EMCON
1921 Ringwood Avenue • San Jose, California 95131-1721 • **(408) 453-7300** • Fax (408) 437-9526

#3756 R0831

Date October 23, 1995
Project 20805-120.004

To:

Mr. Barney Chan
Alameda County Health Care Services Agency
Department of Environmental Health
1131 Harborbay Parkway, Suite 250
Alameda, California 94502-6577

Recd 10/25/95

We are enclosing:

Copies	Description
1	Second quarter 1995 groundwater monitoring report, retail service station, 10600 MacArthur Boulevard, Oakland, CA

For your:		Sent by:	
	X Use		Regular Mail
	Approval		Standard Air
	Review		Courier
	Information	X	Other: Cert. Mail

Comments:

The enclosed groundwater monitoring report is being sent to you per the request of ARCO Products Company. Plaese call if you have questions or comments.

David Larsen
Project Coordinator

cc: Kevin Graves, RWQCB - SFBR
Richard Gilcrease, Drake Builders
Michael Whelan, ARCO Products Company
Beth Dorris, ARCO Legal Department
David Larsen, EMCON
File

ARCO Products Company
Environmental Engineering
2155 South Bascom Avenue, Suite 202
Campbell, California 95008

Date: September 22, 1995

Re: ARCO Station # 10600 MacArthur Boulevard • Oakland, CA
Second Quarter 1995 Groundwater Monitoring and
Remediation System Performance Evaluation Report

" I declare, that to the best of my knowledge at the present time, that the information and/or recommendations contained in the attached proposal or report are true and correct."

Submitted by:

Michael R. Whelan

Michael R. Whelan
Environmental Engineer

EMCON
1921 Ringwood Avenue • San Jose, California 95131-1721 • (408) 453-7300 • Fax (408) 437-9526

September 14, 1995
Project 20805-120.004

Mr. Michael Whelan
ARCO Products Company
2155 South Bascom Avenue, Suite 202
Campbell, California 95008

Re: Second quarter 1995 groundwater monitoring program results and remediation system performance evaluation report, SVE system at retail service station, 10600 MacArthur Boulevard, Oakland, California

Dear Mr. Whelan:

This letter presents the results of the second quarter 1995 groundwater monitoring program for the retail service station at 10600 MacArthur Boulevard, Oakland, California (Figure 1). Operation and performance data for the site's soil-vapor extraction (SVE) system are also presented. The quarterly monitoring program complies with Alameda County Health Care Services Agency (ACHCSA) requirements regarding underground tank investigations.

BACKGROUND

Site History and Previous Assessments

There are four underground storage tanks (USTs), designated T1 through T4, in the western portion of the site. These tanks were replacements for four former USTs (FT1 through FT4) that were removed in February 1990. The four former USTs were located in the southern portion of the site. A former waste-oil tank adjacent to the northeastern wall of the station building was removed in 1988. Four soil samples collected beneath the waste-oil tank were analyzed for volatile organic compounds (VOCs), including perchloroethlyene (PCE), even though ARCO Products Company (ARCO) does not use PCE in its operations. Analytical results indicated no detectable concentrations of PCE in the soil samples collected. The locations of the former tanks, existing tanks, on- and off-site groundwater monitoring wells, and on-site vapor extraction wells are shown in Figure 2.

Adjacent to and immediately southeast of the station is a portion of the former Truck Manufacturing Plant (now a parking lot for Foothill Square Shopping Center). Aerial photographs suggest the possible presence of fuel tanks, fuel dispensers, and storage drums on several portions of the former Truck Manufacturing Plant. Since groundwater monitoring began in 1989, PCE has been detected in groundwater in both on- and off-site monitoring

wells. The highest concentrations of PCE have typically been detected in well MW-6, in the deeper water-bearing zone upgradient from the site, on the former Truck Manufacturing Plant site.

Since 1988, ARCO has conducted several site assessment investigations both on and off site to delineate the lateral and vertical extent of gasoline-impacted soils and groundwater at the site. A total of six on- and off-site groundwater monitoring wells (MW-1, MW-3 through MW-6, and MW-8) and one recovery well (RW-1) screened in the deeper water-bearing zone were installed to evaluate the groundwater flow direction of the deeper water-bearing zone, and to determine the lateral and vertical extent of petroleum-hydrocarbon-impacted soils and groundwater at the site. Wells MW-2 and MW-7 were installed on and off site to evaluate groundwater quality in the shallow water-bearing zone. Wells MW-1 through MW-8, WGR-3, and RW-1 are monitored quarterly.

On- and Off-Site Soil-Vapor Extraction Systems

ARCO installed twenty six 3/4-inch galvanized steel probes off site at the former Truck Manufacturing Plant site to remediate vadose-zone soils impacted by gasoline above the shallow water-bearing zone. The probes and well WGR-3 were connected via subsurface piping to a remediation compound on the ARCO site. This SVE well configuration was operated by EVAX Technologies (EVAX) from September 6, 1990, to March 21, 1991. The EVAX treatment system consisted of a propane-fired internal combustion (IC) engine. Pacific Environmental Group (PEG) replaced the IC engine with a 500 standard cubic foot per minute (scfm) gas-fired Anguil catalytic oxidizer (Cat-ox) and operated the off-site SVE system from June 12, 1991, to August 25, 1992.

A second phase of SVE construction was completed at the ARCO site in July 1992. A total of seven on-site SVE wells (VW-1 through VW-7) was installed and used, along with on-site well MW-2, to remediate hydrocarbon-impacted vadose-zone and capillary-fringe soils in the shallow water-bearing zone on site. Hydrocarbon vapor extracted from these wells is drawn by a 1.5-horsepower (hp) regenerative blower through subsurface remediation piping to the existing Cat-ox in the on-site remediation compound. The on-site SVE system was operated by PEG from August 25 to October 5, 1992. RESNA Industries, Inc. (RESNA, formerly Applied Geosystems), operated the SVE system from October 6, 1992, to May 1994. Operation of the SVE system is regulated under Bay Area Air Quality Management District (BAAQMD) Permit to Operate No. 5998. In December 1993, the SVE system was shut down because of low hydrocarbon concentrations in extracted vapor from the wells. The system was pulsed during first quarter 1994. After the site was transferred from RESNA to EMCON in October 1994, EMCON restarted the system in December 1994.

MONITORING PROGRAM FIELD PROCEDURES

EMCON performed the second quarter 1995 groundwater monitoring event on June 5, 1995. Field work this quarter included (1) measuring depths to groundwater and subjectively analyzing groundwater for the presence of floating product in wells MW-1 through MW-8, RW-1, and WGR-3, (2) purging and subsequently sampling groundwater monitoring wells MW-1 through MW-8, RW-1, and WGR-3 for laboratory analysis, and (3) directing a state-certified laboratory to analyze the groundwater samples. Copies of all field data sheets from the second quarter 1995 groundwater monitoring event are included in Appendix A.

ANALYTICAL PROCEDURES

Groundwater samples collected during second quarter 1995 monitoring were analyzed for total petroleum hydrocarbons as gasoline (TPHG); benzene, toluene, ethylbenzene, and total xylenes (BTEX); and VOCs. Groundwater samples were prepared for analysis by U.S. Environmental Protection Agency (USEPA) method 5030 (purge and trap). Groundwater was analyzed for TPHG by the methods accepted by the Department of Toxic Substances Control, California Environmental Protection Agency (Cal-EPA), and referenced in *Leaking Underground Fuel Tank* (LUFT) *Field Manual* (State Water Resources Control Board, October 1989). Samples were analyzed for VOCs by USEPA method 8240, and BTEX by USEPA method 8020, as described in *Test Methods for Evaluating Solid Waste: Physical/Chemical Methods* (EPA SW-846, November 1986, third edition). Groundwater samples from well MW-4 were also analyzed for total recoverable petroleum hydrocarbons (TRPH) by USEPA method 418.1. These methods are recommended in *Tri-Regional Board Staff Recommendations for Preliminary Evaluation and Investigation of Underground Tank Sites* (August 10, 1990) for analysis of samples from petroleum-hydrocarbon-impacted sites.

MONITORING PROGRAM RESULTS

Results of the second quarter 1995 groundwater monitoring event are summarized in Table 1 and illustrated in Figure 2. Concentrations of PCE in groundwater are illustrated in Figure 3. Historical groundwater elevation data, including top-of-casing elevations, depth-to-water measurements, calculated groundwater elevations, floating-product thickness measurements, and groundwater flow direction and gradient data, are summarized in Table 2. Table 3 summarizes historical laboratory data for TPHG and BTEX analyses. Table 4 summarizes additional historical laboratory data for well MW-4 (TRPH, total petroleum hydrocarbons as diesel [TPHD], and metals). Historical laboratory data for VOC analyses are summarized in Table 5. Table 6 summarizes historical floating-product recovery data for wells MW-2 and MW-7. Copies of the

second quarter 1995 analytical results and chain-of-custody documentation are included in Appendix B.

Groundwater elevation data collected on June 5, 1995, were used in calculating groundwater elevations for second quarter 1995. Consistent with previous quarters, EMCON used groundwater elevation data from wells MW-1, MW-3, and MW-8 to determine the local groundwater flow direction and gradient. Based on these data, EMCON believes the small variance in groundwater elevations observed across the site results in a relatively flat hydraulic gradient, which may be superimposed upon by regional groundwater flow patterns. Figure 2 illustrates groundwater elevations and TPHG and benzene analytical data for second quarter 1995.

Groundwater samples from the deeper water-bearing zone wells, MW-1, MW-3 through MW-6, MW-8, RW-1, and off-site well WGR-3, did not contain detectable concentrations of TPHG or benzene. Method reporting limits for TPHG and benzene were 50 micrograms per liter (µg/L) and 0.5 µg/L, respectively; in wells MW-1 and MW-3 through MW-6, detection limits were raised because of the presence of PCE in the samples. Groundwater samples collected from wells MW-2 and MW-7, screened in the shallow water-bearing zone, contained 1,800 and 36,000 µg/L TPHG, respectively, and 59 and 90 µg/L benzene, respectively.

Groundwater samples collected from wells MW-8 and WGR-3 did not contain detectable concentrations of VOCs (Table 5). Groundwater samples collected from wells MW-1, MW-3 through MW-6, and RW-1, screened in the deeper water-bearing zone, contained concentrations of PCE from 59 to 3,100 µg/L (Figure 3). Groundwater from wells MW-2 and MW-7, screened in the shallow water-bearing zone, contained benzene concentrations of 83 and 86 µg/L, respectively, but did not contain detectable concentrations of PCE.

A total of 18.54 gallons of floating product has been recovered from wells MW-2 and MW-7 since 1991 (Table 6). No floating product has been recovered since 1992.

REMEDIAL PERFORMANCE EVALUATION - SVE SYSTEM

Operation

EMCON restarted the on-site SVE system on December 22, 1994. System operation and performance data since restart of the system in December 1994 are detailed in Tables 7 and 8. Extraction well data (i.e., which well was on-line) are summarized in Table 9. Please refer to *Fourth Quarter 1994 Groundwater Monitoring Results and Remediation System Performance Evaluation Report* (EMCON, March 1995) for operation and

performance data for the on- and off-site SVE systems between September 1990 and May 1994.

The SVE system operated for a total of 38.1 days (915.5 hours) during the 90-day reporting period (42.4 percent operational) from April 11 to July 10, 1995. EMCON shut down the SVE system on May 24, 1995, because of a problem with the fresh-air-dilution valve. The SVE system did not operate for the remainder of second quarter 1995. Table 9 summarizes the status of the vapor extraction wells that have been used for soil venting since December 22, 1994.

Monitoring

Consistent with site-specific BAAQMD air permit requirements, the operating temperature of the Cat-ox unit is measured and recorded continuously during system operation. Once a month, air samples are collected at sample ports influent to the Cat-ox (before fresh-air dilution); after fresh-air dilution; and effluent from the unit (identified as "well-field influent," "system influent," and "system effluent" in Table 7). Air samples are submitted to a state-certified laboratory for chemical analysis. The samples are analyzed for total volatile hydrocarbons as gasoline (TVHG) and BTEX by USEPA methods 8015 and 8020, respectively. Analytical results and chain-of-custody records for air samples collected during this reporting period are enclosed in Appendix C.

In addition to the parameters described above, the SVE system is monitored once a month for (1) TVHG concentrations in extracted vapor from each well using an Eagle Monitoring Systems EM-700 partially-heated flame-ionization detector (FID) (Table 9); (2) applied vacuum on vapor extraction wells; and (3) average extracted air flow rate from the vapor extraction wells. As required by the site-specific BAAQMD permit, extracted vapor is also monitored with an FID once every two weeks at sample ports located influent to the Cat-ox (before fresh-air dilution); after fresh-air dilution; and effluent from the unit (identified as "well-field influent [I-1]," "system influent [I-2]," and "system effluent [E-1]," in Table 8 and in field data sheets, Appendix D). Copies of all original operation and maintenance field data sheets generated during second quarter 1995 are provided in Appendix D.

