1.3	1.8	NT	ND	NT	NT
	31-May-89	10.3	2.5	2.1	NT	ND	NT	NT
	06-Jun-89	9.2	2.8	NT	NT	ND	NT	NT
	20-Jun-89	8.4	1.0	4.0	NT	ND	NT	NT
	06-Jul-89	4.8	ND	NT	NT	NT	NT	NT
	22-Jul-89	5.3	0.5	NT	NT	ND	NT	NT
03-Aug-89	7.7	0.5	NT	NT	ND	--	--	
MW-13	03-Mar-89	11.4/8.6*	1.0	2.0**	0.25	ND	4.1E+6	1.7E+2

Table 6. Results of Inorganic Chemical and Microbial Analyses of Ground-Water Monitoring Well Samples

WELL	DATE	NITRATE	PHOSPHATE	DISSOLVED	DISSOLVED	AMMONIA	MICROBIAL	
				OXYGEN	IRON (Fe)		TC	HCU
LOD		0.5(ppm)	0.5(ppm)	0.5(mg/l)	0.1(ppm)	0.5(ppm)	NA (CFU/ml)	NA (CFU/ml)
	15-Mar-89	9.2	1.1	NT	ND	ND	NT	NT
	29-Mar-89	8.8	6.3	NT	NT	ND	NT	NT
	04-Apr-89	9.7	3.5	NT	ND	ND	NT	NT
	11-Apr-89	13.2	2.8	NT	NT	ND	NT	NT
	18-Apr-89	15.0	8.5	6.0	NT	ND	NT	NT
	25-Apr-89	20.2	2.5	NT	NT	ND	NT	NT
	02-May-89	37.8	2.3	6.8	NT	ND	NT	NT
	09-May-89	42.1	1.5	9.9	NT	ND	NT	NT
	17-May-89	37.0	1.5	10.3	NT	ND	NT	NT
	23-May-89	33.4	1.3	NT	NT	ND	NT	NT
	06-Jun-89	40.5	3.0	NT	NT	ND	NT	NT
	27-Jun-89	57.2	0.8	18.5	NT	ND	5.9E+5	1.1E+3
	06-Jul-89	36.5	ND	NT	NT	NT	5.6E+5	7.8E+2
	22-Jul-89	33.1	0.5	NT	NT	ND	NT	NT
	03-Aug-89	56.3	3.0	NT	NT	ND	--	--
MW-14	03-Mar-89	37.0/22.0*	0.8	3.0**	ND	ND	3.6E+5	2.2E+2
	15-Mar-89	37.0	1.0	NT	ND	ND	NT	NT
	29-Mar-89	22.8	3.8	NT	NT	ND	NT	NT
	04-Apr-89	29.9	3.8	NT	ND	ND	NT	NT
	11-Apr-89	37.4	2.8	NT	NT	ND	NT	NT
	18-Apr-89	43.6	5.8	NT	NT	ND	NT	NT
	25-Apr-89	35.2	1.3	NT	NT	ND	NT	NT
	02-May-89	40.5	5.3	6.7	NT	ND	NT	NT
	09-May-89	45.8	1.8	11.7	NT	ND	NT	NT
	17-May-89	51.0	1.5	9.2	NT	ND	NT	NT
	23-May-89	52.4	1.5	NT	NT	ND	NT	NT
	31-May-89	70.4	2.5	16.2	NT	ND	4.2E+5	2.4E+5
	06-Jun-89	44.7	2.0	NT	NT	ND	NT	NT
	27-Jun-89	48.4	0.8	12.0	NT	ND	1.1E+6	2.4E+5
	06-Jul-89	22.5	ND	NT	NT	NT	2.5E+6	2.4E+5
	22-Jul-89	33.4	0.5	NT	NT	ND	3.8E+6	9.5E+3
	03-Aug-89	38.7	3.0	NT	NT	ND	--	--
MW-15	03-Mar-89	42.2/19.0*	0.9	4.0**	ND	ND	4.5E+5	2.8E+2
	10-Mar-89	40.5	2.2	NT	NT	NT	1.0E+6	2.8E+2
	15-Mar-89	35.2	1.2	NT	ND	ND	6.9E+6	2.8E+2
	29-Mar-89	20.2	4.2	NT	NT	ND	9.1E+5	2.1E+2
	04-Apr-89	24.6	5.3	NT	ND	ND	4.4E+5	1.4E+2
	11-Apr-89	23.1	4.0	NT	NT	ND	2.7E+6	1.7E+2
	18-Apr-89	31.9	1.3	6.3	ND	ND	3.1E+6	2.9E+1
	25-Apr-89	42.2	1.8	9.6	ND	ND	2.2E+5	4.6E+1
	02-May-89	50.6	3.5	11.4	NT	ND	8.5E+5	1.2E+2

Table 6. Results of Inorganic Chemical and Microbial Analyses of Ground-Water Monitoring Well Samples

WELL	DATE	NITRATE	PHOSPHATE	DISSOLVED	DISSOLVED	AMMONIA	MICROBIAL	
				OXYGEN	IRON (Fe)		TC	HCU
LOD		0.5(ppm)	0.5(ppm)	0.5(mg/l)	0.1(ppm)	0.5(ppm)	NA (CFU/ml)	NA (CFU/ml)
	09-May-89	33.0	1.8	9.6	NT	ND	2.4E+6	2.4E+3
	17-May-89	48.4	2.3	12.1	NT	ND	4.6E+5	2.8E+3
	23-May-89	48.4	1.8	11.3	NT	ND	1.0E+6	3.3E+2
	06-Jun-89	53.9	2.5	NT	NT	ND	NT	NT
	06-Jul-89	46.9	7.5	NT	NT	ND	3.8E+6	3.3E+4
	22-Jul-89	28.2	10.3	NT	NT	ND	1.7E+6	2.2E+3
	03-Aug-89	38.5	10.8	NT	NT	ND	--	--
MW-16								
	03-Mar-89	49.3/17.0*	1.2	2.0**	ND	ND	8.4E+5	1.4E+2
	10-Mar-89	14.5	2.2	NT	ND	ND	1.4E+5	1.2E+3
	15-Mar-89	11.4	3.0	NT	ND	ND	6.0E+6	1.1E+3
	29-Mar-89	33.4	7.2	NT	NT	ND	1.6E+6	3.5E+3
	04-Apr-89	39.6	11.5	NT	0.2	NT	2.2E+6	1.2E+3
	11-Apr-89	37.8	16.0	NT	NT	ND	6.7E+5	1.4E+3
	18-Apr-89	52.8	20.0	14.0	ND	ND	1.3E+6	2.3E+2
	25-Apr-89	49.3	22.0	>20.0	ND	ND	5.1E+5	2.2E+2
	02-May-89	57.2	31.3	14.6	NT	ND	2.2E+6	1.7E+3
	09-May-89	59.4	23.6	15.3	NT	ND	4.0E+6	9.5E+2
	17-May-89	41.8	16.5	9.5	NT	ND	6.8E+5	1.4E+3
	23-May-89	46.2	23.9	17.3	NT	ND	1.0E+6	2.2E+3
	31-May-89	61.6	15.7	16.2	NT	ND	4.4E+5	4.9E+3
	06-Jun-89	43.6	18.2	NT	NT	ND	4.0E+6	2.8E+4
	20-Jun-89	61.6	7.6	5.3	NT	ND	1.1E+7	5.4E+4
	06-Jul-89	55.4	23.1	NT	NT	1.5	5.7E+6	4.9E+4
	22-Jul-89	55.0	10.7	NT	NT	ND	NT	NT
	03-Aug-89	45.8	10.0	NT	NT	1.3	--	--
MW-17								
	03-Mar-89	NT	NT	NT	NT	NT	NT	NT
	10-Mar-89	12.3	0.8	NT	ND	ND	1.6E+5	1.1E+3
	15-Mar-89	7.5	3.1	NT	ND	ND	1.1E+7	3.5E+3
	29-Mar-89	25.5	3.8	NT	NT	ND	2.6E+6	1.1E+3
	04-Apr-89	35.2	3.5	NT	ND	ND	3.3E+6	6.8E+2
	11-Apr-89	49.4	8.0	NT	NT	ND	1.5E+6	3.9E+2
	18-Apr-89	52.8	16.0	11.8	ND	ND	1.2E+6	1.4E+2
	25-Apr-89	51.0	11.6	13.5	ND	ND	6.0E+5	1.7E+2
	02-May-89	52.8	17.0	13.3	NT	ND	5.1E+6	3.5E+2
	09-May-89	44.9	5.0	6.6	NT	ND	6.5E+6	9.5E+2
	17-May-89	47.7	17.6	8.4	NT	ND	3.0E+6	5.4E+3
	23-May-89	57.2	14.5	17.0	NT	ND	1.1E+6	3.9E+2
	06-Jun-89	46.2	16.0	NT	NT	ND	3.0E+6	3.5E+4
	14-Jun-89	42.9	18.0	15.4	NT	ND	3.0E+6	4.3E+4
	27-Jun-89	56.8	11.0	NT	NT	ND	1.1E+7	9.2E+4
	06-Jul-89	50.6	13.0	NT	NT	ND	7.2E+6	1.1E+5

Table 6. Results of Inorganic Chemical and Microbial Analyses of Ground-Water Monitoring Well Samples

WELL	DATE	NITRATE	PHOSPHATE	DISSOLVED OXYGEN	DISSOLVED IRON (Fe)	AMMONIA	MICROBIAL ENUMERATION	
							TC	HCU
LOD		0.5(ppm)	0.5(ppm)	0.5(mg/l)	0.1(ppm)	0.5(ppm)	NA (CFU/ml)	NA (CFU/ml)
MW-18	22-Jul-89	45.8	20.0	NT	NT	ND	7.3E+5	7.9E+4
	03-Aug-89	70.4	14.0	NT	NT	1.0	--	--
	03-Mar-89	15.4/9.3*	0.5	2.9**	ND	ND	1.3E+6	7.9E+1
	15-Mar-89	4.0	1.1	NT	ND	ND	NT	NT
	29-Mar-89	8.8	3.0	NT	NT	ND	NT	NT
	04-Apr-89	6.6	2.8	NT	ND	ND	NT	NT
	11-Apr-89	6.6	3.8	NT	NT	ND	NT	NT
	18-Apr-89	6.6	5.8	5.0	NT	ND	NT	NT
	25-Apr-89	2.2	1.3	3.0	NT	ND	NT	NT
	02-May-89	8.8	4.5	3.4	NT	ND	NT	NT
	09-May-89	11.6	1.8	4.1	NT	ND	NT	NT
	17-May-89	5.8	1.8	3.3	NT	ND	NT	NT
	23-May-89	14.5	1.5	3.9	NT	ND	NT	NT
	31-May-89	NT	NT	NT	NT	NT	NT	NT
	06-Jun-89	17.1	1.3	NT	NT	ND	NT	NT
	27-Jun-89	8.8	0.8	NT	NT	ND	NT	NT
	06-Jul-89	15.7	ND	NT	NT	NT	NT	NT
	22-Jul-89	17.2	0.5	NT	NT	ND	NT	NT
03-Aug-89	11.0	0.5	NT	NT	ND	--	--	

NOTES:

HCU: Hydrocarbon Utilizers

TC: Total Count

LOD: Limit of Detection.

NA: Limit of Detection not applicable.

ND: Not detected at or above LOD.

NT: Not tested.

* : First value from HLA laboratory
Second value from Pace Laboratories, Inc.

** : Results from Pace Laboratories, Inc.

-- : Results not available.

Inorganic constituents reported in parts per million (ppm).

Microbial counts reported in colony-forming units per milliliter of water (CFU/ml).

Analyses performed by HLA laboratory unless otherwise indicated.

Table 7. Results of Organic Chemical Analyses of Monitoring and System Well Samples

Purgeable Aromatics (EPA Method 8020) Petroleum Hydrocarbons (EPA Method 8015)						
WELL	DATE	BENZENE	TOLUENE	ETHYL BENZENE	XYLENES, TOTAL	TPH AS GASOLINE
LOD	(mg/L)	0.0005	0.0005	0.0005	0.0005	0.25/0.05**
MW-5	03-May-89	ND	ND	ND	0.029	ND
	06-Jun-89	ND	ND	ND	ND	ND
MW-7	04-Apr-89	ND	0.0007	0.0010	0.0012	ND
	03-May-89	ND	0.0012	0.0018	0.0048	0.27
	06-Jun-89	0.001	0.001	0.0022	0.0011	0.4
	07-Jul-89	0.0002	0.001	0.00034	0.0059	0.56
	02-Aug-89	ND	0.0015	0.0054	0.0059	0.7
MW-9	02-Mar-89	NT	NT	NT	NT	1.2
	04-Apr-89	0.19	0.35	0.041	0.36	1.5
	01-May-89	0.43	0.60	0.033	0.64	4.6
	06-Jun-89	0.36	0.106	0.110	0.10	1.6
	06-Jul-89	0.16	0.084	0.052	1.8	5.2
	02-Aug-89	0.032	0.034	0.012	1.6	4.9
MW-10	02-Mar-89	NT	NT	NT	NT	2.8
	04-Apr-89	1.6	0.76	0.13	0.68	4.2
	01-May-89	1.2	0.67	0.16	0.67	3.4
	06-Jun-89 *	0.66/0.64	0.14/0.14	0.11/0.10	0.24/0.14	4.8/4.3
	06-Jul-89	2.0	2.2	0.54	1.8	12
	02-Aug-89 *	8.8/8.6	1.7/1.7	0.36/0.34	1.5/1.5	19/20
MW-11	02-Mar-89	NT	NT	NT	NT	15
	04-Apr-89	2.5	3.8	0.17	2.4	10
	19-Apr-89	3.8	2.8	ND	5.7	14
	01-May-89	1.3	1.7	0.069	1.7	5.2
	07-Jun-89	0.082	0.097	0.045	0.167	12
	06-Jul-89 *	2.1/2.3	2.5/2.8	0.14/0.16	2.6/3.0	15/15
	02-Aug-89	7.2	7.5	0.26	7.1	37
MW-12	15-Feb-89	ND	ND	ND	ND	ND
	03-Mar-89	NT	NT	NT	NT	ND
	05-Apr-89	0.0014	0.0023	ND	0.0054	ND
	02-May-89	0.026	0.0033	ND	0.0063	0.10
	07-Jun-89	0.034	0.0037	ND	0.012	0.18
	06-Jul-89	0.029	0.0025	ND	0.0059	0.12
	02-Aug-89	0.023	0.002	ND	0.005	ND
MW-13	02-Mar-89	NT	NT	NT	NT	1.4

Table 7. Results of Organic Chemical Analyses of Monitoring and System Well Samples

