

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
SEPTEMBER THROUGH NOVEMBER 1989
SOIL TREATMENT SYSTEM
PACIFIC RENAISSANCE PLAZA
OAKLAND, CALIFORNIA**

HLA Job No. 9382,040.02


Submitted on behalf of:

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1.0 INTRODUCTION AND BACKGROUND

1.1 Introduction

This report describes the operation and monitoring of the in situ soil treatment system at the Pacific Renaissance Plaza (PRP) site in Oakland, California, for the period November 2 to December 6, 1989, and discusses the performance of the system during the third quarter of operation, from September 8 to December 6, 1989. In response to comments from the California Regional Water Quality Control Board, San Francisco Bay Region (RWQCB), some discussion also pertains to the entire treatment system operating period. The PRP site, part of the Oakland Chinatown Redevelopment Project Area, is bounded by 9th, Franklin, and Webster streets and the East Bay Municipal Utility District (EBMUD) property line approximately 100 feet north of the centerline of 10th Street (Plate 1). The soil treatment system is designed to remove petroleum hydrocarbons from soil within the site boundaries before the soil is excavated during construction of the complex. The system began operation on March 4, 1989. Recent discussions with Pacific Renaissance Associates, the developer of the project, indicate that construction is scheduled to begin in May 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 set forth by the 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 effectively removing hydrocarbons from soil at the site using biodegradation. The *Report of Waste Discharge, Pacific Renaissance Plaza, Chinatown Redevelopment Project Area, Oakland, California (HLA, 1989a)*, discusses the design of the soil treatment system 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 from March through October are described in *HLA, 1989b through i*. The objective of the system and a description of the process are presented in *HLA, 1989e*.

2.0 TREATMENT SYSTEM OPERATIONS - NOVEMBER 1989

System operational activities and adjustments made in November are summarized

below:

- o Pumps in Extraction Wells EW-1, EW-2, EW-3, EW-7, EW-8, EW-9, EW-18, and EW-21 were reconditioned; the pumps were removed from the wells and run in a chlorine/soap bath. Flowmeters and water-level probes for each of these wells were also cleaned. The probes and flowmeter at EW-18 were replaced.
- o The concentration of nutrients added in the injection water was maintained at 60 parts per million (ppm).
- o The sand filter at the influent of the carbon treatment system was backwashed twice daily. The sand was changed on November 25. The bag filters were changed approximately every two days.
- o Infiltration Basin BA-10 was filled with water on November 9.
- o Injection Wells IW-12, IW-13, and IW-14 began operation November 29.

3.0 TREATMENT SYSTEM MONITORING - NOVEMBER 1989

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, Table 1 presents the sampling frequency, analytical parameters, and EPA test methods used (for organic constituents). 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

The 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 U.S. Geological Survey ground-water flow computer code MODFLOW (*McDonald and Harbaugh, 1984*). Individual injection well, infiltration basin, and extraction well flow rates from November 1 to December 4 were averaged for use as model input (Tables 2 and 3) for simulating ground-water elevations at the site for November (Plate 2).

4.0 RESULTS

4.1 Hydraulic Analysis - November 1 to December 4, 1989

Flow rates for wells and infiltration basins installed by HLA were calculated based on readings from the flowmeters on the wellheads. Average injection and extraction rates for November are presented in Tables 2 and 3. From November 1 to December 4, the total flow rate for all injection wells was about 17.8 gallons per minute (gpm). The flow rate for injection wells located south of 10th Street, Wells IW-1 through IW-9 and IW-12 through IW-14, was about 16.3 gpm. The average flow rate into Basins BA-1 through BA-7 was about 4.1 gpm from November 1 to December 4; the average flow rate into Basins BA-8 and BA-9 was about 0.7 gpm and into Basin BA-10 about 0.8 gpm (Table 2). All the influent to these covered basins is assumed to infiltrate. Total flow into all injection wells and infiltration basins, calculated as a monthly average, was about 23.4 gpm.

During this monitoring period, the total flow rate for all extraction wells was 24.3 gpm. The flow rate for Wells EW-1 through EW-20 was about 23.3 gpm, and for Wells EW-21 and EW-22 was about 1.0 gpm (Table 3). The average extraction rates exceeded the average injection/infiltration rates in November by about 0.9 gpm.

A summary of treatment system injection/infiltration and extraction rates (including EBMUD dewatering wells) from system startup is presented in Table 4. This summary indicates that total extraction rates have exceeded total injection/infiltration rates in all months except March, September and October. Months in which there are imbalances are associated with periods of increasing ground-water levels, when injection water was going to ground-water storage. In March, startup of the system resulted in increases in water levels as the ground-water mound in the vicinity of the injection wells was established. In September and October, deactivation of the EBMUD

dewatering wells resulted in increasing water levels in areas adjacent to these wells and an imbalance between injection/infiltration and extraction flow rates.

Table 5 presents measurements of depth to water in monitoring wells and calculated water-level elevations from January 3 to December 4, 1989. Ground-water elevations on December 4, 1989, are shown on Plate 2 and represent conditions approximately 275 days after system startup. Contours of ground-water elevations simulated using the numerical model are also presented on Plate 2. 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.

In general, the simulated water levels show good agreement with observed water-level elevations measured at monitoring wells. The average difference between simulated and observed water-level elevations is about 0.4 foot. To assess the effect of differences between observed and simulated water levels on water-level contours, a second contour map was prepared, using the simulated results as a guide to produce contours that match the observed water levels in the monitoring wells. This map is presented as Plate 3, and indicates a larger core of depression in the vicinity of extraction wells at the western end of the site. Contours in other portions of the modeled area are generally similar to model results.

Water-level contours calculated using the site model can be used to assess the hydraulic control of injected water. Plate 4 shows the approximate ground-water flow paths in the vicinity of the PRP soil treatment system for December 4. The flow paths indicate that although the capture zone of the well system is larger than the area enclosed by the ring of extraction wells in the southern area of the site and extends beyond the property boundaries of the PRP site, overall hydraulic control of injection/infiltration water is maintained by the well system. Most injected water is

recovered by the extraction wells without traveling off site. At the eastern and western ends of the site, some of the injected water may travel off site as it moves toward the extraction wells.

Plate 5 shows a cross-sectional representation of ground-water flow in the vicinity of the BART tunnel near the western corner of the treatment system. The potentiometric surface is shown to intersect the BART tunnel at about 10 feet above mean sea level. Ground-water flows from south to north (from MW-18 toward EW-16) with increased vertical components of flow near the BART tunnel. This flow net analysis illustrates that the effects of the BART tunnel are localized, and do not significantly affect the use of the two-dimensional areal ground-water model to assess ground-water levels and flow directions in a plan view.

4.2 Distribution of Inorganic Constituents and Microbial Populations in Ground Water

Tables 6 and 7 present the inorganic chemical and microbiological analysis results for the bioremediation treatment system from startup through December 4, 1989. Nitrate concentrations in ground water at the site for the December 4 sampling round are presented on Plate 6. The December 4 average nitrate concentration within the treatment zone (Wells MW-9, MW-11, MW-15, MW-16, and MW-17) is approximately 5 times higher than the average concentration outside the treatment zone (Wells MW-7, MW-10, MW-12 and MW-18). Phosphate concentrations in ground water at the site for the December 4, 1989, sampling round are presented on Plate 7. The December 4 average phosphate concentration within the treatment zone is approximately 5 times higher than the average concentration outside the treatment zone.

Plates 8 and 9 indicate that nitrate and phosphate concentrations at the western end of the treatment system at MW-11, EW-15 and EW-16 (inside the treatment zone)

are significantly higher than concentrations at MW-12 and MW-18 (outside the treatment zone) from startup of the system in March through the third quarter of operation. Plate 8 shows that nitrate concentrations are generally stable during the third quarter of operation (September 7 to December 4), with average inside concentrations of 55 to 60 ppm and average outside concentrations from 5 to 20 ppm. Plate 9 shows that during the third quarter average inside phosphate concentrations range from 20 to 40 ppm, while average outside concentrations range from 3 to 5 ppm.

Plate 10, showing nitrate concentrations as a function of time in the transect area (Wells MW-15, MW-16 and MW-17), illustrates the rapid transport of nitrate through the soil profile, with concentrations increasing from start-up through the first quarter at similar rates for Well MW-14 (outside the treatment zone) and for transect wells (inside the treatment zone). Concentrations during the third quarter are generally stable (average concentrations about 60 ppm) with no apparent difference between the inside transect wells and MW-14. Plate 11 shows that phosphate has been transported through the soil profile more slowly than nitrate. Phosphate concentrations at MW-16 and MW-17 (closest transect wells to the injection source) increased during the first quarter and again early in the third quarter, whereas , concentrations at MW-15 and MW-14 (furthest from injection sources) do not start to increase until the second and third quarters, respectively. During the third quarter, the average inside concentration was about 35 ppm and the average outside concentration was about 10 ppm in this area. The nitrate and phosphate concentration trends in this area indicate that nitrate is transported more quickly through the soil profile. This is consistent with expected transport rates based on adsorption and microbial utilization characteristics for these inorganic nutrients.

Plates 12 and 13 show the nitrate and phosphate concentrations as a function of time for the southeastern corner of the treatment system at 9th and Webster streets.

Nitrate concentrations are generally highest at EW-8, with concentrations increasing from system startup through the first quarter, remaining elevated through the second quarter, and declining in the third quarter (Plate 12). Nitrate concentrations at MW-10 (outside edge of extraction ring) are generally the lowest in the area with a pattern of first quarter increase similar to but of lesser magnitude than EW-8. Nitrate concentrations at EW-7 are generally between concentrations at EW-8 and MW-10. Phosphate concentrations (Plate 13) show relationships similar to nitrate concentrations (EW-8 - highest; MW-10 - lowest; EW-7 - intermediate). Concentrations at EW-8 begin to increase in late April and at MW-10 in early September. This illustrates the slower transport rate of phosphate through the soil profile as compared to nitrate.

Plate 14 shows a time concentration plot of microbial counts of hydrocarbon utilizing bacteria for selected monitoring wells within the treatment zone (MW-11, MW-15, MW-16, MW-17). The plot illustrates increases in populations from system startup through the early part of the second quarter. The counts decreased slightly during the second quarter and stabilized from the end of the second quarter through the third quarter at around 10,000 colony-forming units per milliliter (CFU/ml). Total microbial counts have also been stable during this period (Table 7).

4.3 Distribution of Petroleum Hydrocarbons in Ground Water

Results of organic analyses of ground-water samples are presented in Table 8. Laboratory data sheets are presented in Appendix A. Petroleum hydrocarbon concentrations as TPH (gasoline) for the December 4-6 sampling round are presented on Plate 15.

Reported TPH values for samples from Monitoring Wells MW-14 and MW-15 for the December sampling round are similar to the November round. Reported TPH values for the December round for remaining monitoring wells are less than values for

November. Petroleum hydrocarbons were not detected at MW-18, located west of the treatment area. December TPH values in ground-water samples from Extraction Wells EW-1, EW-4, EW-6, EW-7, EW-8, EW-12, and EW-16 decreased from the November sampling round, while concentrations in samples from EW-15, EW-19, and EW-21 increased.

Plots of benzene concentrations as a function of time at selected wells are presented in Plates 16, 17, and 18. The plots present results for three areas of the site: the transect area (Wells MW-14, MW-15, MW-16, and MW-17), the southeastern area (represented by Wells MW-10, EW-7, and EW-8) and the western area (represented by Wells MW-11, MW-12, MW-18, EW-15, and EW-16). In the transect area, benzene concentrations at MW-14 have generally been similar to or lower than concentrations at any of the transect wells. Since deactivation of all EBMUD dewatering wells in September, benzene concentrations at MW-14 have shown a declining trend. As noted in previous reports, results of hydraulic analysis indicate the EBMUD dewatering operations had induced flow to the north beyond PRP extraction wells. This interpretation is supported by the peak petroleum hydrocarbon concentrations observed at this location in samples collected during the July monitoring round prior to deactivation of the EBMUD wells.

In the southeastern area of the site, benzene concentrations at Wells EW-7, EW-8, and MW-10 show a peak concentrations at each location in samples collected during the October sampling round (Plate 17).

In the western area of the site, benzene concentrations at Wells MW-11, EW-15, and EW-16 have showed an overall pattern of decline during the third quarter of operation (Plate 18). At MW-12, benzene concentrations have been consistently two to three orders of magnitude below concentrations at MW-11 (Table 8). Concentrations at

MW-12 also declined during the quarter, from 59 ppb (maximum of two duplicate sample results) in samples collected September 7 to 6.2 ppb in a sample collected December 6. Benzene has never been detected in samples collected from MW-18.

5.0 ACTIVITIES PLANNED FOR DECEMBER 1989 THROUGH FEBRUARY 1990

On the basis of observed performance, selected extraction wells will be reconditioned to improve the extraction rate efficiency. Pumps and probes will be cleaned using a chlorine/soap bath to remove silt and microbial mass.

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

Two additional monitoring wells, designated MW-19 and MW-20, were installed and sampled in December. Boring logs and reports of analytical results will be presented in the December monthly report.

An estimated five additional confirmation soil samples will be collected in late January to assess the progress of soil treatment. Borings will be drilled and samples collected, screened in the field for volatile organic components, and submitted to a state-certified laboratory for TPH and BTEX analyses.

6.0 REFERENCES

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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	B	B	B	--	--	--	--	--	--
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	B	B	B	--	--	--	M	M	M
EW-1	D	M	M	M	--	--	M	M	--	M
EW-2	D	--	--	--	--	--	M	--	--	--
EW-3	D	--	--	--	--	--	M	--	--	--
EW-4	D	M	M	M	M	--	M	M	--	M
EW-5	D	--	--	--	--	--	M	--	--	--

Table 1. Schedule for Sampling, Measurement, and Analysis (continued)
 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	B	B	B	--	--	B	M	--	M
EW-7	D	B	B	B	B	--	B	M	--	M
EW-8	D	B	B	B	B	--	B	M	--	M
EW-9	D	B	B	B	--	--	M	B	--	B
EW-10	D	M	M	M	B	--	B	--	--	--
EW-11	D	M	M	M	--	--	B	--	--	--
EW-12	D	M	M	M	M	--	M	M	--	M
EW-13	D	--	--	--	--	--	M	--	--	--
EW-14	D	--	--	--	--	--	--	--	--	--
EW-15	D	B	B	B	B	--	B	M	--	M
EW-16	D	M	M	M	--	--	--	--	--	--
EW-17	D	--	--	--	--	--	--	--	--	--
EW-18	D	--	--	--	--	--	--	--	--	--
EW-19	D	M	M	M	--	--	M	M	--	M
EW-20	D	--	--	--	--	--	--	--	--	--
EW-21	D	B	B	B	--	--	B	M	--	M
EW-22	D	M	M	M	--	--	M	M	--	M

Table 1. Schedule for Sampling, Measurement, and Analysis (continued)
 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)
Monitoring Wells										
MW-2	B	--	--	--	--	--	--	--	--	--
MW-3	B	--	--	--	--	--	--	--	--	--
MW-5	B	--	--	--	--	--	--	--	--	--
MW-6	B	--	--	--	--	--	--	--	--	--
MW-7	B	M	M	M	--	--	--	M	--	M
MW-8	B	--	--	--	--	--	--	--	--	--
MW-9	B	M	M	M	--	--	M	M	--	M
MW-10	B	B	B	B	B	--	B	M	--	M
MW-11	B	B	B	B	B	--	B	M	--	M
MW-12	B	M	M	M	--	--	M	M	--	M
MW-13	B	M	M	M	--	--	M	M	--	M
MW-14	B	M	M	M	--	--	M	M	--	M
MW-15	B	M	M	M	--	--	M	M	--	M
MW-16	B	B	B	B	B	--	B	M	--	M
MW-17	B	B	B	B	B	--	B	M	--	M
MW-18	B	M	M	M	--	--	M	M	--	M

Notes:

- D = daily
- W = weekly
- B = biweekly
- M = monthly
- X = sampled this round but not scheduled for regular sampling
- = no analysis or measurement

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

Injection Well Flow Rates

Meter No.	04-Dec-89 Totalizer Reading	01-Nov-89 Totalizer Reading	Elapsed Time (min)	Average Flow Rate (gpm)
IW-1	1403390	1292816	47705	2.32
IW-2	1314088	1204471	47705	2.30
IW-3	1113220	1012573	47705	2.11
IW-4	1290757	1164095	47705	2.66
IW-5	411668	369764	47705	0.88
IW-6	622190	579954	47705	0.89
IW-7	1472840	1335877	47705	2.87
IW-8	502894	473991	47705	0.61
IW-9	836898	754607	47705	1.72
IW-10	104054	101685	47705	0.05
IW-11	551596	483897	47705	1.42
IW-12 *	12365	11075	47705	0.03
IW-13 *	21030	3637	47705	0.36
IW-14 *	23270	179	47705	0.48
Total (1-9,12-14)	8967945	8188148	47705	16.35
Total (10,11)	655650	585582	47705	1.47
Total (1-14)	9623595	8773730	47705	17.82

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 Note: Totalizer readings in gallons.

*: Flow meter installed on November 29.

Infiltration Basin Flow Rates

Meter No.	04-Dec-89 Totalizer Reading	01-Nov-89 Totalizer Reading	Elapsed Time (min)	Average Flow Rate (gpm)
BA-1	201193	174761	47705	0.55
BA-2	106951	86296	47705	0.43
BA-3	157385	135521	47705	0.46
BA-4	103084	87045	47705	0.34
BA-5	380204	291633	47705	1.86
BA-6 **	2909	2909	47705	0.00
BA-7	127161	105254	47705	0.46
BA-8	115453	87363	47705	0.59
BA-9	48856	42651	47705	0.13
BA-10 ***	40380	2900	47705	0.79
Total (1-7)	1078887	883419	47705	4.10
Total (8,9)	164309	130014	47705	0.72
Total (1-10)	1283576	1016333	47705	5.60

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 Note: Totalizer readings in gallons.

** : Basin flow rate is included in BA-5

*** : Flow meter installed on November 9.

Table 3. Extraction Well Flow Rates - November 1989

Harding Lawson Associates

Meter No.	04-Dec-89 Totalizer Reading	01-Nov-89 Totalizer Reading	Elapsed Time (min)	Average Flow Rate (gpm)
EW-1	357441	314715	47705	0.90
EW-2	389027	333653	47705	1.16
EW-3	639434	535256	47705	2.18
EW-4	449111	384568	47705	1.35
EW-5	492936	448560	47705	0.93
EW-6	180186	169047	47705	0.23
EW-7	143905	134594	47705	0.20
EW-8	352712	317940	47705	0.73
EW-9	424397	363902	47705	1.27
EW-10	335001	298490	47705	0.77
EW-11	359179	311231	47705	1.01
EW-12	294333	258586	47705	0.75
EW-13	317501	280410	47705	0.78
EW-14	364144	319573	47705	0.93
EW-15	580816	507813	47705	1.53
EW-16	936246	836930	47705	2.08
EW-17	814492	698568	47705	2.43
EW-18	798303	721411	47705	1.61
EW-19	631705	555577	47705	1.60
EW-20	318902	275210	47705	0.92
EW-21	109494	86424	47705	0.48
EW-22	47440	22528	47705	0.52
Total (1-20)	9179771	8066034	47705	23.35
Total (21-22)	156934	108952	47705	1.01
Total (1-22)	9336705	8174986	47705	24.35

Note: Totalizer readings in gallons.

Table 4. Summary of Treatment System Flow Rates

DATE	Harding Lawson Associates							
	SOUTH INJECTION/INFILTRATION IW (1-9,12-14) IB(1-9) (gpm)	SOUTH EXTRATION EW (1-20) (gpm)	NORTH INJECTION/INFILTRATION IW (10-11) IB(10) (gpm)	NORTH EXTRATION EW (21-22) (gpm)	DIFFERENCE BETWEEN INJECTION/ INJECTION AND EXTRACTION RATES			
					ALL W/ EBMUD (5 gpm)	SOUTH W/ EBMUD (3 gpm)	NORTH W/ EBMUD (2 gpm)	
March 4-18	23.06	11.74	1.99	0.00	8.31	8.32	-0.01	
March 18-April 4	21.97	19.17	1.90	0.00	-0.30	-0.20	-0.1	
April 4-May 2	19.70	17.65	0.98	0.00	-1.97	-0.95	-1.02	
May 2-June 5	21.21	21.14	1.38	0.09	-3.64	-2.93	-0.71	
June 5-July 5	31.75	30.63	2.24	0.35	-1.99	-1.88	-0.11	
July 5-August 1	34.00 (3.27)**	30.92	2.07	0.38	-0.23	0.08	-0.31	
August 1-September 6	31.57 (6.70)	27.67	1.42	0.35	-0.03	0.90	-0.93	
September 6-October 3 ***	26.20 (6.10)	23.60	1.20	0.50	2.05	1.85	0.2	
October 3-November 1 ****	22.20 (5.12)	23.16	2.29	1.01	0.32	-0.96	1.28	
November 1-December 4 ****	21.17 (4.82)	23.35	2.26 (0.79)	1.01	-0.93	-2.18	1.25	

NOTES:

- *: Minus sign indicates extraction rate exceeds injection rate; includes EBMUD extraction until September 14 (3 gpm in south area, 2 gpm in north area).
- ** : Values in parentheses are infiltration basin flow rates.
- ***: EBMUD wells turned off on September 14 - Extraction rate as monthly average is 2.5 gpm.
- ****: EBMUD Extraction rate is 0.0 gpm.