Air Sample Results

Copies of analytical results and chain-of-custody documentation for all air samples collected during the second quarter 1995 are enclosed in Appendix C.

Destruction Efficiency and Emission Rates

The system destruction efficiency for the April 26 and May 8, 1995, sampling events were not calculated because the TVHG concentrations in the air samples collected influent to and effluent from the unit were below laboratory detection limits. Since nondetectable levels of benzene were reported in air samples collected effluent from the Cat-ox unit, there was no emission of benzene to the atmosphere. Hence, the unit was in compliance with the BAAQMD air permit requirement of a benzene emission rate less than 0.11 pound per day.

Hydrocarbon Removal Rates

Based on the information provided by EVAX, PEG, and RESNA, approximately 7,666 pounds (1,236 gallons) of petroleum hydrocarbons were removed by the on- and off-site SVE systems from September 1990 to December 22, 1994.

Table 7 summarizes hydrocarbon removal rates, pounds of hydrocarbons removed this period, and cumulative pounds of hydrocarbons removed since startup. The calculations and assumptions for estimating hydrocarbon removal rates for the SVE system are shown in Table 7.

Approximately 15.5 pounds (or 2.5 gallons) of hydrocarbons were recovered by SVE system operation during this 90-day period. A total of approximately 7,714 pounds (or 1,244 gallons) of hydrocarbons has been recovered from the site since system startup in September 1990.

LIMITATIONS

No monitoring event is thorough enough to describe all geologic and hydrogeologic conditions of interest at a given site. If conditions have not been identified during the monitoring event, such a finding should not therefore be construed as a guarantee of the absence of such conditions at the site, but rather as the result of the scope, limitations, and cost of work performed during the monitoring event.

SITE STATUS UPDATE

This update reports site activities performed during the second quarter of 1995 and the anticipated site activities for the third quarter of 1995.

Second Quarter 1995 Activities

- Prepared quarterly groundwater monitoring and SVE system performance evaluation report for first quarter 1995.
- Performed quarterly groundwater monitoring for second quarter 1995.
- Performed operation and maintenance activities for the SVE system during second quarter 1995.
- Prepared and submitted a response letter dated May 26, 1995, to ACHCSA on discussion held during the March 28, 1995, pre-enforcement hearing, and to previously submitted letters and reports by Augeas Corporation.

Work Anticipated for Third Quarter 1995

- Prepare and submit quarterly groundwater monitoring and SVE system performance evaluation report for second quarter 1995.
- Perform quarterly groundwater monitoring for third quarter 1995.
- Continue with on- and off-site SVE remediation.

Please call if you have questions.

Sincerely,

EMCON

David Larsen
Project Coordinator

Valli Voruganti
Project Engineer

Lynn A. Gallagher, R.G. 6090
Project Geologist

REGISTERED GEOLOGIST
LYNN A. GALLAGHER
RG6090
STATE OF CALIFORNIA

Attachments:

Table 1 -	Groundwater Monitoring Data, Second Quarter 1995
Table 2 -	Historical Groundwater Elevation Data
Table 3 -	Historical Groundwater Analytical Data (TPHG and BTEX)
Table 4 -	Historical Groundwater Analytical Data (TRPH, TPHD, and Metals)
Table 5 -	Historical Groundwater Analytical Data (Volatile Organic Compounds)
Table 6 -	Approximate Cumulative Floating Product Recovered
Table 7 -	Soil-Vapor Extraction System Operation and Performance Data
Table 8 -	Field Vapor Monitoring Results and Destruction Efficiency
Table 9 -	Soil-Vapor Extraction Well Data
Figure 1 -	Site Location
Figure 2 -	Groundwater Data, Second Quarter 1995
Figure 3 -	Tetrachloroethene (PCE) Concentrations in Groundwater, Second Quarter 1995
Appendix A -	Field Data Sheets, Second Quarter 1995 Groundwater Monitoring Event
Appendix B -	Analytical Results and Chain-of-Custody Documentation, Groundwater Monitoring, Second Quarter 1995
Appendix C -	Analytical Results and Chain-of-Custody Documentation for SVE System Air Samples, Second Quarter 1995
Appendix D -	Operation and Maintenance Field Data Sheets for On-Site SVE System, Second Quarter 1995

cc: Barney Chan, ACHCSA
Kevin Graves, RWQCB-SFBR
Richard Gilcrease, Drake Builders
Beth Dorris, ARCO Legal Department
John Young, EMCON

Table 1
Groundwater Monitoring Data
Second Quarter 1995

10600 and 10700 MacArthur Boulevard
Oakland, California

Date: 09-11-95
Project Number: 0805-120.04

Well Designation	Water Level Field Date	TOC Elevation	Depth to Water	Ground-Water Elevation	Floating Product Thickness	Ground-Water Flow Direction	Hydraulic Gradient	Water Sample Field Date	TPHG	Benzene	Toluene	Ethyl-benzene	Total Xylenes
		ft-MSL	feet	ft-MSL	feet	MWN	foot/foot		µg/L	µg/L	µg/L	µg/L	µg/L
MW-1	06-05-95	55.92	25.71	30.21	ND	FG	FG	06-05-95	<84*	<0.5	<0.5	<0.5	<0.5
MW-2	06-05-95	55.10	15.65	39.45	ND	FG	FG	06-05-95	1800	59	10	53	130
MW-3	06-05-95	56.55	26.34	30.21	ND	FG	FG	06-05-95	<970*	<1**	<1**	1.1	1.8
MW-4	06-05-95	55.98	25.79	30.19	ND	FG	FG	06-05-95	<1200*	<1**	<1**	<1**	<1**
MW-5	06-05-95	55.43	25.30	30.13	ND	FG	FG	06-05-95	<130*	<0.5	<0.5	<0.5	<0.5
MW-6	06-05-95	61.21	31.15	30.06	ND	FG	FG	06-05-95	<750*	<0.5	<0.5	<0.5	<0.5
MW-7	06-05-95	58.22	19.68	38.54	ND	FG	FG	06-05-95	36000	90	51	450	2000
MW-8	06-05-95	53.65	23.48	30.17	ND	FG	FG	06-05-95	<50	<0.5	<0.5	<0.5	<0.5
RW-1	06-05-95	56.32	26.20	30.12	ND	FG	FG	06-05-95	<50	<0.5	<0.5	<0.5	<0.5
WGR-3	06-05-95	NR	19.25	NR	ND	NR	NR	06-05-95	<50	<0.5	<0.5	<0.5	<0.5

TOC: top of casing (Groundwater elevation = TOC - depth to water)
ft-MSL: elevation in feet, relative to mean sea level
MWN: ground-water flow direction and gradient apply to the entire monitoring well network
TPHG: total petroleum hydrocarbons as gasoline
µg/L =micrograms per liter
ND: none detected
FG: flat gradient; the groundwater gradient over the local area was nearly flat
*. raised method reporting limit due to matrix interference; the sample contains a single non-fuel component eluting in the gasoline range and quantitated as gasoline (possibly PCE), and the chromatogram does not match the typical gasoline fingerprint
**: raised method reporting limit due to matrix interference requiring sample dilution
NR: not reported; data not available or not measurable

Table 2
Historical Groundwater Elevation Data

10600 and 10700 MacArthur Boulevard
Oakland, California

Date: 09-11-95
Project Number: 0805-120.04

Well Designation	Water Level Field Date	TOC Elevation ft-MSL	Depth to Water feet	Ground-Water Elevation ft-MSL	Floating Product Thickness feet	Ground-Water Flow Direction MWN	Hydraulic Gradient foot/foot
MW-1	04-17-89	55.91	33.04	22.87	ND	NR	NR
MW-1	04-24-89	55.91	33.84	22.07	ND	NR	NR
MW-1	10-13-89	55.91	37.19	18.72	ND	NR	NR
MW-1	02-01-90	55.91	36.73	19.18	ND	NR	NR
MW-1	07-31-90	55.91	36.42	19.49	ND	NR	NR
MW-1	08-01-90	55.91	36.41	19.50	ND	NR	NR
MW-1	08-28-90	55.91	36.88	19.03	ND	NR	NR
MW-1	10-30-90	55.91	37.73	18.18	ND	NR	NR
MW-1	11-20-90	55.91	37.92	17.99	ND	NR	NR
MW-1	12-19-90	55.91	37.90	18.01	ND	NR	NR
MW-1	01-30-91	55.91	38.06	17.85	ND	NR	NR
MW-1	02-27-91	55.91	37.66	18.25	ND	NR	NR
MW-1	03-20-91	55.91	36.77	19.14	ND	NR	NR
MW-1	04-30-91	55.91	34.63	21.28	ND	NR	NR
MW-1	05-31-91	55.91	34.83	21.08	ND	NR	NR
MW-1	07-24-91	55.91	35.96	19.95	ND	NR	NR
MW-1	08-06-91	55.91	36.21	19.70	ND	NR	NR
MW-1	09-03-91	55.91	36.74	19.17	ND	NR	NR
MW-1	10-17-91	55.91	37.57	18.34	ND	NR	NR
MW-1	11-05-91	55.91	37.65	18.26	ND	NR	NR
MW-1	12-24-91	55.91	38.14	17.77	ND	NR	NR
MW-1	01-19-92	55.91	37.62	18.29	ND	NR	NR
MW-1	02-20-92	55.91	36.23	19.68	ND	NR	NR
MW-1	03-10-92	55.91	34.58	21.33	ND	NR	NR
MW-1	04-20-92	55.91	32.82	23.09	ND	NR	NR
MW-1	05-15-92	55.91	33.17	22.74	ND	NR	NR
MW-1	06-30-92	55.91	34.55	21.36	ND	NR	NR
MW-1	07-15-92	55.91	34.90	21.01	ND	NR	NR
MW-1	08-25-92	55.92	35.34	20.58	ND	NR	NR
MW-1	09-09-92	55.92	35.71	20.21	ND	NR	NR
MW-1	10-31-92	55.92	36.62	19.30	ND	NR	NR
MW-1	11-20-92	55.92	36.90	19.02	ND	NR	NR
MW-1	12-16-92	55.92	36.18	19.74	ND	NR	NR
MW-1	01-22-93	55.92	32.24	23.68	ND	NR	NR
MW-1	02-12-93	55.92	30.65	25.27	ND	NR	NR
MW-1	03-26-93	55.92	28.36	27.56	ND	NR	NR
MW-1	04-30-93	55.92	28.45	27.47	ND	NR	NR
MW-1	05-12-93	55.92	28.88	27.04	ND	NR	NR
MW-1	06-17-93	55.92	29.67	26.25	ND	NR	NR
MW-1	08-18-93	55.92	31.44	24.48	ND	NR	NR
MW-1	11-10-93	55.92	33.33	22.59	ND	NR	NR
MW-1	02-04-94	55.92	24.48	31.44	ND	NR	NR
MW-1	05-02-94	55.92	31.66	24.26	ND	NR	NR
MW-1	08-03-94	55.92	32.54	23.38	ND	SW	0.002
MW-1	12-06-94	55.92	31.89	24.03	ND	W	0.001
MW-1	03-10-95	55.92	26.26	29.66	ND	NNE	0.003
MW-1	06-05-95	55.92	25.71	30.21	ND	FG	FG