Purgeable Aromatics (EPA Method 8020)						
Petroleum Hydrocarbons (EPA Method 8015)						
WELL	DATE	BENZENE	TOLUENE	ETHYL BENZENE	XYLENES, TOTAL	TPH AS GASOLINE
LOD	(mg/l)	0.0005	0.0005	0.0005	0.0005	0.25/0.05**
MW-14	04-Apr-89	0.041	0.039	0.0038	0.28	0.71
	01-May-89	0.048	0.049	0.013	0.13	0.34
	07-Jun-89	0.051	0.037	0.02	0.082	0.98
	06-Jul-89	0.210	0.054	0.013	0.109	0.76
	02-Aug-89	0.098	0.011	0.0005	0.031	0.27
	02-Mar-89	NT	NT	NT	NT	ND
MW-15	04-Apr-89	0.44	0.063	ND	0.27	1.4
	01-May-89	0.35	0.011	ND	0.094	0.94
	07-Jun-89 *	0.057/ND	0.0022/ND	0.0005/ND	0.043/ND	1.1/0.64
	06-Jul-89	3.0	1.7	0.050	3.6	14
	01-Aug-89	0.49	0.084	ND	0.84	4.5
	03-Mar-89	NT	NT	NT	NT	3.9
MW-16	04-Apr-89	0.88	0.97	0.11	0.93	3.7
	02-May-89	1.5	1.1	0.086	0.74	2.7
	07-Jun-89	5.7	4.3	0.3	2.4	22
	05-Jul-89	2.0	3.0	0.26	2.0	12
	03-Aug-89	2.6	2.8	0.75	3.8	24
	02-Mar-89	NT	NT	NT	NT	2.1
MW-17	04-Apr-89	2.1	2.2	0.18	1.4	6.7
	02-May-89	0.74	0.94	0.11	0.95	2.7
	07-Jun-89	0.37	0.56	0.51	0.35	14
	05-Jul-89	1.9	2.7	1.8	4.5	16
	03-Aug-89 *	1.8/1.9	2.6/2.6	0.18/0.19	5.7/6.0	17/17
	04-Apr-89	3.1	2.9	0.27	3.9	12
MW-18	02-May-89	1.2	1.0	0.11	1.4	3.9
	07-Jun-89	1.2	1.2	ND	1.3	6.3
	05-Jul-89	3.0	3.3	2.7	3.9	18
	02-Aug-89	4.8	9.5	0.63	14	47
	03-Aug-89	5.1	6.1	0.73	12	NT
	15-Feb-89	ND	ND	ND	ND	ND
03-Mar-89	NT	NT	NT	NT	ND	
05-Apr-89	ND	ND	ND	ND	ND	
02-May-89	ND	ND	ND	ND	ND	
07-Jun-89	ND	ND	ND	ND	ND	
06-Jul-89	ND	ND	ND	ND	ND	
02-Aug-89	ND	ND	ND	ND	ND	

Table 7. Results of Organic Chemical Analyses of Monitoring and System Well Samples

Purgeable Aromatics (EPA Method 8020) Petroleum Hydrocarbons (EPA Method 8015)						
WELL	DATE	BENZENE	TOLUENE	ETHYL BENZENE	XYLENES, TOTAL	TPH AS GASOLINE
LOD	(mg/l)	0.0005	0.0005	0.0005	0.0005	0.25/0.05**
EW-1	04-Apr-89	1.6	1.0	0.087	1.8	5.9
	01-May-89	3.2	1.2	0.15	1.4	6.3
	05-Jun-89	7.7	5.0	0.2	3.5	24
	05-Jul-89	4.4	5.1	0.32	3.8	24
	02-Aug-89	3.1	4.0	0.4	2.9	23
EW-4	04-Apr-89	NT	NT	NT	NT	2.5
	01-May-89	0.56	0.28	0.034	0.72	2.0
	05-Jun-89	0.4	0.2	ND	0.6	3.1
	05-Jul-89	0.29	0.15	0.021	1.2	4.3
	02-Aug-89	0.23	0.1	0.023	1.1	6.3
EW-7	05-Jul-89	18	16	0.67	10	74
EW-8	01-May-89	1.1	0.49	0.021	0.30	2.3
	05-Jun-89	2.5	2.0	ND	1.4	8.3
	05-Jul-89	3.3	2.9	0.22	3.1	19
	02-Aug-89	5.7	5.6	0.33	5.8	37
EW-12	01-May-89	1.8	0.66	0.048	0.62	3.6
	05-Jun-89	25	20	0.8	11	71
	05-Jul-89	5.2	5.6	0.38	3.4	25
	02-Aug-89	4.5	5.4	0.39	3.3	25
EW-13	19-Apr-89	0.068	0.0064	ND	0.20	0.79
EW-14	05-Jul-89	1.8	1.7	0.08	1.1	8.7
EW-15	19-Apr-89 #	13080	61000	16000	140000	660000
	05-Jul-89	2.0	2.8	0.26	2.9	19
	02-Aug-89	1.7	3.4	0.68	2.5	15
EW-16	04-Apr-89 *	2.8/3.3	2.0/2.6	0.10/0.14	0.99/1.2	8.9/8.8
	19-Apr-89	0.002	0.0027	ND	0.0021	0.57
	01-May-89	5.0	4.6	0.34	2.5	12
	05-Jun-89	2.5	2.6	ND	1.8	9.5
	05-Jul-89	2.8	3.6	0.28	1.8	16
	02-Aug-89	1.1	1.2	0.86	1.2	6.6
EW-19	01-May-89	1.4	1.2	0.068	0.77	3.4

Table 7. Results of Organic Chemical Analyses of Monitoring and System Well Samples

Purgeable Aromatics (EPA Method 8020) Petroleum Hydrocarbons (EPA Method 8015)						
WELL	DATE	BENZENE	TOLUENE	ETHYL BENZENE	XYLENES, TOTAL	TPH AS GASOLINE

LOD	(mg/L)	0.0005	0.0005	0.0005	0.0005	0.25/0.05**

	05-Jun-89	0.9	0.6	ND	0.6	2.9
	05-Jul-89 *	2.2/1.4	0.62/0.71	0.041/0.043	0.72/0.8	4.8/5.3
	02-Aug-89	1.7	1.1	0.039	0.95	7.4
EW-21	05-Jun-89	ND	ND	ND	0.3	3.2
	05-Jul-89	0.0026	0.015	0.017	0.095	1.1
	02-Aug-89	0.0027	0.012	0.0054	0.031	0.48
BLANK	05-Apr-89	0.5	ND	ND	ND	ND
	01-May-89	ND	ND	ND	ND	ND
	06-Jun-89	ND	ND	ND	ND	ND
	06-Jul-89	ND	ND	ND	ND	ND
	01-Aug-89	ND	ND	ND	ND	ND
	02-Aug-89	ND	ND	ND	ND	ND
	03-Aug-89	ND	ND	ND	ND	ND

NOTES:

LOD: Limit of Detection.

ND: Not detected at or above LOD.

NT: Not tested.

*: Two values indicate results of duplicate samples

**: LOD Changed to 0.05 after 4/19/89

#: Free product observed in well.

Organic constituents reported in milligrams per liter.

Analyses performed by PACE Laboratories, Inc.

Table 8. Results of Organic Chemical Analyses of Soil Samples from Confirmation Borings, Infiltration Basins and Test Pits.

Purgeable Aromatics (EPA Method 8020) and Petroleum Hydrocarbons (EPA Method 8015)

LOCATION	DEPTH (ft)	OVA HEADSPACE	BENZENE	TOLUENE	ETHYL BENZENE	XYLENES, TOTAL	TPH as GASOLINE	TPH as DIESEL
LOD	(mg/kg)		0.005	0.005	0.005	0.005	1.0	10
CONFIRMATION BORINGS								
BC-1 17-Jul-89	21-21.5	450	NT	NT	NT	NT	NT	NT
	23-23.5	>1000	NT	NT	NT	NT	NT	NT
	24.5-25	>1000	0.26	4.6	9.5	66	400	NT
	25-25.5*	>1000	ND (5)	20	ND (20)	110	1000	NT
	26.5-27	>1000	NT	NT	NT	NT	NT	NT
	28-28.5	60	NT	NT	NT	NT	NT	NT
	29.5-30	3	NT	NT	NT	NT	NT	NT
BC-2 17-Jul-89	21-21.5	>1000	NT	NT	NT	NT	NT	NT
	23-23.5	>1000	NT	NT	NT	NT	NT	NT
	25-25.5	>1000	94	640	160	980	5200	NT
	25-25.5**	>1000	84	580	160	1000	4600	NT
	27-27.5	>1000	NT	NT	NT	NT	NT	NT
	29-29.5	350	NT	NT	NT	NT	NT	NT
	31-31.5	14	NT	NT	NT	NT	NT	NT
32.5-33	10	NT	NT	NT	NT	NT	NT	
BC-3 18-Jul-89	21-21.5	200	NT	NT	NT	NT	NT	NT
	23-23.5	800	NT	NT	NT	NT	NT	NT
	25-25.5	>1000	4.3	20	4.3	30	150	NT
	27-27.5	>1000	NT	NT	NT	NT	NT	NT
	29-29.5	200	NT	NT	NT	NT	NT	NT
BC-4 18-Jul-89	16-16.5	1	NT	NT	NT	NT	NT	NT
	18-18.5	1	NT	NT	NT	NT	NT	NT
	19.5-20	2	ND	ND	ND	ND	ND	NT
	20-20.5*	2	ND (0.05)	ND (0.1)	ND (0.2)	ND (0.1)	ND (10)	NT
	22-22.5	>1000	NT	NT	NT	NT	NT	NT
	23.5-24	>1000	NT	NT	NT	NT	NT	NT
	24-24.5	>1000	23	240	69	240	2400	NT
	24.5-25*	>1000	ND (5)	13	11	73	1100	NT
26-26.5	200	NT	NT	NT	NT	NT	NT	
BC-5 18-Jul-89	21-21.5	>1000	NT	NT	NT	NT	NT	NT
	23-23.5	>1000	NT	NT	NT	NT	NT	NT
	25-25.5	>1000	25	170	47	290	1500	NT
	27-27.5	>1000	NT	NT	NT	NT	NT	NT
	29-29.5	70	NT	NT	NT	NT	NT	NT

Table 8. Results of Organic Chemical Analyses of Soil Samples from Confirmation Borings, Infiltration Basins and Test Pits.

Purgeable Aromatics (EPA Method 8020) and Petroleum Hydrocarbons (EPA Method 8015)

LOCATION	DEPTH (ft)	OVA HEADSPACE	BENZENE	TOLUENE	ETHYL BENZENE	XYLENES, TOTAL	TPH as GASOLINE	TPH as DIESEL
LOD	(mg/kg)		0.005	0.005	0.005	0.005	1.0	10
BC-6	21-21.5	20	NT	NT	NT	NT	NT	NT
	23-23.5	25	NT	NT	NT	NT	NT	NT
18-Jul-89	25-25.5	60	0.092	0.019	ND	0.014	ND	NT
	26.5-27	50	NT	NT	NT	NT	NT	NT
	29-29.5	10	NT	NT	NT	NT	NT	NT
BC-7	21-21.5	80	NT	NT	NT	NT	NT	NT
	23-23.5	200	NT	NT	NT	NT	NT	NT
18-Jul-89	25-25.5	>1000	3.1	16	5.4	33	940	NT
	27-27.5	700	NT	NT	NT	NT	NT	NT
	29-29.5	30	NT	NT	NT	NT	NT	NT
BC-8	16-16.5	300	NT	NT	NT	NT	NT	NT
	18-18.5	700	NT	NT	NT	NT	NT	NT
19-Jul-89	19.5-20	800	NT	NT	NT	NT	NT	NT
	20.5-21	920	1.2	ND	0.62	2.5	7.3	NT
	21-21.5	>1000	NT	NT	NT	NT	NT	NT
	23.5-24	>1000	110	1000	260	1600	7700	NT
	23.5-24**	>1000	15	190	60	35	2200	NT
	25-25.5	>1000	NT	NT	NT	NT	NT	NT
	27-27.5	200	NT	NT	NT	NT	NT	NT
	28.5-29	250	NT	NT	NT	NT	NT	NT
TEST PITS								
T1	4-4.5	07-Jul-89	ND	ND	ND	ND	ND	ND (50)
								ND
T2	0.5-1	07-Jul-89	ND	0.009	ND	0.009	ND	15
	3-3.5	07-Jul-89	ND	ND	ND	ND	ND	ND (20)
T4	4-4.5	10-Jul-89	ND	0.026	ND	0.001	ND (0.25)	ND
T6	4-4.5	10-Jul-89	ND	0.073	ND	ND	ND (0.25)	24
T7	4.5-5	10-Jul-89	ND	0.32	ND	0.002	ND (0.25)	13

Table 8. Results of Organic Chemical Analyses of Soil Samples from Confirmation Borings, Infiltration Basins and Test Pits.