Table 5. Water-Level Elevations - January through November 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	-	-	-	-	-	-	-	-	-	-	-	-	23.36	15.14
25-Apr-89	-	-	-	-	-	-	-	-	28.13	10.97	-	-	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	12.98	27.44	11.66	28.79	11.68	21.60	16.90
09-Aug-89	27.18	12.37	25.91	12.44	25.36	12.50	26.57	13.02	27.40	11.70	28.74	11.73	21.66	16.84
15-Aug-89	27.24	12.31	25.95	12.40	25.48	12.38	27.63	11.96	27.62	11.48	28.79	11.68	21.80	16.70
30-Aug-89	27.21	12.34	-	-	25.69	12.17	26.60	12.99	27.52	11.58	28.66	11.81	22.98	15.52
06-Sep-89	27.22	12.33	25.93	12.42	25.55	12.31	26.61	12.98	27.38	11.72	28.77	11.70	21.97	16.53
28-Sep-89	-	-	-	-	-	-	-	-	-	-	-	-	22.37	16.13
03-Oct-89	26.71	12.84	25.24	13.11	24.75	13.11	26.30	13.29	27.35	11.75	28.29	12.18	22.55	15.95
01-Nov-89	26.49	13.06	25.07	13.28	24.55	13.31	26.12	13.47	26.96	12.14	28.14	12.33	22.33	16.17
20-Nov-89	26.28	13.27	24.91	13.44	-	-	25.96	13.63	26.80	12.30	28.00	12.47	22.46	16.04
04-Dec-89	26.18	13.37	24.76	13.59	24.04	13.82	25.88	13.71	26.87	12.23	27.91	12.56	22.22	16.28

Notes:

Elevations are in feet above mean sea level (MSL).
 Depth to water in feet measured from top of casing.

Mr. David Leland

Page 8

January 03, 1990

PACE Project

Number: 491205503

PRP

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

Stephen F. Nackord

Stephen F. Nackord

Director, Sampling and Analytical Services

Douglas E. Oram

Douglas E. Oram, Ph.D.

Organic Chemistry Manager

CHAIN OF CUSTODY FORM

Tab: Page

Samplers: Bruce Felton, Dave Evans

Job Number: LA 82, 039 02

Name/Location: RKP

Project Manager: Kane Lelstad

Recorder: [Signature]
 (Signature Required)

ANALYSIS REQUESTED									
EPA 601/8010	EPA 602/8020	EPA 624/8240	EPA 625/8270	Priority Pestic. Metals	Benzene/Toluene/Xylene	Total Petrol. Hydrocarb.			
<u>EW-15</u>	<u>X</u>	<u>X</u>	<u>X</u>			<u>X</u>			
<u>EW-19</u>	<u>X</u>	<u>X</u>	<u>X</u>			<u>X</u>			
<u>EW-21</u>	<u>X</u>	<u>X</u>	<u>X</u>			<u>X</u>			
<u>MW-14</u>	<u>X</u>	<u>X</u>	<u>X</u>			<u>X</u>			
<u>MW-9</u>	<u>X</u>	<u>X</u>	<u>X</u>			<u>X</u>			
<u>MW-15</u>	<u>X</u>	<u>X</u>	<u>X</u>			<u>X</u>			
<u>MW-16</u>	<u>X</u>	<u>X</u>	<u>X</u>			<u>X</u>			
<u>MW-17</u>	<u>X</u>	<u>X</u>	<u>X</u>			<u>X</u>			
<u>MW-10</u>	<u>X</u>	<u>X</u>	<u>X</u>			<u>X</u>			
<u>MW-11</u>	<u>X</u>	<u>X</u>	<u>X</u>			<u>X</u>			

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	
<u>23</u>	<u>X</u>						<u>3</u>		<u>89</u>	<u>49</u>	<u>0009</u>	<u>89</u>	<u>12</u>	<u>05</u>	<u>10 28 45</u>	<u>EW-15</u>
<u>23</u>	<u>X</u>						<u>3</u>		<u>89</u>	<u>49</u>	<u>0010</u>	<u>89</u>	<u>12</u>	<u>05</u>	<u>09 05</u>	<u>EW-19</u>
<u>23</u>	<u>X</u>						<u>3</u>		<u>89</u>	<u>49</u>	<u>0011</u>	<u>89</u>	<u>12</u>	<u>05</u>	<u>09 31</u>	<u>EW-21</u>
<u>23</u>	<u>X</u>						<u>3</u>		<u>89</u>	<u>49</u>	<u>0012</u>	<u>89</u>	<u>12</u>	<u>05</u>	<u>10 14</u>	<u>MW-14</u>
<u>23</u>	<u>X</u>						<u>3</u>		<u>89</u>	<u>49</u>	<u>0013</u>	<u>89</u>	<u>12</u>	<u>05</u>	<u>10 45</u>	<u>MW-9</u>
<u>23</u>	<u>X</u>						<u>3</u>		<u>89</u>	<u>49</u>	<u>0014</u>	<u>89</u>	<u>12</u>	<u>05</u>	<u>11 35</u>	<u>MW-15</u>
<u>23</u>	<u>X</u>						<u>3</u>		<u>89</u>	<u>49</u>	<u>0015</u>	<u>89</u>	<u>12</u>	<u>05</u>	<u>12 28</u>	<u>MW-16</u>
<u>23</u>	<u>X</u>						<u>3</u>		<u>89</u>	<u>49</u>	<u>0016</u>	<u>89</u>	<u>12</u>	<u>05</u>	<u>12 55</u>	<u>MW-17</u>
<u>23</u>	<u>X</u>						<u>5</u>		<u>89</u>	<u>49</u>	<u>0021</u>	<u>89</u>	<u>12</u>	<u>05</u>	<u>15 13</u>	<u>MW-10</u>
<u>23</u>	<u>X</u>						<u>3</u>		<u>89</u>	<u>49</u>	<u>0022</u>	<u>89</u>	<u>12</u>	<u>05</u>	<u>15 50</u>	<u>MW-11</u>

LAB NUMBER			DEPTH IN FEET	COL MTD CD	QA CODE	MISCELLANEOUS
Yr	Wk	Seq				
						<u>SIA TAT</u>

CHAIN OF CUSTODY RECORD		
RELINQUISHED BY: (Signature)	RECEIVED BY: (Signature)	DATE/TIME
<u>[Signature]</u>		
DISPATCHED BY: (Signature)	DATE/TIME	RECEIVED FOR LAB BY: (Signature)
<u>[Signature]</u>	<u>12/12/89 10:15</u>	<u>[Signature]</u>
METHOD OF SHIPMENT <u>1st class with insurance</u>		

CHAIN OF CUSTODY FORM

Samplers: Bill Kelly/Dave Evans

Job Number: 0938203902

Name/Location: PKP

Project Manager: Mike Leland

Recorder: [Signature]
 (Signature Required)

ANALYSIS REQUESTED												
EPA 601/8010	EPA 602/8020 dTAC	EPA 624/8240	EPA 625/8270	Priority Plltnt. Metals	Benzene/Toluene/Xylenes	Total Petrol. Hydrocarb.	EPA 3045 (TAA)	Distilled Oxygen	Chlorine	EPA 504 (EOD)		
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	
10	X				3		3		89	4	0017	8	11	20	51345	Influent
10	X						3		89	4	0018	8	11	20	51355	intermediat
10	X				3		3		89	4	0019	8	11	20	51405	effluent
10	X						3		89	4	0020	8	11	20	51410	trip blank

LAB NUMBER			DEPTH IN FEET	COL MTD CD	QA CODE	MISCELLANEOUS
Yr	Wk	Seq				
						5th TAT

CHAIN OF CUSTODY RECORD		
RELINQUISHED BY: (Signature) <u>[Signature]</u>	RECEIVED BY: (Signature) <u>[Signature]</u>	DATE/TIME
RELINQUISHED BY: (Signature) <u>[Signature]</u>	RECEIVED BY: (Signature) <u>[Signature]</u>	DATE/TIME
RELINQUISHED BY: (Signature) <u>[Signature]</u>	RECEIVED BY: (Signature) <u>[Signature]</u>	DATE/TIME
RELINQUISHED BY: (Signature) <u>[Signature]</u>	RECEIVED BY: (Signature) <u>[Signature]</u>	DATE/TIME
DISPATCHED BY: (Signature) <u>[Signature]</u>	DATE/TIME 12/5/89 12:00	RECEIVED FOR LAB BY: (Signature) <u>[Signature]</u>
METHOD OF SHIPMENT Cubes with Blue Ice		

January 03, 1990

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

RE: PACE Project No. 491206.501
PRP

Dear Mr. Leland:

Enclosed is the report of laboratory analyses for samples received
December 06, 1989.

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

January 03, 1990
PACE Project
Number: 491206501

Attn: Mr. David Leland

MRP

PACE Sample Number:
Date Collected:
Date Received:
Parameter

	MW-18	MW-12	MW-7
	800550	800560	800570
	12/06/89	12/06/89	12/06/89
	12/06/89	12/06/89	12/06/89
<u>MDL</u>	<u>89490023</u>	<u>89490024</u>	<u>89490025</u>

Units

MDL

ORGANIC ANALYSIS

PURGEABLE FUELS AND AROMATICS

TOTAL FUEL HYDROCARBONS, (LIGHT):
Total Purgeable Fuels, as Gasoline
PURGEABLE AROMATICS (BTXE BY EPA 8020):
Benzene
Ethylbenzene
Toluene
Xylenes, Total

	mg/L	MDL	MW-18	MW-12	MW-7
Total Purgeable Fuels, as Gasoline	0.05	ND	-	0.06	0.32
Benzene	0.0002	ND	-	0.0062	0.0006
Ethylbenzene	0.0002	ND	-	ND	0.0059
Toluene	0.0002	0.0009	0.0012	0.0012	0.0007
Xylenes, Total	0.0002	0.0013	0.0017	0.0017	0.0036

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

Mr. David Leland
Page 2

January 03, 1990
PACE Project
Number: 491206501

Parameter	Units	MDL	<i>mw-13</i> 800580 12/06/89 12/06/89 89490026	<i>mw-13</i> 800590 12/06/89 12/06/89 89490027
-----------	-------	-----	--	--

ORGANIC ANALYSIS

PURGEABLE FUELS AND AROMATICS				
TOTAL FUEL HYDROCARBONS, (LIGHT):			-	-
Total Purgeable Fuels, as Gasoline	mg/L	0.05	5.1	4.4
PURGEABLE AROMATICS (BTXE BY EPA 8020):				
Benzene	mg/L	0.0002	1.2	1.1
Ethylbenzene	mg/L	0.0002	0.21	0.19
Toluene	mg/L	0.0002	0.15	0.14
Xylenes, Total	mg/L	0.0002	0.46	0.42

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

CHAIN OF CUSTODY FORM

Lab: _____

Job Number: 04-82-039-02

Name/Location: EPD

Project Manager: DANIEL LELAND

Samplers: Bull Geotechnical Associates

Recorder: [Signature]
 (Signature Required)

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								89	4	00	28	12	06	07:55	MW 18
23	X								89	4	00	24	12	06	08:35	MW 12
23	X								89	4	00	25	12	06	09:40	MW 7
23	X								89	4	00	26	12	06	10:32	MW 13
23	X								89	4	00	27	12	06	11:42	Dup MW 13

ANALYSIS REQUESTED										
EPA 601/8010	EPA 602/8020	EPA 624/8240	EPA 625/8270	Priority/Pilmt. Metals & V	Benzene/Toluene/Xylene	Total Petrol. Hydrocarb.	EPA 8015 (Lead)			
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				

CHAIN OF CUSTODY RECORD		
RELINQUISHED BY: (Signature) <u>[Signature]</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)	DATE/TIME	RECEIVED FOR LAB BY: (Signature) <u>[Signature]</u> 12/6/24/300
METHOD OF SHIPMENT <u>Covered w/Blue Ice</u>		<u>PACE Labs.</u>

DISTRIBUTION

REPORT OF SYSTEM MONITORING
SEPTEMBER THROUGH NOVEMBER 1989
SOIL TREATMENT SYSTEM
PACIFIC RENAISSANCE PLAZA
OAKLAND, CALIFORNIA
January 9, 1990

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/jjh/D10667-H

QUALITY CONTROL REVIEWER

Tamara L. Williams
Tamara L. Williams
Geologist - 3954

Table 5. Water-Level Elevations - January through November 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
09-Aug-89	21.77	14.58	27.17	10.38	26.85	10.15	29.21	11.56	26.68	13.58	25.28	15.45	23.45	17.08
15-Aug-89	22.86	13.49	27.16	10.39	26.98	10.02	29.42	11.35	26.97	13.29	25.85	14.88	24.07	16.46
30-Aug-89	23.20	13.15	26.87	10.68	26.44	10.56	29.17	11.60	27.42	12.84	26.24	14.49	24.86	15.67
06-Sep-89	23.78	12.57	26.92	10.63	26.33	10.67	28.88	11.89	27.17	13.09	26.00	14.73	24.45	16.08
28-Sep-89	22.40	13.95	28.26	9.29	-	-	29.83	10.94	26.75	13.51	26.28	14.45	24.93	15.60
03-Oct-89	21.60	14.75	27.30	10.25	26.85	10.15	29.53	11.24	26.85	13.41	26.50	14.23	25.19	15.34
01-Nov-89	22.57	13.78	28.12	9.43	27.28	9.72	29.27	11.50	26.97	13.29	26.55	14.18	25.39	15.14
20-Nov-89	22.30	14.05	27.43	10.12	26.73	10.27	29.18	11.59	26.68	13.58	26.45	14.28	25.31	15.22
04-Dec-89	20.89	15.46	27.59	9.96	26.82	10.18	29.16	11.61	26.20	14.06	25.92	14.81	24.83	15.70

Notes:

Elevations are in feet above mean sea level (MSL).
 Depth to water in feet measured from top of casing.

Table 5. Water-Level Elevations - January through November 1989

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
09-Aug-89	21.59	18.57	25.31	10.57
15-Aug-89	21.21	18.95	25.49	10.39
30-Aug-89	23.24	16.92	25.37	10.51
06-Sep-89	22.75	17.41	25.24	10.64
28-Sep-89	23.34	16.82	-	-
03-Oct-89	23.65	16.51	25.38	10.50
01-Nov-89	23.98	16.18	25.68	10.20
20-Nov-89	23.91	16.25	25.46	10.42
04-Dec-89	23.31	16.85	25.45	10.43

Notes:

Elevations are in feet above mean sea level (MSL).
Depth to water in feet measured from top of casing.

Table 6. 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)
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	NT	NT
	07-Sep-89	63.8	14.5	17.7	NT	ND	NT	NT
	18-Sep-89	74.8	17.0	12.2	NT	ND	NT	NT
	29-Sep-89	NT	NT	17.3	NT	NT	NT	NT
	05-Oct-89	59.4	21.5	14.9	NT	ND	NT	NT
	02-Nov-89	59.4	24.0	16.2	NT	ND	NT	NT
	04-Dec-89	54.2	21.3	10.2	NT	ND	NT	NT
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
	21-Jul-89	NT	NT	16.5	NT	NT	NT	NT
	07-Sep-89	NT	NT	>20.0	NT	NT	NT	NT
	18-Sep-89	NT	NT	>20.0	NT	NT	NT	NT
	29-Sep-89	NT	NT	>20.0	NT	NT	NT	NT
	05-Oct-89	NT	NT	>20.0	NT	NT	NT	NT
	04-Dec-89	NT	NT	19.0	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

Table 6. 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)
	27-Jun-89	NT	NT	NT	NT	NT	NT	NT
	06-Jul-89	NT	NT	14.0	NT	NT	NT	NT
	21-Jul-89	NT	NT	>20.0	NT	NT	NT	NT
	07-Sep-89	NT	NT	>20.0	NT	NT	NT	NT
	18-Sep-89	NT	NT	19.9	NT	NT	NT	NT
	29-Sep-89	NT	NT	18.5	NT	NT	NT	NT
	05-Oct-89	NT	NT	>20.0	NT	NT	NT	NT
	04-Dec-89	NT	NT	13.5	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
	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	NT	NT
	17-Aug-89	61.6	20.0	NT	NT	0.7	NT	NT
	07-Sep-89	83.6	12.0	9.0	NT	1.3	NT	NT
	18-Sep-89	72.6	24.6	8.1	NT	1.2	NT	NT
	29-Sep-89	NT	NT	8.6	NT	NT	NT	NT
	05-Oct-89	NT	NT	4.8	NT	NT	NT	NT
	23-Oct-89	70.4	17.0	9.1	NT	1.2	2.9E+5	5.4E+3
	02-Nov-89	69.5	18.0	4.7	NT	0.9	--	--
	04-Dec-89	78.5	20.3	0.5	NT	1.6	--	--
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

Table 6. 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)
EU-6	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
	18-Sep-89	NT	NT	18.5	NT	NT	NT	NT
	29-Sep-89	NT	NT	8.5	NT	NT	NT	NT
	05-Oct-89	NT	NT	16.5	NT	NT	NT	NT
	04-Dec-89	NT	NT	19.4	NT	NT	NT	NT
	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
EU-7	06-Jul-89	NT	NT	8.2	NT	NT	NT	NT
	18-Sep-89	NT	NT	10.3	NT	NT	NT	NT
	29-Sep-89	NT	NT	0.8	NT	NT	NT	NT
	05-Oct-89	NT	NT	0.8	NT	NT	NT	NT
	02-Nov-89	34.8	11.0	2.6	NT	ND	NT	NT
	20-Nov-89	33.7	6.7	2.0	NT	0.5	NT	NT
	04-Dec-89	29.9	6.4	2.1	NT	0.5	NT	NT
	23-May-89	NT	NT	1.8	NT	NT	NT	NT
	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	
EU-8	18-Sep-89	NT	NT	1.5	NT	NT	NT	NT
	29-Sep-89	NT	NT	1.1	NT	NT	NT	NT
	05-Oct-89	39.2	11.0	1.0	NT	0.6	2.2E+6	7.9E+3
	23-Oct-89	26.9	4.8	0.9	NT	ND	3.5E+5	3.5E+3
	02-Nov-89	17.6	3.5	1.5	NT	ND	--	--
	20-Nov-89	29.9	1.6	2.9	NT	ND	--	--
	04-Dec-89	36.5	2.4	4.5	NT	ND	--	--
	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	

Table 6. 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	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	1.5E+7	1.2E+3
	17-Aug-89	49.5	20.0	NT	NT	1.3	2.9E+6	5.4E+3
	07-Sep-89	29.7	20.0	4.3	NT	2.9	NT	NT
	18-Sep-89	39.6	21.0	14.4	NT	2.0	NT	NT
	29-Sep-89	NT	NT	5.2	NT	NT	NT	NT
	05-Oct-89	59.0	25.0	9.2	NT	2.0	6.3E+6	3.5E+4
	23-Oct-89	46.2	22.0	10.8	NT	1.9	1.2E+6	2.2E+4
	02-Nov-89	40.7	19.6	9.7	NT	1.5	--	--
	20-Nov-89	39.3	18.1	7.4	NT	2.9	--	--
	04-Dec-89	28.1	11.2	1.1	NT	5.6	--	--
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
	18-Sep-89	NT	NT	16.3	NT	NT	NT	NT
	29-Sep-89	NT	NT	14.0	NT	NT	NT	NT
	05-Oct-89	NT	NT	13.6	NT	NT	NT	NT
	04-Dec-89	40.2	16.5	9.3	NT	2.6	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
	27-Jun-89	NT	NT	16.4	NT	NT	NT	NT
	06-Jul-89	NT	NT	13.5	NT	NT	NT	NT
	07-Sep-89	42.9	15.5	4.6	NT	ND	NT	NT
	18-Sep-89	48.4	NT	17.2	NT	NT	2.6E+7	2.2E+4
	29-Sep-89	NT	NT	7.2	NT	NT	NT	NT
	05-Oct-89	56.8	21.5	4.5	NT	NT	3.5E+6	1.4E+4
	23-Oct-89	55.0	21.6	14.9	NT	ND	2.8E+6	1.8E+4
	02-Nov-89	51.7	22.6	15.8	NT	0.6	--	--
	20-Nov-89	46.8	21.3	10.5	NT	1.2	--	--
	04-Dec-89	NT	NT	14.7	NT	NT	--	--