Table 2
Historical Groundwater Elevation Data

10600 and 10700 MacArthur Boulevard
Oakland, California

Date: 09-11-95
Project Number: 0805-120.04

Well Designation	Water Level Field Date	TOC Elevation ft-MSL	Depth to Water feet	Ground-Water Elevation ft-MSL	Floating Product Thickness feet	Ground-Water Flow Direction MWN	Hydraulic Gradient foot/foot
MW-2	04-17-89	55.35	17.20	38.15	ND	NR	NR
MW-2	04-24-89	55.35	17.83	37.52	ND	NR	NR
MW-2	10-13-89	55.35	^20.15	^35.20	0.03	NR	NR
MW-2	02-01-90	55.35	NR	NR	NR	NR	NR
MW-2	07-31-90	55.35	18.90	36.45	ND	NR	NR
MW-2	08-01-90	55.35	^18.23	^37.03	1.04	NR	NR
MW-2	08-28-90	55.35	^21.25	^34.10	0.83	NR	NR
MW-2	10-30-90	55.35	^24.21	^31.14	1.04	NR	NR
MW-2	11-20-90	55.35	^25.08	^30.27	0.60	NR	NR
MW-2	12-19-90	55.35	^18.23	^37.12	ND	NR	NR
MW-2	01-30-91	55.35	^19.47	^35.88	0.03	NR	NR
MW-2	02-27-91	55.35	^18.84	^36.51	0.02	NR	NR
MW-2	03-20-91	55.35	^16.02	^39.33	0.01	NR	NR
MW-2	04-30-91	55.35	16.55	38.80	Sheen	NR	NR
MW-2	05-31-91	55.35	^18.41	^36.94	0.01	NR	NR
MW-2	07-24-91	55.35	19.81	35.54	Sheen	NR	NR
MW-2	08-06-91	55.35	^20.59	^34.76	0.14	NR	NR
MW-2	09-03-91	55.35	^23.23	^32.12	0.54	NR	NR
MW-2	10-17-91	55.35	^24.81	^30.54	0.20	NR	NR
MW-2	11-05-91	55.35	^18.88	^36.47	0.01	NR	NR
MW-2	12-24-91	55.35	^19.34	^36.01	0.09	NR	NR
MW-2	01-19-92	55.35	18.00	37.35	Sheen	NR	NR
MW-2	02-20-92	55.35	14.81	40.54	Skimmer	NR	NR
MW-2	03-10-92	55.35	14.95	40.40	Skimmer	NR	NR
MW-2	04-20-92	55.35	16.13	39.22	ND	NR	NR
MW-2	05-15-92	55.35	17.66	37.69	ND	NR	NR
MW-2	06-30-92	55.35	19.11	36.24	Sheen	NR	NR
MW-2	07-15-92	55.35	19.50	35.85	ND	NR	NR
MW-2	08-25-92	55.10	^21.35	^33.73	0.05	NR	NR
MW-2	09-09-92	55.10	^22.70	^32.40	0.05	NR	NR
MW-2	10-31-92	55.10	22.34	32.76	ND	NR	NR
MW-2	11-20-92	55.10	^19.85	^32.25	0.02^^	NR	NR
MW-2	12-16-92	55.10	NR	NR	NR	NR	NR
MW-2	01-22-93	55.10	13.10	42.00	ND	NR	NR
MW-2	02-12-93	55.10	14.71	40.39	0.05^^	NR	NR
MW-2	03-26-93	55.10 Not surveyed: well was inaccessible					
MW-2	04-30-93	55.10	15.48	39.62	ND	NR	NR
MW-2	05-12-93	55.10	^15.81	^39.29	0.01	NR	NR
MW-2	06-17-93	55.10	18.45	36.65	ND	NR	NR
MW-2	08-18-93	55.10	NR	NR	NR	NR	NR
MW-2	11-10-93	55.10	21.24	33.86	ND^^	NR	NR
MW-2	02-04-94	55.10	16.42	38.68	ND	NR	NR
MW-2	05-02-94	55.10	16.15	38.95	ND	NR	NR
MW-2	08-03-94	55.10 Not surveyed: well was inaccessible due to a parked vehicle					
MW-2	12-06-94	55.10	14.74	40.36	Sheen	W	0.001
MW-2	03-10-95	55.10	13.98	41.12	ND	NNE	0.003
MW-2	06-05-95	55.10	15.65	39.45	ND	FG	FG

Table 2
Historical Groundwater Elevation Data

10600 and 10700 MacArthur Boulevard
Oakland, California

Date: 09-11-95
Project Number: 0805-120.04

Well Designation	Water Level Field Date	TOC Elevation ft-MSL	Depth to Water feet	Ground-Water Elevation ft-MSL	Floating Product Thickness feet	Ground-Water Flow Direction MWN	Hydraulic Gradient foot/foot
MW-3	04-24-89	56.55	34.47	22.08	ND	NR	NR
MW-3	10-13-89	56.55	37.60	18.95	ND	NR	NR
MW-3	02-01-90	56.55	37.20	19.35	ND	NR	NR
MW-3	07-31-90	56.55	36.90	19.65	ND	NR	NR
MW-3	08-01-90	56.55	36.87	19.68	ND	NR	NR
MW-3	08-28-90	56.55	37.33	19.22	ND	NR	NR
MW-3	10-30-90	56.55	38.15	18.40	ND	NR	NR
MW-3	11-20-90	56.55	38.33	18.22	ND	NR	NR
MW-3	12-19-90	56.55	38.30	18.25	ND	NR	NR
MW-3	01-30-91	56.55	DRY	DRY	ND	NR	NR
MW-3	02-27-91	56.55	38.11	18.44	ND	NR	NR
MW-3	03-20-91	56.55	37.26	19.29	ND	NR	NR
MW-3	04-30-91	56.55	35.02	21.53	ND	NR	NR
MW-3	05-31-91	56.55	35.26	21.29	ND	NR	NR
MW-3	07-24-91	56.55	36.40	20.15	ND	NR	NR
MW-3	08-06-91	56.55	36.66	19.89	ND	NR	NR
MW-3	09-03-91	56.55	37.20	19.35	ND	NR	NR
MW-3	10-17-91	56.55	38.04	18.51	ND	NR	NR
MW-3	11-05-91	56.55	38.08	18.47	ND	NR	NR
MW-3	12-24-91	56.55	DRY	DRY	ND	NR	NR
MW-3	01-19-92	56.55	38.07	18.48	ND	NR	NR
MW-3	02-20-92	56.55	36.71	19.84	ND	NR	NR
MW-3	03-10-92	56.55	34.96	21.59	ND	NR	NR
MW-3	04-20-92	56.55	33.20	23.35	ND	NR	NR
MW-3	05-15-92	56.55	33.70	22.85	ND	NR	NR
MW-3	06-30-92	56.55	34.97	21.58	ND	NR	NR
MW-3	07-15-92	56.55	35.35	21.20	ND	NR	NR
MW-3	08-25-92	56.55	35.94	20.61	ND	NR	NR
MW-3	09-09-92	56.55	36.19	20.36	ND	NR	NR
MW-3	10-31-92	56.55	36.13	20.42	ND	NR	NR
MW-3	11-20-92	56.55	37.40	19.15	ND	NR	NR
MW-3	12-16-92	56.55	36.68	19.87	ND	NR	NR
MW-3	01-22-93	56.55	32.58	23.97	ND	NR	NR
MW-3	02-12-93	56.55	30.86	25.69	ND	NR	NR
MW-3	03-26-93	56.55	28.60	27.95	ND	NR	NR
MW-3	04-30-93	56.55	28.79	27.76	ND	NR	NR
MW-3	05-12-93	56.55	29.17	27.38	ND	NR	NR
MW-3	06-17-93	56.55	30.11	26.44	ND	NR	NR
MW-3	08-18-93	56.55	31.91	24.64	ND	NR	NR
MW-3	11-10-93	56.55	33.80	22.75	ND	NR	NR
MW-3	02-04-94	56.55	33.58	22.97	ND	NR	NR
MW-3	05-02-94	56.55	32.16	24.39	ND	NR	NR
MW-3	08-03-94	56.55	33.09	23.46	ND	SW	0.002
MW-3	12-06-94	56.55	32.46	24.09	ND	W	0.001
MW-3	03-10-95	56.55	26.74	29.81	ND	NNE	0.003
MW-3	06-05-95	56.55	26.34	30.21	ND	FG	FG

Table 2
Historical Groundwater Elevation Data

10600 and 10700 MacArthur Boulevard
Oakland, California

Date: 09-11-95
Project Number: 0805-120.04

Well Designation	Water Level Field Date	TOC Elevation ft-MSL	Depth to Water feet	Ground-Water Elevation ft-MSL	Floating Product Thickness feet	Ground-Water Flow Direction MWN	Hydraulic Gradient foot/foot
MW-4	04-17-89	55.94	33.87	22.07	ND	NR	NR
MW-4	04-24-89	55.94	33.76	22.18	ND	NR	NR
MW-4	10-13-89	55.94	37.03	18.91	ND	NR	NR
MW-4	02-01-90	55.94	36.57	19.37	ND	NR	NR
MW-4	07-31-90	55.94	36.39	19.55	ND	NR	NR
MW-4	08-01-90	55.94	36.32	19.62	ND	NR	NR
MW-4	08-28-90	55.94	36.79	19.15	ND	NR	NR
MW-4	10-30-90	55.94	37.62	18.32	ND	NR	NR
MW-4	11-20-90	55.94	37.82	18.12	ND	NR	NR
MW-4	12-19-90	55.94	37.74	18.20	ND	NR	NR
MW-4	01-30-91	55.94	37.97	17.97	ND	NR	NR
MW-4	02-27-91	55.94	37.52	18.42	ND	NR	NR
MW-4	03-20-91	55.94	36.69	19.25	ND	NR	NR
MW-4	04-30-91	55.94	34.48	21.46	ND	NR	NR
MW-4	05-31-91	55.94	34.73	21.21	ND	NR	NR
MW-4	07-24-91	55.94	35.86	20.08	ND	NR	NR
MW-4	08-06-91	55.94	36.15	19.79	ND	NR	NR
MW-4	09-03-91	55.94	36.66	19.28	ND	NR	NR
MW-4	10-17-91	55.94	37.49	18.45	ND	NR	NR
MW-4	11-05-91	55.94	37.54	18.40	ND	NR	NR
MW-4	12-24-91	55.94	38.01	17.93	ND	NR	NR
MW-4	01-19-92	55.94	37.48	18.46	ND	NR	NR
MW-4	02-20-92	55.94	36.11	19.83	ND	NR	NR
MW-4	03-10-92	55.94	34.96	20.98	ND	NR	NR
MW-4	04-20-92	55.94	32.60	23.34	ND	NR	NR
MW-4	05-15-92	55.94	33.12	22.82	ND	NR	NR
MW-4	06-30-92	55.94	34.06	21.88	ND	NR	NR
MW-4	07-15-92	55.94	NR	NR	NR	NR	NR
MW-4	08-25-92	55.98	35.22	20.76	ND	NR	NR
MW-4	09-09-92	55.98	35.63	20.35	ND	NR	NR
MW-4	10-31-92	55.98	33.84	22.14	ND	NR	NR
MW-4	11-20-92	55.98	36.87	19.11	ND	NR	NR
MW-4	12-16-92	55.98	36.09	19.89	ND	NR	NR
MW-4	01-22-93	55.98	31.98	24.00	ND	NR	NR
MW-4	02-12-93	55.98	30.31	25.67	ND	NR	NR
MW-4	03-26-93	55.98	27.97	28.01	ND	NR	NR
MW-4	04-30-93	55.98	28.24	27.74	ND	NR	NR
MW-4	05-12-93	55.98	28.60	27.38	ND	NR	NR
MW-4	06-17-93	55.98	29.54	26.44	ND	NR	NR
MW-4	08-18-93	55.98	31.37	24.61	ND	NR	NR
MW-4	11-10-93	55.98	33.27	22.71	ND	NR	NR
MW-4	02-04-94	55.98	33.07	22.91	ND	NR	NR
MW-4	05-02-94	55.98	31.60	24.38	ND	NR	NR
MW-4	08-03-94	55.98	32.53	23.45	ND	SW	0.002
MW-4	12-06-94	55.98	31.91	24.07	ND	W	0.001
MW-4	03-10-95	55.98	26.22	29.76	ND	NNE	0.003
MW-4	06-05-95	55.98	25.79	30.19	ND	FG	FG