Purgeable Aromatics (EPA Method 8020) and Petroleum Hydrocarbons (EPA Method 8015)

LOCATION	DEPTH (ft)	OVA HEADSPACE	BENZENE	TOLUENE	ETHYL BENZENE	XYLENES, TOTAL	TPH as GASOLINE	TPH as DIESEL
LOD	(mg/kg)		0.005	0.005	0.005	0.005	1.0	10

INFILTRATION BASIN BA-1

P4		29-Jun-89	ND	ND	ND	ND	790	210
P1RS		27-Jun-89	NT	NT	NT	NT	ND (0.2)	ND
P1GS		27-Jun-89	NT	NT	NT	NT	ND (0.2)	ND
PIT 1		27-Jun-89	NT	NT	NT	NT	1.2	ND

NOTES:

Organic constituents reported in milligrams per kilogram (mg/kg)

Analyses performed by PACE Laboratories unless otherwise noted

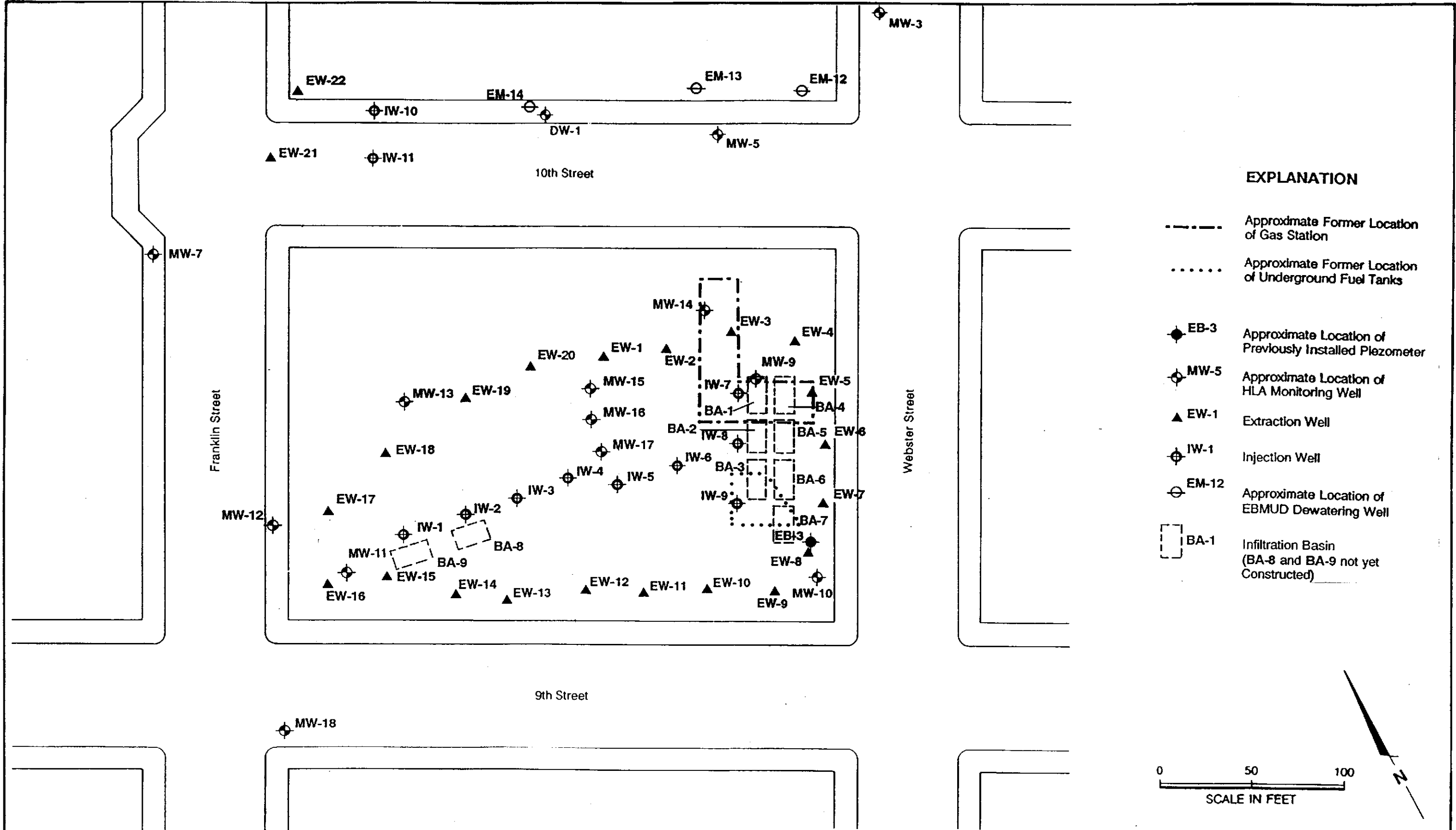
LOD: Limit of Detection unless otherwise noted

ND (0.25): Not detected at or above limit of detection (LOD)

NT: Not tested

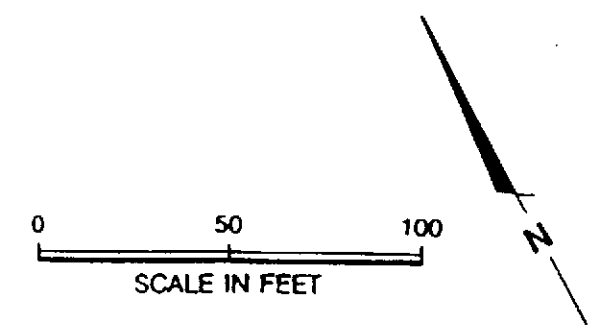
*: Sample analyses performed by ChemWest Laboratories

** : Second analysis performed by PACE on core extracted from opposite end of sample tube.

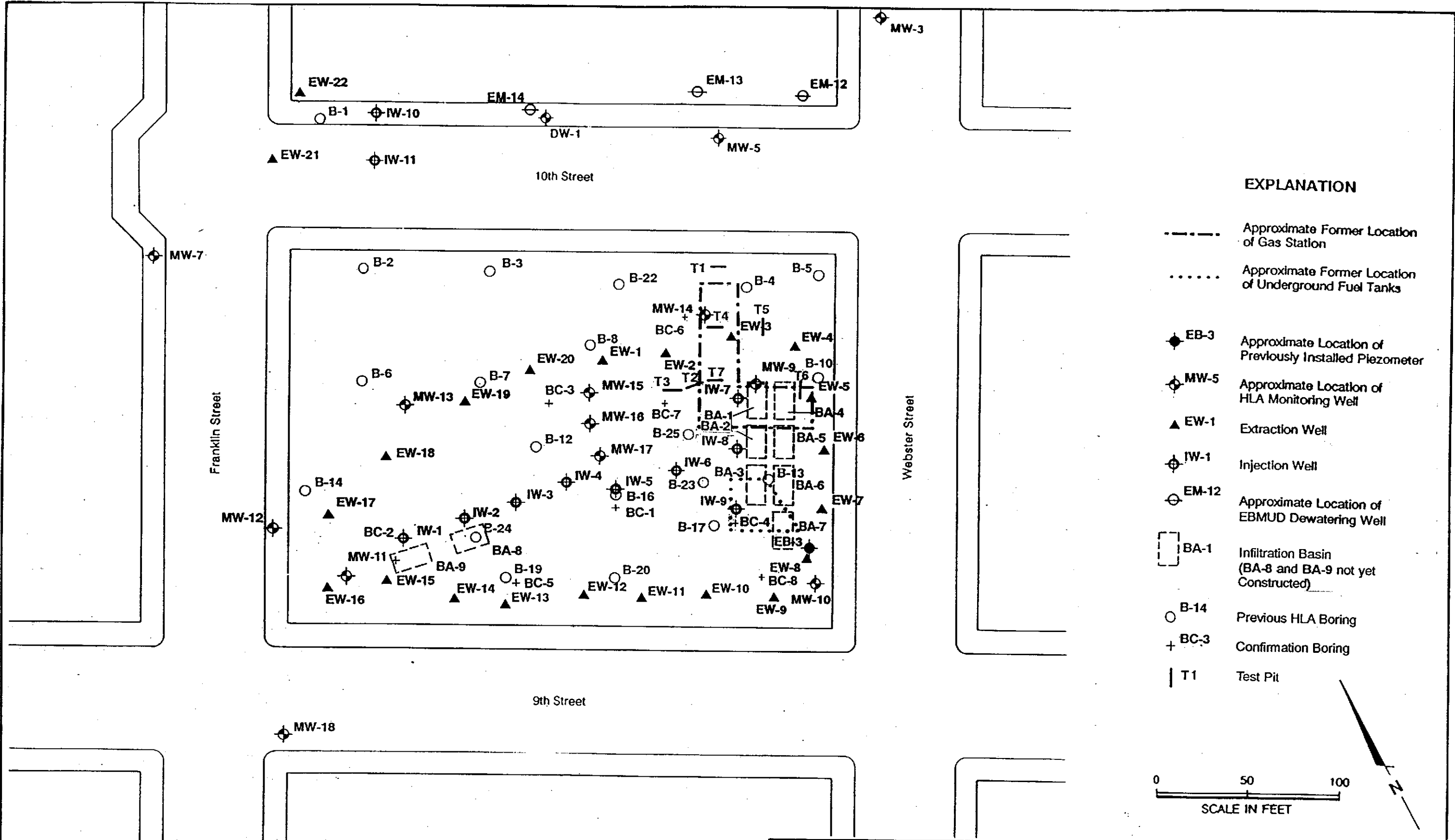


EXPLANATION

- Approximate Former Location of Gas Station
- Approximate Former Location of Underground Fuel Tanks
- ◆ EB-3 Approximate Location of Previously Installed Plezometer
- ⊕ MW-5 Approximate Location of HLA Monitoring Well
- ▲ EW-1 Extraction Well
- ⊕ IW-1 Injection Well
- ⊖ EM-12 Approximate Location of EBMUD Dewatering Well
- BA-1 Infiltration Basin (BA-8 and BA-9 not yet Constructed)

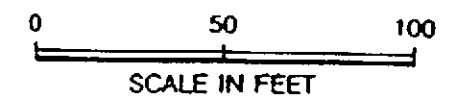


Harding Lawson Associates Engineers, Geologists & Geophysicists	Site Plan Soil Treatment System Pacific Renaissance Plaza Oakland, California		PLATE 1
	DRAWN LZ	JOB NUMBER 09382,040.02	APPROVED DFL
			REVISED DATE

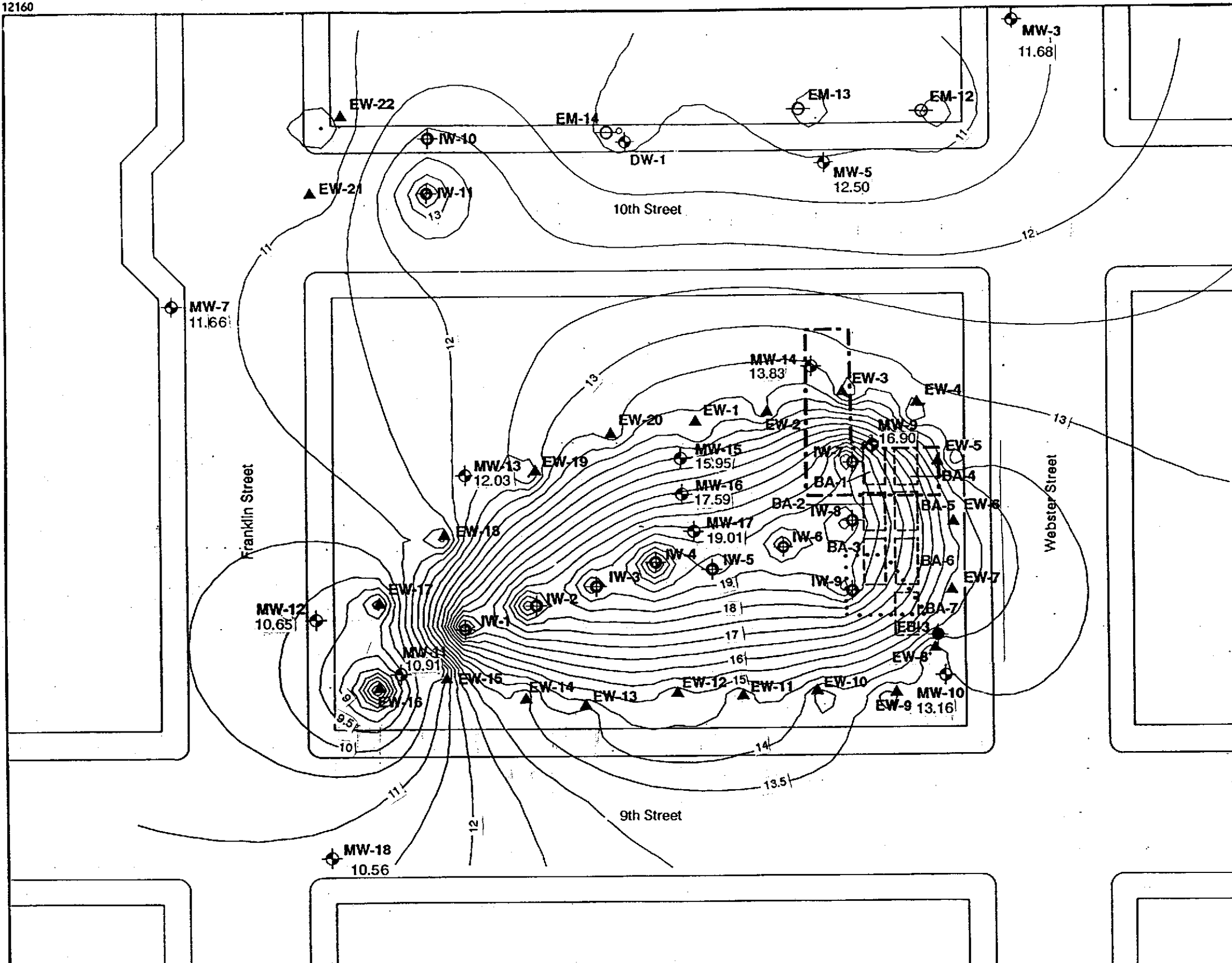


EXPLANATION

- Approximate Former Location of Gas Station
- Approximate Former Location of Underground Fuel Tanks
- ◆ EB-3 Approximate Location of Previously Installed Piezometer
- ◆ MW-5 Approximate Location of HLA Monitoring Well
- ▲ EW-1 Extraction Well
- ⊕ IW-1 Injection Well
- ⊖ EM-12 Approximate Location of EBMUD Dewatering Well
- BA-1 Infiltration Basin (BA-8 and BA-9 not yet Constructed)
- B-14 Previous HLA Boring
- + BC-3 Confirmation Boring
- | T1 Test Pit

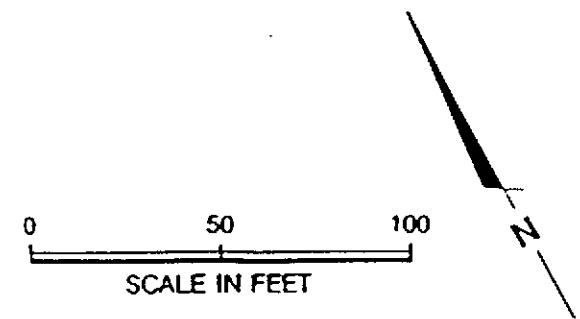



Harding Lawson Associates Engineers, Geologists & Geophysicists	Site Plan Showing Well, Boring, Test Pit and Basin Locations Soil Treatment System Pacific Renaissance Plaza Oakland, California			PLATE 2
	DRAWN LZ	JOB NUMBER 09382,040.02	APPROVED DFL	DATE 8/89