Table 6. 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)
EW-11								
	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
	06-Jul-89	NT	NT	14.8	NT	NT	NT	NT
	07-Sep-89	49.9	14.3	18.1	NT	ND	NT	NT
	18-Sep-89	NT	NT	18.4	NT	NT	NT	NT
	29-Sep-89	NT	NT	17.7	NT	NT	NT	NT
	05-Oct-89	NT	NT	15.1	NT	NT	NT	NT
	23-Oct-89	57.6	17.0	16.1	NT	ND	NT	NT
	20-Nov-89	43.9	20.8	18.8	NT	1.2	NT	NT
	04-Dec-89	NT	NT	>20.0	NT	NT	NT	NT
EW-12								
	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	2.3E+5	2.1E+2
	17-Aug-89	59.0	10.6	NT	NT	ND	1.2E+5	2.4E+3
	07-Sep-89	58.3	17.0	3.8	NT	ND	NT	NT
	18-Sep-89	53.9	15.5	19.5	NT	ND	1.8E+5	7.0E+3
	29-Sep-89	NT	NT	18.7	NT	NT	NT	NT
	05-Oct-89	58.3	21.5	18.3	NT	ND	NT	NT
	04-Dec-89	41.1	20.3	>20.0	NT	ND	NT	NT
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

Table 6. 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)
	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
	07-Sep-89	63.8	21.5	>20.0	NT	ND	NT	NT
	18-Sep-89	NT	NT	19.0	NT	NT	NT	NT
	29-Sep-89	NT	NT	>20.0	NT	NT	NT	NT
	05-Oct-89	NT	NT	>20.0	NT	NT	NT	NT
EW-14	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	NT	NT
	07-Sep-89	53.9	22.0	14.8	NT	1.1	NT	NT
	18-Sep-89	45.1	18.0	17.4	NT	0.6	1.4E+7	1.1E+4
	29-Sep-89	NT	NT	18.0	NT	NT	NT	NT
	05-Oct-89	63.8	25.0	>20.0	NT	ND	1.9E+7	2.4+5
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	3.3E+5	1.8E+3
	07-Sep-89	56.8	85.8	>20.0	NT	7.2	NT	NT
	18-Sep-89	64.9	38.0	>20.0	NT	5.8	2.1E+7	5.4E+4
	29-Sep-89	NT	NT	14.5	NT	NT	NT	NT
	05-Oct-89	59.4	45.0	>20.0	NT	5.2	3.5E+6	5.4E+4
	23-Oct-89	52.1	39.0	>20.0	NT	6.1	7.6E+6	4.9E+4
	02-Nov-89	46.9	36.3	>20.0	NT	7.7	--	--

Table 6. Results of Inorganic Chemical and Microbial Analyses of Ground-Water Samples from System Wells

WELL	DATE	NITRATE	PHOSPHATE	DISSOLVED OXYGEN	DISSOLVED IRON	AMMONIA	MICROBIAL ENUMERATION	
							TC	MCU
LOD		0.5(ppm)	0.5(ppm)	0.1(ppm)	0.1(ppm)	0.5(ppm)	NA (CFU/ml)	NA (CFU/ml)
	20-Nov-89	51.4	29.3	>20.0	NT	7.0	--	--
		61.7	30.7	>20.0	NT	8.0	--	--
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
	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	NT	NT
	17-Aug-89	52.8	25.6	NT	NT	2.3	8.0E+5	3.1E+3
	07-Sep-89	55.0	25.0	18.8	NT	1.3	NT	NT
	18-Sep-89	NT	NT	19.8	NT	NT	NT	NT
	29-Sep-89	NT	NT	15.1	NT	NT	NT	NT
	05-Oct-89	55.0	25.8	14.0	NT	2.9	NT	NT
	02-Nov-89	28.2	20.0	13.3	NT	2.2	NT	NT
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
	18-Sep-89	NT	NT	>20.0	NT	NT	NT	NT
	29-Sep-89	NT	NT	>20.0	NT	NT	NT	NT
	05-Oct-89	NT	NT	>20.0	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

Table 6. Results of Inorganic Chemical and Microbial Analyses of Ground-Water Samples from System Wells

WELL	DATE	NITRATE	PHOSPHATE	DISSOLVED OXYGEN	DISSOLVED IRON	AMMONIA	MICROBIAL ENUMERATION	
							TC	HCU
LOD		0.5(ppm)	0.5(ppm)	0.1(ppm)	0.1(ppm)	0.5(ppm)	NA (CFU/ml)	NA (CFU/ml)
	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
	18-Sep-89	NT	NT	>20.0	NT	NT	NT	NT
	29-Sep-89	NT	NT	>20.0	NT	NT	NT	NT
	05-Oct-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
	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	NT	NT
	17-Aug-89	61.6	17.2	NT	NT	NT	2.9E+4	1.7E+3
	07-Sep-89	61.6	24.6	>20.0	NT	>20.0	NT	NT
	18-Sep-89	NT	NT	>20.0	NT	NT	NT	NT
	29-Sep-89	NT	NT	>20.0	NT	NT	NT	NT
	05-Oct-89	70.4	27.5	>20.0	NT	ND	NT	NT
	23-Oct-89	59.4	27.0	>20.0	NT	ND	NT	NT
	02-Nov-89	57.9	32.5	>20.0	NT	ND	NT	NT
	04-Dec-89	51.4	25.3	>20.0	NT	ND	NT	NT
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
	22-Jul-89	NT	NT	17.1	NT	NT	NT	NT

Table 6. 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)
	07-Sep-89	NT	NT	>20.0	NT	NT	NT	NT
	18-Sep-89	NT	NT	19.9	NT	NT	NT	NT
	29-Sep-89	NT	NT	14.0	NT	NT	NT	NT
	05-Oct-89	NT	NT	>20.0	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	NT	NT
	17-Aug-89	48.0	3.0	NT	NT	ND	2.9E+4	1.7E+3
	07-Sep-89	23.8	7.8	9.0	NT	ND	NT	NT
	18-Sep-89	39.2	9.5	9.4	NT	ND	NT	NT
	29-Sep-89	NT	NT	7.9	NT	NT	NT	NT
	05-Oct-89	39.4	9.5	10.3	NT	ND	NT	NT
	23-Oct-89	48.0	9.1	13.8	NT	ND	NT	NT
	02-Nov-89	39.2	12.0	15.4	NT	ND	NT	NT
	20-Nov-89	40.2	10.9	12.4	NT	ND	NT	NT
	05-Dec-89	29.9	8.8	12.6	NT	ND	NT	NT
EW-22								
	20-Nov-89	38.3	7.2	NT	NT	2.9	NT	NT
Injection Composite								
	21-Mar-89	26.0	42.0	NT	NT	15.0	NT	NT
	18-Apr-89	37.8	110.0	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
	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	NT	NT	10.2	NT	NT
	17-Aug-89	17.6	80.0	NT	NT	16.0	NT	NT
	07-Sep-89	35.0	50.0	NT	NT	10.9	NT	NT
	18-Sep-89	55.0	58.0	NT	NT	17.4	NT	NT

Table 6. Results of Inorganic Chemical and Microbial Analyses of Ground-Water Samples from System Wells

WELL	DATE	NITRATE	PHOSPHATE	DISSOLVED OXYGEN	DISSOLVED IRON	AMMONIA	MICROBIAL ENUMERATION	
							TC	HCU
LOD		0.5(ppm)	0.5(ppm)	0.1(ppm)	0.1(ppm)	0.5(ppm)	NA (CFU/ml)	NA (CFU/ml)
	05-Oct-89	48.4	35.0	NT	NT	5.4	NT	NT
	23-Oct-89	33.4	40.5	NT	NT	6.2	NT	NT
	02-Nov-89	18.7	39.0	NT	NT	7.3	NT	NT
	20-Nov-89	33.7	40.0	NT	NT	9.6	NT	NT
	04-Dec-89	27.1	36.0	NT	NT	8.7	NT	NT
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	NT	NT
	17-Aug-89	39.6	NT	NT	NT	1.7	NT	NT
	07-Sep-89	NT	NT	NT	NT	NT	NT	NT
	18-Sep-89	59.4	28.0	NT	NT	1.9	NT	NT
	05-Oct-89	61.6	27.5	NT	NT	4.0	NT	NT
	23-Oct-89	57.2	26.0	NT	NT	2.9	NT	NT
	02-Nov-89	NT	NT	NT	NT	NT	NT	NT
	20-Nov-89	46.8	21.9	NT	NT	2.2	NT	NT
	04-Dec-89	46.8	22.4	NT	NT	2.9	NT	NT

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 7. 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-1	03-Aug-89	5.3	ND	NT	NT	ND	NT	NT
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	NT	NT
	07-Sep-89	ND	9.0	NT	NT	ND	NT	NT
	05-Oct-89	ND	8.0	NT	NT	ND	NT	NT
	02-Nov-89	ND	ND	5.3	NT	ND	NT	NT
	06-Dec-89	ND	5.3	22.3	NT	ND	NT	NT
MW-8	06-Jun-89	NT	NT	4.2	NT	NT	NT	NT
	06-Jul-89	NT	NT	4.2	NT	NT	NT	NT
	02-Nov-89	NT	NT	6.5	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	NT	NT
	17-Aug-89	74.4	20.0	NT	NT	3.9	NT	NT
	07-Sep-89	83.6	39.0	15.5	NT	6.6	NT	NT
	05-Oct-89	105.6	41.3	13.5	NT	5.6	NT	NT
	02-Nov-89	78.3	18.6	18.9	NT	2.3	NT	NT
	05-Dec-89	91.6	20.3	11.0	NT	2.0	NT	NT
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

Table 7. 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)
	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
	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	NT	NT
	17-Aug-89	16.5	1.3	NT	NT	ND	NT	NT
	07-Sep-89	18.0	1.5	6.2	NT	ND	NT	NT
	18-Sep-89	9.9	6.0	NT	NT	ND	NT	NT
	05-Oct-89	21.8	11.0	6.1	NT	0.7	NT	NT
	23-Oct-89	23.8	3.0	6.5	NT	ND	3.2E+6	7.0E+3
	02-Nov-89	21.1	1.5	8.9	NT	ND	--	--
	20-Nov-89	7.1	0.5	6.5	NT	ND	--	--
	05-Dec-89	23.6	7.7	6.5	NT	ND	--	--
MW-11	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	1.9E+5	1.1E+4
	17-Aug-89	58.3	38.9	NT	NT	5.8	1.1E+6	1.8E+4
	07-Sep-89	61.6	47.2	15.3	NT	7.4	1.3E+6	4.9E+3
	18-Sep-89	56.8	40.6	NT	NT	6.6	9.1E+6	9.5E+3
	05-Oct-89	70.4	47.5	19.4	NT	7.5	2.1E+6	1.1E+4
	23-Oct-89	50.6	41.3	11.4	NT	4.7	NT	NT

Table 7. 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)
	02-Nov-89	56.5	40.0	16.4	NT	6.1	--	--
	20-Nov-89	52.4	28.0	16.1	NT	4.6	--	--
	05-Dec-89	55.2	33.6	14.0	NT	8.0	--	--
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	NT	NT
	17-Aug-89	2.0	1.3	NT	NT	ND	NT	NT
	07-Sep-89	4.5	4.8	NT	NT	ND	NT	NT
	18-Sep-89	4.2	5.8	NT	NT	ND	NT	NT
	05-Oct-89	3.4	5.3	NT	NT	ND	NT	NT
	02-Nov-89	7.0	2.3	4.9	NT	ND	NT	NT
	05-Dec-89	2.6	5.3	5.5	NT	ND	NT	NT
MW-13	03-Mar-89	11.4/8.6*	1.0	2.0**	0.25	ND	4.1E+6	1.7E+2
	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	NT	NT
	17-Aug-89	47.4	4.3	NT	NT	ND	NT	NT
	07-Sep-89	59.8	10.0	NT	NT	ND	NT	NT

Table 7. 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)
	18-Sep-89	NT	NT	NT	NT	NT	NT	NT
	05-Oct-89	35.2	9.0	12.8	NT	ND	NT	NT
	02-Nov-89	41.8	3.0	13.1	NT	ND	NT	NT
	06-Dec-89	34.6	6.7	12.6	NT	ND	NT	NT
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	NT	NT
	17-Aug-89	35.2	4.3	13.0	NT	ND	NT	NT
	07-Sep-89	59.8	7.5	NT	NT	ND	NT	NT
	05-Oct-89	63.8	14.8	>20.0	NT	ND	NT	NT
	02-Nov-89	72.6	11.0	>20.0	NT	ND	NT	NT
	05-Dec-89	61.7	10.9	16.5	NT	ND	NT	NT
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
	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	NT	NT
	17-Aug-89	70.4	18.6	NT	NT	ND	NT	NT
	07-Sep-89	56.8	29.0	16.5	NT	1.6	NT	NT

Table 7. 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)
	18-Sep-89	56.8	32.0	NT	NT	1.6	NT	NT
	05-Oct-89	70.0	29.0	>20.0	NT	1.5	NT	NT
	02-Nov-89	60.7	36.0	>20.0	NT	1.9	NT	NT
	05-Dec-89	54.2	30.4	19.2	NT	3.2	NT	NT
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	1.1E+5	1.8E+3
	17-Aug-89	74.8	19.0	NT	NT	1.5	8.1E+5	1.4E+4
	07-Sep-89	61.6	52.1	16.6	NT	3.7	8.2E+5	1.1E+4
	18-Sep-89	28.2	42.9	NT	NT	5.4	1.4E+6	5.4E+4
	05-Oct-89	66.0	49.0	>20.0	NT	6.3	1.8E+6	7.9E+3
	23-Oct-89	48.4	36.5	>20.0	NT	4.7	NT	NT
	02-Nov-89	48.4	35.0	>20.0	NT	5.5	--	--
	20-Nov-89	42.1	26.7	18.2	NT	4.1	--	--
	05-Dec-89	55.2	32.0	>20.0	NT	5.8	--	--
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

Table 7. 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)
	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
	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	8.3E+4	1.3E+3
	17-Aug-89	63.8	20.0	NT	NT	1.7	2.3E+5	9.2E+3
	07-Sep-89	79.2	32.0	NT	NT	1.4	9.2E+6	1.3E+4
	18-Sep-89	71.5	24.6	NT	NT	3.3	6.5E+5	1.7E+4
	05-Oct-89	75.9	39.0	NT	NT	5.8	9.3E+5	2.4E+4
	23-Oct-89	52.8	38.0	>20.0	NT	4.7	7.5E+5	2.4E+3
	02-Nov-89	57.2	36.0	>20.0	NT	6.9	--	--
	20-Nov-89	52.4	24.0	15.4	NT	4.8	--	--
	05-Dec-89	65.5	28.8	19.4	NT	7.3	--	--
MW-18								
	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	NT	NT
	17-Aug-89	16.5	1.3	NT	NT	ND	NT	NT
	07-Sep-89	15.0	3.0	NT	NT	ND	NT	NT
	05-Oct-89	22.0	6.0	NT	NT	ND	NT	NT
	02-Nov-89	15.0	2.3	NT	NT	ND	NT	NT
	06-Dec-89	13.5	5.9	6.1	NT	ND	NT	NT

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.

Table 7. 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	MCU
LOD		0.5(ppm)	0.5(ppm)	0.5(mg/l)	0.1(ppm)	0.5(ppm)	NA (CFU/ml)	NA (CFU/ml)

**: 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 8. 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)		0.0005/0.0002 *		0.0005/0.0002 *		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	0.00152	0.0054	0.0059	0.7	
	07-Sep-89	ND	ND	ND	0.00152	0.59	
	05-Oct-89	ND	0.0011	0.0006	0.0013	0.73	
	02-Nov-89	0.0002	0.001	0.0055	0.0036	0.63	
	06-Dec-89	0.0006	0.0007	0.0059	0.0036	0.32	
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	
	06-Sep-89	0.007	0.022	ND	0.36	1.5	
	04-Oct-89	LT 0.025	0.08	LT 0.025	1.3	4.1	
	01-Nov-89	0.0012/0.0007	0.014/0.015	ND/ND	0.67/0.69	3.1/2.9	
	05-Dec-89	LT 0.0010	0.0044	LT 0.0010	0.39	1.9	
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	
	06-Sep-89 @	8.1/11	5.2/6.3	0.82/0.93	5.5/6.1	36/34	
	04-Oct-89	40	79	11	94	620	
	01-Nov-89	21	10	2.0	12	95	
	05-Dec-89	21	14	2.6	17	90	
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	
	06-Sep-89	5.0	6.5	0.41	5.2	47	

Table 8. 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	(ng/l)	0.0005/0.0002 *		0.0005/0.0002 *		0.25/0.05**	

MW-12	04-Oct-89	3.3	2.8	0.15	2.5	11	
	01-Nov-89	2.1	2.8	0.11	1.8	13	
	05-Dec-89	1.3	1.5	0.084	1.3	7.6	
	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	
	07-Sep-89 @	0.051/0.059	0.0016/0.0022	ND/ND	0.0049/0.0058	ND/ND	
	05-Oct-89 @	0.037/0.040	0.0032/0.0031	ND/ND	0.0086/0.0094	ND/ND	
MW-13	02-Nov-89	0.0056	0.0011	ND	0.0019	0.071	
	06-Dec-89	0.0062	0.0012	ND	0.0017	0.06	
	02-Mar-89	NT	NT	NT	NT	1.4	
	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	
	07-Sep-89	0.039	0.0020	ND	0.0050	ND	
	04-Oct-89	4.0	1.6	0.20	1.5	9.2	
	01-Nov-89	1.7	0.086	0.091	0.37	5.6	
	06-Dec-89 @	1.2/1.1	0.15/0.14	0.21/0.19	0.46/0.42	5.1/4.4	
MW-14	02-Mar-89	NT	NT	NT	NT	ND	
	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	
	06-Sep-89	1.0	0.090	ND	1.4	4.9	
	04-Oct-89	0.70	0.015	ND	0.75	3.1	
	01-Nov-89	0.36	0.0058	ND	0.24	1.4	
	05-Dec-89	0.35	0.0065	LT 0.0010	0.25	1.3	
	MW-15	03-Mar-89	NT	NT	NT	NT	3.9
		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	

Table 8. 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)	0.0005/0.0002 *		0.0005/0.0002 *		0.25/0.05**
MW-16	06-Sep-89	1.1	1.4	0.23	1.3	7.3
	04-Oct-89	0.59	1.1	0.076	0.59	3.7
	01-Nov-89	1.6	2.3	0.23	1.7	9.7
	05-Dec-89	1.7	2.6	0.22	1.3	10
	02-Mar-89	NT	NT	NT	NT	2.1
	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
	06-Sep-89	0.96	3.3	0.26	1.3	8.9
	04-Oct-89	0.72	2.1	0.16	1.3	5.4
	02-Nov-89	0.74	2.8	0.37	2.4	11
05-Dec-89	0.38	0.79	0.087	0.75	3.6	
MW-17	04-Apr-89	3.1	2.9	0.27	3.9	12
	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
	06-Sep-89	2.8	4.5	0.32	8.4	21
	04-Oct-89	0.47	0.092	0.018	1.0	2.8
	01-Nov-89	0.19	0.011	0.11	0.18	0.93
	05-Dec-89	0.16	0.036	0.0071	0.13	0.76
	MW-18	15-Feb-89	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
06-Sep-89		ND	ND	ND	ND	ND
05-Oct-89		ND	ND	ND	ND	ND
01-Nov-89		ND	ND	ND	ND	ND
06-Dec-89	ND	0.0009	ND	0.0013	ND	
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

Table 8. 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)	0.0005/0.0002 *		0.0005/0.0002 *		0.25/0.05**
EW-4	06-Sep-89	3.0	3.7	0.26	3.0	11
	05-Oct-89	1.3	1.7	LT 0.10	0.3	7.3
	02-Nov-89	2.4	4.0	0.23	2.1	19
	04-Dec-89	1.3	2.2	0.014	1.3	7.5
	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
	06-Sep-89	0.17	0.038	LT 0.0005	0.80	3.0
EW-6	02-Nov-89	0.12	0.089	0.009	0.48	5.3
	04-Dec-89	0.17	0.029	0.011	0.62	3.5
	02-Nov-89	20	22	0.54	12	100
EW-7	04-Dec-89	20	24	1.3	13	93
	05-Jul-89	18	16	0.67	10	74
EW-8	05-Oct-89	38	46	LT 0.50	11	210
	02-Nov-89	30	39	1.8	15	170
	04-Dec-89	27	36	1.9	17	130
EW-9	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
	06-Sep-89	5.7	5.5	0.19	10	38
	05-Oct-89	13	4.6	LT 0.25	7.0	71
	02-Nov-89	8.1	8.6	0.21	6.2	56
	04-Dec-89	0.62	0.51	0.037	3.0	8.8
EW-10	21-Nov-89	ND	ND	ND	ND	ND
	04-Dec-89	4.5	6.7	0.35	5.7	27
EW-11	07-Sep-89	8.1	7.4	0.80	9.2	42
	05-Oct-89	6.1	4.6	0.20	7.0	19
	02-Nov-89	1.7	1.2	0.048	3.3	14
EW-12	07-Sep-89	7.7	8.0	0.52	5.3	25
	01-May-89	1.8	0.66	0.048	0.62	3.6
EW-12	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