Table 2
Historical Groundwater Elevation Data

10600 and 10700 MacArthur Boulevard
Oakland, California

Date: 09-11-95
Project Number: 0805-120.04

Well Designation	Water Level Field Date	TOC Elevation ft-MSL	Depth to Water feet	Ground-Water Elevation ft-MSL	Floating Product Thickness feet	Ground-Water Flow Direction MWN	Hydraulic Gradient foot/foot
MW-5	04-17-89	55.43	33.17	22.26	ND	NR	NR
MW-5	04-24-89	55.43	33.06	22.37	ND	NR	NR
MW-5	10-13-89	55.43	36.33	19.10	ND	NR	NR
MW-5	02-01-90	55.43	35.96	19.47	ND	NR	NR
MW-5	07-31-90	55.43	35.70	19.73	ND	NR	NR
MW-5	08-01-90	55.43	35.69	19.74	ND	NR	NR
MW-5	08-28-90	55.43	36.14	19.29	ND	NR	NR
MW-5	10-30-90	55.43	36.94	18.49	ND	NR	NR
MW-5	11-20-90	55.43	37.09	18.34	ND	NR	NR
MW-5	12-19-90	55.43	37.05	18.38	ND	NR	NR
MW-5	01-30-91	55.43	37.26	18.17	ND	NR	NR
MW-5	02-27-91	55.43	36.81	18.62	ND	NR	NR
MW-5	03-20-91	55.43	36.04	19.39	ND	NR	NR
MW-5	04-30-91	55.43	33.75	21.68	ND	NR	NR
MW-5	05-31-91	55.43	34.01	21.42	ND	NR	NR
MW-5	07-24-91	55.43	35.20	20.23	ND	NR	NR
MW-5	08-06-91	55.43	35.48	19.95	ND	NR	NR
MW-5	09-03-91	55.43	36.00	19.43	ND	NR	NR
MW-5	10-17-91	55.43	36.84	18.59	ND	NR	NR
MW-5	11-05-91	55.43	36.86	18.57	ND	NR	NR
MW-5	12-24-91	55.43	37.31	18.12	ND	NR	NR
MW-5	01-19-92	55.43	36.95	18.48	ND	NR	NR
MW-5	02-20-92	55.43	35.39	20.04	ND	NR	NR
MW-5	03-10-92	55.43	33.67	21.76	ND	NR	NR
MW-5	04-20-92	55.43	31.80	23.63	ND	NR	NR
MW-5	05-15-92	55.43	32.37	23.06	ND	NR	NR
MW-5	06-30-92	55.43	34.00	21.43	ND	NR	NR
MW-5	07-15-92	55.43	34.32	21.11	ND	NR	NR
MW-5	08-25-92	55.43	35.76	19.67	ND	NR	NR
MW-5	09-09-92	55.43	34.97	20.46	ND	NR	NR
MW-5	10-31-92	55.43	35.97	19.46	ND	NR	NR
MW-5	11-20-92	55.43	36.26	19.17	ND	NR	NR
MW-5	12-16-92	55.43	35.45	19.98	ND	NR	NR
MW-5	01-22-93	55.43	31.05	24.38	ND	NR	NR
MW-5	02-12-93	55.43	29.42	26.01	ND	NR	NR
MW-5	03-26-93	55.43	27.07	28.36	ND	NR	NR
MW-5	04-30-93	55.43	27.40	28.03	ND	NR	NR
MW-5	05-12-93	55.43	27.83	27.60	ND	NR	NR
MW-5	06-17-93	55.43	28.84	26.59	ND	NR	NR
MW-5	08-18-93	55.43	30.75	24.68	ND	NR	NR
MW-5	11-10-93	55.43	32.70	22.73	ND	NR	NR
MW-5	02-04-94	55.43	32.45	22.98	ND	NR	NR
MW-5	05-02-94	55.43	31.06	24.37	ND	NR	NR
MW-5	08-03-94	55.43	32.05	23.38	ND	SW	0.002
MW-5	12-06-94	55.43	31.44	23.99	ND	W	0.001
MW-5	03-10-95	55.43	25.62	29.81	ND	NNE	0.003
MW-5	06-05-95	55.43	25.30	30.13	ND	FG	FG

Table 2
Historical Groundwater Elevation Data

10600 and 10700 MacArthur Boulevard
Oakland, California

Date: 09-11-95
Project Number: 0805-120.04

Well Designation	Water Level Field Date	TOC Elevation	Depth to Water	Ground-Water Elevation	Floating Product Thickness	Ground-Water Flow Direction	Hydraulic Gradient
		ft-MSL	feet	ft-MSL	feet	MWN	foot/foot
MW-6	06-30-92	61.21	35.50	25.71	ND	NR	NR
MW-6	07-15-92	61.21	39.89	21.32	ND	NR	NR
MW-6	08-25-92	61.21	34.90	26.31	ND	NR	NR
MW-6	09-09-92	61.21	Not surveyed: well was paved over				
MW-6	10-31-92	61.21	NR	NR	NR	NR	NR
MW-6	11-20-92	61.21	Not surveyed: well was paved over				
MW-6	12-16-92	61.21	NR	NR	NR	NR	NR
MW-6	01-22-93	61.21	36.52	24.69	ND	NR	NR
MW-6	02-12-93	61.21	35.65	25.56	ND	NR	NR
MW-6	03-28-93	61.21	33.33	27.88	ND	NR	NR
MW-6	04-30-93	61.21	33.56	27.65	ND	NR	NR
MW-6	05-12-93	61.21	33.95	27.26	ND	NR	NR
MW-6	06-17-93	61.21	34.90	26.31	ND	NR	NR
MW-6	08-18-93	61.21	36.72	24.49	ND	NR	NR
MW-6	11-10-93	61.21	38.64	22.57	ND	NR	NR
MW-6	02-04-94	61.21	38.48	22.73	ND	NR	NR
MW-6	05-02-94	61.21	37.02	24.19	ND	NR	NR
MW-6	08-03-94	61.21	37.97	23.24	ND	SW	0.002
MW-6	12-06-94	61.21	37.33	23.88	ND	W	0.001
MW-6	03-10-95	61.21	31.54	29.67	ND	NNE	0.003
MW-6	06-05-95	61.21	31.15	30.06	ND	FG	FG

Table 2
Historical Groundwater Elevation Data

10600 and 10700 MacArthur Boulevard
Oakland, California

Date: 09-11-95
Project Number: 0805-120.04

Well Designation	Water Level Field Date	TOC Elevation ft-MSL	Depth to Water feet	Ground-Water Elevation ft-MSL	Floating Product Thickness feet	Ground-Water Flow Direction MWN	Hydraulic Gradient foot/foot
MW-7	06-30-92	58.22	23.70	34.52	ND	NR	NR
MW-7	07-15-92	58.22	23.10	35.12	ND	NR	NR
MW-7	08-25-92	58.22	34.23	23.99	ND	NR	NR
MW-7	09-09-92	58.22	^26.30	^31.92	1.31	NR	NR
MW-7	10-31-92	58.22	35.44	22.78	ND	NR	NR
MW-7	11-20-92	58.22	^23.47	^34.75	0.02	NR	NR
MW-7	12-16-92	58.22	^19.07	^39.15	0.04	NR	NR
MW-7	01-22-93	58.22	^16.56	^41.66	0.02	NR	NR
MW-7	02-12-93	58.22	^18.22	^40.00	0.04	NR	NR
MW-7	03-26-93	58.22	18.04	40.18	ND	NR	NR
MW-7	04-30-93	58.22	19.34	38.88	NR	NR	NR
MW-7	05-12-93	58.22	^19.80	^38.42	0.01	NR	NR
MW-7	06-17-93	58.22	^22.63	^35.59	0.01	NR	NR
MW-7	08-18-93	58.22	22.44	35.78	0.01	NR	NR
MW-7	11-10-93	58.22	24.51	33.71	ND^^	NR	NR
MW-7	02-04-94	58.22	20.78	37.44	ND	NR	NR
MW-7	05-02-94	58.22	20.51	37.71	ND	NR	NR
MW-7	08-03-94	58.22	22.66	35.56	ND	SW	0.002
MW-7	12-06-94	58.22	18.37	## 39.86	0.02	W	0.001
MW-7	03-10-95	58.22	17.69	40.53	ND^^	NNE	0.003
MW-7	06-05-95	58.22	19.68	38.54	ND	FG	FG

Table 2
Historical Groundwater Elevation Data

10600 and 10700 MacArthur Boulevard
Oakland, California

Date: 09-11-95
Project Number: 0805-120.04

Well Designation	Water Level Field Date	TOC Elevation ft-MSL	Depth to Water feet	Ground-Water Elevation ft-MSL	Floating Product Thickness feet	Ground-Water Flow Direction MWN	Hydraulic Gradient foot/foot
MW-8	08-25-92	53.65	NR	NR	NR	NR	NR
MW-8	09-09-92	53.65	33.20	20.45	ND	NR	NR
MW-8	10-31-92	53.65	37.12	16.53	ND	NR	NR
MW-8	11-24-92	53.65	34.45	19.20	ND	NR	NR
MW-8	12-16-92	53.65	NR	NR	NR	NR	NR
MW-8	01-22-93	53.65	28.59	25.06	ND	NR	NR
MW-8	02-12-93	53.65	27.57	26.08	ND	NR	NR
MW-8	03-26-93	53.65	25.16	28.49	ND	NR	NR
MW-8	04-30-93	53.65	25.50	28.15	ND	NR	NR
MW-8	05-12-93	53.65	25.95	27.70	ND	NR	NR
MW-8	06-17-93	53.65	NR	NR	NR	NR	NR
MW-8	08-18-93	53.65	28.97	24.68	ND	NR	NR
MW-8	11-10-93	53.65	30.96	22.69	ND	NR	NR
MW-8	02-04-94	53.65	30.73	22.92	ND	NR	NR
MW-8	05-02-94	53.65	29.26	24.39	ND	NR	NR
MW-8	08-03-94	53.65	30.33	23.32	ND	SW	0.002
MW-8	12-06-94	53.65	29.66	23.99	ND	W	0.001
MW-8	03-10-95	53.65	23.60	30.05	ND	NNE	0.003
MW-8	06-05-95	53.65	23.48	30.17	ND	FG	FG

Table 2
Historical Groundwater Elevation Data

10600 and 10700 MacArthur Boulevard
Oakland, California

Date: 09-11-95
Project Number: 0805-120.04

Well Designation	Water Level Field Date	TOC Elevation	Depth to Water	Ground-Water Elevation	Floating Product Thickness	Ground-Water Flow Direction	Hydraulic Gradient
		ft-MSL	feet	ft-MSL	feet	MWN	foot/foot
RW-1	11-05-91	56.32	37.89	18.43	ND	NR	NR
RW-1	12-24-91	56.32	38.35	17.97	ND	NR	NR
RW-1	01-19-92	56.32	37.82	18.50	ND	NR	NR
RW-1	02-20-92	56.32	36.42	19.90	ND	NR	NR
RW-1	03-10-92	56.32	34.74	21.58	ND	NR	NR
RW-1	04-20-92	56.32	32.90	23.42	ND	NR	NR
RW-1	05-15-92	56.32	33.43	22.89	ND	NR	NR
RW-1	06-30-92	56.32	34.74	21.58	ND	NR	NR
RW-1	07-15-92	56.32	35.12	21.20	ND	NR	NR
RW-1	08-25-92	56.32	36.75	19.57	ND	NR	NR
RW-1	09-09-92	56.32	35.99	20.33	ND	NR	NR
RW-1	10-31-92	56.32	34.32	22.00	ND	NR	NR
RW-1	11-20-92	56.32	37.11	19.21	ND	NR	NR
RW-1	12-16-92	56.32	36.40	19.92	ND	NR	NR
RW-1	01-22-93	56.32	32.30	24.02	ND	NR	NR
RW-1	02-12-93	56.32	30.64	25.68	ND	NR	NR
RW-1	03-26-93	56.32	28.32	28.00	ND	NR	NR
RW-1	04-30-93	56.32	28.55	27.77	ND	NR	NR
RW-1	05-12-93	56.32	28.94	27.38	ND	NR	NR
RW-1	06-17-93	56.32	29.89	26.43	ND	NR	NR
RW-1	08-18-93	56.32	31.74	24.58	ND	NR	NR
RW-1	11-10-93	56.32	33.61	22.71	ND	NR	NR
RW-1	02-04-94	56.32	33.43	22.89	ND	NR	NR
RW-1	05-02-94	56.32	31.96	24.36	ND	NR	NR
RW-1	08-03-94	56.32	32.90	23.42	ND	SW	0.002
RW-1	12-06-94	56.32	32.24	24.08	ND	W	0.001
RW-1	03-10-95	56.32	26.48	29.84	Sheen	NNE	0.003
RW-1	06-05-95	56.32	26.20	30.12	ND	FG	FG

Table 2
Historical Groundwater Elevation Data

10600 and 10700 MacArthur Boulevard
Oakland, California

Date: 09-11-95
Project Number: 0805-120.04

Well Designation	Water Level Field Date	TOC Elevation ft-MSL	Depth to Water feet	Ground-Water Elevation ft-MSL	Floating Product Thickness feet	Ground-Water Flow Direction MWN	Hydraulic Gradient foot/foot
WGR-3	05-02-94	NR	20.06	NR	ND	NR	NR
WGR-3	08-03-94	NR	22.30	NR	ND	NR	NR
WGR-3	12-06-94	NR	17.52	NR	ND	NR	NR
WGR-3	03-10-95	NR	15.20	NR	ND	NR	NR
WGR-3	06-05-95	NR	19.25	NR	ND	NR	NR