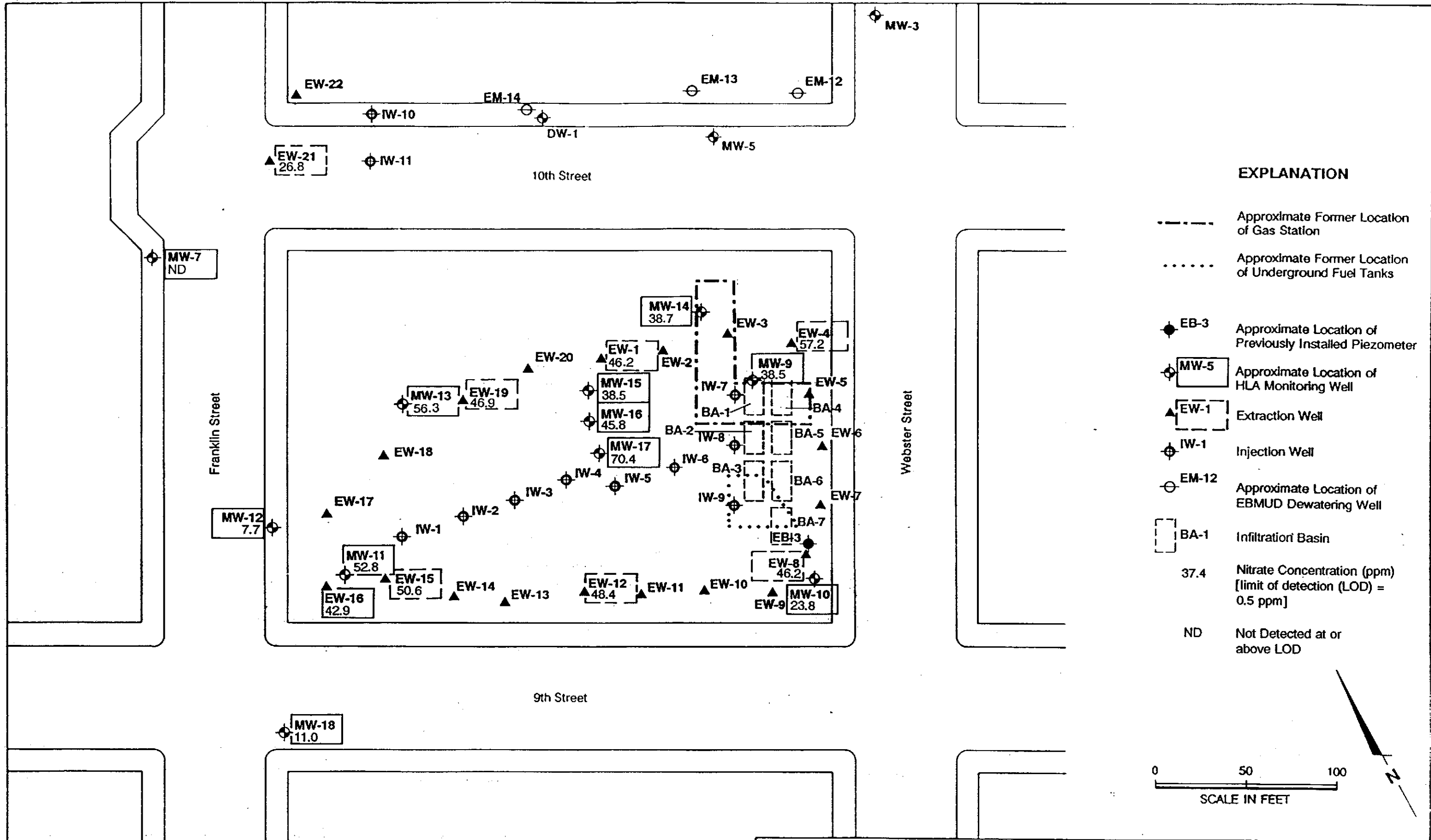


EXPLANATION

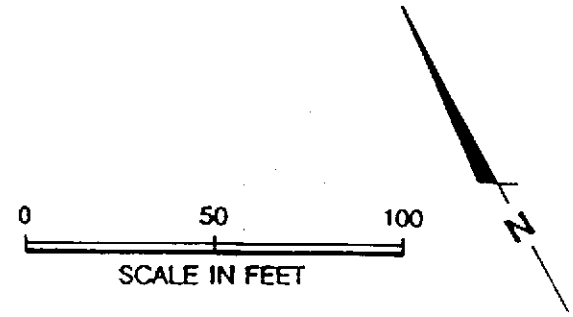
- Approximate Former Location of Gas Station
- Approximate Former Location of Underground Fuel Tanks
- EB-3 Approximate Location of Previously Installed Piezometer
- MW-5 Approximate Location of HLA Monitoring Well
- ▲ EW-1 Extraction Well
- ⊕ IW-1 Injection Well
- ⊖ EM-12 Approximate Location of EBMUD Dewatering Well
- BA-1 Infiltration Basin
- 18.78 Observed Ground-Water Elevation (feet above MSL)
- 13 Simulated Ground-Water Elevation Contour (contour interval 0.5 feet)



 Harding Lawson Associates Engineers, Geologists & Geophysicists	Observed and Simulated Ground-Water Elevations - August 1, 1989 Soil Treatment System Pacific Renaissance Plaza Oakland, California		PLATE 3
	DRAWN LZ	JOB NUMBER 09382,040.02	APPROVED DFL



- EXPLANATION**
- Approximate Former Location of Gas Station
 - Approximate Former Location of Underground Fuel Tanks
 - EB-3 Approximate Location of Previously Installed Piezometer
 - MW-5 Approximate Location of HLA Monitoring Well
 - EW-1 Extraction Well
 - IW-1 Injection Well
 - EM-12 Approximate Location of EBMUD Dewatering Well
 - BA-1 Infiltration Basin
 - 37.4 Nitrate Concentration (ppm) [limit of detection (LOD) = 0.5 ppm]
 - ND Not Detected at or above LOD

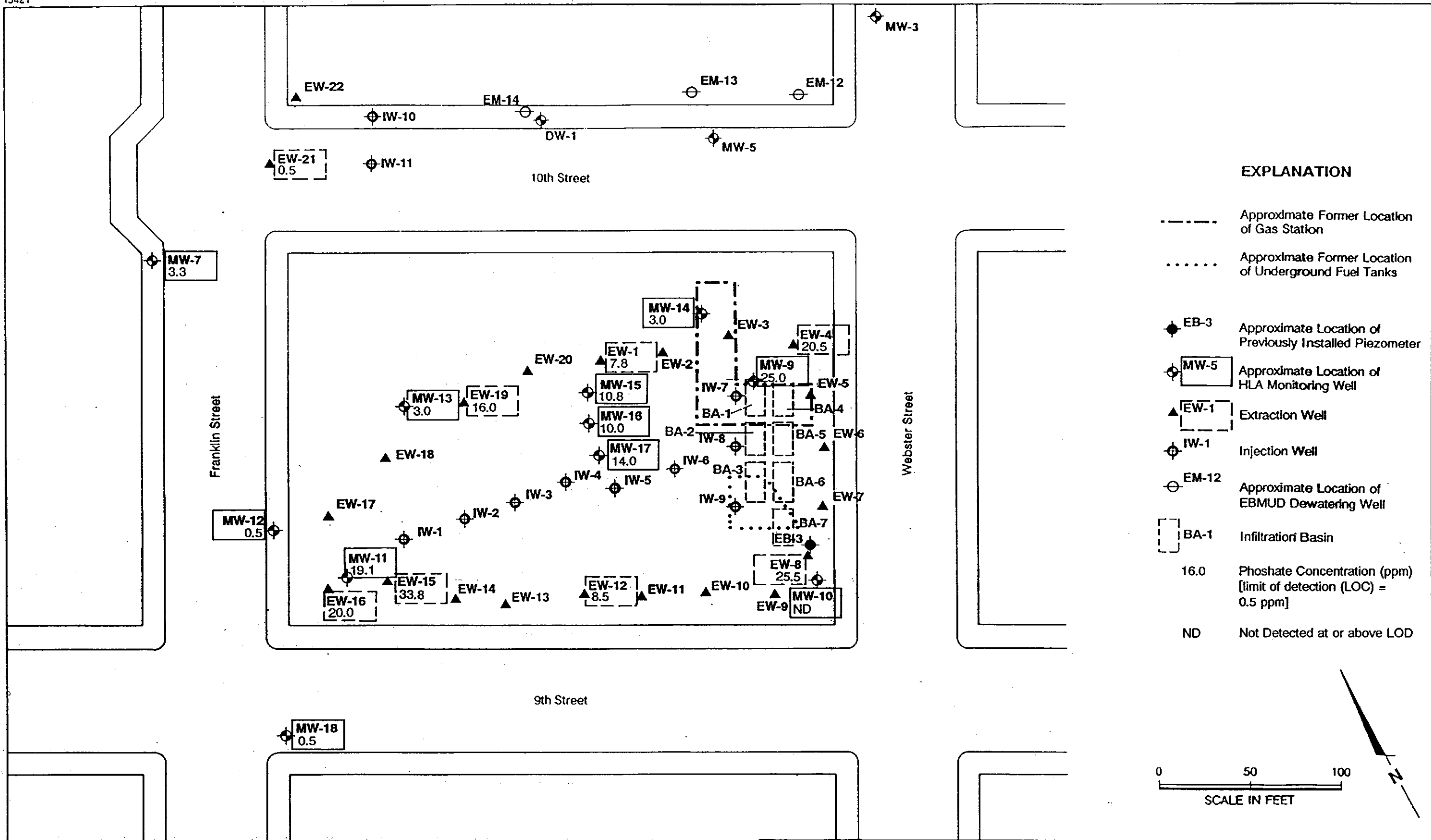


HLA Harding Lawson Associates
Engineers and Geoscientists

Concentrations of Nitrate in Ground Water - August 3, 1989
Pacific Renaissance Plaza
Oakland, California

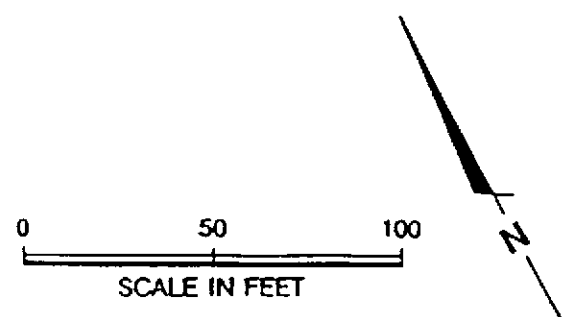
DRAWN: ML JOB NUMBER: 9382,040.02 APPROVED: DXL DATE: 8/89

PAGE: REVISED: DATE: **4**

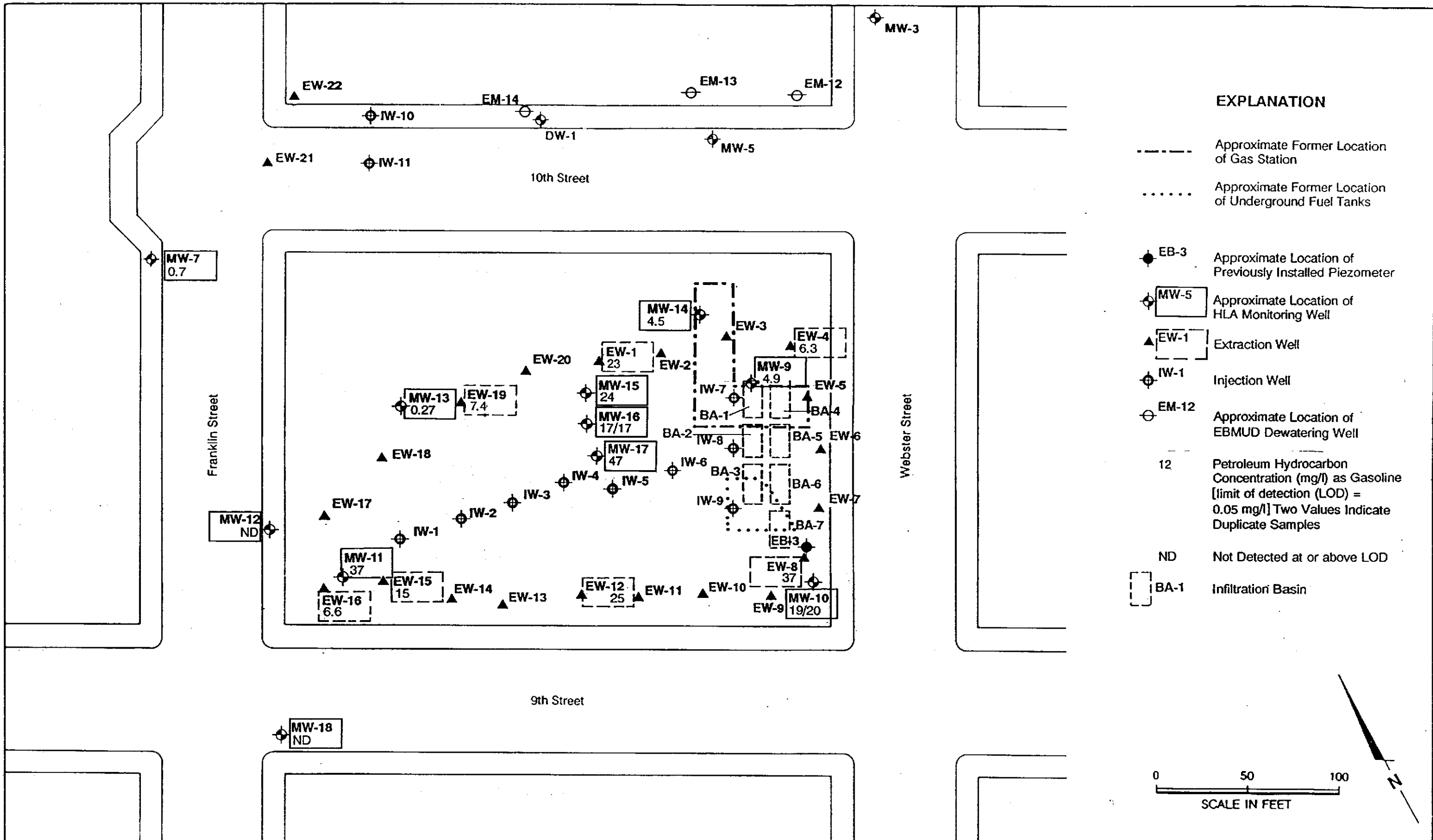


EXPLANATION

- Approximate Former Location of Gas Station
- Approximate Former Location of Underground Fuel Tanks
- EB-3 Approximate Location of Previously Installed Piezometer
- MW-5 Approximate Location of HLA Monitoring Well
- EW-1 Extraction Well
- IW-1 Injection Well
- EM-12 Approximate Location of EBMUD Dewatering Well
- BA-1 Infiltration Basin
- 16.0 Phosphate Concentration (ppm) [limit of detection (LOC) = 0.5 ppm]
- ND Not Detected at or above LOD

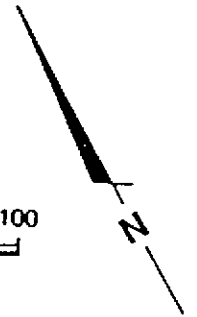
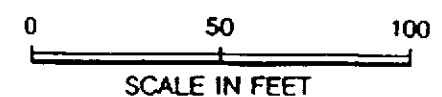


<p>Harding Lawson Associates Engineers and Geoscientists</p>	<p>Concentrations of Phosphate in Ground Water - August 3, 1989 Pacific Renaissance Plaza Oakland, California</p>		<p>PLATE 5</p>
	<p>DRAWN ML</p>	<p>JOB NUMBER 9382,040.02</p>	<p>APPROVED DL</p>



EXPLANATION

- Approximate Former Location of Gas Station
- Approximate Former Location of Underground Fuel Tanks
- EB-3 Approximate Location of Previously Installed Piezometer
- MW-5 Approximate Location of HLA Monitoring Well
- EW-1 Extraction Well
- IW-1 Injection Well
- EM-12 Approximate Location of EBMUD Dewatering Well
- 12 Petroleum Hydrocarbon Concentration (mg/l) as Gasoline [limit of detection (LOD) = 0.05 mg/l] Two Values Indicate Duplicate Samples
- ND Not Detected at or above LOD
- BA-1 Infiltration Basin



HLA Harding Lawson Associates
Engineers and Geoscientists

Concentrations of Petroleum Hydrocarbons in Ground Water - August 1-3, 1989
Pacific Renaissance Plaza
Oakland, California

PLATE
6

DRAWN ML	JOB NUMBER 9382,040.02	APPROVED DL	DATE 8/89	REVISED	DATE
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Appendix A

LABORATORY ANALYTICAL RESULTS FOR WATER SAMPLES

10 AUG 89 9:42

August 09, 1989

Mr. David Leland
Harding Lawson Associates
200 Rush Landing Road
Novato, CA 94945

Dear Mr. Leland:

Enclosed is the report of laboratory analyses for samples received
08/01/89.