Table 8. 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)	0.0005/0.0002 *		0.0005/0.0002 *		0.25/0.05**	
EW-13	07-Sep-89	2.2	1.8	0.059	2.2	9.9	
	05-Oct-89	4.4	5.5	LT 0.10	2.0	21	
	04-Dec-89	3.2	4.7	0.20	2.3	17	
	19-Apr-89	0.068	0.0064	ND	0.20	0.79	
	07-Sep-89	3.3	3.2	1.8	0.026	15	
EW-14	05-Jul-89	1.8	1.7	0.08	1.1	8.7	
	07-Sep-89	4.1	3.5	0.20	3.7	16	
	05-Oct-89	4.3	5.2	LT 0.10	0.74	24	
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	
	07-Sep-89	8.4	7.6	0.20	6.3	37	
	05-Oct-89	2.6	1.7	LT 0.10	0.62	12	
	02-Nov-89	ND	0.0014	ND	0.0029	0.16	
	05-Dec-89	3.1	4.1	0.32	3.0	19	
	04-Apr-89 @	2.8/3.3	2.0/2.6	0.10/0.14	0.99/1.2	8.9/8.8	
EW-16	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	
	07-Sep-89	2.6	2.7	0.21	1.9	11	
	05-Oct-89	3.6	2.9	0.15	2.4	16	
	02-Nov-89	1.8	1.7	0.82	0.33	11	
	EW-19	01-May-89	1.4	1.2	0.068	0.77	3.4
		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	
07-Sep-89		2.5	2.1	0.15	1.5	9.1	
05-Oct-89		5.1	3.7	0.048	3.0	13	
02-Nov-89		0.35	0.29	0.028	0.31	3.2	
05-Dec-89		1.2	0.84	0.092	0.92	5.3	
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	
	07-Sep-89	0.0060	0.0095	0.0020	0.0026	0.34	
	05-Oct-89	0.0009	0.0098	0.0012	0.0093	0.50	
	02-Nov-89	0.002	0.028	0.0068	0.14	0.88	

Table 8. 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)	0.0005/0.0002 *		0.0005/0.0002 *		0.25/0.05**	
EW-22	05-Dec-89	0.0034	0.064	0.019	0.14	0.97	
	21-Nov-89	0.056	0.015	LT	0.005	0.12	6.1
BLANK	05-Apr-89	0.5	ND	ND	ND	ND	ND
	01-May-89	ND	ND	ND	ND	ND	ND
	06-Jun-89	ND	ND	ND	ND	ND	ND
	06-Jul-89	ND	ND	ND	ND	ND	ND
	01-Aug-89	ND	ND	ND	ND	ND	ND
	02-Aug-89	ND	ND	ND	ND	ND	ND
	03-Aug-89	ND	ND	ND	ND	ND	ND
	06-Sep-89	ND	ND	ND	ND	ND	ND
	07-Sep-89	ND	ND	ND	ND	ND	ND
	04-Oct-89	ND	ND	ND	ND	ND	ND
02-Nov-89	ND	ND	ND	ND	ND	ND	
05-Dec-89	ND	ND	ND	ND	ND	ND	

NOTES:

LOD: Limit of Detection.

ND: Not detected at or above LOD.

NT: Not tested.

*: LOD Changed to 0.0002 on 01-May-89

**: LOD Changed to 0.05 on 01-May-89

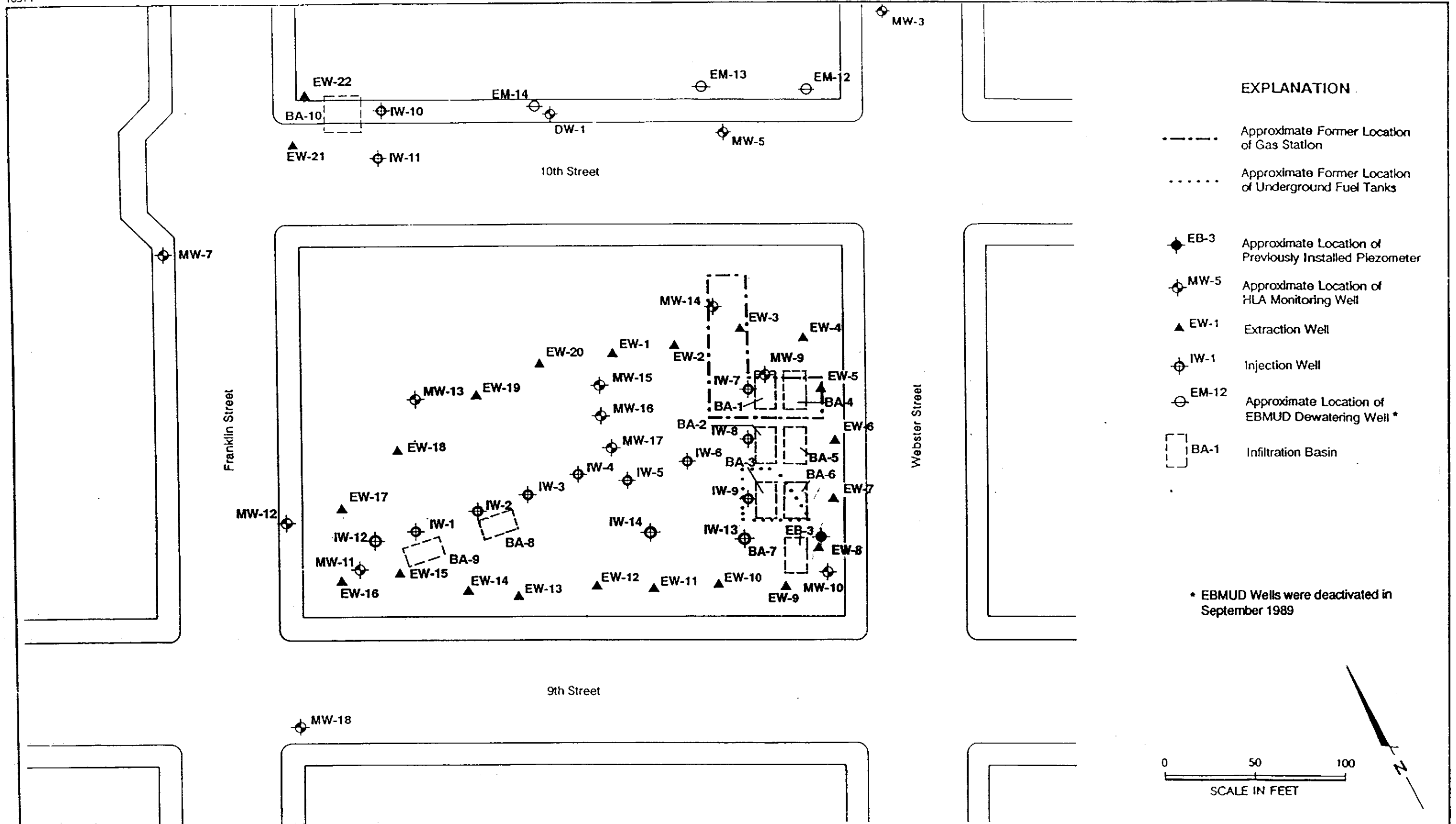
@: Two values indicate results of duplicate analyses.

LT: Less Than

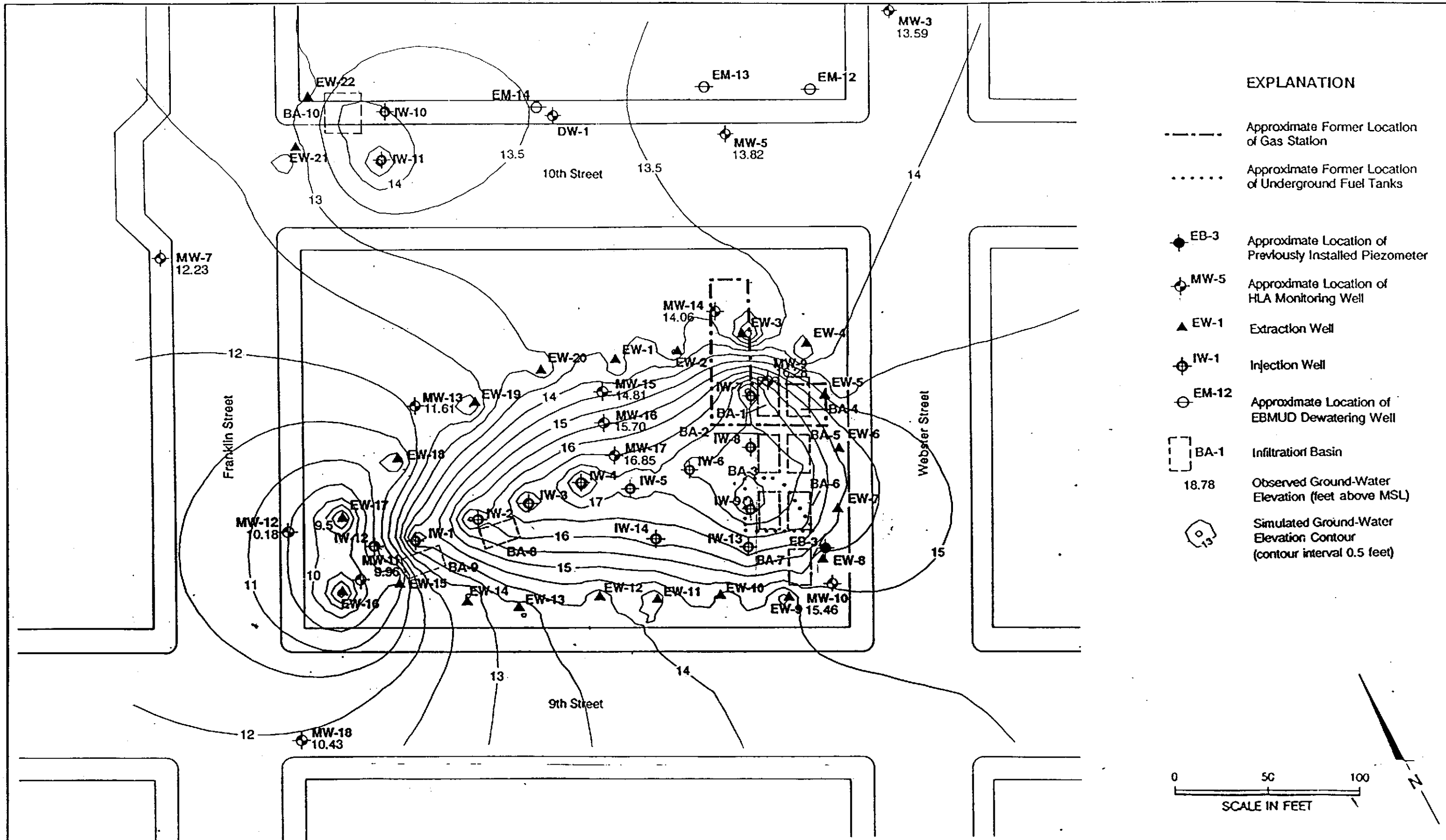
#: Free product observed in well.

Organic constituents reported in milligrams per liter.

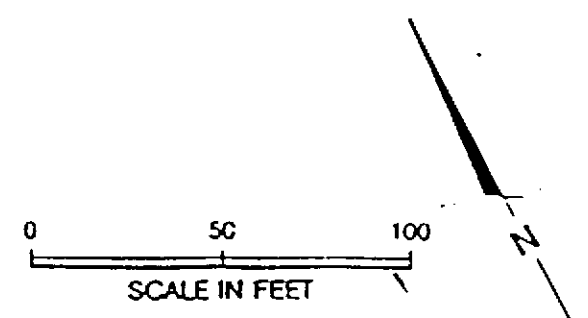
Analyses performed by PACE Laboratories, Inc.





Harding Lawson Associates Engineers Geologists & Geophysicists	Site Plan and Treatment System Well and Basin Locations				PLATE 1
	Soil Treatment System Pacific Renaissance Plaza Oakland, California				
DRAWN LZ	JOB NUMBER 09382,040.02	APPROVED DFL	DATE 12/89	REVISED	DATE 1/90

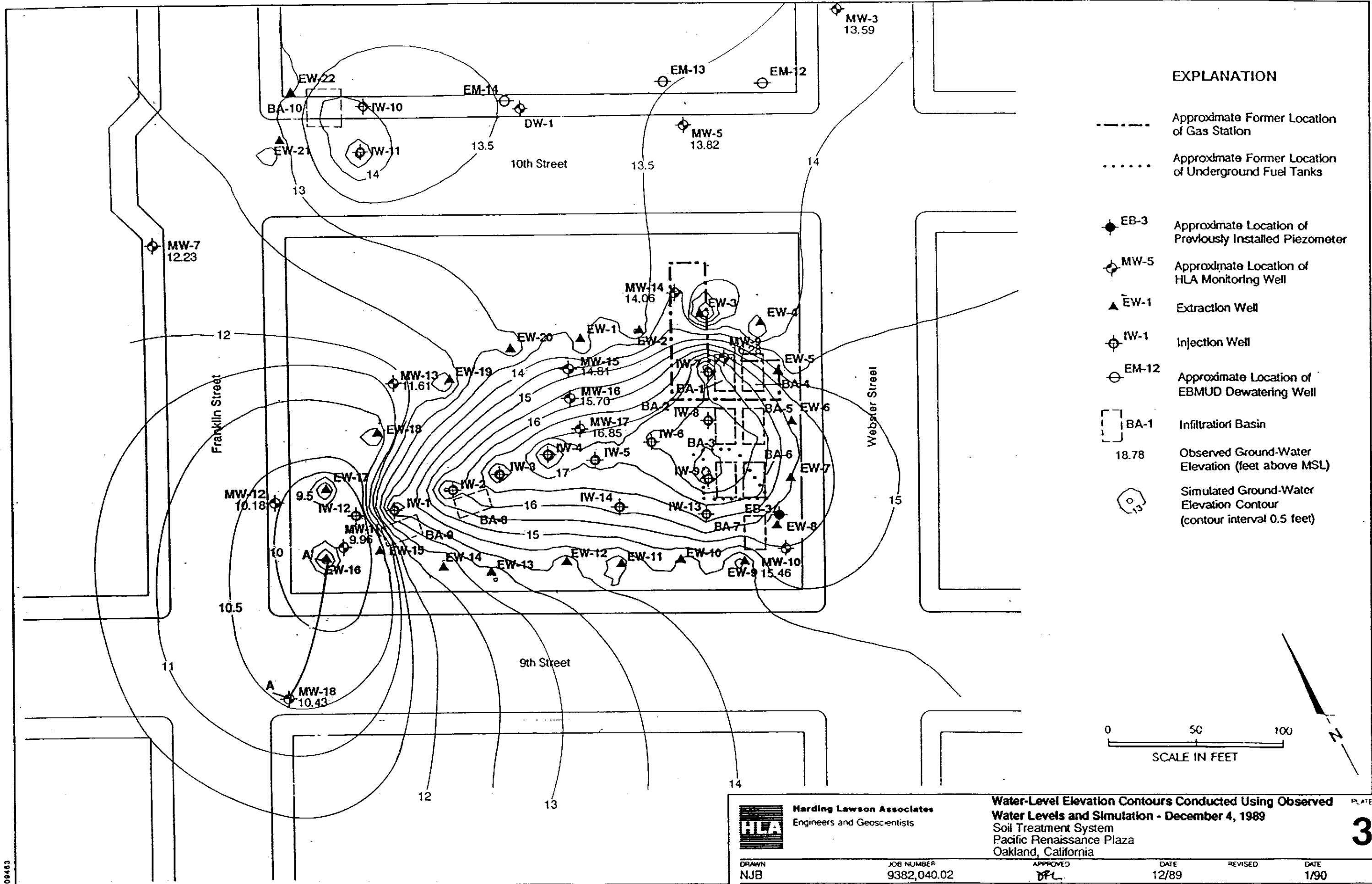


- EXPLANATION**
- Approximate Former Location of Gas Station
 - Approximate Former Location of Underground Fuel Tanks
 - ◆ EB-3 Approximate Location of Previously Installed Piezometer
 - ⊕ MW-5 Approximate Location of HLA Monitoring Well
 - ▲ EW-1 Extraction Well
 - ⊕ IW-1 Injection Well
 - ⊖ EM-12 Approximate 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)



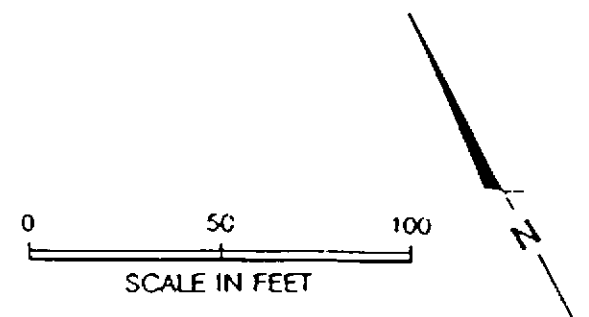
 Harding Lawson Associates Engineers and Geoscientists	Observed and Simulated Ground-Water Elevations - December 4, 1989 Soil Treatment System Pacific Renaissance Plaza Oakland, California		PLATE 2
	DRAWN NJB	JOB NUMBER 9382,040.02	APPROVED 

109463



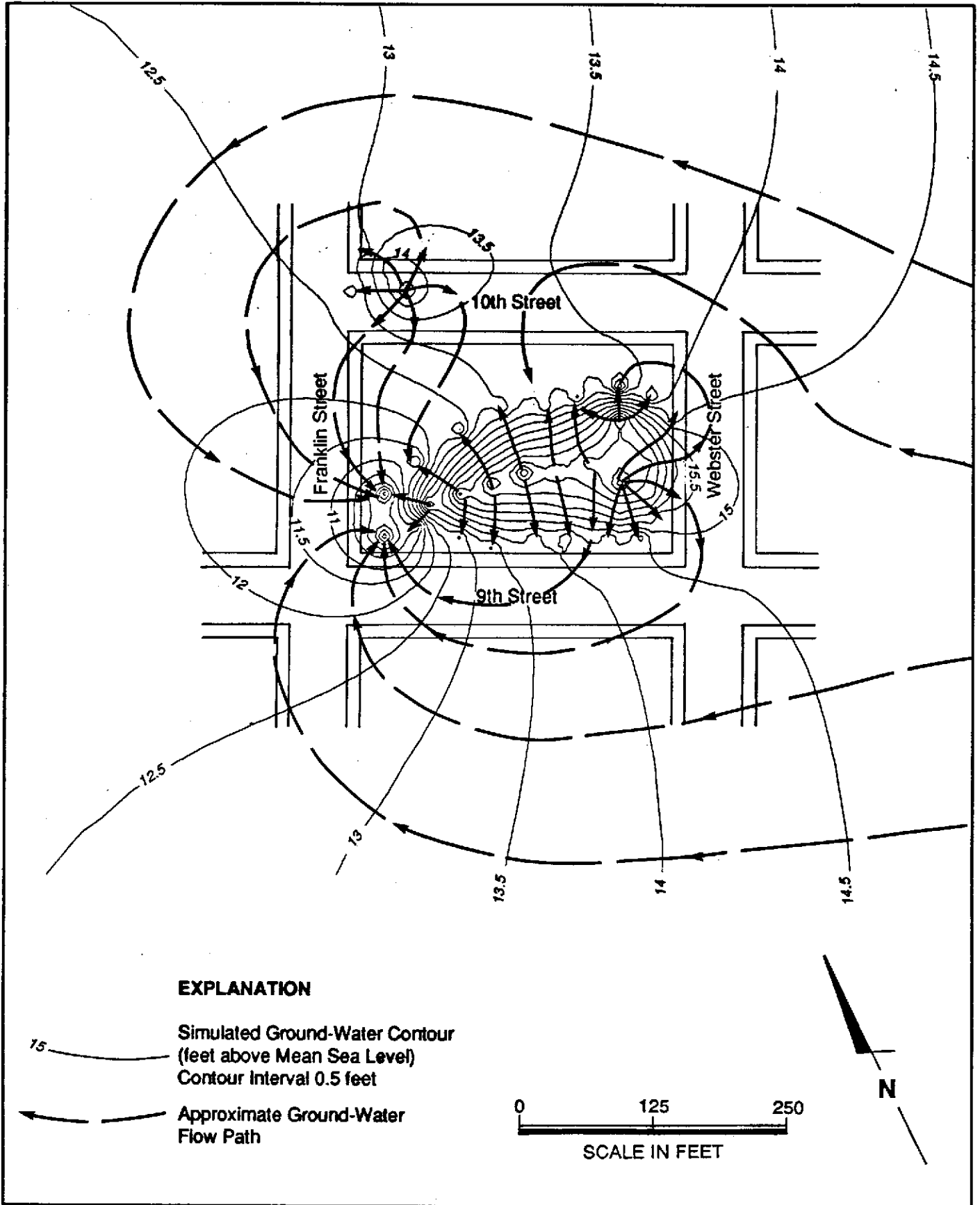
EXPLANATION

- 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)