TOC: top of casing (Groundwater elevation = TOC - depth to water)
ft-MSL: elevation in feet, relative to mean sea level
MWN: ground-water flow direction and gradient apply to the entire monitoring well network
ND: none detected
NR: not reported; data not available or not measurable
SW: southwest
W: west
NNE: north-northeast
FG: flat gradient; the groundwater gradient over the local area was nearly flat
^: Depth to water (DTW) and groundwater elevation (GWE) were adjusted as follows: The thickness of the floating product (FPT) and the depth to water were recorded. The recorded thickness of floating product was then multiplied by 0.80 to obtain an approximate value for the displacement of water by the floating product The approximate displacement value was then subtracted from the measured depth to water to obtain a calculated depth to water (potentiometric surface). GWE = TOC - [DTW - (FPT x 0.8)]
^^: floating product entered the well during purging
DRY: dry well; groundwater was not detected
##: corrected elevation (Z'), such that: $Z' = Z + (h * 0.73)$ where: Z = measured elevation, h = floating product thickness, 0.73 = density ratio of oil to water

Table 3
Historical Groundwater Analytical Data
(TPHG and BTEX)

10600 and 10700 MacArthur Boulevard
Oakland, California

Date: 07-11-95
Project Number: 0805-120.04

Well Designation	Water Sample Field Date	TPHG µg/L	Benzene µg/L	Toluene µg/L	Ethyl-benzene µg/L	Total Xylenes µg/L
MW-1	04-24-89	<50	<0.5	<0.5	<0.5	<0.5
MW-1	10-13-89	<20	<0.5	<0.5	<0.5	<0.5
MW-1	02-01-90	91#	<0.3	<0.3	<0.3	0.36
MW-1	07-31-90	<20	<0.5	<0.5	<0.5	<0.5
MW-1	10-30-90	<50	<0.5	<0.5	<0.5	<0.5
MW-1	01-30-91	<50	<0.5	<0.5	<0.5	<0.5
MW-1	04-30-91	<30	<0.3	<0.3	<0.3	<0.3
MW-1	08-06-91	<30	<0.3	<0.3	<0.3	<0.3
MW-1	11-05-91	<30	<0.3	<0.3	<0.3	<0.3
MW-1	03-10-92	<50	<0.5	<0.5	<0.5	<0.5
MW-1	06-30-92	<50	<0.5	<0.5	<0.5	<0.5
MW-1	09-09-92	<50	<0.5	<0.5	<0.5	<0.5
MW-1	11-20-92	<50	<0.5	<0.5	<0.5	<0.5
MW-1	02-12-93	<50	<0.5	<0.5	<0.5	<0.5
MW-1	05-12-93	<100*	<0.5	<0.5	<0.5	<0.5
MW-1	08-18-93	<51*	<0.5	<0.5	<0.5	<0.5
MW-1	11-10-93	<50	<0.5	<0.5	<0.5	<0.5
MW-1	02-04-94	<50	<0.5	<0.5	<0.5	<0.5
MW-1	05-02-94	<50	<0.5	<0.5	<0.5	<0.5
MW-1	08-03-94	<50	<0.5	<0.5	<0.5	<0.5
MW-1	12-06-94	<50	<0.5	<0.5	<0.5	<0.5
MW-1	03-10-95	<57*	<0.5	<0.5	<0.5	<0.5
MW-1	06-05-95	<84*	<0.5	<0.5	<0.5	<0.5

Table 3
Historical Groundwater Analytical Data
(TPHG and BTEX)

10600 and 10700 MacArthur Boulevard
Oakland, California

Date: 07-11-95
Project Number: 0805-120.04

Well Desig-nation	Water Sample Field Date	TPHG	Benzene	Toluene	Ethyl-benzene	Total Xylenes
		µg/L	µg/L	µg/L	µg/L	µg/L
MW-2	04-24-89	165000	13000	21000	2100	12700
MW-2	10-13-89	Not sampled: well contained floating product				
MW-2	02-01-90	Not sampled: well contained floating product				
MW-2	07-31-90	240000	14000	24000	3000	17000
MW-2	10-30-90	Not sampled: well contained floating product				
MW-2	01-30-91	Not sampled: well contained floating product				
MW-2	04-30-91	Not sampled: well contained floating product				
MW-2	08-06-91	Not sampled: well contained floating product				
MW-2	11-05-91	Not sampled: well contained floating product				
MW-2	03-10-92	220000	8200	13000	4500	22000
MW-2	06-30-92	130000	10000	16000	4700	24000
MW-2	09-09-92	Not sampled: well contained floating product				
MW-2	11-20-92	Not sampled: well contained floating product				
MW-2	02-12-93	Not sampled: well contained floating product				
MW-2	05-12-93	Not sampled: well contained floating product				
MW-2	08-18-93	Not sampled:				
MW-2	11-10-93	Not sampled: floating product entered well during purging				
MW-2	02-04-94	2100	110	5.6	26	110
MW-2	05-02-94	3400	130	21	73	180
MW-2	08-03-94	Not sampled: well was inaccessible due to a parked vehicle				
MW-2	12-07-94	26000	570	43	220	1100
MW-2	03-11-95	2800	88	12	16	200
MW-2	06-05-95	1800	59	10	53	130

Table 3
Historical Groundwater Analytical Data
(TPHG and BTEX)

10600 and 10700 MacArthur Boulevard
Oakland, California

Date: 07-11-95
Project Number: 0805-120.04

Well Designation	Water Sample Field Date	TPHG µg/L	Benzene µg/L	Toluene µg/L	Ethyl-benzene µg/L	Total Xylenes µg/L
MW-3	04-24-89	560#	0.54	0.75	<0.5	<0.5
MW-3	10-12-89	450#	<0.5	<0.5	<0.5	<0.5
MW-3	02-01-90	360#	<0.3	<0.3	<0.3	0.85
MW-3	08-01-90	440#	<0.5	<0.5	<0.5	<0.5
MW-3	10-30-90	340#	<0.5	<0.5	<0.5	<0.5
MW-3	01-30-91	Not sampled: dry well				
MW-3	04-30-91	Not sampled: well was inaccessible due to construction				
MW-3	08-06-91	430#	<0.3	<0.3	<0.3	<0.3
MW-3	11-05-91	290#	<1.5	<1.5	<1.5	<1.5
MW-3	03-10-92	<360*	<0.5	<0.5	<0.5	<0.5
MW-3	06-30-92	<530*	<0.5	<0.5	<0.5	<0.5
MW-3	09-09-92	<290*	<0.5	<0.5	<0.5	<0.5
MW-3	11-20-92	<270*	<0.5	<0.5	<2.4**	<1.8**
MW-3	02-12-93	<500*	<0.5	<0.5	<0.5	<0.5
MW-3	05-12-93	<670*	<0.5	<0.5	<0.5	<0.5
MW-3	08-18-93	<590*	<0.5	<0.5	<0.5	<0.5
MW-3	11-10-93	<400*	<0.5	<0.5	<0.5	<0.9**
MW-3	02-04-94	<190*	<0.5	<0.5	<0.5	<0.5
MW-3	05-02-94	<480*	<0.5	<0.5	<0.5	<0.9**
MW-3	08-03-94	<250*	<0.5	<0.5	<0.5	<0.5
MW-3	12-06-94	<380*	<0.5	<0.5	<0.5	<0.5
MW-3	03-11-95	<440*	<0.5	<0.5	<0.5	0.7
MW-3	06-05-95	<970*	<1**	<1**	1.1	1.8

Table 3
Historical Groundwater Analytical Data
(TPHG and BTEX)

10600 and 10700 MacArthur Boulevard
Oakland, California

Date: 07-11-95
Project Number: 0805-120.04

Well Designation	Water Sample Field Date	TPHG µg/L	Benzene µg/L	Toluene µg/L	Ethyl-benzene µg/L	Total Xylenes µg/L
MW-4	04-24-89	2500#	270	1.4	<0.5	85
MW-4	10-13-89	760#	0.86	<0.5	1.2	<0.5
MW-4	02-01-90	680#	<0.3	<0.3	<0.3	1.6
MW-4	07-31-90	470#	<0.5	<0.5	<0.5	<0.5
MW-4	10-30-90	430#	<0.5	<0.5	<0.5	<0.5
MW-4	01-30-91	<50	<0.5	<0.5	1.2	<0.5
MW-4	04-30-91	600#	<0.3	0.3	<0.3	0.43
MW-4	08-06-91	520#	<0.3	<0.3	<0.3	<0.3
MW-4	11-05-91	900#	<3.0***	<3.0***	<3.0***	<3.0***
MW-4	03-10-92	<730*	<0.5	<0.5	<0.5	<0.5
MW-4	06-30-92	<670*	<0.5	<0.5	<2.3**	500
MW-4	09-09-92	<470*	<0.5	<0.5	<0.5	<0.5
MW-4	11-20-92	<680*	<0.5	<0.5	<6.3**	<3.2**
MW-4	02-12-93	<860*	<0.5	<0.5	<0.5	<0.5
MW-4	05-12-93	<670*	<0.5	<0.5	<1.4**	<1.3**
MW-4	08-18-93	<700*	<0.5	<0.5	<0.5	<0.5
MW-4	11-10-93	<460*	<0.5	<0.5	<0.5	<1.3**
MW-4	02-04-94	<480*	<0.5	<0.5	<0.5	1.4
MW-4	05-02-94	<490*	<0.5	<0.5	<0.5	<0.9**
MW-4	08-03-94	<400*	<0.5	<0.5	<0.5	<0.5
MW-4	12-06-94	<970*	<2.5**	<2.5**	<2.5**	<2.5**
MW-4	03-11-95	<780*	<1.0**	<1.0**	<1.0**	1
MW-4	06-05-95	<1200*	<1**	<1**	<1**	<1**

Table 3
Historical Groundwater Analytical Data
(TPHG and BTEX)

10600 and 10700 MacArthur Boulevard
Oakland, California

Date: 07-11-95
Project Number: 0805-120.04

Well Desig-nation	Water Sample Field Date	TPHG µg/L	Benzene µg/L	Toluene µg/L	Ethyl-benzene µg/L	Total Xylenes µg/L
MW-5	04-24-89	130#	0.67	<0.5	<0.5	<0.5
MW-5	10-13-89	75#	<0.5	<0.5	<0.5	<0.5
MW-5	02-01-90	81#	0.94	0.88	<0.3	1.8
MW-5	07-31-90	110#	<0.5	<0.5	<0.5	<0.5
MW-5	10-30-90	<50	<0.5	<0.5	<0.5	<0.5
MW-5	01-30-91	<50	<0.5	<0.5	<0.5	<0.5
MW-5	04-30-91	120#	<0.3	<0.3	<0.3	<0.3
MW-5	08-06-91	<30	<0.3	<0.3	<0.3	<0.3
MW-5	11-05-91	77#	1	3.6	0.6	2.6
MW-5	03-10-92	<110*	<0.5	<0.5	<0.5	<0.6**
MW-5	06-30-92	<50	<0.5	<0.5	<0.5	<0.5
MW-5	09-09-92	<50	<0.5	<0.5	<0.5	<0.5
MW-5	11-24-92	<50	<0.5	<0.5	<0.5	<0.5
MW-5	02-12-93	<150*	<0.5	<0.5	<0.5	<0.5
MW-5	05-12-93	<50	<0.5	<0.5	<0.5	<0.5
MW-5	08-18-93	<50	<0.5	<0.5	<0.5	<0.5
MW-5	11-10-93	<50	<0.5	<0.5	<0.5	<1.4**
MW-5	02-04-94	<50	<0.5	<0.5	<0.5	<0.5
MW-5	05-02-94	<50	<0.5	<0.5	<0.5	<0.5
MW-5	08-03-94	<50	<0.5	<0.5	<0.5	<0.5
MW-5	12-06-94	<550*	<0.5	0.6	1.1	2
MW-5	03-10-95	<110*	<0.5	<0.5	<0.5	<0.5
MW-5	06-05-95	<130*	<0.5	<0.5	<0.5	<0.5
MW-6	06-30-92	<850*	<0.5	<0.5	<0.5	<0.5
MW-6	09-09-92	Not sampled: well was paved over				
MW-6	11-20-92	Not sampled: well was paved over				
MW-6	02-12-93	<1900*	<2.5***	<2.5***	<2.5***	<2.5***
MW-6	05-12-93	<1600*	<2.5***	<2.5***	<2.5***	<2.5***
MW-6	08-18-93	<1500*	<2.5***	<2.5***	<2.5***	<2.5***
MW-6	11-10-93	<1000*	<2.5***	<2.5***	<2.5***	<2.5***
MW-6	02-04-94	<830*	<2.5***	<2.5***	<2.5***	3.1
MW-6	05-02-94	<860*	<1***	<1***	<1***	1.3
MW-6	08-03-94	<660*	<1***	<1***	<1***	<1***
MW-6	12-07-94	<720*	<1**	<1**	<1**	<1**
MW-6	03-11-95	<390*	<0.5	<0.5	<0.5	<0.5
MW-6	06-05-95	<750*	<0.5	<0.5	<0.5	<0.5