If you have any questions concerning this report, please feel free
to contact us.

Sincerely,

Stephen F. Nackord
Stephen F. Nackord
Director, Sampling and Analytical Services

Enclosures

Harding Lawson Associates
200 Rush Landing Road
Novato, CA 94945

August 09, 1989
PACE Project Number: 490801503

Attn: Mr. David Leland

Pacific Ren. Plaza

Date Sample(s) Collected: 08/01/89
Date Sample(s) Received: 08/01/89

PACE Sample Number:

Parameter	Units	MDL	753550 8930MW41	753560 8930MW14
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ORGANIC ANALYSIS

Field Blank HW-14

INDIVIDUAL PARAMETERS

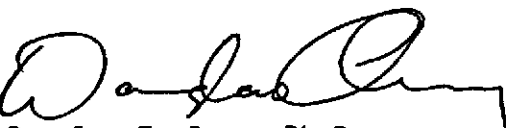
Purgeable Fuels, as Gasoline (EPA 8015)	mg/L	0.25	ND	4.5
---	------	------	----	-----

AROMATIC VOLATILE COMPOUNDS EPA 8020

Benzene	ug/L	0.2	ND	490
Toluene	ug/L	0.2	ND	84
Chlorobenzene	ug/L	0.2	ND	LT 5.0
Ethylbenzene	ug/L	0.2	ND	LT 5.0
Xylenes, Total	ug/L	0.2	ND	840
1,3-Dichlorobenzene	ug/L	0.2	ND	LT 5.0
1,4-Dichlorobenzene	ug/L	0.2	ND	LT 5.0
1,2-Dichlorobenzene	ug/L	0.2	ND	LT 5.0
Fluorobenzene (Surrogate Recovery)			98%	92%

ND Not detected at or above the MDL.
MDL Method Detection Limit
LT Less than.

The data contained in this report were obtained using EPA or other approved methodologies. All analyses were performed by me or under my direct supervision.


Douglas E. Oram, Ph.D.
Organic Chemistry Manager



Harding Lawson Associates
 200 Nash Landing Road
 P.O. Box 6107
 Novato, California 94948
 415/892-0821
 Telecopy: 415/892-1588

CHAIN OF CUSTODY FORM

Lab: Page 490201.503

Job Number: 09382.039.02

Name/Location: PRP

Project Manager: David E. Land

Samplers: David M Evans
Gleam M Carter

Recorder: David M Evans
 (Signature Required)

SOURCE CODE	MATRIX				#CONTAINERS & PRESERV.				SAMPLE NUMBER OR LAB NUMBER			DATE			
	Water	Sediment	Soil	Oil	Unpres.	H ₂ SO ₄	HNO ₃	HCL	Yr	Wk	Seq	Yr	Mo	Dy	Time
23	X							2	89	30	MW41	89	08	01	1630
23	X							2	89	30	MW14	89	08	01	1535

STATION DESCRIPTION/NOTES
PAGE #
75355
75356

ANALYSIS REQUESTED	
EPA 601/8010	
EPA 601/8020	X
EPA 624/8240	X
EPA 625/8270	
Priority Pllmt. Metals	
Benzene/Toluene/Xylene	
Total Petrol. Hydrocarb.	X
	8015

LAB NUMBER			DEPTH IN FEET	COL MTD CD	QA CODE	MISCELLANEOUS
Yr	Wk	Seq				

CHAIN OF CUSTODY RECORD		
RELINQUISHED BY: (Signature) <u>David M Evans</u>	RECEIVED BY: (Signature)	DATE/TIME
RELINQUISHED BY: (Signature)	RECEIVED BY: (Signature)	DATE/TIME
RELINQUISHED BY: (Signature)	RECEIVED BY: (Signature)	DATE/TIME
RELINQUISHED BY: (Signature)	RECEIVED BY: (Signature)	DATE/TIME
DISPATCHED BY: (Signature) <u>David M Evans</u>	DATE/TIME <u>8-1-89 1630</u>	RECEIVED FOR LAB BY: (Signature) <u>E. Sontag</u>
METHOD OF SHIPMENT <u>delivered in cooler w/ice PACE</u>		DATE/TIME <u>8/1/89 536 PM</u>

AUG 30

August 28, 1989

Mr. David Leland
Harding Lawson Associates
200 Rush Landing Road
Novato, CA 94945

Dear Mr. Leland:

Enclosed is a revised report of laboratory analyses for samples received 08/02/89. The original report is dated 08/10/89.

The revisions were made to detection limits only. No changes were made to the results.

If you have any questions concerning this report, please feel free to contact us.

Sincerely,


Stephen F. Nackord
Director, Sampling and Analytical Services

Enclosures

Harding Lawson Associates
200 Rush Landing Road
Novato, CA 94945

August 28, 1989
PACE Project Number: 490802504
PACE WPPLAB Number: 1004

Attn: Mr. David Leland

Pacific Ren. Plaza

Date Sample(s) Collected: 08/02/89
Date Sample(s) Received: 08/02/89

PACE Sample Number:
Parameter

Units	MDL	753840 8930MW18	753850 8930MW12	753860 8930MW07
		MW-18	MW-12	MW-7

ORGANIC ANALYSIS

PURGEABLE FUELS AND AROMATICS

TOTAL FUEL HYDROCARBONS, (LIGHT):

Parameter	Units	MDL	753840 8930MW18	753850 8930MW12	753860 8930MW07
Purgeable Fuels, as Gasoline (EPA 8015)	mg/L	0.05	ND	ND	0.7
PURGEABLE AROMATICS (BTXE BY EPA 8020):					
Benzene	mg/L	0.0002	ND	0.023	ND
Ethylbenzene	mg/L	0.0002	ND	ND	0.0054
Toluene	mg/L	0.0002	ND	0.002	0.0015
Xylenes, total	mg/L	0.0002	ND	0.005	0.0059

MDL Method Detection Limit
ND Not detected at or above the MDL.

Mr. David Leland
Page 2

August 28, 1989
PACE Project Number: 490802504

PACE Sample Number:
Parameter

	Units	MDL	753870 8930MW09 MW-9	753880 8930MW10 MW-10	753890 8930MW01 MW-10 Duplicate
<u>ORGANIC ANALYSIS</u>					
PURGEABLE FUELS AND AROMATICS					
TOTAL FUEL HYDROCARBONS, (LIGHT):					
Purgeable Fuels, as Gasoline (EPA 8015)	mg/L	0.05	4.9	19	20
PURGEABLE AROMATICS (BTXE BY EPA 8020):					
Benzene	mg/L	0.0002	0.032	8.8	8.6
Ethylbenzene	mg/L	0.0002	0.012	0.36	0.34
Toluene	mg/L	0.0002	0.034	1.7	1.7
Xylenes, total	mg/L	0.0002	1.6	1.5	1.5

MDL Method Detection Limit

Mr. David Leland
Page 3

August 28, 1989
PACE Project Number: 490802504

PACE Sample Number:
Parameter

<u>Units</u>	<u>MDL</u>	753900 8930MW11 MW-17	753910 8930MW13 MW-13	753920 8930MW17 MW-17
--------------	------------	-----------------------------	-----------------------------	-----------------------------

ORGANIC ANALYSIS

PURGEABLE FUELS AND AROMATICS

TOTAL FUEL HYDROCARBONS, (LIGHT):

Purgeable Fuels, as Gasoline (EPA 8015)

PURGEABLE AROMATICS (BTXE BY EPA 8020):

Benzene

Ethylbenzene

Toluene

Xylenes, total

mg/L	0.05	37	0.27	47
mg/L	0.0002	7.2	0.098	4.8
mg/L	0.0002	0.26	0.0005	0.63
mg/L	0.0002	7.5	0.011	9.5
mg/L	0.0002	7.1	0.031	14

MDL Method Detection Limit

Mr. David Leland
Page 4

August 28, 1989
PACE Project Number: 490802504


PACE Sample Number:			753930
<u>Parameter</u>	<u>Units</u>	<u>MDL</u>	<u>8930MW32</u>
			Field Blank

ORGANIC ANALYSIS

PURGEABLE FUELS AND AROMATICS			
TOTAL FUEL HYDROCARBONS, (LIGHT):			
Purgeable Fuels, as Gasoline (EPA 8015)	mg/L	0.05	-
PURGEABLE AROMATICS (BTXE BY EPA 8020):			
Benzene	mg/L	0.0002	ND
Ethylbenzene	mg/L	0.0002	ND
Toluene	mg/L	0.0002	ND
Xylenes, total	mg/L	0.0002	ND

MDL Method Detection Limit
ND Not detected at or above the MDL.

The data contained in this report were obtained using EPA or other approved methodologies. All analyses were performed by me or under my direct supervision.


Douglas E. Oram, Ph.D.
Organic Chemistry Manager



Harding Lawson Associates
 200 Rush Landing Road
 P.O. Box 6107
 Novato, California 94948
 415-892-0821
 Telecopy: 415/892-1586

CHAIN OF CUSTODY FORM

Lab: Page

Job Number: 09382,039.02
 Name/Location: PRP
 Project Manager: Dave Leland

Samplers: David M Evans
Glenn M Carter
 Recorder: David M Evans
 (Signature Required)

ANALYSIS REQUESTED										
EPA 601/8010	EPA 602/8020	EPA 624/8240	EPA 625/8270	Priority Piltmt. Metals	Benzene/Toluene/Xylene	Total Petrol. Hydrocarb.	EPA 8015 TPHL	EPA 8020 BTL		
							X	X		
							X	X		
							X	X		
							X	X		
							X	X		
							X	X		
							X	X		
							X	X		
							X	X		
							X	X		
							X	X		
							X	X		

SOURCE CODE	MATRIX				#CONTAINERS & PRESERV.				SAMPLE NUMBER OR LAB NUMBER			DATE				STATION DESCRIPTION/NOTES
	Water	Sediment	Soil	Oil	Unpres.	H ₂ SO ₄	HNO ₃	HCL	Yr	Wk	Seq	Yr	Mo	Dy	Time	
23	X						2	89	30	MW18	89	08	02	07	00	X 75384
23	X						2	89	30	MW12	89	08	02	02	50	X 385
23	X						2	89	30	MW07	89	08	02	08	20	X 75386
23	X						2	89	30	MW09	89	08	02	09	25	X 387
23	X						2	89	30	MW10	89	08	02	10	18	X 388
23	X						2	89	30	MW01	89	08	02	10	25	X 389
23	X						2	89	30	MW11	89	08	02	11	08	X 75390
23	X						2	89	30	MW13	89	08	02	11	50	X 91
23	X						2	89	30	MW17	89	08	02	12	50	X 92
23	X						2	89	30	MW32	89	08	02	11	18	X 75393

LAB NUMBER			DEPTH IN FEET	COL MTD CD	QA CODE	MISCELLANEOUS
Yr	Wk	Seq				
						Regular turn around time
						9/2

CHAIN OF CUSTODY RECORD		
RELINQUISHED BY: (Signature) <u>David M Evans</u>	RECEIVED BY: (Signature)	DATE/TIME
RELINQUISHED BY: (Signature)	RECEIVED BY: (Signature)	DATE/TIME
RELINQUISHED BY: (Signature)	RECEIVED BY: (Signature)	DATE/TIME
RELINQUISHED BY: (Signature)	RECEIVED BY: (Signature)	DATE/TIME
DISPATCHED BY: (Signature) <u>David M Evans</u>	DATE/TIME 8-2-89 13:30	RECEIVED FOR LAB BY: (Signature) <u>C. JONTAY</u> 8/2/89 3:12 PM
METHOD OF SHIPMENT delivered in cooler w/ice pack		

AUG 28 1989

August 28, 1989

Mr. David Leland
Harding Lawson Associates
200 Rush Landing Road
Novato, CA 94945


Dear Mr. Leland:

Enclosed is a revised report of laboratory analyses for samples received 08/03/89. The original report is dated 08/10/89.

The revisions were made to detection limits. No results were changed.

If you have any questions concerning this report, please feel free to contact us.

Sincerely,


Stephen F. Mackord
Director, Sampling and Analytical Services

Enclosures

Harding Lawson Associates
200 Rush Landing Road
Novato, CA 94945

August 28, 1989
PACE Project Number: 490803500
PACE WPPLAB Number: 1006

Attn: Mr. David Leland

Pacific Ren. Plaza

Date Sample(s) Collected: 08/03/89
Date Sample(s) Received: 08/03/89

PACE Sample Number:
Parameter

	<u>Units</u>	<u>MDL</u>	753950 8930MW15	753960 8930MW72	753970 8930MW16
<u>ORGANIC ANALYSIS</u>					
PURGEABLE FUELS AND AROMATICS					
TOTAL FUEL HYDROCARBONS, (LIGHT):					
Purgeable Fuels, as Gasoline (EPA 8015)	mg/L	0.05	24	ND	17
PURGEABLE AROMATICS (BTXE BY EPA 8020):					
Benzene	mg/L	0.0002	2.6	ND	1.8
Ethylbenzene	mg/L	0.0002	0.75	ND	0.18
Toluene	mg/L	0.0002	2.8	ND	2.6
Xylenes, total	mg/L	0.0002	3.8	ND	5.7

MDL Method Detection Limit
ND Not detected at or above the MDL.