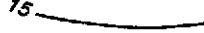
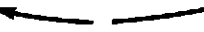


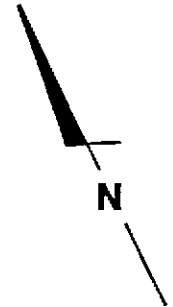
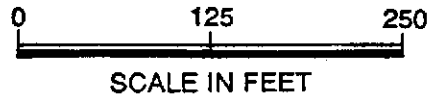
	Harding Lawson Associates Engineers and Geoscientists	Water-Level Elevation Contours Conducted Using Observed Water Levels and Simulation - December 4, 1989	PLATE
		Soil Treatment System Pacific Renaissance Plaza Oakland, California	3
DRAWN NJB	JOB NUMBER 9382,040.02	APPROVED DPL	DATE 12/89
		REVISED	DATE 1/90

109463



EXPLANATION

-  Simulated Ground-Water Contour
(feet above Mean Sea Level)
Contour Interval 0.5 feet
-  Approximate Ground-Water
Flow Path

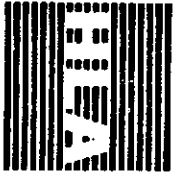
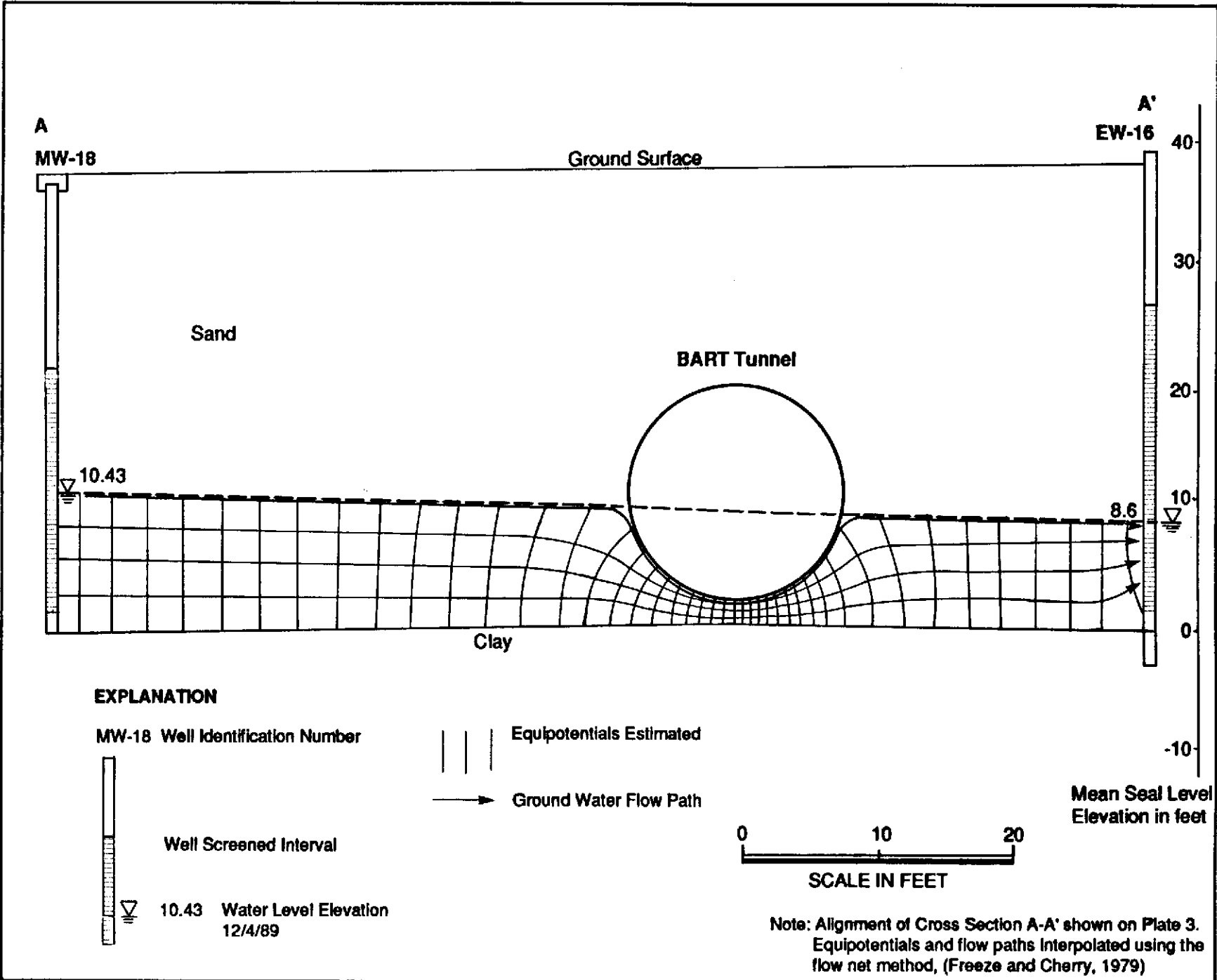


Harding Lawson Associates
Engineering and
Environmental Services

**Simulated Ground-Water Elevations and
Ground-Water Flow Paths - December 4, 1989**
Pacific Renaissance Plaza
Oakland, California

PLATE
4

DRAWN NJB	JOB NUMBER 9382,040.02	APPROVED <i>gds</i>	DATE 12/89	REVISED DATE
--------------	---------------------------	------------------------	---------------	--------------



Harding Lawson Associates
 Engineering and
 Environmental Services

DRAWN
 JA
 JOB NUMBER
 9382,040.02

**Cross-Sectional Representation of Ground-Water Flow
 In the Vicinity of the BART Tunnel
 Soil Treatment System
 Pacific Renaissance Plaza
 Oakland, California**

APPROVED
 JDS

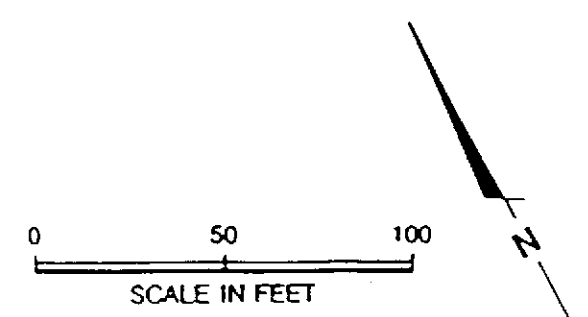
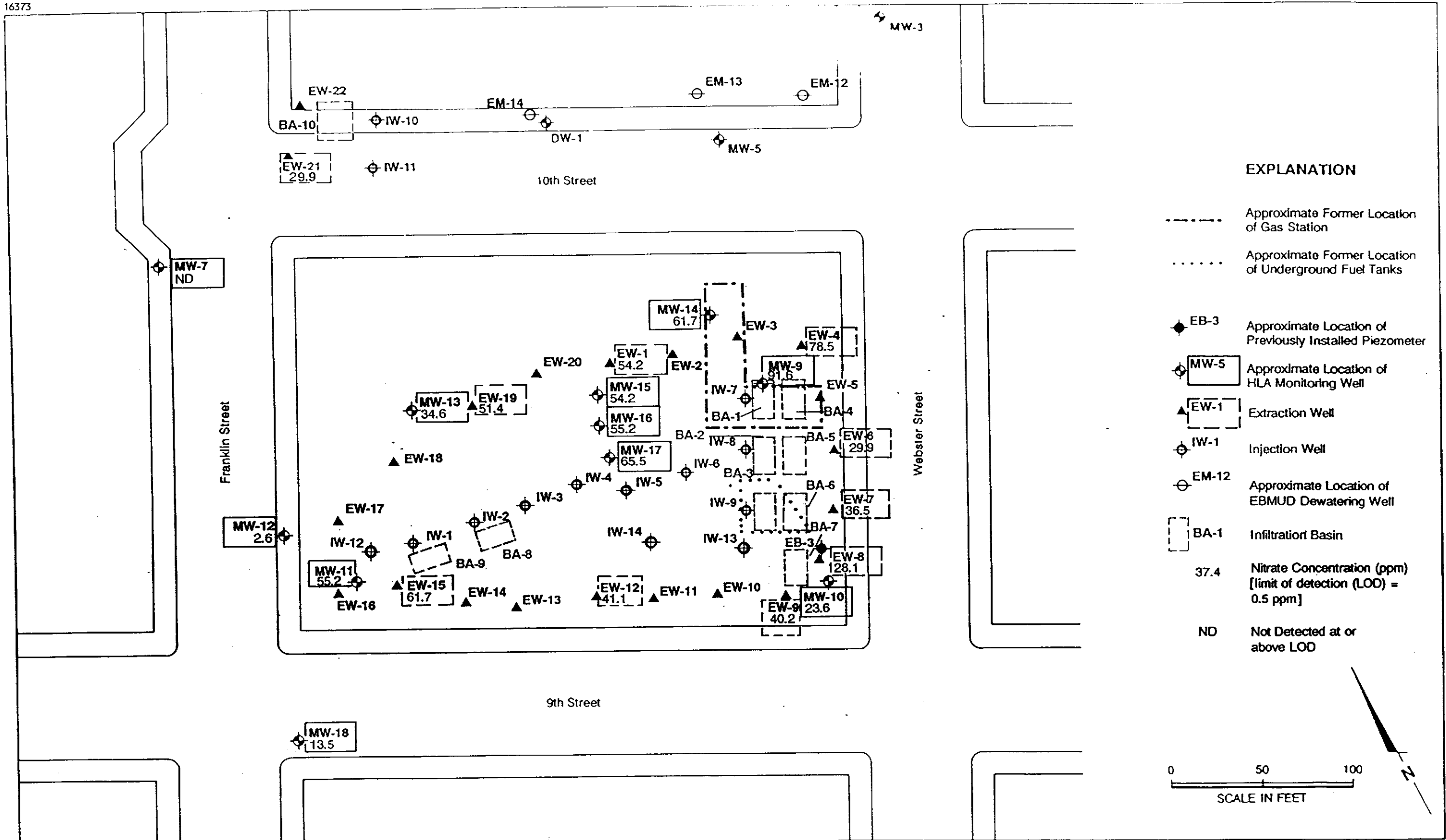
DATE
 1/90

REVISED DATE

5

PLATE

Note: Alignment of Cross Section A-A' shown on Plate 3.
 Equipotentials and flow paths interpolated using the
 flow net method, (Freeze and Cherry, 1979)

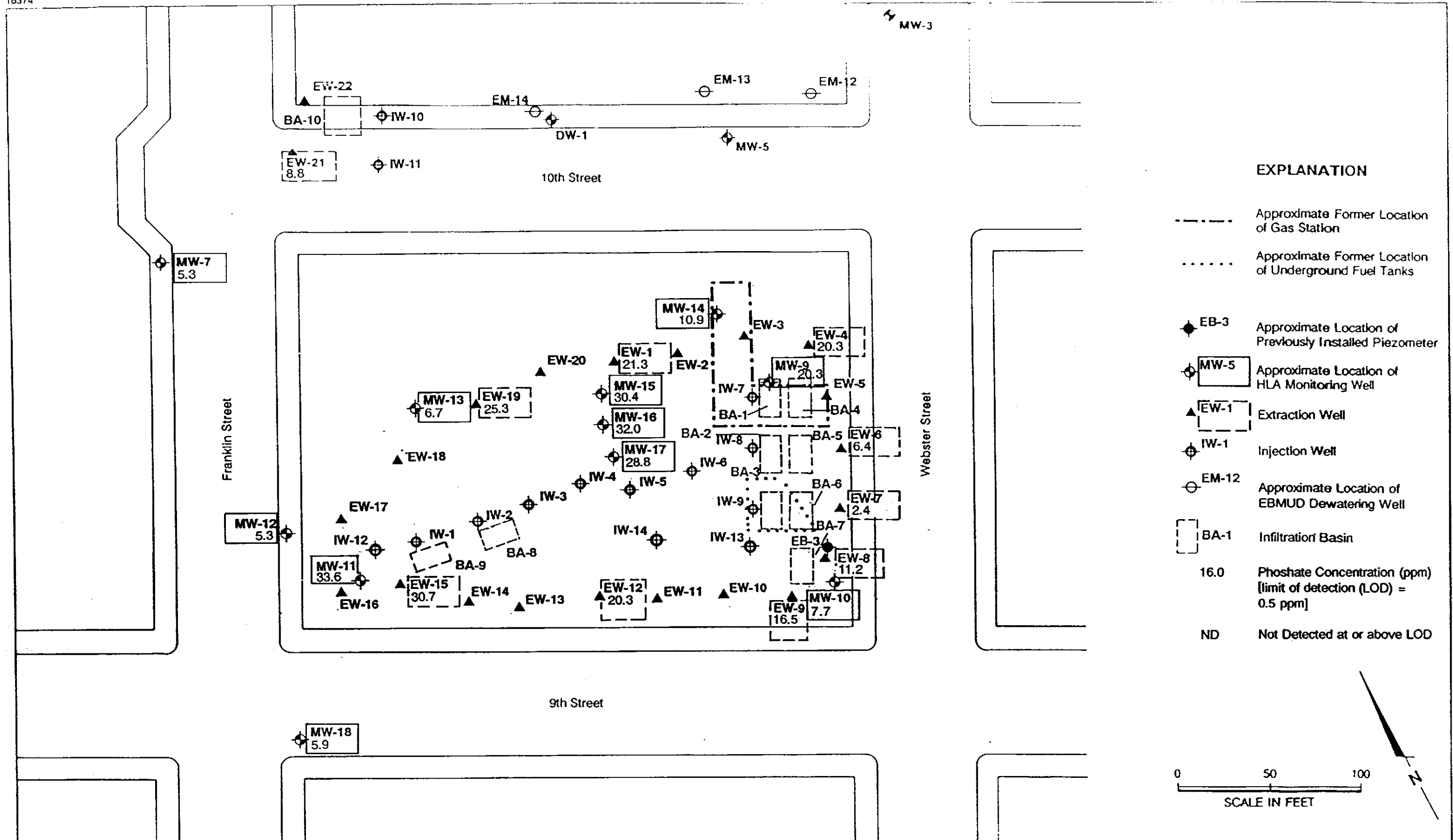


Harding Lawson Associates
Engineers and Geoscientists

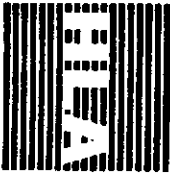
Concentrations of Nitrate in Ground Water - December 4-6, 1989
Pacific Renaissance Plaza
Oakland, California

DRAWN: ML JOB NUMBER: 9382,040.02 APPROVED: DFL DATE: 12/89

PAGE 6



<p>Herding Lawson Associates Engineers and Geoscientists</p>	<p>Concentrations of Phosphate in Ground Water - December 4-6, 1989 Pacific Renaissance Plaza Oakland, California</p>		<p>PLATE 7</p>
	<p>DRAWN ML</p>	<p>JOB NUMBER 9382,040.02</p>	<p>APPROVED JFL</p>



Harding Lawson Associates
Engineering and
Environmental Services

DRAWN
CVD
JOB NUMBER
9382,040.02

APPROVED
905
DATE
12/89
REVISED DATE

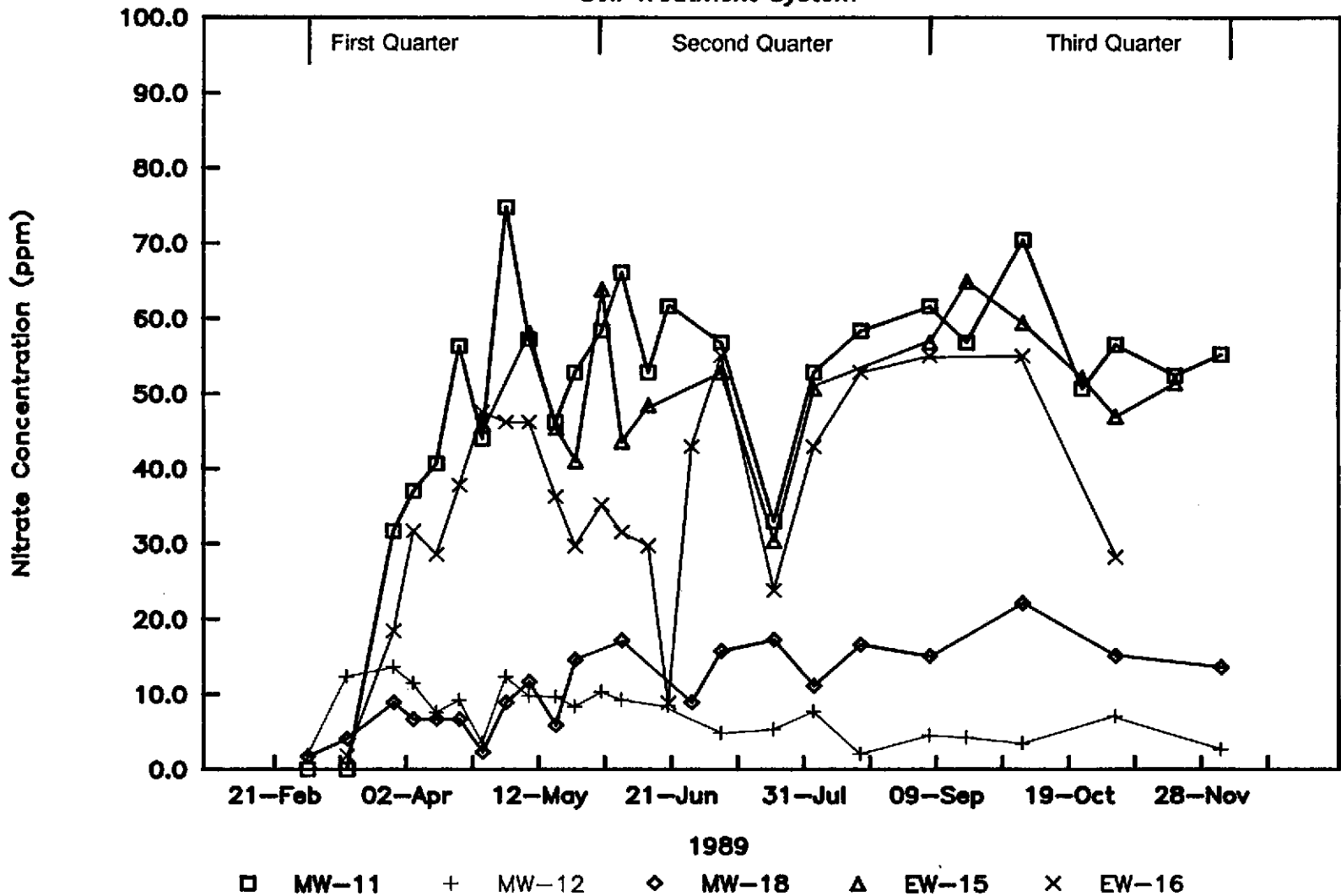
Nitrate Concentrations - Wells
MW-11, MW-12, MW-18, EW-15, EW-16
Soil Treatment System
Pacific Renaissance Plaza
Oakland, California

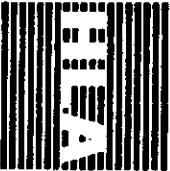
PLATE

8

Pacific Renaissance Plaza

Soil Treatment System





Harding Lawson Associates
Engineering and
Environmental Services

DRAWN
CVD

JOB NUMBER
9382,040.02

APPROVED
gps

Phosphate Concentrations - Wells
MW-11, MW-12, MW-18, EW-15, EW-16
Soil Treatment System
Pacific Renaissance Plaza
Oakland, California