Table 3
Historical Groundwater Analytical Data
(TPHG and BTEX)

10600 and 10700 MacArthur Boulevard
Oakland, California

Date: 07-11-95
Project Number: 0805-120.04

Well Designation	Water Sample Field Date	TPHG µg/L	Benzene µg/L	Toluene µg/L	Ethyl-benzene µg/L	Total Xylenes µg/L
MW-7	06-30-92	71000	5100	6600	2300	14000
MW-7	09-09-92	Not sampled: well contained floating product				
MW-7	11-20-92	Not sampled: well contained floating product				
MW-7	02-12-93	Not sampled: well contained floating product				
MW-7	05-12-93	Not sampled: well contained floating product				
MW-7	08-18-93	Not sampled: well contained floating product				
MW-7	11-10-93	Not sampled: floating product entered the well during purging				
MW-7	02-04-94	40000	900	980	1100	9700
MW-7	05-02-94	38000	640	600	930	7200
MW-7	08-03-94	47000	1000	1200	1500	10000
MW-7	12-07-94	260000	<200***	380	2200	11000
MW-7	03-11-95	Not sampled: floating product entered the well during purging				
MW-7	06-05-95	36000	90	51	450	2000
MW-8	09-09-92	<50	3.4	<0.5	<0.5	0.7
MW-8	11-24-92	<50	<0.5	<0.5	<0.5	<0.5
MW-8	02-12-93	<50	<0.5	<0.5	<0.5	<0.5
MW-8	05-12-93	<50	<0.5	<0.5	<0.5	<0.5
MW-8	08-18-93	<50	<0.5	<0.5	<0.5	<0.5
MW-8	11-10-93	<50	<0.5	<0.5	<0.5	1.1
MW-8	02-04-94	<50	<0.5	<0.5	<0.5	<0.5
MW-8	05-02-94	<50	<0.5	<0.5	<0.5	<0.5
MW-8	08-03-94	<50	<0.5	<0.5	<0.5	<0.5
MW-8	12-07-94	<50	<0.5	<0.5	<0.5	<0.5
MW-8	03-10-95	<50	<0.5	<0.5	<0.5	<0.5
MW-8	06-05-95	<50	<0.5	<0.5	<0.5	<0.5
RW-1	11-05-91	750#	4.8	3.7	<3.0	<3.0
RW-1	03-10-92	<140*	<0.5	<0.5	<0.5	<0.6**
RW-1	06-30-92	<400*	<0.5	<0.5	<0.5	<0.5
RW-1	09-09-92	<520*	<0.5	<0.5	<0.5	<0.5
RW-1	11-24-92	<650*	<0.5	<0.5	<8.6**	<7.2**
RW-1	02-12-93	<260*	<0.5	<0.5	<0.5	<0.5
RW-1	05-12-93	<240*	<0.5	<0.5	<0.5	<0.5
RW-1	08-18-93	<230*	<0.5	<0.5	<0.5	<0.5
RW-1	11-10-93	<380*	<0.5	<0.5	<0.5	<0.8**
RW-1	02-04-94	<540*	<0.5	<0.5	<0.5	<1.5**
RW-1	05-02-94	<50	<0.5	<0.5	<0.5	<0.5
RW-1	08-03-94	<140*	<0.5	<0.5	<0.5	<0.5
RW-1	12-07-94	<79*	<0.5	<0.5	<0.5	<0.5
RW-1	03-10-95	<180*	<0.5	<0.5	<0.5	<0.5
RW-1	06-05-95	<50	<0.5	<0.5	<0.5	<0.5

Table 3
Historical Groundwater Analytical Data
(TPHG and BTEX)

10600 and 10700 MacArthur Boulevard
Oakland, California

Date: 07-11-95
Project Number: 0805-120.04

Well Designation	Water Sample Field Date	TPHG µg/L	Benzene µg/L	Toluene µg/L	Ethyl-benzene µg/L	Total Xylenes µg/L
WGR-3	05-02-94	<50	<0.5	<0.5	<0.5	<0.5
WGR-3	08-03-94	<50	<0.5	<0.5	<0.5	<0.5
WGR-3	12-07-94	<50	<0.5	<0.5	<0.5	0.6
WGR-3	03-11-95	<50	<0.5	<0.5	<0.5	<0.5
WGR-3	06-05-95	<50	<0.5	<0.5	<0.5	<0.5

TPHG: total petroleum hydrocarbons as gasoline
µg/L: micrograms per liter
#. based on new results, the chromatogram peaks previously interpreted to be TPHG and BTEX have been reinterpreted to be a single peak hydrocarbon (possibly PCE)
*: raised method reporting limit due to matrix interference, the sample contains a single non-fuel component eluting in the gasoline range and quantitated as gasoline (possibly PCE), and the chromatogram does not match the typical gasoline fingerprint
**: raised method reporting limit due to matrix interference requiring sample dilution
***: raised method reporting limit due to high analyte concentration requiring sample dilution

Table 4
Historical Groundwater Analytical Data
(TRPH, TPHD, and Metals)

10600 and 10700 MacArthur Boulevard
Oakland, California

Date: 07-11-95
Project Number: 0805-120.04

Well Designation	Water Sample Field Date	TOG or TRPH µg/L	TPHD µg/L	Cadmium by EPA 6010 µg/L	Chromium by EPA 6010 µg/L	Lead by EPA 7421 µg/L	Nickel by EPA 6010 µg/L	Zinc by EPA 6010 µg/L
MW-4	04-24-89	NA	NA	NA	NA	NA	NA	NA
MW-4	10-13-89	NA	NA	NA	NA	NA	NA	NA
MW-4	02-01-90	NA	NA	NA	NA	NA	NA	NA
MW-4	07-31-90	<500	240	NA	NA	NA	NA	NA
MW-4	10-30-90	<500	<100	NA	NA	NA	NA	NA
MW-4	01-30-91	<500	<100	NA	NA	NA	NA	NA
MW-4	04-30-91	NA	NA	NA	NA	NA	NA	NA
MW-4	08-06-91	NA	NA	<10	65	6.7	140	96
MW-4	11-05-91	NA	NA	NA	NA	NA	NA	NA
MW-4	03-10-92	<2500	NA	NA	NA	NA	NA	NA
MW-4	06-30-92	500	NA	NA	NA	NA	NA	NA
MW-4	09-09-92	3600	NA	NA	NA	NA	NA	NA
MW-4	11-20-92	800	NA	NA	NA	NA	NA	NA
MW-4	02-12-93	25000	NA	NA	NA	NA	NA	NA
MW-4	05-12-93	120000	NA	NA	NA	NA	NA	NA
MW-4	08-18-93	<500	NA	NA	NA	NA	NA	NA
MW-4	11-10-93	<500	NA	NA	NA	NA	NA	NA
MW-4	02-04-94	<500	NA	NA	NA	NA	NA	NA
MW-4	05-02-94	5900	NA	NA	NA	NA	NA	NA
MW-4	08-03-94	<500	NA	NA	NA	NA	NA	NA
MW-4	12-06-94	1800	NA	NA	NA	NA	NA	NA
MW-4	03-11-95	<500	NA	NA	NA	NA	NA	NA
MW-4	06-05-95	600	NA	NA	NA	NA	NA	NA

TOG: total oil and grease by standard methods 5520 C&F
TRPH: total recoverable petroleum hydrocarbons by USEPA Method 418.1
TPHD. total petroleum hydrocarbons as diesel by USEPA Method 3510/California DHS LUFT Method
µg/L: micrograms per liter
NA. not analyzed

Table 5
Historical Groundwater Analytical Data
(Volatile Organic Compounds)

10600 and 10700 MacArthur Boulevard
Oakland, California

Date: 07-11-95
Project Number: 0805-120.04

Well Designation	Water Sample Field Date	Halogenated Volatile Organic Compounds by EPA Method 601/8010 or 624/8240					BTEX by EPA Method 624/8240			
		PCE µg/L	TCE µg/L	1,2-DCE µg/L	cis-1,2-DCE µg/L	Freon 12 µg/L	Benzene µg/L	Toluene µg/L	Ethyl-benzene µg/L	Total Xylenes µg/L
MW-1	09-03-91	4.5	ND	ND	ND		ND	ND	ND	ND
MW-1	11-06-91	<2.0	<2.0	<2.0	<2.0		ND	ND	ND	ND
MW-1	03-10-92	8.2	ND	ND	ND		ND	ND	ND	ND
MW-1	06-30-92	15	ND	ND	ND		ND	ND	ND	ND
MW-1	09-09-92	6	ND	ND	ND		ND	ND	ND	ND
MW-1	11-20-92	2	ND	ND	ND		ND	ND	ND	ND
MW-1	02-12-93	92	ND	ND	ND		ND	ND	ND	ND
MW-1	05-12-93	280	ND	ND	ND		ND	ND	ND	ND
MW-1	08-18-93	120	ND	ND	ND		ND	ND	ND	ND
MW-1	11-10-93	46	ND	ND	ND		ND	ND	ND	ND
MW-1	02-04-94	22	<1	<1	<1		<1	<1	<1	<5
MW-1	05-02-94	35	<1	<1	<1		<1	<1	<1	<5
MW-1	08-03-94	14	<1		<1		<1	<1	<1	<5
MW-1	12-06-94	17	<1		<1		<1	<1	<1	<5
MW-1	03-10-95	170	<1		<1		<1	<1	<1	<5
MW-1	06-05-95	210	<5		<5		<5	<5	<5	<25

Table 5
Historical Groundwater Analytical Data
(Volatile Organic Compounds)

10600 and 10700 MacArthur Boulevard
Oakland, California

Date: 07-11-95
Project Number: 0805-120.04

Well Designation	Water Sample Field Date	Halogenated Volatile Organic Compounds by EPA Method 601/8010 or 624/8240					BTEX by EPA Method 624/8240			
		PCE	TCE	1,2-DCE	cis-1,2-DCE	Freon 12	Benzene	Toluene	Ethyl-benzene	Total Xylenes
		µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L
MW-2	09-03-91	Not sampled: well contained floating product								
MW-2	11-06-91	Not sampled: well contained floating product								
MW-2	03-10-92	0.9	ND	5.4	ND		ND	ND	ND	ND
MW-2	06-30-92	<2000	<2000	<2000	<2000		9300	18000	4200	27000
MW-2	09-09-92	Not sampled: well contained floating product								
MW-2	11-20-92	Not sampled: well contained floating product								
MW-2	02-12-93	Not sampled: well contained floating product								
MW-2	05-12-93	Not sampled: well contained floating product								
MW-2	08-18-93	Not sampled:								
MW-2	11-10-93	Not sampled: floating product entered the well during purging								
MW-2	02-04-94	<1	<1	<1	<1		170	9	36	160
MW-2	05-02-94	<1	<1	<1	<1		140	21	79	190
MW-2	08-03-94	Not sampled: well was inaccessible due to a parked car								
MW-2	12-06-94	<5	<5		<5		620	28	220	1200
MW-2	03-11-95	<1	<1		<1		110	12	15	240
MW-2	06-05-95	<1	<1		<1		83	14	72	190

Table 5
Historical Groundwater Analytical Data
(Volatile Organic Compounds)

10600 and 10700 MacArthur Boulevard
Oakland, California

Date: 07-11-95
Project Number: 0805-120.04

Well Designation	Water Sample Field Date	Halogenated Volatile Organic Compounds by EPA Method 601/8010 or 624/8240					BTEX by EPA Method 624/8240			
		PCE µg/L	TCE µg/L	1,2-DCE µg/L	cis-1,2-DCE µg/L	Freon 12 µg/L	Benzene µg/L	Toluene µg/L	Ethyl-benzene µg/L	Total Xylenes µg/L
MW-3	09-03-91	1600	ND	ND	ND		ND	ND	ND	ND
MW-3	11-06-91	400	ND	ND	ND		ND	ND	ND	ND
MW-3	03-10-92	980	5.6	ND	1	3.4	ND	ND	ND	ND
MW-3	06-30-92	1500	ND	ND	ND		ND	ND	ND	ND
MW-3	09-09-92	800	ND	ND	ND		ND	ND	ND	ND
MW-3	11-20-92	690	ND	ND	ND		ND	ND	ND	ND
MW-3	02-12-93	1200	ND	ND	ND		ND	ND	ND	ND
MW-3	05-12-93	1600	ND	ND	ND		ND	ND	ND	ND
MW-3	08-18-93	1300	ND	ND	ND		ND	ND	ND	ND
MW-3	11-10-93	1300	ND	ND	ND		ND	ND	ND	ND
MW-3	02-04-94	91	<5	<5	<5		<5	<5	<5	<25
MW-3	05-02-94	1600	<20	<20	<20		<20	<20	<20	<100
MW-3	08-03-94	680	<20		<20		<20	<20	<20	<100
MW-3	12-06-94	1100	<25		<25		<25	<25	<25	<125
MW-3	03-11-95	1700	<10		<10		<10	<10	<10	<50
MW-3	06-05-95	2500	<20		<20		<20	<20	<20	<100