Mr. David Leland
Page 2

August 28, 1989
PACE Project Number: 490803500

PACE Sample Number:
Parameter

Units	MDL	753980 8930MW61	753990 8930MW17
-------	-----	--------------------	--------------------

ORGANIC ANALYSIS

PURGEABLE FUELS AND AROMATICS

TOTAL FUEL HYDROCARBONS, (LIGHT):

Purgeable Fuels, as Gasoline (EPA 8015) mg/L

PURGEABLE AROMATICS (BTXE BY EPA 8020):

Benzene mg/L

Ethylbenzene mg/L

Toluene mg/L

Xylenes, total mg/L

PURGEABLE AROMATIC COMPOUNDS, EPA 8020

Benzene mg/L

Ethylbenzene mg/L

Toluene mg/L

Xylenes, total mg/L

MW-16
Duplicate

MW-17

-	-	-	-
0.05	17	-	-
0.0002	1.9	-	-
0.0002	0.19	-	-
0.0002	2.6	-	-
0.0002	6.0	-	-
0.0002	-	5.1	-
0.0002	-	0.73	-
0.0002	-	6.1	-
0.0002	-	12.0	-

MDL Method Detection Limit

The data contained in this report were obtained using EPA or other approved methodologies. All analyses were performed by me or under my direct supervision.



Douglas E. Oram, Ph.D.
Organic Chemistry Manager



Harding Lawson Associates
 200 Rush Landing Road
 P.O. Box 6107
 Novato, California 94948
 415 892-0821
 Telecopy: 415/892-1588

CHAIN OF CUSTODY FORM

Lab: Page 490003.500

Job Number: 09382, 039, 102
 Name/Location: PRP
 Project Manager: Dave Leland

Samplers: David M Evans
Glenn M Carter
 Recorder: David M Evans
 (Signature Required)

SOURCE CODE	MATRIX				#CONTAINERS & PRESERV.			SAMPLE NUMBER OR LAB NUMBER			DATE				
	Water	Sediment	Soil	Oil	Unpres.	H ₂ SO ₄	HNO ₃	HCL	Yr	Wk	Seq	Yr	Mo	Dy	Time
23	X						2	89	30	MW	15	89	08	03	07:35
23	X						2	89	30	MW	72	89	08	03	06:56
23	X						2	89	30	MW	16	89	08	03	08:15
23	X						2	89	30	MW	61	89	08	03	08:10
23	X						2	89	30	MW	17	89	08	03	08:45

STATION DESCRIPTION/NOTES
PAGE #
75395
75396
75397
75398
75399
BTXE ONLY PER DEVA

ANALYSIS REQUESTED										
EPA 601/8010	EPA 602/8020	EPA 624/8240	EPA 625/8270	Priority Pflnt. Metals	Benzene/Toluene/Xylene	Total Petrol. Hydrocarb.	8015	THAL	BTXE	
X	X				X	X				
X	X				X	X				
X	X				X	X				
X	X				X	X				
X	X				X	X				

LAB NUMBER			DEPTH IN FEET	COL MTD CD	QA CODE	MISCELLANEOUS
Yr	Wk	Seq				
						9/1

CHAIN OF CUSTODY RECORD			
RELINQUISHED BY: (Signature)	RECEIVED BY: (Signature)	DATE/TIME	
<u>David M Evans</u>	<u>Glenn M Carter</u>	8-3-89	09:30
RELINQUISHED BY: (Signature)	RECEIVED BY: (Signature)	DATE/TIME	
RELINQUISHED BY: (Signature)	RECEIVED BY: (Signature)	DATE/TIME	
RELINQUISHED BY: (Signature)	RECEIVED BY: (Signature)	DATE/TIME	
DISPATCHED BY: (Signature)	DATE/TIME	RECEIVED FOR LAB BY: (Signature)	DATE/TIME
<u>David M Evans</u>	8/3/89 10:20	<u>L. Smith</u>	8/3/89 10:30
METHOD OF SHIPMENT: <u>Delivered in cooler w/ ice</u> PAGE			

AUG 28 1989

August 28, 1989

Mr. David Leland
Harding Lawson Associates
200 Rush Landing Road
Novato, CA 94945

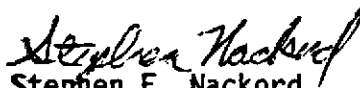
Dear Mr. Leland:

Enclosed is a revised report of laboratory analyses for samples received 08/02/89. The original report is dated 08/16/89.

The revisions were made to detection limits. No results were changed.

If you have any questions concerning this report, please feel free to contact us.

Sincerely,


Stephen F. Nackord
Director, Sampling and Analytical Services

Enclosures

Harding Lawson Associates
200 Rush Landing Road
Novato, CA 94945

August 28, 1989
PACE Project Number: 490802503
PACE WPPLAB Number: 1005

Attn: Mr. David Leland

Pacific Ren. Plaza

Date Sample(s) Collected: 08/02/89
Date Sample(s) Received: 08/02/89

PACE Sample Number:
Parameter

	Units	MDL	753760 8930EW01	753770 8930EW04	753780 8930EW08
<u>ORGANIC ANALYSIS</u>					
<u>INDIVIDUAL PARAMETERS</u>					
Purgeable Fuels, as Gasoline (EPA 8015)	mg/L	0.05	23	6.3	37
<u>AROMATIC VOLATILE COMPOUNDS EPA 8020</u>					
Benzene	ug/L	0.2	3100	230	5700
Toluene	ug/L	0.2	4000	100	5600
Chlorobenzene	ug/L	0.2	LT 20	LT 5.0	LT 20
Ethylbenzene	ug/L	0.2	400	23.0	330
Xylenes, Total	ug/L	0.2	2900	1100	5800
1,3-Dichlorobenzene	ug/L	0.2	LT 20	LT 5.0	LT 20
1,4-Dichlorobenzene	ug/L	0.2	LT 20	LT 5.0	LT 20
1,2-Dichlorobenzene	ug/L	0.2	LT 20	LT 5.0	LT 20
Fluorobenzene (Surrogate Recovery)			91%	80%	92%

MDL Method Detection Limit
LT Less than.

Mr. David Leland
Page 2

August 28, 1989
PACE Project Number: 490802503

PACE Sample Number:
Parameter

<u>Units</u>	<u>MDL</u>	753790 8930EW12	753800 8930EW15	753810 8930EW16
		EW-12	EW-15	EW-16

ORGANIC ANALYSIS

INDIVIDUAL PARAMETERS

Purgeable Fuels, as Gasoline (EPA 8015)	mg/L	0.05	25	15	6.6
---	------	------	----	----	-----

AROMATIC VOLATILE COMPOUNDS EPA 8020

Benzene	ug/L	0.2	4500	1700	1100
Toluene	ug/L	0.2	5400	3400	1200
Chlorobenzene	ug/L	0.2	LT 20	LT 10	LT 5.0
Ethylbenzene	ug/L	0.2	390	68	86
Xylenes, Total	ug/L	0.2	3300	2500	1200
1,3-Dichlorobenzene	ug/L	0.2	LT 20	LT 10	LT 5.0
1,4-Dichlorobenzene	ug/L	0.2	LT 20	LT 10	LT 5.0
1,2-Dichlorobenzene	ug/L	0.2	LT 20	LT 10	LT 5.0
Fluorobenzene (Surrogate Recovery)			95%	103%	102%

MDL Method Detection Limit
LT Less than.


Mr. David Leland
Page 3

August 28, 1989
PACE Project Number: 490802503

PACE Sample Number: Parameter	Units	MDL	753820 8930EW19	753830 8930EW21
			EW-19	EW-21
<u>ORGANIC ANALYSIS</u>				
<u>INDIVIDUAL PARAMETERS</u>				
Purgeable Fuels, as Gasoline (EPA 8015)	mg/L	0.05	7.4	0.48
<u>AROMATIC VOLATILE COMPOUNDS EPA 8020</u>				
Benzene	ug/L	0.2	1700	2.7
Toluene	ug/L	0.2	1100	12
Chlorobenzene	ug/L	0.2	LT 5.0	ND
Ethylbenzene	ug/L	0.2	39	5.4
Xylenes, Total	ug/L	0.2	950	31
1,3-Dichlorobenzene	ug/L	0.2	LT 5.0	ND
1,4-Dichlorobenzene	ug/L	0.2	LT 5.0	ND
1,2-Dichlorobenzene	ug/L	0.2	LT 5.0	ND
Fluorobenzene (Surrogate Recovery)			99%	87%

MDL Method Detection Limit
LT Less than.
ND Not detected at or above the MDL.

The data contained in this report were obtained using EPA or other approved methodologies. All analyses were performed by me or under my direct supervision.


Douglas E. Oram, Ph.D.
Organic Chemistry Manager



Harding Lawson Associates
 200 Rush Landing Road
 P.O. Box 6107
 Novato, California 94948
 415 892-0821
 Telecopy: 415/892-1586

CHAIN OF CUSTODY FORM

49030-505
 Lab: PACE

Job Number: 9382,039.02
 Name/Location: PRP
 Project Manager: D. Deland

Samplers: Rob Nelson
 Recorder: Robert K. Nelson
 (Signature Required)

SOURCE CODE	MATRIX				#CONTAINERS & PRESERV.			SAMPLE NUMBER OR LAB NUMBER			DATE				
	Water	Sediment	Soil	Oil	Unpres.	H ₂ SO ₄	HNO ₃	HCL(3)	Yr	Wk	Seq	Yr	Mo	Dy	Time
23	X						X	89	30	EW01	89	08	02	09	30
23	X						X	89	30	EW04	89	08	02	09	48
23	X						X	89	30	EW08	89	08	02	10	17
23	X						X	89	30	EW12	89	08	02	11	00
23	X						X	89	30	EW15	89	08	02	11	20
23	X						X	89	30	EW16	89	08	02	11	45
23	X						X	89	30	EW19	89	08	02	12	20
23	X						X	89	30	EW21	89	08	02	12	45

STATION DESCRIPTION/NOTES
75376
75377 Sm. bubble in vial
75378
75379
75380
75381
all 75382 w/ bubbles in both
75383

ANALYSIS REQUESTED									
EPA 601/8010	EPA 602/8020	EPA 624/8240	EPA 625/8270	Priority Pflmt. Metals	Benzene/Toluene/Xylene	Total Petrol. Hydrocarb.	EPA 8015		
X	X				X	X			
X	X				X	X			
X	X				X	X			
X	X				X	X			
X	X				X	X			
X	X				X	X			
X	X				X	X			

LAB NUMBER			DEPTH IN FEET	COL MTD CD	QA CODE	MISCELLANEOUS
Yr	Wk	Seq				
						6/1

CHAIN OF CUSTODY RECORD			
RELINQUISHED BY: (Signature) <u>Robert K. Nelson</u>	RECEIVED BY: (Signature) <u>David M. Evans</u>	DATE/TIME 8-2-89	DATE/TIME 14:15
RELINQUISHED BY: (Signature)	RECEIVED BY: (Signature)	DATE/TIME	DATE/TIME
RELINQUISHED BY: (Signature)	RECEIVED BY: (Signature)	DATE/TIME	DATE/TIME
RELINQUISHED BY: (Signature)	RECEIVED BY: (Signature)	DATE/TIME	DATE/TIME
DISPATCHED BY: (Signature) <u>David M. Evans</u>	DATE/TIME 8-2-89	DATE/TIME 14:15	RECEIVED FOR LAB BY: (Signature) <u>C. J. Sunday</u>
METHOD OF SHIPMENT <u>delivered in cooler w/ice</u>			DATE/TIME 8/2/89 13:15

Appendix B

LABORATORY ANALYTICAL RESULTS FOR SOIL SAMPLES

July 26, 1989

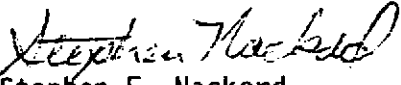
Mr. David Leland
Harding Lawson Associates
200 Rush Landing Road
Novato, CA 94945

Dear Mr. Leland:

Enclosed is the report of laboratory analyses for samples received 07/19/89.

If you have any questions concerning this report, please feel free to contact us.

Sincerely,


Stephen F. Nackord
Director, Sampling and Analytical Services

Enclosures

Harding Lawson Associates
200 Rush Landing Road
Novato, CA 94945

July 26, 1989
PACE Project Number: 490719503

Attn: Mr. David Leland
Oakland PRP

Date Sample(s) Collected: 07/17/89, 07/18/89, 07/19/89
Date Sample(s) Received: 07/19/89

PACE Sample Number:
Parameter

	Units	MDL	746950 BC-1.3	746960 BC-2.3	746970 BC-3.3
	Sample Depth		24.5-25	25-25.5	25-25.5
ORGANIC ANALYSIS					
PURGEABLE FUELS AND AROMATICS					
TOTAL FUEL HYDROCARBONS, (LIGHT):					
Purgeable Fuels, as Gasoline (EPA 8015)	mg/kg wet	1.0	400	5200	150
PURGEABLE AROMATICS (BTXE BY EPA 8020):					
Benzene	mg/kg wet	0.005	0.26	94	4.3
Ethylbenzene	mg/kg wet	0.005	9.5	160	4.3
Toluene	mg/kg wet	0.005	4.6	640	20
Xylenes, Total	mg/kg wet	0.005	66	980	30

MDL Method Detection Limit

Mr. David Leland
Page 2

July 26, 1989
PACE Project Number: 490719503

PACE Sample Number:
Parameter

Units	MDL	746980 BC-4.3	746990 BC-4.7	747000 BC-5.3
<u>ORGANIC ANALYSIS</u>				
	Sample Depth	19.5-20	24-24.5	25-25.5
<u>PURGEABLE FUELS AND AROMATICS</u>				
TOTAL FUEL HYDROCARBONS, (LIGHT):				
Purgeable Fuels, as Gasoline (EPA 8015)	mg/kg wet	1.0	ND	2400
PURGEABLE AROMATICS (BTXE BY EPA 8020):				
Benzene	mg/kg wet	0.005	ND	23
Ethylbenzene	mg/kg wet	0.005	ND	69
Toluene	mg/kg wet	0.005	ND	240
Xylenes, Total	mg/kg wet	0.005	ND	480

MDL Method Detection Limit
ND Not detected at or above the MDL.

Mr. David Leland
Page 3

July 26, 1989
PACE Project Number: 490719503

PACE Sample Number:
Parameter

Units	MDL	747010 BC-6.3	747020 BC-7.3	747030 BC-8.4
<i>Sample Depth</i>		25-25.5	25-25.5	20.5-21
PURGEABLE FUELS AND AROMATICS				
TOTAL FUEL HYDROCARBONS, (LIGHT):				
Purgeable Fuels, as Gasoline (EPA 8015)	mg/kg wet 1.0	ND	940	7.3
PURGEABLE AROMATICS (BTXE BY EPA 8020):				
Benzene	mg/kg wet 0.005	0.092	3.1	1.2
Ethylbenzene	mg/kg wet 0.005	ND	5.4	ND
Toluene	mg/kg wet 0.005	0.019	16	0.62
Xylenes, Total	mg/kg wet 0.005	0.014	33	2.5

MDL Method Detection Limit
ND Not detected at or above the MDL.