DATE
12/89

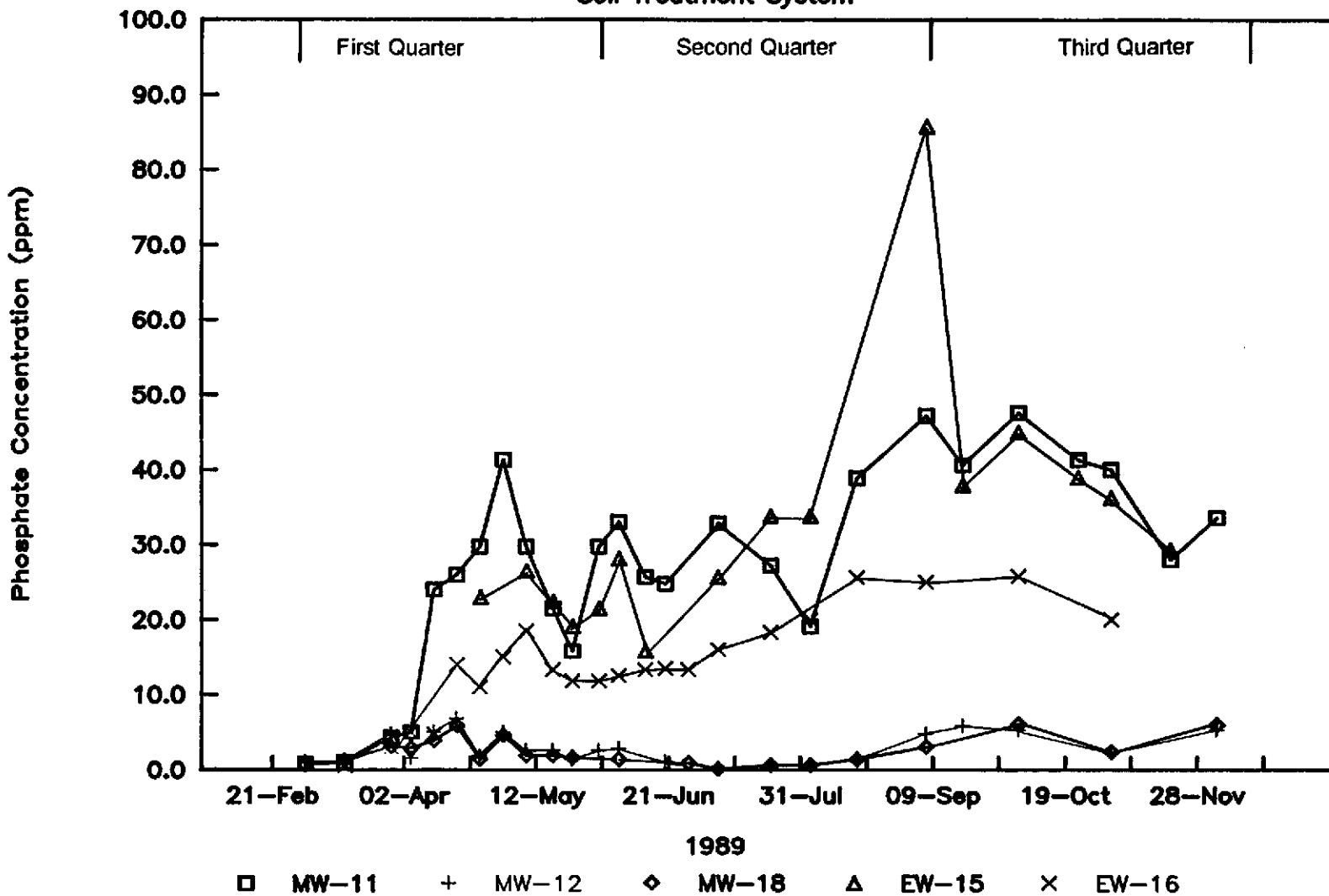
REVISED DATE

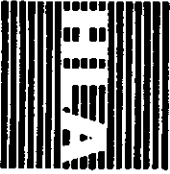
9

PLATE

Pacific Renaissance Plaza

Soil Treatment System





Harding Lawson Associates
Engineering and
Environmental Services

DRAWN
CVD

JOB NUMBER
9382,040.02

APPROVED
gds

DATE
12/89

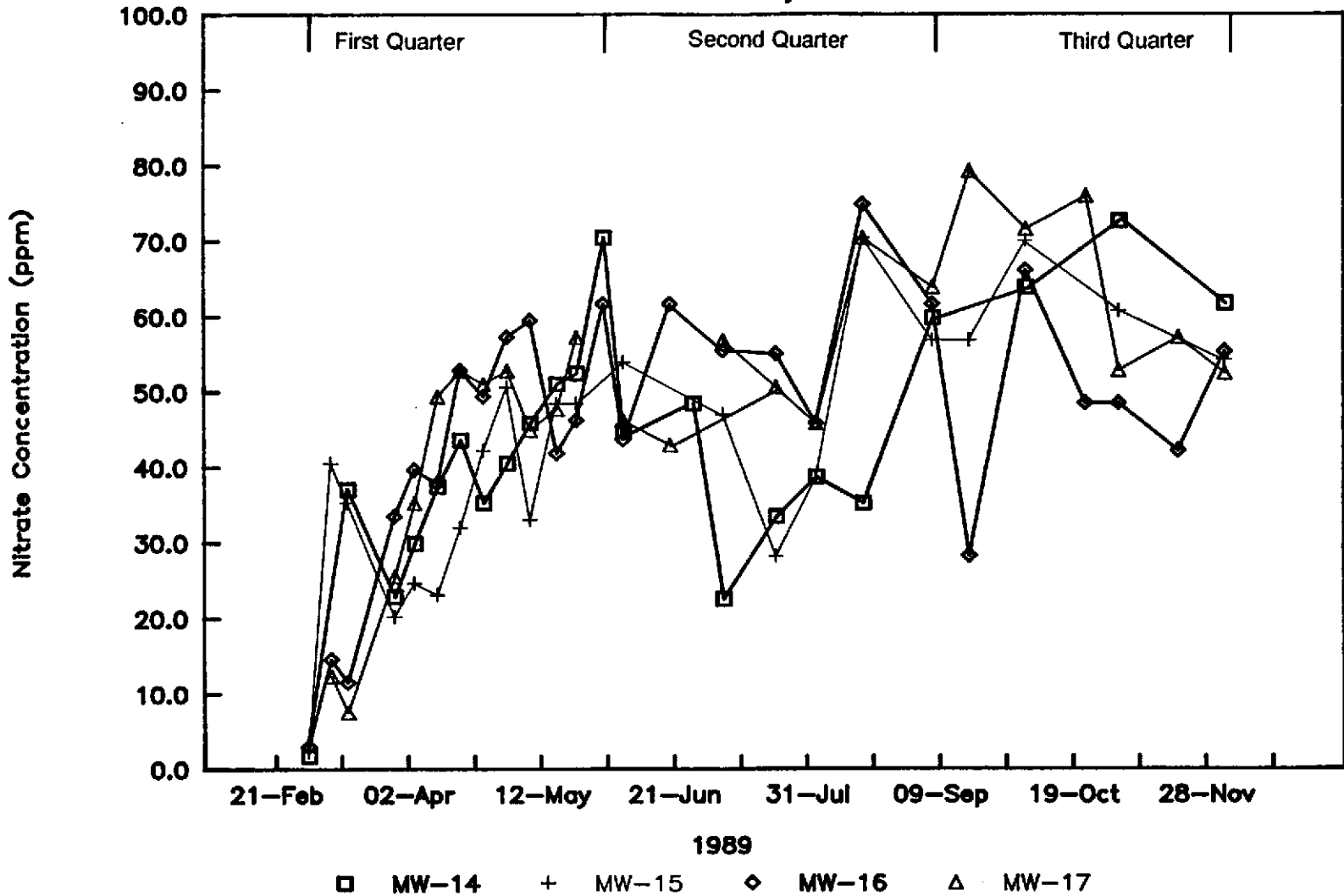
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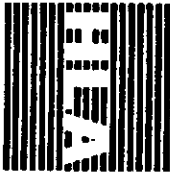
Nitrate Concentrations - Wells
MW-14, MW-15, MW-16, MW-17
Soil Treatment System
Pacific Renaissance Plaza
Oakland, California

PLATE
10

Pacific Renaissance Plaza

Soil Treatment System





Harding Lawson Associates
Engineering and
Environmental Services

DRAWN
CVD

JOB NUMBER
9382.040.02

APPROVED
995

DATE
12/89

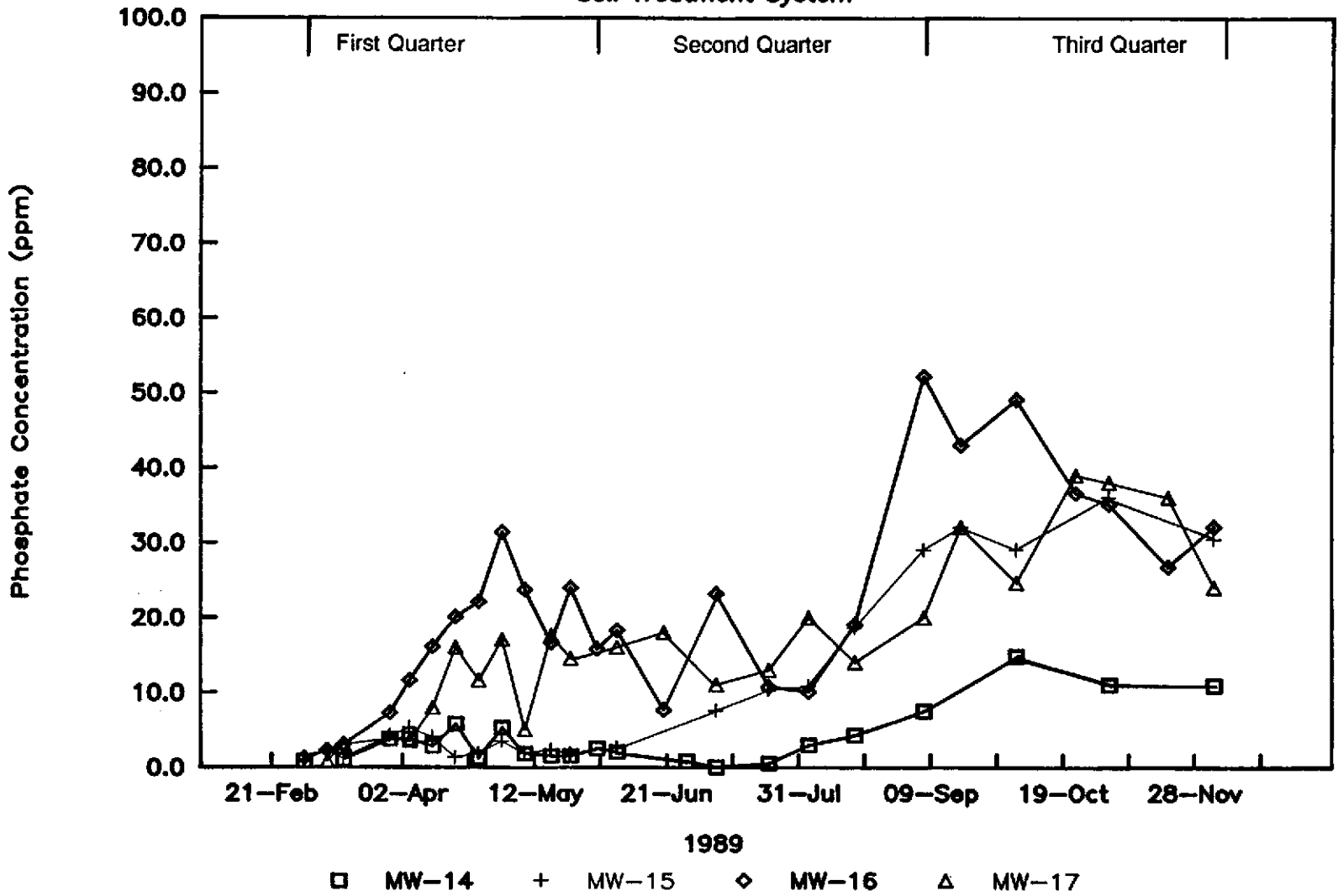
REVISED DATE

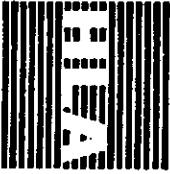
Phosphate Concentrations - Wells
MW-14, MW-15, MW-16, MW-17
Soil Treatment System
Pacific Renaissance Plaza
Oakland, California

PLATE
11

Pacific Renaissance Plaza

Soil Treatment System





Harding Lawson Associates
Engineering and
Environmental Services

DRAWN
CVD
JOB NUMBER
9382,040.02

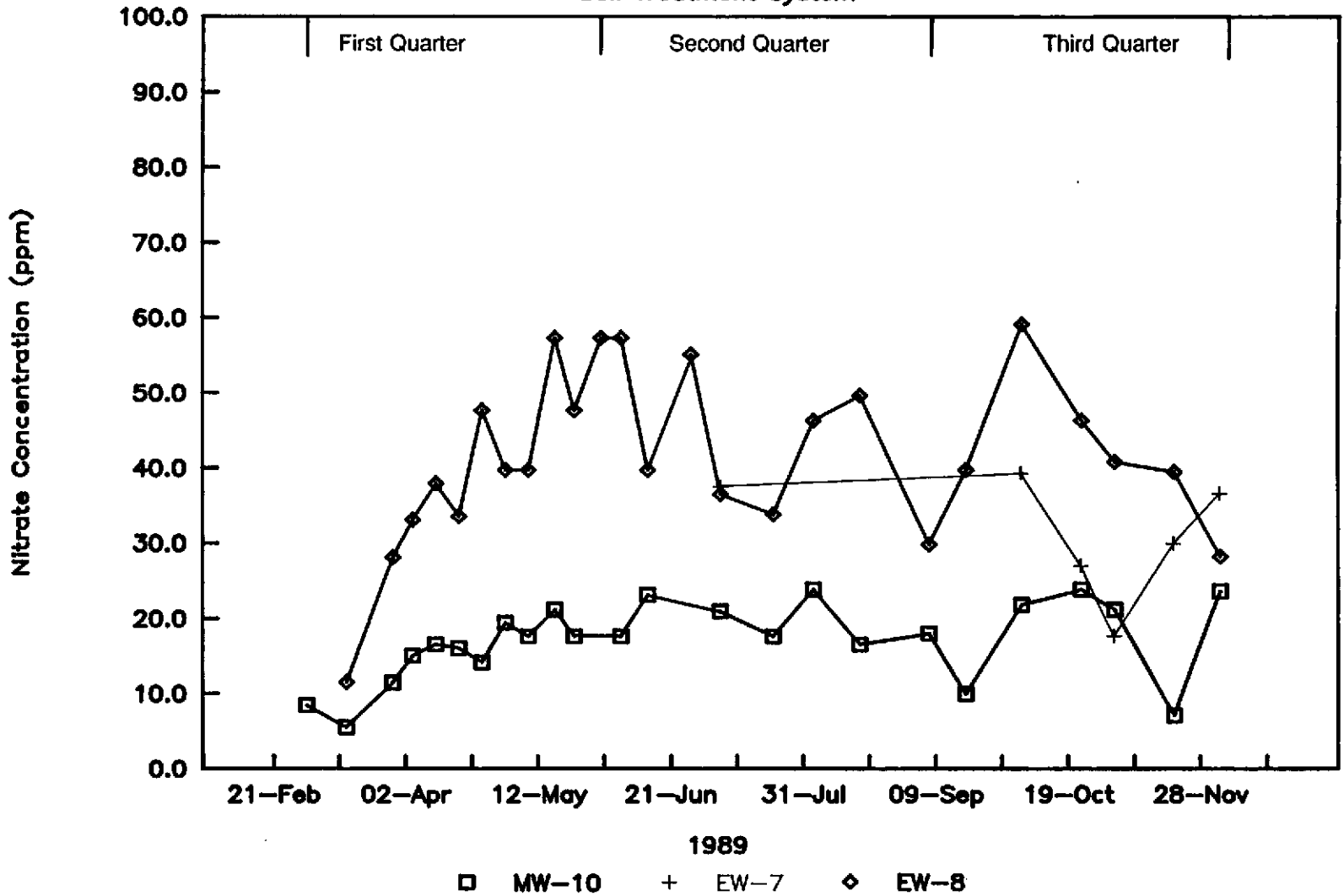
APPROVED
gds
DATE
12/89

REVISED DATE

Nitrate Concentrations - Wells
MW-10, EW-7, EW-8
Soil Treatment System
Pacific Renaissance Plaza
Oakland, California

PLATE
12

Pacific Renaissance Plaza Soil Treatment System





Harding Lawson Associates
Engineering and
Environmental Services

DRAWN
CVD

JOB NUMBER
9382,040,02

APPROVED
gjs

DATE
12/89

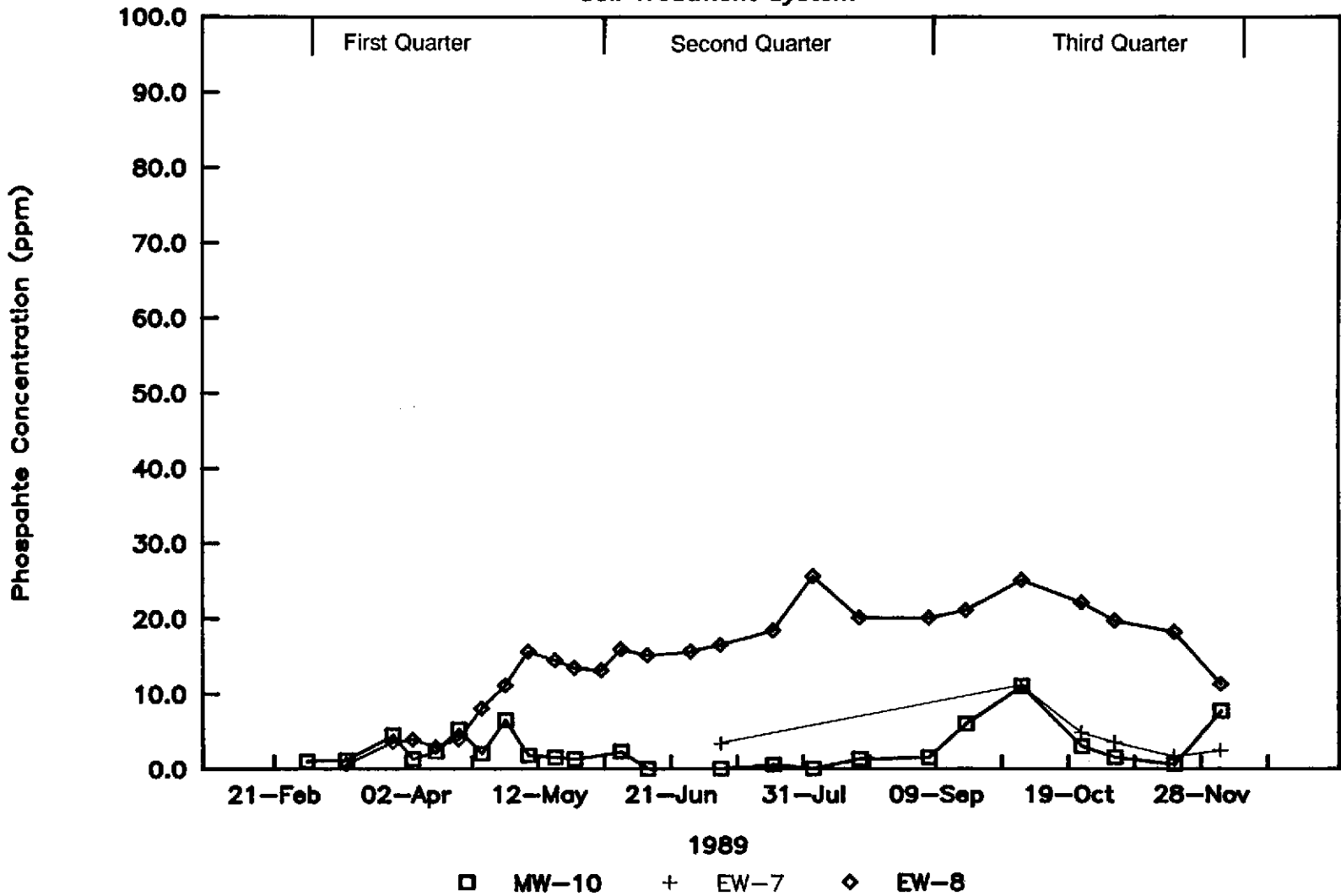
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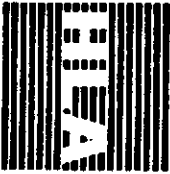
Phosphate Concentrations - Wells
MW-10, EW-7, EW-8
Soil Treatment System
Pacific Renaissance Plaza
Oakland, California