Table 5
Historical Groundwater Analytical Data
(Volatile Organic Compounds)

10600 and 10700 MacArthur Boulevard
Oakland, California

Date: 07-11-95
Project Number: 0805-120.04

Well Designation	Water Sample Field Date	Halogenated Volatile Organic Compounds by EPA Method 601/8010 or 624/8240					BTEX by EPA Method 624/8240			
		PCE µg/L	TCE µg/L	1,2-DCE µg/L	cis-1,2-DCE µg/L	Freon 12 µg/L	Benzene µg/L	Toluene µg/L	Ethyl-benzene µg/L	Total Xylenes µg/L
MW-4	07-31-90	1600	7.5	0.7	ND		ND	ND	ND	ND
MW-4	10-30-90	3600	8.1	0.7	ND		ND	ND	ND	ND
MW-4	01-30-91	4900	12	ND	ND		ND	ND	ND	ND
MW-4	04-30-91	2200	ND	ND	ND		ND	ND	ND	ND
MW-4	08-06-91	1700	ND	ND	ND		ND	ND	ND	ND
MW-4	09-03-91	2000	ND	ND	ND		ND	ND	ND	ND
MW-4	11-06-91	1000	6.3	ND	ND		ND	ND	ND	ND
MW-4	03-10-92	2300	13	ND	4		ND	ND	ND	ND
MW-4	06-30-92	1800	ND	ND	ND		ND	ND	ND	ND
MW-4	09-09-92	1300	ND	ND	ND		ND	ND	ND	ND
MW-4	11-20-92	1700	ND	ND	ND		ND	ND	ND	ND
MW-4	02-12-93	1800	ND	ND	ND		ND	ND	ND	ND
MW-4	05-12-93	1500	ND	ND	ND		ND	ND	ND	ND
MW-4	08-18-93	1800	ND	ND	ND		ND	ND	ND	ND
MW-4	11-10-93	1800	ND	ND	ND		ND	ND	ND	ND
MW-4	02-04-94	1900	<20	<20	<20		<20	<20	<20	<100
MW-4	05-02-94	1700	<20	<20	<20		<20	<20	<20	<100
MW-4	08-03-94	1200	<20		<20		<20	<20	<20	<100
MW-4	12-06-94	2200	<20		<20		<20	<20	<20	<100
MW-4	03-11-95	2600	<20		<20		<20	<20	<20	<100
MW-4	06-05-95	3100	<20		<20		<20	<20	<20	<100

Table 5
Historical Groundwater Analytical Data
(Volatile Organic Compounds)

10600 and 10700 MacArthur Boulevard
Oakland, California

Date: 07-11-95
Project Number: 0805-120.04

Well Designation	Water Sample Field Date	Halogenated Volatile Organic Compounds by EPA Method 601/8010 or 624/8240					BTEX by EPA Method 624/8240			
		PCE µg/L	TCE µg/L	1,2-DCE µg/L	cis-1,2-DCE µg/L	Freon 12 µg/L	Benzene µg/L	Toluene µg/L	Ethyl-benzene µg/L	Total Xylenes µg/L
MW-5	08-06-91	7.3	ND	ND	ND		ND	ND	ND	ND
MW-5	09-03-91	25	ND	ND	ND		ND	ND	ND	ND
MW-5	11-06-91	12	ND	ND	ND		ND	ND	ND	ND
MW-5	03-10-92	300	1.3	ND	ND		ND	ND	ND	ND
MW-5	06-30-92	30	ND	ND	ND		ND	ND	ND	ND
MW-5	09-09-92	120	ND	ND	ND		ND	ND	ND	ND
MW-5	11-24-92	93	ND	ND	ND		ND	ND	ND	ND
MW-5	02-12-93	210	ND	ND	ND		ND	ND	ND	ND
MW-5	05-12-93	50	ND	ND	ND		ND	ND	ND	ND
MW-5	08-18-93	80	ND	ND	ND		ND	ND	ND	ND
MW-5	11-10-93	42	ND	ND	ND		ND	ND	ND	ND
MW-5	02-04-94	39	<1	<1	<1		<1	<1	<1	<5
MW-5	05-02-94	35	<1	<1	<1		<1	<1	<1	<5
MW-5	08-03-94	25	<1		<1		<1	<1	<1	<5
MW-5	12-06-94	1800	<20		<20		<20	<20	<20	<100
MW-5	03-10-95	270	<5		<5		<5	<5	<5	<25
MW-5	06-05-95	310	<5		<5		<5	<5	<5	<25

Table 5
Historical Groundwater Analytical Data
(Volatile Organic Compounds)

10600 and 10700 MacArthur Boulevard
Oakland, California

Date: 07-11-95
Project Number: 0805-120.04

Well Designation	Water Sample Field Date	Halogenated Volatile Organic Compounds by EPA Method 601/8010 or 624/8240					BTEX by EPA Method 624/8240			
		PCE	TCE	1,2-DCE	cis-1,2-DCE	Freon 12	Benzene	Toluene	Ethyl-benzene	Total Xylenes
		µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L
MW-6	06-30-92	2400	ND	ND	ND		ND	ND	ND	ND
MW-6	09-09-92	Not sampled: well was paved over								
MW-6	11-20-92	Not sampled: well was paved over								
MW-6	02-12-93	4200	ND	ND	ND		ND	ND	ND	ND
MW-6	05-12-93	3500	ND	ND	ND		ND	ND	ND	ND
MW-6	08-18-93	3000	ND	ND	ND		ND	ND	ND	ND
MW-6	11-10-93	3900	ND	ND	ND		ND	ND	ND	ND
MW-6	02-04-94	2900	<50	<50	<50		<50	<50	<50	<250
MW-6	05-02-94	2000	<50	<50	<50		<50	<50	<50	<250
MW-6	08-03-94	1400	<50		<50		<50	<50	<50	<250
MW-6	12-06-94	2000	<50		<50		<50	<50	<50	<250
MW-6	03-11-95	1300	<20		<20		<20	<20	<20	<100
MW-6	06-05-95	2000	<20		<20		<20	<20	<20	<100

Table 5
Historical Groundwater Analytical Data
(Volatile Organic Compounds)

10600 and 10700 MacArthur Boulevard
Oakland, California

Date: 07-11-95
Project Number: 0805-120.04

Well Designation	Water Sample Field Date	Halogenated Volatile Organic Compounds by EPA Method 601/8010 or 624/8240					BTEX by EPA Method 624/8240			
		PCE µg/L	TCE µg/L	1,2-DCE µg/L	cis-1,2-DCE µg/L	Freon 12 µg/L	Benzene µg/L	Toluene µg/L	Ethyl-benzene µg/L	Total Xylenes µg/L
MW-7	06-30-92	<1000	<1000	<1000	<1000		5100	6800	2300	16000
MW-7	09-09-92	Not sampled: well contained floating product								
MW-7	11-20-92	Not sampled: well contained floating product								
MW-7	02-12-93	Not sampled: well contained floating product								
MW-7	05-12-93	Not sampled: well contained floating product								
MW-7	08-18-93	Not sampled: well contained floating product								
MW-7	11-10-93	Not sampled: floating product entered the well during purging								
MW-7	02-04-94	<50	<50	<50	<50		940	950	1100	9100
MW-7	05-02-94	<50	<50	<50	<50		440	400	660	5200
MW-7	08-03-94	<50	<50		<50		640	770	960	6200
MW-7	12-06-94	<50	<50		<50		230	180	750	4800
MW-7	03-11-95	Not sampled: floating product entered the well during purging								
MW-7	06-05-95	<10	<10		<10		86	27	420	1400

Table 5
Historical Groundwater Analytical Data
(Volatile Organic Compounds)

10600 and 10700 MacArthur Boulevard
Oakland, California

Date: 07-11-95
Project Number: 0805-120.04

Well Designation	Water Sample Field Date	Halogenated Volatile Organic Compounds by EPA Method 601/8010 or 624/8240					BTEX by EPA Method 624/8240			
		PCE	TCE	1,2-DCE	cis-1,2-DCE	Freon 12	Benzene	Toluene	Ethyl-benzene	Total Xylenes
		µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L
MW-8	09-09-92	37	ND	ND	ND		4	ND	ND	ND
MW-8	11-24-92	2	ND	ND	ND		ND	ND	ND	ND
MW-8	02-12-93	<1	<1	<1	<1		ND	ND	ND	ND
MW-8	05-12-93	<1	<1	<1	<1		ND	ND	ND	ND
MW-8	08-18-93	<1	<1	<1	<1		ND	ND	ND	ND
MW-8	11-10-93	<1	<1	<1	<1		ND	ND	ND	ND
MW-8	02-04-94	<1	<1	<1	<1		<1	<1	<1	<5
MW-8	05-02-94	<1	<1	<1	<1		<1	<1	<1	<5
MW-8	08-03-94	<1	<1		<1		<1	<1	<1	<5
MW-8	12-06-94	2	<1		<1		<1	<1	<1	<5
MW-8	03-10-95	<1	<1		<1		<1	<1	<1	<5
MW-8	06-05-95	<1	<1		<1		<1	<1	<1	<5

Table 5
Historical Groundwater Analytical Data
(Volatile Organic Compounds)

10600 and 10700 MacArthur Boulevard
Oakland, California

Date: 07-11-95
Project Number: 0805-120.04

Well Designation	Water Sample Field Date	Halogenated Volatile Organic Compounds by EPA Method 601/8010 or 624/8240					BTEX by EPA Method 624/8240			
		PCE µg/L	TCE µg/L	1,2-DCE µg/L	cis-1,2-DCE µg/L	Freon 12 µg/L	Benzene µg/L	Toluene µg/L	Ethyl-benzene µg/L	Total Xylenes µg/L
RW-1	11-06-91	980	ND	ND	ND		ND	ND	ND	ND
RW-1	03-10-92	400	1.7	ND	ND		ND	ND	ND	ND
RW-1	06-30-92	1100	ND	ND	ND		ND	ND	ND	ND
RW-1	09-09-92	1500	ND	ND	ND		ND	ND	ND	ND
RW-1	11-24-92	1500	ND	ND	ND		ND	ND	ND	ND
RW-1	02-12-93	620	ND	ND	ND		ND	ND	ND	ND
RW-1	05-12-93	500	ND	ND	ND		ND	ND	ND	ND
RW-1	08-18-93	470	ND	ND	ND		ND	ND	ND	ND
RW-1	11-10-93	1500	ND	ND	ND		ND	ND	ND	ND
RW-1	02-04-94	2200	<20	<20	<20		<20	<20	<20	<100
RW-1	05-02-94	45	<1	<1	<1		<1	<1	<1	<5
RW-1	08-03-94	350	4		<1		<1	<1	<1	<5
RW-1	12-06-94	340	<5		<5		<5	<5	<5	<25
RW-1	03-10-95	260	<5		<5		<5	<5	<5	<25
RW-1	06-05-95	59	<1		<1		<1	<1	<1	<5

Table 5
Historical Groundwater Analytical Data
(Volatile Organic Compounds)

10600 and 10700 MacArthur Boulevard
Oakland, California

Date: 07-11-95
Project Number: 0805-120.04

Well Designation	Water Sample Field Date	Halogenated Volatile Organic Compounds by EPA Method 601/8010 or 624/8240					BTEX by EPA Method 624/8240			
		PCE	TCE	1,2-DCE	cis-1,2-DCE	Freon 12	Benzene	Toluene	Ethyl-benzene	Total Xylenes
		µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L
WGR-3	05-02-94	<1	<1	<1	<1		<1	<1	<1	<5
WGR-3	08-03-94	<1	<1		<1		<1	<1	<1	<5
WGR-3	12-06-94	4	<1		<1		<1	<1	<1	<5
WGR-3	03-11-95	<1	<1		<1		<1	<1	<1	<5
WGR-3	06-05-95	<1	<1		<1		<1	<1	<1	<5

PCE: tetrachloroethene
TCE: trichloroethene
1,2-DCE. 1,2-dichloroethene
cis-1,2-DCE cis-1,2-dichloroethene
µg/L: micrograms per liter
ND: not detected at or above the method detection limit