Mr. David Leland
Page 4

July 26, 1989
PACE Project Number: 490719503

PACE Sample Number:
Parameter

	<u>Units</u>	<u>MDL</u>	<u>747040</u> <u>8C-8.6</u>
<u>ORGANIC ANALYSIS</u>	<i>Sample Depth</i>		23.5-24

PURGEABLE FUELS AND AROMATICS

TOTAL FUEL HYDROCARBONS, (LIGHT):

Purgeable Fuels, as Gasoline (EPA 8015) mg/kg wet 1.0 7700

PURGEABLE AROMATICS (BTXE BY EPA 8020):

Benzene mg/kg wet 0.005 110
Ethylbenzene mg/kg wet 0.005 260
Toluene mg/kg wet 0.005 1000

Xylenes, Total mg/kg wet 0.005 1600

MDL Method Detection Limit

Mr. David Leland
Page 5

July 26, 1989
PACE Project Number: 490719503

PACE Sample Number:

	747170	747180	747190
	Prep. Blank	Laboratory Control, Recovery	Sample Background for Spike

Parameter

Units

MDL

ORGANIC ANALYSIS

PURGEABLE FUELS AND AROMATICS

TOTAL FUEL HYDROCARBONS, (LIGHT):

Purgeable Fuels, as Gasoline (EPA 8015)	mg/kg wet	1.0	ND	-	102%	ND
<u>PURGEABLE AROMATICS (BTXE BY EPA 8020):</u>						
Benzene	mg/kg wet	0.005	ND	-	93%	ND
Ethylbenzene	mg/kg wet	0.005	ND	-	94%	ND
Toluene	mg/kg wet	0.005	ND	-	94%	0.0565 AU*
Xylenes, Total	mg/kg wet	0.005	ND	-	94%	ND

MDL Method Detection Limit
ND Not detected at or above the MDL.
AU Arbitrary Units

Mr. David Leland
Page 6

July 26, 1989
PACE Project Number: 490719503

PACE Sample Number:

Parameter

Units

MDL

747200
Spike
Result

747210
Spike
Added

747220
Recovery

ORGANIC ANALYSIS

PURGEABLE FUELS AND AROMATICS

TOTAL FUEL HYDROCARBONS, (LIGHT):

Purgeable Fuels, as Gasoline (EPA 8015)

PURGEABLE AROMATICS (BTXE BY EPA 8020):

Benzene

Ethylbenzene

Toluene

			-	-	-
mg/kg wet	1.0	0.35	0.40	87%	
			-	-	
mg/kg wet	0.005	0.378 AU*	0.388 AU	97%	
mg/kg wet	0.005	0.184 AU	0.189 AU	91%	
mg/kg wet	0.005	1.72 AU	1.57 AU	106%	
mg/kg wet	0.005	0.322 AU	0.322 AU	94%	

Xylenes, Total

MDL Method Detection Limit

Mr. David Leland
Page 7

July 26, 1989
PACE Project Number: 490719503

PACE Sample Number:

747230	747240
Sample	Sample
Result,	Result,
First	Duplicate

Parameter

Units

MDL

First

Duplicate

ORGANIC ANALYSIS

PURGEABLE FUELS AND AROMATICS

TOTAL FUEL HYDROCARBONS, (LIGHT):

Purgeable Fuels, as Gasoline (EPA 8015)	mg/kg wet	1.0	-	0.35	-	0.400
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PURGEABLE AROMATICS (BTXE BY EPA 8020):

Benzene	mg/kg wet	0.005	-	0.224	-	0.213
---------	-----------	-------	---	-------	---	-------

Ethylbenzene	mg/kg wet	0.005	-	0.157	-	0.148
--------------	-----------	-------	---	-------	---	-------

Toluene	mg/kg wet	0.005	-	1.06	-	1.01
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Xylenes, Total	mg/kg wet	0.005	-	1.60	-	1.52
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MDL Method Detection Limit

The data contained in this report were obtained using EPA or other approved methodologies. All analyses were performed by me or under my direct supervision.



Douglas E. Oram, Ph.D.
Organic Chemistry Manager

 **CHEMWEST**
ANALYTICAL LABORATORIES, INC.

July 29, 1989

Harding Lawson Associates
200 Rush Landing Road
Novato, CA 94948

Attention: Mr. Pete Mote

Subject: Report of Data - Case Number 4234

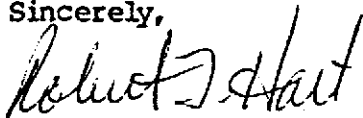
Dear Mr. Mote:

The technical staff at CHEMWEST is pleased to provide our report for the analyses you requested: Total Petroleum Hydrocarbons, purgeable (gasoline) - DHS Method, LUFT Field Manual; and BTEX - EPA Method 602.

Three soil samples for Project Oakland PRP, Project Number 09382,039.02 were received July 18, 1989 in good condition. Results of the analyses, along with the analytical methodology and appropriate reporting limits, are presented on the following pages.


Thank you for choosing CHEMWEST Laboratories. Should you have questions concerning this data report or the analytical methods employed, please do not hesitate to contact your project manager. We hope that you will consider CHEMWEST Laboratories for your future analytical support and service requirements.

Sincerely,



Robert T. Hart
Data Control Manager

and



Kirk Pocan
Project Manager

KP:ba

cc: Joel Bird, President
File

CHEMWEST ANALYTICAL LABORATORIES
 BENZENE, TOLUENE, ETHYL BENZENE, XYLENES
 AND TOTAL PETROLEUM HYDROCARBONS - PURGEABLE

Client I.D.: BC-1.4 Sample Depth 25-25.5 CHEMWEST I.D.: 4234-1
 Date Extracted: 07/25/89 Matrix : Soil
 Date Analyzed : 07/27/89

Compound	Amount Detected (mg/Kg)	RL * (mg/Kg)
Benzene	BRL	5
Toluene	20	10
Ethyl Benzene	BRL	20
Para-Xylene	22	10
Meta-Xylene	43	10
Ortho-Xylene	47	10
Total-Xylenes (1)	110	10
Total Petroleum Hydrocarbon (Purgeable)	1000	1000

Surrogate	% Recovery	Acceptance Window
Bromofluorobenzene	86%	50-150%

BRL: Below Reporting Limit.
 RL: Reporting Limit.
 *: Please see Cover Letter.
 (1): Total of P-, M-, and O- Xylenes.

Approved by:

REV2.9.88

CHEMWEST ANALYTICAL LABORATORIES
 BENZENE, TOLUENE, ETHYL BENZENE, XYLENES
 AND TOTAL PETROLEUM HYDROCARBONS - PURGEABLE

Client I.D.: BC-4.4 Sample Depth 20-20.5 CHEMWEST I.D.: 4234-2
 Date Extracted: 07/20/89 Matrix : Soil
 Date Analyzed : 07/22/89

Compound	Amount Detected (mg/Kg)	RL (mg/Kg)
Benzene	BRL	0.05
Toluene	BRL	0.1
Ethyl Benzene	BRL	0.2
Para-Xylene	BRL	0.1
Meta-Xylene	BRL	0.1
Ortho-Xylene	BRL	0.1
Total-Xylenes (1)	BRL	0.1
Total Petroleum Hydrocarbon (Purgeable)	BRL	10

Surrogate	% Recovery	Acceptance Window
Bromofluorobenzene	72%	50-150%

BRL: Below Reporting Limit.

RL: Reporting Limit.

(1): Total of P-, M-, and O- Xylenes.

Approved by: YF

REV2.9.88

CHEMWEST ANALYTICAL LABORATORIES
 BENZENE, TOLUENE, ETHYL BENZENE, XYLENES
 AND TOTAL PETROLEUM HYDROCARBONS - PURGEABLE

Client I.D.: BC-4.6 Sample Depth 24.5-25 CHEMWEST I.D.: 4234-3
 Date Extracted: 07/20/89 Matrix : Soil
 Date(s) Analyzed : 07/22-25/89

Compound	Amount Detected (mg/Kg)	RL (mg/Kg)
Benzene	BRL	5
Toluene	13	10
Ethyl Benzene	11	20
Para-Xylene	14	10
Meta-Xylene	45	10
Ortho-Xylene	14	10
Total-Xylenes (1)	73	10
Total Petroleum Hydrocarbon (Purgeable)	1100	1000

Surrogate	% Recovery	Acceptance Window
Bromofluorobenzene	114%	50-150%

BRL: Below Reporting Limit.
 RL: Reporting Limit.

(1): Total of P-, M-, and O- Xylenes.

Approved by: *V*

REV2.9.88

CHEMWEST ANALYTICAL LABORATORIES
 BENZENE, TOLUENE, ETHYL BENZENE, XYLENES
 AND TOTAL PETROLEUM HYDROCARBONS - PURGEABLE

Client I.D.: Method Blank
 Date Extracted: NA
 Date Analyzed : 07/22/89

CHEMWEST I.D.: 4234-MB
 Matrix : Soil

Compound	Amount Detected (mg/Kg)	RL (mg/Kg)
Benzene	BRL	0.05
Toluene	BRL	0.1
Ethyl Benzene	BRL	0.2
Para-Xylene	BRL	0.1
Meta-Xylene	BRL	0.1
Ortho-Xylene	BRL	0.1
Total-Xylenes (1)	BRL	0.1
Total Petroleum Hydrocarbon (Purgeable)	BRL	10

Surrogate	% Recovery	Acceptance Window
Bromofluorobenzene	72%	50-150%

BRL: Below Reporting Limit.
 RL: Reporting Limit.

(1): Total of P-, M-, and O- Xylenes.

Approved by:

REV2.9.88

CHEMWEST ANALYTICAL LABORATORIES
 BENZENE, TOLUENE, ETHYL BENZENE, XYLENES
 AND TOTAL PETROLEUM HYDROCARBONS - PURGEABLE

Client I.D.: Method Blank
 Date Extracted: NA
 Date Analyzed : 07/25/89

CHEMWEST I.D.: 4234-MB
 Matrix : Soil

Compound	Amount Detected (mg/Kg)	RL (mg/Kg)
Benzene	BRL	0.05
Toluene	BRL	0.1
Ethyl Benzene	BRL	0.2
Para-Xylene	BRL	0.1
Meta-Xylene	BRL	0.1
Ortho-Xylene	BRL	0.1
Total-Xylenes (1)	BRL	0.1
Total Petroleum Hydrocarbon (Purgeable)	BRL	10

Surrogate	% Recovery	Acceptance Window
Bromofluorobenzene	103%	50-150%

BRL: Below Reporting Limit.
 RL: Reporting Limit.

(1): Total of P-, M-, and O- Xylenes.

Approved by: NP

REV2.9.88

Job Number: 09382, 039.02
 Name/Location: Oakland PRP
 Project Manager: Pete Note

Samplers: S. Michelle Watson

Recorder: S. Watson
 (Signature Required)

SOURCE CODE	MATRIX				#CONTAINERS & PRESERV.			SAMPLE NUMBER OR LAB NUMBER			DATE			
	Water	Sediment	Soil	Oil	Unpres.	H ₂ SO ₄	HNO ₃	Yr	Wk	Seq	Yr	Mo	Dy	Time
50			X				1	BC	-	14	89	07	17	11:45
50			X				1	BC	-	44	89	07	18	09:45
50			X				1	BC	-	46	89	07	18	10:10

STATION DESCRIPTION/NOTES

SAMPLES RECEIVED IN GOOD CONDITION

ANALYSIS REQUESTED						
EPA 801/8010	EPA 802/8020	EPA 824/8240	EPA 825/8270	Priority Pllmt. Metals	Benzene/Toluene/Xylene	Total Petrol. Hydrocarb. Light
				X	X	
				X	X	
				X	X	

LAB NUMBER			DEPTH IN FEET	COL MTD CD	QA CODE	MISCELLANEOUS
Yr	Wk	Seq				
						5 Day Turn Around

CHAIN OF CUSTODY RECORD		
RELINQUISHED BY: (Signature) <u>S. Michelle Watson</u>	RECEIVED BY: (Signature) <u>Gary Bial</u>	DATE/TIME <u>7-18-89 13:25</u>
RELINQUISHED BY: (Signature) <u>Gary Bial</u>	RECEIVED BY: (Signature)	DATE/TIME <u>7-18-89 17:25</u>
RELINQUISHED BY: (Signature)	RECEIVED BY: (Signature)	DATE/TIME
RELINQUISHED BY: (Signature)	RECEIVED BY: (Signature)	DATE/TIME
DISPATCHED BY: (Signature)	DATE/TIME	RECEIVED FOR LAB BY: (Signature) <u>M. JOURN</u>
METHOD OF SHIPMENT CHEM WEST COURIER		DATE/TIME <u>7-18 17:29</u>

July 26, 1989

Mr. David Leland
Harding Lawson Associates
200 Rush Landing Road
Novato, CA 94945

Dear Mr. Leland:

Enclosed is the report of laboratory analyses for samples received
07/12/89.

If you have any questions concerning this report, please feel free
to contact us.

Sincerely,



Stephen F. Nackord
Director, Sampling and Analytical Services

Enclosures

Harding Lawson Associates
200 Rush Landing Road
Novato, CA 94945

July 26, 1989
PACE Project Number: 490712501

Attn: Mr. David Leland
Pacific Ren. Plaza

Date Sample(s) Collected: 07/10/89
Date Sample(s) Received: 07/12/89

PACE Sample Number:
Parameter

Units	MDL	744390 8927T4-1	744400 8927T6-1	744410 8927T7-1
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ORGANIC ANALYSIS

PURGEABLE FUELS AND AROMATICS

TOTAL FUEL HYDROCARBONS, (LIGHT):

Purgeable Fuels, as Gasoline (EPA 8015)

mg/kg wet	0.25	ND	ND	ND
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PURGEABLE AROMATICS (BTXE BY EPA 8020):

Benzene

mg/kg wet	0.0005	ND	ND	ND
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Ethylbenzene

mg/kg wet	0.0005	ND	ND	ND
-----------	--------	----	----	----

Toluene

mg/kg wet	0.0005	0.026	0.073	0.32
-----------	--------	-------	-------	------

Xylenes, Total

mg/kg wet	0.0005	0.001	ND	0.002
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EXTRACTABLE FUELS

Extractable Fuels, as Diesel

mg/kg	10	ND	24	13
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Sonication Extraction, Date Started

	07/19/89	07/19/89	07/19/89
--	----------	----------	----------

MDL Method Detection Limit
ND Not detected at or above the MDL.