PLATE
13

Pacific Renaissance Plaza

Soil Treatment System





Harding Lawson Associates
Engineering and
Environmental Services

DRAWN
JA
JOB NUMBER
9382,040.02

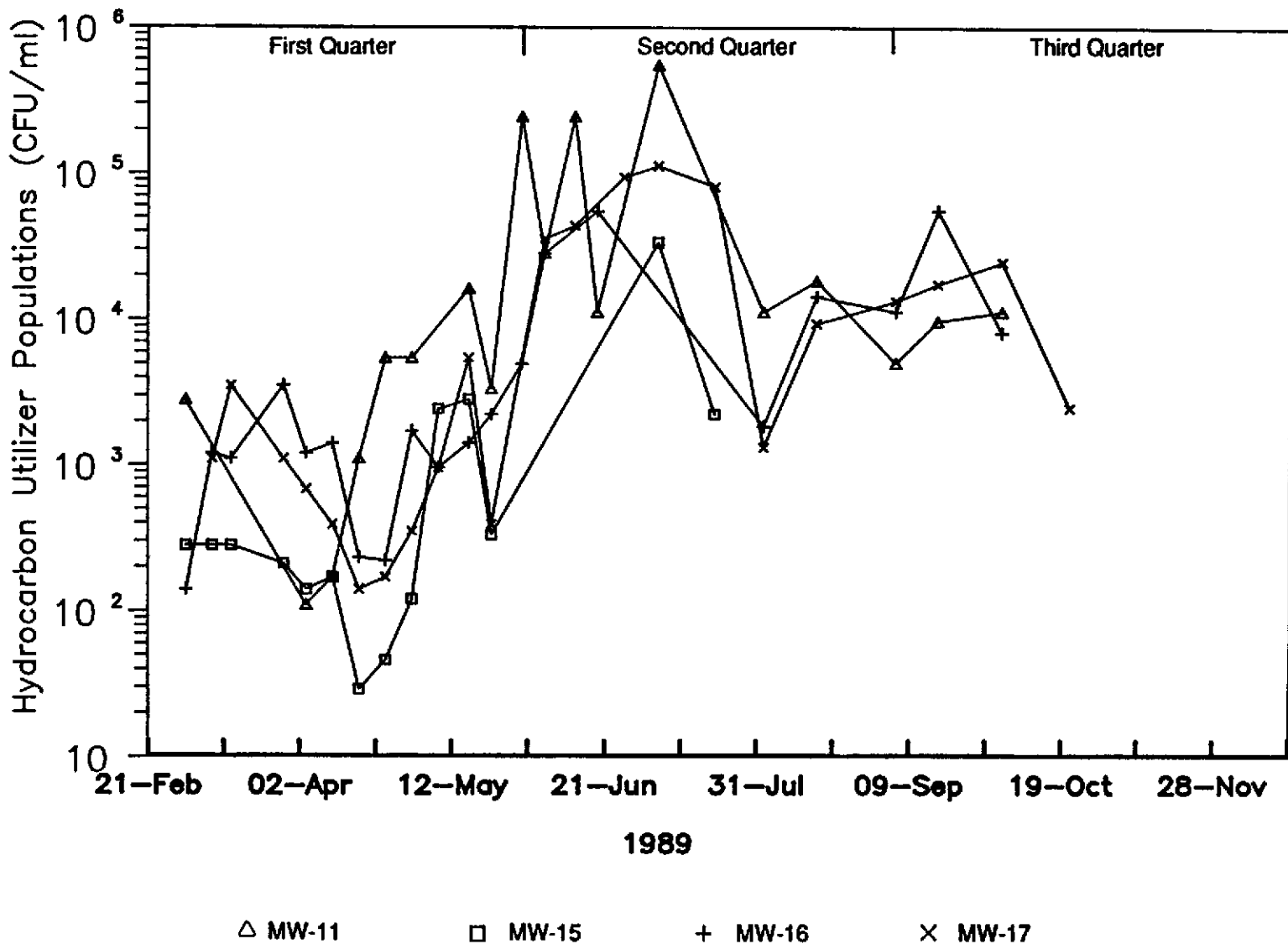
Hydrocarbon Utilizer Populations
Wells MW-11, MW-15, MW-16, and MW-17
Pacific Renaissance Plaza
Oakland, California

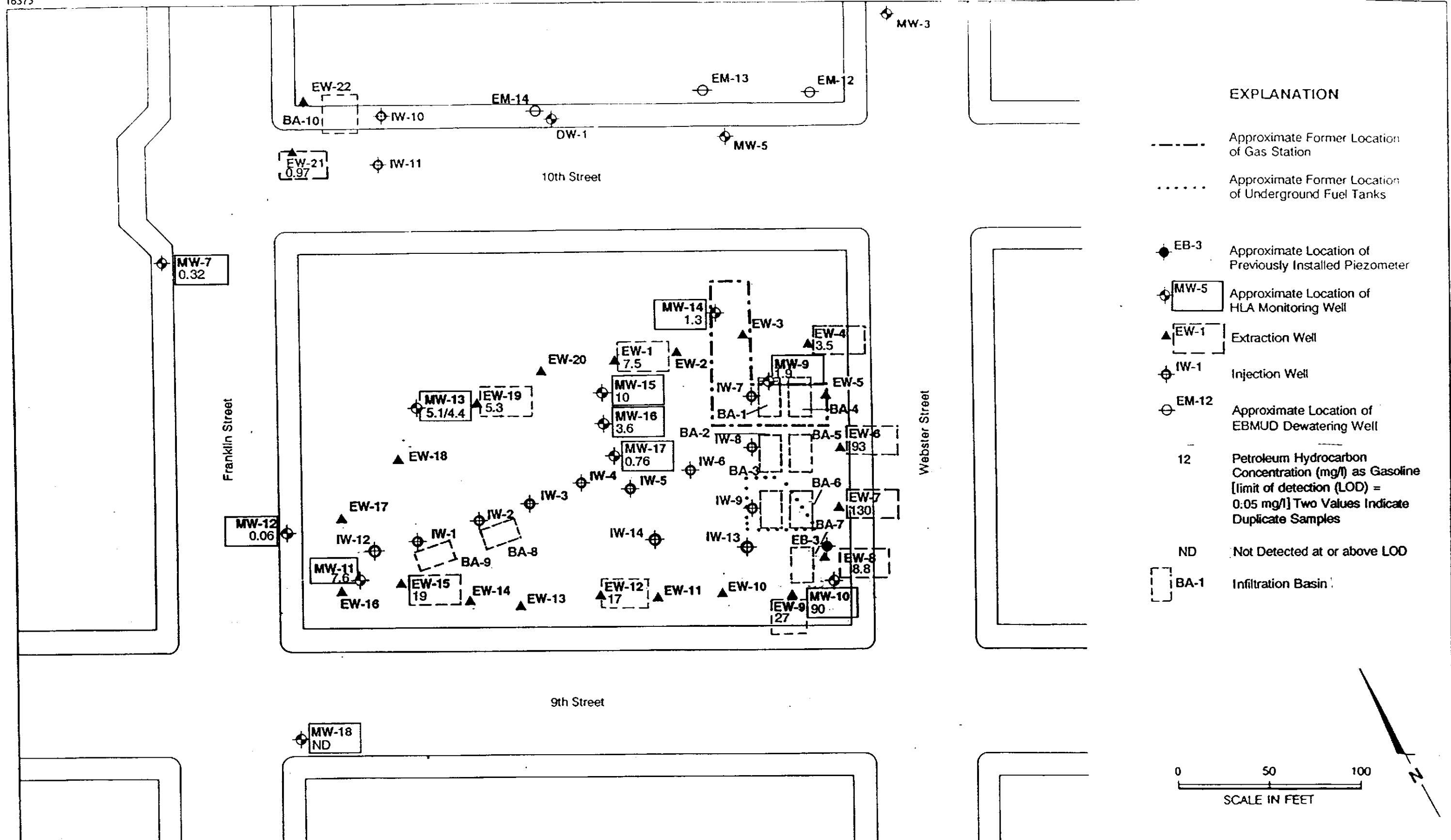
APPROVED
gds
DATE
1990
REVISED DATE

PLATE
14

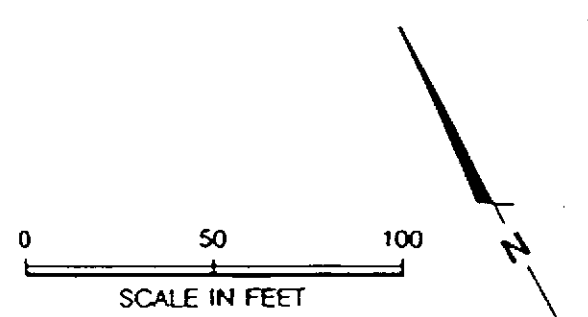
Pacific Renaissance Plaza



Soil Treatment System

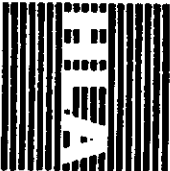




- EXPLANATION**
- Approximate Former Location of Gas Station
 - Approximate Former Location of Underground Fuel Tanks
 - EB-3 Approximate Location of Previously Installed Piezometer
 - MW-5 Approximate Location of HLA Monitoring Well
 - EW-1 Extraction Well
 - IW-1 Injection Well
 - EM-12 Approximate 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



 Harding Lawson Associates Engineers and Geoscientists	Concentrations of Petroleum Hydrocarbons in Ground Water - December 4-6, 1989 Pacific Renaissance Plaza Oakland, California		PLATE 15
	DRAWN ML	JOB NUMBER 9382,040.02	APPROVED 



Harding Lawson Associates
Engineering and
Environmental Services

DRAWN
CVD

JOB NUMBER
9382,040,02

APPROVED
gls

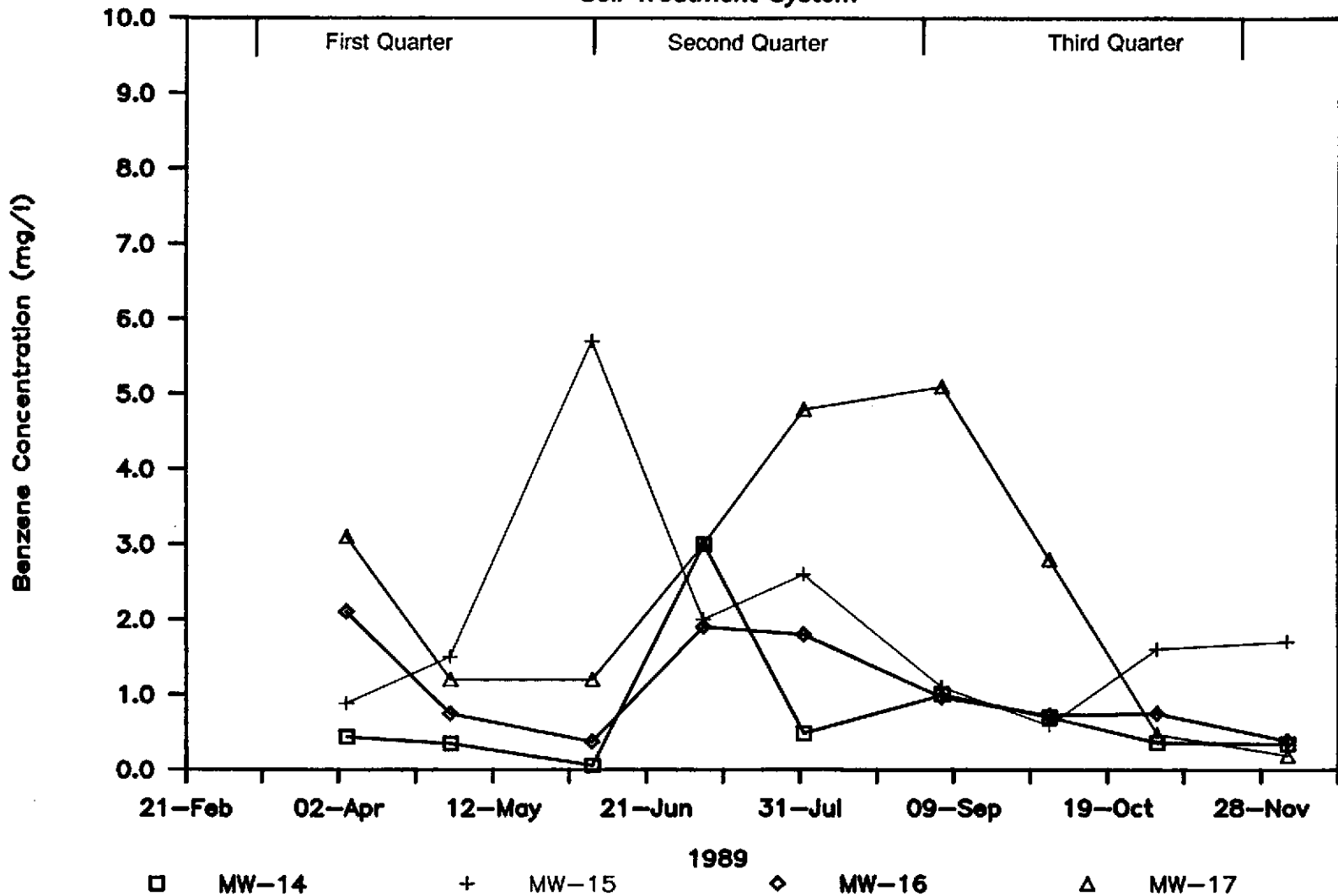
DATE
12/89

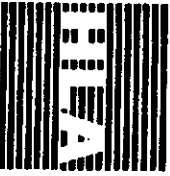
REVISED DATE

Benzene Concentrations - Wells
MW-14, MW-15, MW-16, MW-17
Soil Treatment System
Pacific Renaissance Plaza
Oakland, California

PLATE
16

Pacific Renaissance Plaza Soil Treatment System





Harding Lawson Associates
Engineering and
Environmental Services

DRAWN
CVD

JOB NUMBER
9382,040.02

APPROVED
[Signature]

DATE
12/89

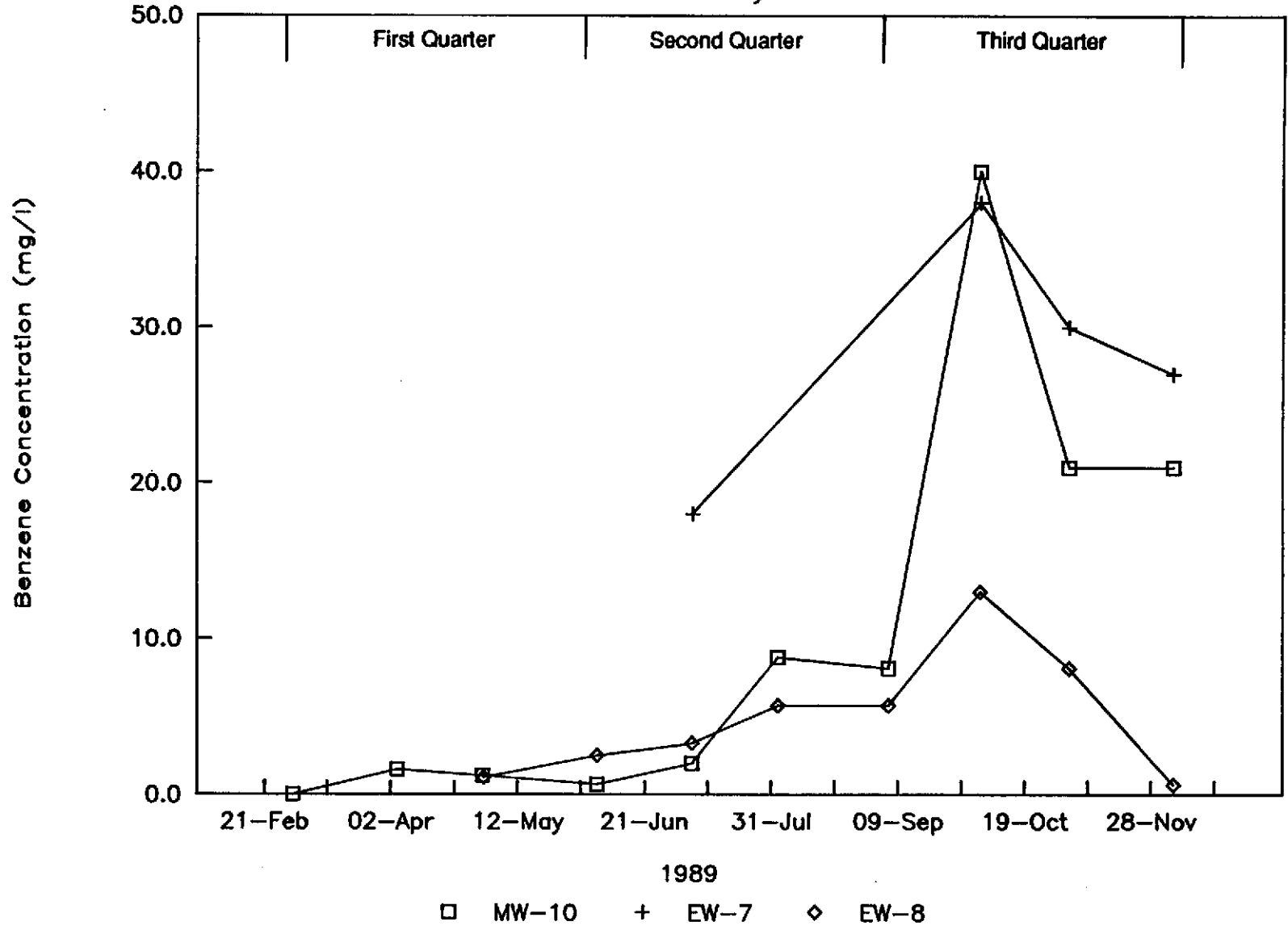
REVISED DATE

Benzene Concentrations - Wells
MW-10, EW-7, EW-8
Soil Treatment System
Pacific Renaissance Plaza
Oakland, California

PLATE
17

Pacific Renaissance Plaza

Soil Treatment System





Harding Lawson Associates
Engineering and
Environmental Services

DRAWN
CVD

JOB NUMBER
9382,040,02

APPROVED

DATE
12/89

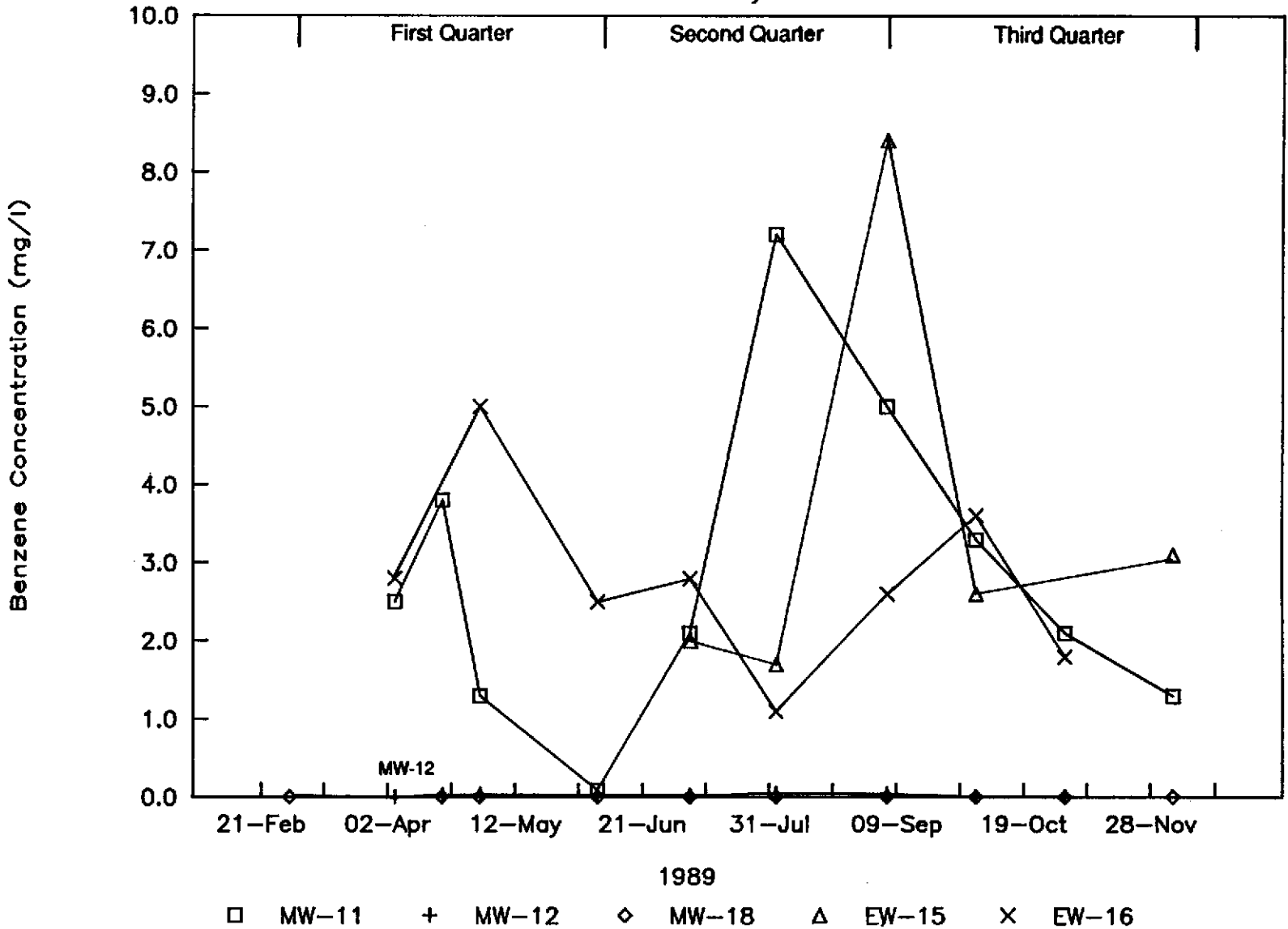
REVISED DATE

Benzene Concentrations - Wells
MW-11, MW-12, MW-18, EW-15, EW-16
Soil Treatment System
Pacific Renaissance Plaza
Oakland, California

PLATE
18

Pacific Renaissance Plaza

Soil Treatment System



Appendix

LABORATORY ANALYTICAL RESULTS FOR WATER SAMPLES

EC 89 7: 38

December 19, 1989

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

RE: PACE Project No. 491121.505
PRP/OAKLAND

Dear Mr. Leland:

Enclosed is the report of laboratory analyses for samples received
November 21, 1989.