The data contained in this report were obtained using EPA or other approved methodologies. All analyses were performed by me or under my direct supervision.



Douglas E. Oram, Ph.D.
Organic Chemistry Manager

July 22, 1989

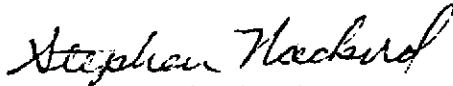
Mr. David Leland
Harding Lawson Associates
200 Rush Landing Road
Novato, CA 94945

Dear Mr. Leland:

Enclosed is the report of laboratory analyses for samples received
07/07/89.

If you have any questions concerning this report, please feel free
to contact us.

Sincerely,


Stephen F. Nackord
Director, Sampling and Analytical Services

Enclosures

Harding Lawson Associates
200 Rush Landing Road
Novato, CA 94945

July 22, 1989
PACE Project Number: 490707504

Attn: Mr. David Leland

PRP Basins

Date Sample(s) Collected: 07/07/89
Date Sample(s) Received: 07/07/89

PACE Sample Number:

Parameter	Units	MDL	743750 8927T101	743760 8927T201	743770 8927T202
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ORGANIC ANALYSIS

PURGEABLE FUELS AND AROMATICS

TOTAL FUEL HYDROCARBONS, (LIGHT):			-	-	-
Purgeable Fuels, as Gasoline (EPA 8015)	mg/kg wet	1.0	ND	ND	ND
<u>PURGEABLE AROMATICS (BTXE BY EPA 8020):</u>			-	-	-
Benzene	mg/kg wet	0.005	ND	ND	ND
Ethylbenzene	mg/kg wet	0.005	ND	ND	ND
Toluene	mg/kg wet	0.005	ND	0.009	ND
Xylenes, Total	mg/kg wet	0.005	ND	0.009	ND

EXTRACTABLE FUELS

Extractable Fuels, as Diesel	mg/kg	10	LT 50(*)	15	LT 20(*)
Sonication Extraction, Date Started			07/11/89	07/11/89	07/11/89

(*) Unknown compound/pattern present in sample extracts.

MDL Method Detection Limit
ND Not detected at or above the MDL.
LT Less than.

The data contained in this report were obtained using EPA or other approved methodologies. All analyses were performed by me or under my direct supervision.

Steve Mackard for:

Douglas E. Oram, Ph.D.
Organic Chemistry Manager

July 20, 1989

Mr. David Leland
Harding Lawson Associates
200 Rush Landing Road
Novato, CA 94945

Dear Mr. Leland:

Enclosed is the report of laboratory analyses for samples received
06/30/89.

If you have any questions concerning this report, please feel free
to contact us.

Sincerely,



Stephen F. Nackord
Director, Sampling and Analytical Services

Enclosures

Mr. David Leland
Page 2

July 20, 1989
PACE Project Number: 490630508

PACE Sample Number:
Parameter

Units MDL 742730
8926P401

INORGANIC ANALYSIS

Infiltration Basin
BA-4

INDIVIDUAL PARAMETERS

Lead mg/kg wet 10 31

ORGANIC ANALYSIS

INDIVIDUAL PARAMETERS

Purgeable Fuels, as Gasoline (EPA 8015) mg/kg wet 1.0 790

VOLATILE HALOCARBONS AND AROMATICS

VOLATILE HALOCARBONS BY EPA 8010

Dichlorodifluoromethane	ug/kg	20	-	LT 2500
Chloromethane	ug/kg	20		LT 2500
Vinyl Chloride	ug/kg	20		LT 2500
Bromomethane	ug/kg	20		LT 2500
Chloroethane	ug/kg	20		LT 2500

Trichlorofluoromethane	ug/kg	20		LT 2500
1,1-Dichloroethene	ug/kg	5.0		LT 2500
Methylene Chloride	ug/kg	5.0		LT 2500
trans-1,2-Dichloroethene	ug/kg	5.0		LT 2500
1,1-Dichloroethane	ug/kg	5.0		LT 2500
Chloroform	ug/kg	5.0		LT 2500

1,1,1-Trichloroethane (TCA)	ug/kg	5.0		LT 2500
Carbon Tetrachloride	ug/kg	5.0		LT 2500
1,2-Dichloroethane (EDC)	ug/kg	5.0		LT 2500
Trichloroethene (TCE)	ug/kg	5.0		LT 2500
1,2-Dichloropropane	ug/kg	5.0		LT 2500
Bromodichloromethane	ug/kg	5.0		LT 2500

2-Chloroethylvinyl ether	ug/kg	5.0		LT 2500
trans-1,3-Dichloropropene	ug/kg	5.0		LT 2500
cis-1,3-Dichloropropene	ug/kg	5.0		LT 2500
1,1,2-Trichloroethane	ug/kg	5.0		LT 2500
Tetrachloroethene	ug/kg	5.0		LT 2500
Dibromochloromethane	ug/kg	5.0		LT 2500

MDL Method Detection Limit
LT Less than.

Mr. David Leland
Page 3

July 20, 1989
PACE Project Number: 490630508

PACE Sample Number:
Parameter

Units	MDL	742730 8926P401
		BA-4

ORGANIC ANALYSIS

VOLATILE HALOCARBONS AND AROMATICS

Chlorobenzene	ug/kg	5.0	LT 2500
Bromoform	ug/kg	5.0	LT 2500
1,1,2,2-Tetrachloroethane	ug/kg	5.0	LT 2500
1,3-Dichlorobenzene	ug/kg	5.0	LT 2500
1,4-Dichlorobenzene	ug/kg	5.0	LT 2500
1,2-Dichlorobenzene	ug/kg	5.0	LT 2500

Bromochloromethane (Surrogate Recovery)			110%
1,4-Dichlorobutane (Surrogate Recovery)			89%

VOLATILE AROMATICS BY EPA 8020

Benzene	ug/kg	1.0	LT 500
Toluene	ug/kg	1.0	LT 500
Chlorobenzene	ug/kg	1.0	LT 500

Ethylbenzene	ug/kg	1.0	LT 500
Xylene	ug/kg	1.0	LT 500
1,3-Dichlorobenzene	ug/kg	1.0	LT 500
1,4-Dichlorobenzene	ug/kg	1.0	LT 500
1,2-Dichlorobenzene	ug/kg	1.0	LT 500
Fluorobenzene (Surrogate Recovery)			99%

EXTRACTABLE FUELS

Extractable Fuels, as Diesel	mg/kg	10	210
Sonication Extraction, Date Started			07/11/89

LT Less than.
MDL Method Detection Limit

Sample diluted for 8010/8020 analysis due to matrix components
(fuel hydrocarbons).

Mr. David Leland
Page 4

July 20, 1989
PACE Project Number: 490630508

The data contained in this report were obtained using EPA or other approved methodologies. All analyses were performed by me or under my direct supervision.

Stephen F. Nackord

Stephen F. Nackord
Director, Sampling and Analytical Services

Douglas E. Oram

Douglas E. Oram, Ph.D.
Organic Chemistry Manager

200 Ft. Landing Road
 P.O. Box 6107
 Novato, California 94948
 415/892-0821
 Telecopy: 415/892-1586

CHAIN OF CUSTODY FORM

Lab: PACE 17-30-89

Job Number: 9382 037.02
 Name/Location: PRP
 Project Manager: D.kland

Samplers: Rob Nelson
 Recorder: Robert H. Nelson
 (Signature Required)

SOURCE CODE	MATRIX				#CONTAINERS & PRESERV.			SAMPLE NUMBER OR LAB NUMBER			DATE			
	Water	Sediment	Soil	Oil	Unpres.	H ₂ SO ₄	HNO ₃	Yr	Wk	Seq	Yr	Mo	Dy	Time
48		X			1			89	26	P401	89	06	29	1340
10	X				1			89	26	TSE1	89	06	30	1430

STATION DESCRIPTION/NOTES
TIME 12
TIME 11

ANALYSIS REQUESTED												
EPA 601/8010	EPA 602/8020	EPA 624/8240	EPA 625/8270	Priority Plltnt. Metals	Benzene/Toluene/Xylene	Total Petrol. Hydrocarb.	TPH Light	TPH HEAVY	LEAD	8010	8020	Dissolved Chlorine
							X	X	X	X	X	
												X

LAB NUMBER			DEPTH IN FEET	COL MTD CD	QA CODE	MISCELLANEOUS
Yr	Wk	Seq				
						No 5
						10/2

CHAIN OF CUSTODY RECORD		
RELINQUISHED BY: (Signature) <u>Robert H. Nelson</u>	RECEIVED BY: (Signature)	DATE/TIME <u>6-30-89 14:40</u>
RELINQUISHED BY: (Signature)	RECEIVED BY: (Signature) <u>Robert H. Nelson</u>	DATE/TIME <u>6-30-89</u>
RELINQUISHED BY: (Signature)	RECEIVED BY: (Signature)	DATE/TIME
RELINQUISHED BY: (Signature)	RECEIVED BY: (Signature)	DATE/TIME
DISPATCHED BY: (Signature)	DATE/TIME	RECEIVED FOR LAB BY: (Signature) <u>...</u>
METHOD OF SHIPMENT		

June 30, 1989

Mr. David Leland
Harding Lawson Associates
200 Rush Landing Road
Novato, CA 94947

Dear Mr. Leland:

Enclosed is the report of laboratory analyses for samples received
06/22/89.

If you have any questions concerning this report, please feel free
to contact us.

Sincerely,


Stephen F. Nackord
Director, Sampling and Analytical Services

Enclosures

Harding Lawson Associates
200 Rush Landing Road
Novato, CA 94947

June 30, 1989
PACE Project Number: 490622503

Attn: Mr. David Leland

Pacific Ren. Plaza

Date Sample(s) Collected: 06/15/89
Date Sample(s) Received: 06/22/89

PACE Sample Number:
Parameter

<u>Units</u>	<u>MDL</u>	<u>740310</u> <u>8925P1RS</u>	<u>740320</u> <u>8925P1GS</u>
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ORGANIC ANALYSIS

INDIVIDUAL PARAMETERS

Purgeable Fuels, as Gasoline (EPA 8015) mg/kg wet 0.2 ND ND

EXTRACTABLE FUELS

Extractable Fuels, as Diesel mg/kg 10 ND ND
Sonication Extraction, Date Started 06/27/89 06/27/89

ND Not detected at or above the MDL.
MDL Method Detection Limit

The data contained in this report were obtained using EPA or other approved methodologies. All analyses were performed by me or under my direct supervision.



Douglas E. Oram, Ph.D.
Organic Chemistry Manager

Job Number: 4302, 037.02
 Name/Location: PRP
 Project Manager: D. Island

Samplers: Robert L. Nelson
ph # 839-0906
w TPH-light
 Recorder: Robert L. Nelson
 (Signature Required)

SOURCE CODE	MATRIX				#CONTAINERS & PRESERV.			SAMPLE NUMBER OR LAB NUMBER			DATE			
	Water	Sediment	Soil	Oil	Unpres.	H ₂ SO ₄	HNO ₃	Yr	Wk	Seq	Yr	Mo	Dy	Time
48		X			X			37	25	PI RS	89	06	15	1630
48		X			X			37	25	PI GS	89	06	15	1630

STATION DESCRIPTION/NOTES

samples HOT (74031)
 samples HOT (74032)

collected site correct
 50%
 Surcharge
 on TPH-heavy

ANALYSIS REQUESTED										
EPA 601/8010	EPA 602/8020	EPA 624/8240	EPA 625/8270	Priority Pllmt. Metals	Benzene/Toluene/Xylene	Total Petrol. Hydrocarb.	TPH light & heavy			

LAB NUMBER			DEPTH IN FEET	COL MTD CD	QA CODE	MISCELLANEOUS
Yr	Wk	Seq				
						TPH on hold as of 6/22 6:30 PM - Rush not possible. *TPH-L due Monday AM
						DK per Rob. Nelson 6/23

100% Surcharge → Navy due Heavy took 1wk Light Monday Sam

RELINQUISHED BY: (Signature)		RECEIVED BY: (Signature)		DATE/TIME	
Robert L. Nelson					
RELINQUISHED BY: (Signature)		RECEIVED BY: (Signature)		DATE/TIME	
RELINQUISHED BY: (Signature)		RECEIVED BY: (Signature)		DATE/TIME	
RELINQUISHED BY: (Signature)		RECEIVED BY: (Signature)		DATE/TIME	
DISPATCHED BY: (Signature)		DATE/TIME		RECEIVED FOR LAB BY: (Signature)	
				Michelle Casey 6/23/90	
METHOD OF SHIPMENT					

June 30, 1989

Mr. David Leland
Harding Lawson Associates
200 Rush Landing Road
Novato, CA 94947

Dear Mr. Leland:

Enclosed is the report of laboratory analyses for samples received
06/14/89.

If you have any questions concerning this report, please feel free
to contact us.

Sincerely,



Stephen F. Nackord
Director, Sampling and Analytical Services

Enclosures

Harding Lawson Associates
200 Rush Landing Road
Novato, CA 94947

June 30, 1989
PACE Project Number: 490614505

Attn: Mr. David Leland

PRP

Date Sample(s) Collected: 06/14/89
Date Sample(s) Received: 06/14/89

PACE Sample Number: 737330
Parameter Units MDL 8924 Pit 1

ORGANIC ANALYSIS

INDIVIDUAL PARAMETERS


Purgeable Fuels, as Gasoline (EPA 8015) mg/kg wet 1.0 1.2

EXTRACTABLE FUELS

Extractable Fuels, as Diesel mg/kg 10 ND
Sonication Extraction, Date Started 06/27/89

MDL Method Detection Limit
ND Not detected at or above the MDL.

The data contained in this report were obtained using EPA or other approved methodologies. All analyses were performed by me or under my direct supervision.


Douglas E. Oram, Ph.D.
Organic Chemistry Manager

DISTRIBUTION

REPORT OF SYSTEM MONITORING
JULY 1989
SOIL TREATMENT SYSTEM
PACIFIC RENAISSANCE PLAZA
OAKLAND, CALIFORNIA
September 5, 1989

Copy No. 4

		<u>Copy No.</u>
1 copy:	California Regional Water Quality Control Board San Francisco Bay Region 1111 Jackson Street, Room 6000 Oakland, California 94607 Attention: Mr. Don Dalke	1
2 copies:	City of Oakland Redevelopment Agency One City Hall Plaza Oakland, California 94612 Attention: Mr. Peter Chen	2-3
1 copy:	Alameda County Department of Environmental Health 80 Swan Way, Room 200 Oakland, California 94621 Attention: Mr. Lowell Miller	4
1 copy:	Job File	5
1 copy:	QC/Bound Report File	6

JDS/DFL/TLW/bht/19747-H

QUALITY CONTROL REVIEWER

Tamara L. Williams
Tamara L. Williams
Geologist - 3954