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

December 19, 1989
PACE Project
Number: 491121505

Attn: Mr. David Leland

TRP/OAKLAND

PACE Sample Number:
Date Collected:
Date Received:
Parameter

	EW-9	EW-22
Sample Number	796010	796020
Date Collected	11/21/89	11/21/89
Date Received	11/21/89	11/21/89
Parameter	8947001-	8947002-

Units MDL

ORGANIC ANALYSIS

Parameter	Units	MDL	EW-9	EW-22
PURGEABLE FUELS AND AROMATICS				
TOTAL FUEL HYDROCARBONS, (LIGHT):			-	-
Total Purgeable Fuels, as Gasoline	mg/L	0.05	ND	6.1
PURGEABLE AROMATICS (BTXE BY EPA 8020):				
Benzene	mg/L	0.0002	ND	0.056
Ethylbenzene	mg/L	0.0002	ND	LT 0.005
Toluene	mg/L	0.0002	ND	0.015
Xylenes, Total	mg/L	0.0002	ND	0.12

MDL Method Detection Limit
ND Not detected at or above the MDL.
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
Douglas E. Oram, Ph.D.
Organic Chemistry Manager

Novato, California 94948
415/892-0821
Telecopy: 415/892-1586

Samplers: JAMES W. ANDERSON

Job Number: 09382.039.02

Name/Location: PRP / OAKLAND

Project Manager: DAVID LELAND

Recorder: [Signature]
(Signature Required)

ANALYSIS REQUESTED

SOURCE CODE	MATRIX				#CONTAINERS & PRESERV.				SAMPLE NUMBER OR LAB NUMBER			DATE				
	Water	Sediment	Soil	OH	Unpres.	H ₂ SO ₄	HNO ₃			Yr	Wk	Seq	Yr	Mo	Dy	Time
23	X				3					89	47	001	89	11	21	1342
23	X				3					89	47	002	89	11	21	1713

STATION DESCRIPTION/NOTES
EXTRACTION WELL # 9
EXTRACTION WELL # 22

EPA 601/8010	
EPA 602/8020 (BTXE)	X
EPA 624/8240	X
EPA 625/8270	
Priority Piltmt. Metals	
Benzene/Toluene/Xylene	
Total Petrol. Hydrocarb.	X
EPA 8015 (TPH)	X

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

CHAIN OF CUSTODY RECORD		
RELINQUISHED BY: (Signature) <u>[Signature]</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)	DATE/TIME	RECEIVED FOR LAB BY: (Signature) DATE/TIME <u>[Signature]</u> 11/19/95
METHOD OF SHIPMENT		

DEC 29 10:01

December 22, 1989

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

RE: PACE Project No. 491204.504
PRP

Dear Mr. Leland:

Enclosed is the report of laboratory analyses for samples received
December 04, 1989.

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

Sincerely,


Stephen F. Nackord
Director, Sampling and Analytical Services

Enclosures



REPORT OF LABORATORY ANALYSIS

Offices:
Minneapolis, Minnesota
Tampa, Florida
Coralville, Iowa
Novato, California
Leawood, Kansas
Irvine, California
Asheboro, North Carolina

Harding Lawson Associates
100 Rush Landing Road
Novato, CA 94945

December 22, 1989
PACE Project
Number: 491204504

Attn: Mr. David Leland

PRP

PACE Sample Number:
Date Collected:
Date Received:
Parameter

EW Composite EW-1 EW-4
799630 799640 799650
12/04/89 12/04/89 12/04/89
12/04/89 12/04/89 12/04/89
89490001 89490002 89490003

Units MDL

ORGANIC ANALYSIS

PURGEABLE FUELS AND AROMATICS

Table with 5 columns: Parameter, Units, MDL, EW Composite, EW-1, EW-4. Rows include: TOTAL FUEL HYDROCARBONS, (LIGHT): mg/L (0.05, 4.0, 7.5, 3.5); Total Purgeable Fuels, as Gasoline; PURGEABLE AROMATICS (BTXE BY EPA 8020): Benzene mg/L (0.0002, 0.91, 1.3, 0.17); Ethylbenzene mg/L (0.0002, 0.016, 0.14, 0.011); Toluene mg/L (0.0002, 0.68, 2.2, 0.029); Xylenes, Total mg/L (0.0002, 1.1, 1.3, 0.62)

MDL Method Detection Limit

Mr. David Leland
Page 2

December 22, 1989
PACE Project
Number: 491204504

PRP

PACE Sample Number:
Date Collected:
Date Received:
Parameter

	EW-6	EW-7	EW-9
	799660	799670	799680
	12/04/89	12/04/89	12/04/89
	12/04/89	12/04/89	12/04/89
Units	MDL	MDL	MDL
	89490004	89490005	89490006

ORGANIC ANALYSIS

PURGEABLE FUELS AND AROMATICS

TOTAL FUEL HYDROCARBONS, (LIGHT):		-	-	-	
Total Purgeable Fuels, as Gasoline	mg/L	0.05	93	130	27
PURGEABLE AROMATICS (BTXE BY EPA 8020):		-	-	-	
Benzene	mg/L	0.0002	20	27	4.5
Ethylbenzene	mg/L	0.0002	1.3	1.9	0.35
Toluene	mg/L	0.0002	24	36	6.7
Xylenes, Total	mg/L	0.0002	13	17	5.7

MDL Method Detection Limit

REPORT OF LABORATORY ANALYSIS

Offices:
Minneapolis, Minnesota
Tampa, Florida
Coralville, Iowa
Novato, California
Leawood, Kansas
Irvine, California
Asheboro, North Carolina

Mr. David Leland
Page 3

December 22, 1989
PACE Project
Number: 491204504

PRP

PACE Sample Number:
Date Collected:
Date Received:
Parameter

	EW-8	EW-12
	799690	799700
	12/04/89	12/04/89
	12/04/89	12/04/89
<u>Units</u>	<u>MDL</u>	<u>MDL</u>
	89490007	89490008

ORGANIC ANALYSIS

PURGEABLE FUELS AND AROMATICS

TOTAL FUEL HYDROCARBONS, (LIGHT):		-	-
Total Purgeable Fuels, as Gasoline	mg/L	0.05	8.8
PURGEABLE AROMATICS (BTXE BY EPA 8020):		-	-
Benzene	mg/L	0.0002	0.62
Ethylbenzene	mg/L	0.0002	0.037
Toluene	mg/L	0.0002	0.51
Xylenes, Total	mg/L	0.0002	3.0

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.

Steve Blackhead for:
Douglas E. Oram, Ph.D.
Organic Chemistry Manager

CHAIN OF CUSTODY FORM

Job Number: 09202, 03902
 Name/Location: PRP
 Project Manager: Paul Leland

Samplers: James Anderson
Bill Feller
 Recorder: Will [Signature]
 (Signature Required)

ANALYSIS REQUESTED										
EPA 601/8010	EPA 602/8020 (BTEX)	EPA 624/8240	EPA 625/8270	Priority Piltmt. Metals	Benzene/Toluene/Xylene	Total Petrol. Hydrocarb.	2015 (TPH - UG1+T)			
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	OH	Unpres.	H ₂ SO ₄	HNO ₃	HCL	Yr	Wk	Seq	Yr	Mo	Dy	Time	
23	X						3	89	4	00021	89	12	04	14	36	E.W. COMPOSITE
23	X						3	89	4	00022	89	12	04	14	55	E.W. 01
23	X						3	89	4	0003	89	12	04	15	15	E.W. 04
23	X						3	89	4	0004	89	12	04	15	37	E.W. 06
23	X						3	89	4	0005	89	12	04	16	05	E.W. 07
23	X						3	89	4	0006	89	12	04	16	21	E.W. 09
23	X						3	89	4	0007	89	12	04	16	37	E.W. 08
23	X						3	89	4	0008	89	12	04	16	50	E.W. 12

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

CHAIN OF CUSTODY RECORD		
RELINQUISHED BY: (Signature) <u>Will [Signature]</u>	RECEIVED BY: (Signature) <u>[Signature]</u>	DATE/TIME <u>12/4/18/93</u>
RELINQUISHED BY: (Signature) <u>[Signature]</u>	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) <u>[Signature]</u>
METHOD OF SHIPMENT		

January 03, 1990

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

RE: PACE Project No. 491205.503
PRP

Dear Mr. Leland:

Enclosed is the report of laboratory analyses for samples received
December 05, 1989.

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

Sincerely,


Stephen F. Nackord
Director, Sampling and Analytical Services

Enclosures



REPORT OF LABORATORY ANALYSIS

Offices:
Minneapolis, Minnesota
Tampa, Florida
Coralville, Iowa
Novato, California
Leawood, Kansas
Irvine, California
Asheboro, North Carolina

Harding Lawson Associates
100 Rush Landing Road
Novato, CA 94945

January 03, 1990
PACE Project
Number: 491205503

Attn: Mr. David Leland

PRP

PACE Sample Number:
Date Collected:
Date Received:
Parameter

Table with 5 columns: Parameter, Units, MDL, EW-15, EW-19, EW-21. Rows include sample numbers and dates for each location.

ORGANIC ANALYSIS

PURGEABLE FUELS AND AROMATICS
TOTAL FUEL HYDROCARBONS, (LIGHT):
Total Purgeable Fuels, as Gasoline
PURGEABLE AROMATICS (BTXE BY EPA 8020):
Benzene
Ethylbenzene
Toluene
Xylenes, Total

Table with 5 columns: Units, MDL, EW-15, EW-19, EW-21. Rows show concentrations for various organic compounds.

MDL Method Detection Limit

Mr. David Leland
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January 03, 1990
PACE Project
Number: 491205503

PRP

PACE Sample Number:
Date Collected:
Date Received:
Parameter

	MW-14	MW-9	MW-15
	800340	800350	800360
	12/05/89	12/05/89	12/05/89
	12/05/89	12/05/89	12/05/89
Units	MDL		
	89490012	89490013	89490014

ORGANIC ANALYSIS

PURGEABLE FUELS AND AROMATICS

TOTAL FUEL HYDROCARBONS, (LIGHT):
Total Purgeable Fuels, as Gasoline
PURGEABLE AROMATICS (BTXE BY EPA 8020):
Benzene
Ethylbenzene
Toluene
Xylenes, Total

	MDL	MW-14	MW-9	MW-15
		-	-	-
mg/L	0.05	1.3	1.9	10
		-	-	-
mg/L	0.0002	0.35	LT 0.0010	1.7
mg/L	0.0002	LT 0.0010	LT 0.0010	0.22
mg/L	0.0002	0.0065	0.0044	2.6
mg/L	0.0002	0.25	0.39	1.3

MDL Method Detection Limit
LT Less than.

Mr. David Leland
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January 03, 1990
PACE Project
Number: 491205503

PRP

PACE Sample Number:
Date Collected:
Date Received:
Parameter

	MW-16	MW-17	MW-10
	800370	800380	800390
	12/05/89	12/05/89	12/05/89
	12/05/89	12/05/89	12/05/89
Units	MDL	MDL	MDL
	89490015	89490016	89490021

ORGANIC ANALYSIS

PURGEABLE FUELS AND AROMATICS

TOTAL FUEL HYDROCARBONS, (LIGHT):
Total Purgeable Fuels, as Gasoline
PURGEABLE AROMATICS (BTXE BY EPA 8020):
Benzene
Ethylbenzene
Toluene
Xylenes, Total

	MDL	MW-16	MW-17	MW-10
		-	-	-
mg/L	0.05	3.6	0.76	90
		-	-	-
mg/L	0.0002	0.38	0.16	21
mg/L	0.0002	0.087	0.0071	2.6
mg/L	0.0002	0.79	0.036	14
mg/L	0.0002	0.75	0.13	17

MDL Method Detection Limit

Mr. David Leland
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PRP

January 03, 1990
PACE Project
Number: 491205503

Parameter	Units	MDL	MW-11	Influent	Intermediate
ACE Sample Number:			800400	800410	800420
Date Collected:			12/05/89	12/05/89	12/05/89
Date Received:			12/05/89	12/05/89	12/05/89
Parameter	Units	MDL	89490022	89490017	89490018

INORGANIC ANALYSIS

INDIVIDUAL PARAMETERS

Chlorine, Total Residual	mg/L	0.05	-	ND	-
Oxygen, Dissolved	mg/L	0.1	-	5.6	-

ORGANIC ANALYSIS

PURGEABLE FUELS AND AROMATICS

TOTAL FUEL HYDROCARBONS, (LIGHT):			-	-	-
Total Purgeable Fuels, as Gasoline	mg/L	0.05	7.6	0.05	ND
PURGEABLE AROMATICS (BTXE BY EPA 8020):			-	-	-
Benzene	mg/L	0.0002	1.3	0.0037	ND
Ethylbenzene	mg/L	0.0002	0.084	ND	ND
Toluene	mg/L	0.0002	1.5	0.000	0.0018
Xylenes, Total	mg/L	0.0002	1.3	0.025	ND

HALOGENATED VOLATILE COMPOUNDS EPA 8010

Dichlorodifluoromethane	ug/L	2.0	-	ND	ND
Chloromethane	ug/L	2.0	-	ND	ND
Vinyl Chloride	ug/L	2.0	-	ND	ND
Bromomethane	ug/L	2.0	-	ND	ND
Chloroethane	ug/L	2.0	-	ND	ND
Trichlorofluoromethane (Freon 11)	ug/L	2.0	-	ND	ND
1,1-Dichloroethene	ug/L	0.5	-	ND	ND
Methylene Chloride	ug/L	0.5	-	ND	ND
trans-1,2-Dichloroethene	ug/L	0.5	-	ND	ND
1,1-Dichloroethane	ug/L	0.5	-	ND	ND
Chloroform	ug/L	0.5	-	3.3	3.8
1,1,1-Trichloroethane (TCA)	ug/L	0.5	-	ND	ND
Carbon Tetrachloride	ug/L	0.5	-	ND	ND
1,2-Dichloroethane (EDC)	ug/L	0.5	-	7.1	6.6
Trichloroethene (TCE)	ug/L	0.5	-	ND	ND

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

Mr. David Leland
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PRP

January 03, 1990
PACE Project
Number: 491205503

		MW-11	Influent	Intermediate
ACE Sample Number:		800400	800410	800420
Date Collected:		12/05/89	12/05/89	12/05/89
Date Received:		12/05/89	12/05/89	12/05/89
Parameter	Units	MDL	89490022	89490017
			89490018	

ORGANIC ANALYSIS

HALOGENATED VOLATILE COMPOUNDS EPA 8010

1,2-Dichloropropane	ug/L	0.5	-	ND	ND
Bromodichloromethane	ug/L	0.5	-	ND	ND
1-Chloroethylvinyl ether	ug/L	0.5	-	ND	ND
trans-1,3-Dichloropropene	ug/L	0.5	-	ND	ND
cis-1,3-Dichloropropene	ug/L	0.5	-	ND	ND
1,1,2-Trichloroethane	ug/L	0.5	-	ND	ND
Tetrachloroethene	ug/L	0.5	-	ND	ND
1,1,1-Tribromochloromethane	ug/L	0.5	-	.63	ND
Chlorobenzene	ug/L	0.5	-	ND	ND
Bromoform	ug/L	0.5	-	ND	ND
1,1,1,2-Tetrachloroethane	ug/L	0.5	-	ND	ND
1,3-Dichlorobenzene	ug/L	0.5	-	ND	ND
1,4-Dichlorobenzene	ug/L	0.5	-	ND	ND
1,2-Dichlorobenzene	ug/L	0.5	-	ND	ND
Bromochloromethane (Surrogate Recovery)		-	-	85%	97%
1,4-Dichlorobutane (Surrogate Recovery)		-	-	85%	91%
1,2-DIBROMOETHANE (EDB) EPA METHOD 504					
1,2-Dibromoethane	ug/L	0.02	-	LT 4.0	-
Date Extracted				12/19/89	-

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

Mr. David Leland
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January 03, 1990
PACE Project
Number: 491205503

PRP

		Effluent	Trip Blank
PACE Sample Number:		800430	800440
Date Collected:		12/05/89	12/05/89
Date Received:		12/05/89	12/05/89
Parameter	Units	MDL	89490019
			89490020

INORGANIC ANALYSIS

INDIVIDUAL PARAMETERS

Chlorine, Total Residual	mg/L	0.05	ND	-
Oxygen, Dissolved	mg/L	0.1	5.3	-

ORGANIC ANALYSIS

PURGEABLE FUELS AND AROMATICS

TOTAL FUEL HYDROCARBONS, (LIGHT):		-	-	-
Total Purgeable Fuels, as Gasoline	mg/L	0.05	ND	ND
PURGEABLE AROMATICS (BTXE BY EPA 8020):		-	-	-
Benzene	mg/L	0.0002	ND	ND
Ethylbenzene	mg/L	0.0002	ND	ND
Toluene	mg/L	0.0002	0.0012	ND
Xylenes, Total	mg/L	0.0002	ND	ND

HALOGENATED VOLATILE COMPOUNDS EPA 8010

Dichlorodifluoromethane	ug/L	2.0	ND	-
Chloromethane	ug/L	2.0	ND	-
Vinyl Chloride	ug/L	2.0	ND	-
Bromomethane	ug/L	2.0	ND	-
Chloroethane	ug/L	2.0	ND	-
Trichlorofluoromethane (Freon 11)	ug/L	2.0	ND	-
1,1-Dichloroethene	ug/L	0.5	ND	-
Methylene Chloride	ug/L	0.5	0.53	-
trans-1,2-Dichloroethene	ug/L	0.5	ND	-
cis-1,2-Dichloroethane	ug/L	0.5	ND	-
Chloroform	ug/L	0.5	1.6	-
1,1,1-Trichloroethane (TCA)	ug/L	0.5	ND	-
Carbon Tetrachloride	ug/L	0.5	ND	-
1,2-Dichloroethane (EDC)	ug/L	0.5	3.0	-
Trichloroethene (TCE)	ug/L	0.5	ND	-

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

Mr. David Leland
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January 03, 1990
PACE Project
Number: 491205503

PACE Sample Number:	Date Collected:	Date Received:	Parameter	Units	Effluent	Trip Blank
					MDL	MDL
					800430	800440
					12/05/89	12/05/89
					12/05/89	12/05/89
					89490019	89490020

ORGANIC ANALYSIS

HALOGENATED VOLATILE COMPOUNDS EPA 8010

1,2-Dichloropropane	ug/L	0.5	ND	-
Bromodichloromethane	ug/L	0.5	ND	-
1-Chloroethylvinyl ether	ug/L	0.5	ND	-
trans-1,3-Dichloropropene	ug/L	0.5	ND	-
cis-1,3-Dichloropropene	ug/L	0.5	ND	-
1,1,2-Trichloroethane	ug/L	0.5	ND	-
Tetrachloroethene	ug/L	0.5	ND	-
Dibromochloromethane	ug/L	0.5	ND	-
Chlorobenzene	ug/L	0.5	ND	-
Bromoform	ug/L	0.5	ND	-
1,1,2,2-Tetrachloroethane	ug/L	0.5	ND	-
1,3-Dichlorobenzene	ug/L	0.5	ND	-
1,4-Dichlorobenzene	ug/L	0.5	ND	-
1,2-Dichlorobenzene	ug/L	0.5	ND	-
Bromochloromethane (Surrogate Recovery)			94%	-
1,4-Dichlorobutane (Surrogate Recovery)			98%	-
1,2-DIBROMOETHANE (EDB) EPA METHOD 504	ug/L	0.02	ND	-
1,2-Dibromoethane			12/19/89	-
Date Extracted				

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