Table 6
Approximate Cumulative Floating Product Recovered

10600 and 10700 MacArthur Boulevard
Oakland, California

Date: 07-11-95
Project Number: 0805-120.04

Well Designation	Date	Floating Product Recovered gallons
MW-2 and MW-7	1991	18.15
MW-2 and MW-7	1992	0.39
MW-2 and MW-7	1993	0.00
MW-2 and MW-7	1994	0.00
MW-2 and MW-7	1995	0.00
	1991 to 1995 Total:	18.54

Table 7
Soil-Vapor Extraction System
Operation and Performance Data

Location: 10600 and 10700 MacArthur Boulevard
Oakland, California

Vapor Treatment Unit: Anguil Energy Systems
Remedi-Cat, 500cfm
Catalytic Oxidizer

Consultant: EMCON
1921 Ringwood Avenue
San Jose, California

Start-Up Date: 09-06-90
Reporting Period From: 09-06-90
To: 07-10-95

Date Begin:		09-06-90	12-22-94	01-12-95	02-14-95	03-13-95
Date End:		12-22-94	01-12-95	02-14-95	03-13-95	04-11-95
Mode of Oxidation:		Catalytic (12)	Catalytic	Catalytic	Catalytic	Catalytic
Days of Operation:		0.0	11.7	33.0	27.0	29.0
Days of Downtime:		0.0	9.3	0.0	0.0	0.0
Vapor Monitoring Concentrations						
On-site Well Field:	mg/m3 as gasoline (1)	NA (13)	116	<60	<60	4.4
	ppmv as gasoline (2) (3)	NA	32	<17	<17	1.2
	mg/m3 as benzene	NA	<0.5	<0.5	<0.5	<0.16
	ppmv as benzene (4)	NA	<0.1	<0.2	<0.2	<0.05
Off-site Well Field:	mg/m3 as gasoline	NA	closed	closed	<60	4.9
	ppmv as gasoline	NA	closed	closed	<17	1.4
	mg/m3 as benzene	NA	closed	closed	<0.5	<0.16
	ppmv as benzene	NA	closed	closed	<0.2	<0.05
System Influent:	mg/m3 as gasoline	NA	116	<60	<60	<3.6
	ppmv as gasoline	NA	32	<17	<17	<1.0
	mg/m3 as benzene	NA	<0.5	<0.5	<0.5	<0.16
	ppmv as benzene	NA	<0.1	<0.2	<0.2	<0.05
System Effluent:	mg/m3 as gasoline	NA	<60	<60	<60	4.6
	ppmv as gasoline	NA	<17	<17	<17	1.3
	mg/m3 as benzene	NA	<0.5	<0.5	<0.5	<0.16
	ppmv as benzene	NA	<0.1	<0.2	<0.2	<0.05
On-site Well Field Flow Rate, scfm (5):		NA	82.6	57.3	72.4	71.1
Off-site Well Field Flow Rate, scfm:		NA	closed	closed	10.9	11.0
System Influent Flow Rate, scfm:		NA	82.6	57.3	83.3	82.1
Total Process Flow Rate, scfm:		NA	500.0	500.0	500.0	500.0
Destruction Efficiency, percent (6):		NA	95.7	100.0	100.0	NA
Emission Rates (pounds per day) (7)						
Gasoline:		NA	<0.45	<0.31	<0.45	0.03
Benzene:		NA	<0.00	<0.00	<0.00	<0.00
Operating Hours This Period:		NA	280.5	792.0	648.0	696.0
Operating Hours To Date:		NA	280.5	1072.5	1720.5	2416.5
Pounds/ Hour Removal Rate, as gasoline (8):		NA	0.036	0.013	0.019	0.001
Pounds Removed This Period, as gasoline (9):		NA	10.1	10.2	12.1	0.8
Pounds Removed To Date, as gasoline (10):		7665.5	7675.6	7685.8	7697.9	7698.6
Gallons Removed This Period, as gasoline (11):		NA	1.6	1.6	2.0	0.1
Gallons Removed To Date, as gasoline:		1236.4	1238.1	1239.7	1241.7	1241.8

Table 7
Soil-Vapor Extraction System
Operation and Performance Data

Location: 10600 and 10700 MacArthur Boulevard
Oakland, California

Vapor Treatment Unit: Anguil Energy Systems
Remedi-Cat, 500cfm
Catalytic Oxidizer

Consultant: EMCON
1921 Ringwood Avenue
San Jose, California

Start-Up Date: 09-06-90
Reporting Period From: 09-06-90
To: 07-10-95

Date Begin:	04-11-95	05-08-95	06-08-95
Date End:	05-08-95	06-08-95	07-10-95
Mode of Oxidation:	Catalytic	Catalytic	Catalytic
Days of Operation:	27.0	11.1	0.0
Days of Downtime:	0.0	19.9	32.0
Vapor Monitoring Concentrations			
On-site Well Field: mg/m3 as gasoline (1)	<60	<60	NA
ppmv as gasoline (2) (3)	<17	<17	NA
mg/m3 as benzene	<0.5	<0.5	NA
ppmv as benzene (4)	<0.2	<0.2	NA
Off-site Well Field: mg/m3 as gasoline	<60	<60	NA
ppmv as gasoline	<17	<17	NA
mg/m3 as benzene	<0.5	<0.5	NA
ppmv as benzene	<0.2	<0.2	NA
System Influent: mg/m3 as gasoline	<60	<60	NA
ppmv as gasoline	<17	<17	NA
mg/m3 as benzene	<0.5	<0.5	NA
ppmv as benzene	<0.2	<0.2	NA
System Effluent: mg/m3 as gasoline	<60	<60	NA
ppmv as gasoline	<17	<17	NA
mg/m3 as benzene	<0.5	<0.5	NA
ppmv as benzene	<0.2	<0.2	NA
On-site Well Field Flow Rate, scfm (5):	73.2	76.2	0.0
Off-site Well Field Flow Rate, scfm:	8.7	8.2	0.0
System Influent Flow Rate, scfm:	75.5	75.6	0.0
Total Process Flow Rate, scfm:	500.0	500.0	0.0
Destruction Efficiency, percent (6):	NA	NA	NA
Emission Rates (pounds per day) (7)			
Gasoline:	<0.41	<0.41	0.00
Benzene:	<0.00	<0.00	0.00
Operating Hours This Period:	648.6	266.9	0.0
Operating Hours To Date:	3065.1	3332.0	3332.0
Pounds/ Hour Removal Rate, as gasoline (8):	0.017	0.017	0.000
Pounds Removed This Period, as gasoline (9):	11.0	4.5	0.0
Pounds Removed To Date, as gasoline (10):	7709.6	7714.2	7714.2
Gallons Removed This Period, as gasoline (11):	1.8	0.7	0.0
Gallons Removed To Date, as gasoline:	1243.6	1244.3	1244.3

Table 7
Soil-Vapor Extraction System
Operation and Performance Data

Location: 10600 and 10700 MacArthur Boulevard Oakland, California	Vapor Treatment Unit: Anguil Energy Systems Remedi-Cat, 500cfm Catalytic Oxidizer
Consultant: EMCON 1921 Ringwood Avenue San Jose, California	Start-Up Date: 09-06-90 Reporting Period From: 09-06-90 To: 07-10-95

CURRENT REPORTING PERIOD:	04-11-95	to	07-10-95
DAYS / HOURS IN PERIOD:	90.0		2160.0
DAYS / HOURS OF OPERATION:	38.1		915.5
DAYS / HOURS OF DOWN TIME:	51.9		1244.5
PERCENT OPERATIONAL:			42.4 %
PERIOD POUNDS REMOVED:	15.5		
PERIOD GALLONS REMOVED:	2.5		
AVERAGE SYSTEM INFLUENT FLOW RATE (scfm):			75.5

1. mg/m3: milligrams per cubic meter
2. ppmv: parts per million by volume
3. concentration (as gasoline in ppmv) = [concentration (as gasoline in mg/m3) x 24.05 (lb/m3/lb-mole of air)/mg] / 87 lb/lb-mole (rounded as appropriate)
4. concentration (as benzene in ppmv) = [concentration (as benzene in mg/m3) x 24.05 (lb/m3/lb-mole of air)/mg] / 78 lb/lb-mole (rounded as appropriate)
5. scfm: flow in standard cubic feet per minute at one atmosphere and 70 degrees Farenheit
6. destruction efficiency, percent = ([system influent concentration (as gasoline in mg/m3) - system effluent concentration (as gasoline in mg/m3)] / system influent concentration (as gasoline in mg/m3)) x 100 percent
7. emission rates (pounds per day) = system effluent concentration (as gasoline or benzene in mg/m3) x system influent flow rate (scfm) x 0.02832 m3/ft3 x 1440 minutes/day x 1 pound/454,000 mg
8. pounds/ hour removal rate (as gasoline) = system influent concentration (as gasoline in mg/m3) x system influent flow rate (scfm) x 0.02832 m3/ft3 x 60 minutes/hour x 1 pound/454,000 mg
9. pounds removed this period (as gasoline) = pounds/ hour removal rate x hours of operation
10. Pounds removed data for the period from September 6, 1990 through December 22, 1994, were reported by EVAX, PEG, and RESNA. Please refer to *Fourth Quarter 1994 Groundwater Monitoring Results and Remediation System Performance Evaluation Report, EMCON March 1995,* for additioanl data for system operation before December 1994.
11. gallons removed this period (as gasoline) = pounds removed this period (as gasoline) x 0.1613 gallons/pound of gasoline
12. The existing catalytic oxidation unit was used as the off-gas abatement device for the site, with the exception of the period from September 6, 1990 to March 21, 1991, when EVAX used an internal combustion engine as the abatement device.
13. NA: not analyzed, not available, or not applicable

Table 8
Soil-Vapor Extraction System
Field Vapor Monitoring Results and Destruction Efficiencies

10600 and 10700 MacArthur Boulevard
Oakland, California

Date: 09-11-95
Project Number: 0805-120.04

Field Date	Field Vapor Monitoring Results (1)				Destruction Efficiency (2)
	On-Site Well Field (I-1)	Off-Site Well Field (Off Site)	Total System Influent (I-2)	System Effluent (E-1)	
	ppmv (3)	ppmv	ppmv	ppmv	percent
12/22/94	24.6	closed	24.6	2.1	91.5
01/05/95	20.9	closed	20.9	1.3	93.8
01/31/95	0.2	closed	0.2	0.0	100.0
02/09/95	0.2	closed	0.2	0.0	100.0
03/03/95	0.2	0.2	0.3	0.5	-66.7 (4)
03/27/95	0.9	0.0	0.5	0.0	100.0
04/14/95	1.2	0.1	1.0	0.1	90.0
05/24/95	1.4	0.1	0.8	0.0	100.0

1. Concentrations are reported in ppmv as measured by a flame-ionization detector (FID).
2. destruction efficiency (percent) = [(I-2 - E-1) / I-2] * 100
3. ppmv: parts per million by volume
4. The system was in compliance with permit conditions despite the negative destruction efficiency because laboratory analytical results for system influent and effluent air samples collected between February 14 and March 13, 1995, indicate nondetectable levels of TVHG (gasoline) and benzene (i.e., no emissions).

Table 9
Soil-Vapor Extraction Well Data

10600 and 10700 MacArthur Boulevard
Oakland, California

Date: 09-11-95
Project Number: 0805-120.04

Date	Well Identification											
	VW-1			VW-2			VW-3			VW-4		
	Valve Position	TVHG ppmv	Vacuum Response in-H2O	Valve Position	TVHG ppmv	Vacuum Response in-H2O	Valve Position	TVHG ppmv	Vacuum Response in-H2O	Valve Position	TVHG ppmv	Vacuum Response in-H2O
12-22-94	open	<15 LAB	13.1	open	68 LAB	13.0	open	28 LAB	12.0	open	<15 LAB	13.1
01-17-95	closed	NA	NA	open	NA	NA	open	NA	NA	closed	NA	NA
02-16-95	open	NA	NA	open	NA	NA	open	NA	NA	open	NA	NA
03-27-95	open	NA	NA	open	NA	NA	open	NA	NA	open	NA	NA
05-24-95	System was shut doun											

TVHG: concentration of total volatile hydrocarbons as gasoline
ppmv: parts per million by volume
in-H2O: inches of water
open: open to the system
passive: open to the atmosphere
closed: closed to the system and atmosphere
NA: not analyzed or not measured
FID: TVHG concentration was measured with a portable flame ionization detector
LAB: TVHG concentration was analyzed in the laboratory
PID: TVHG concentration was measured with a portable photoionization detector

Table 9
Soil-Vapor Extraction Well Data

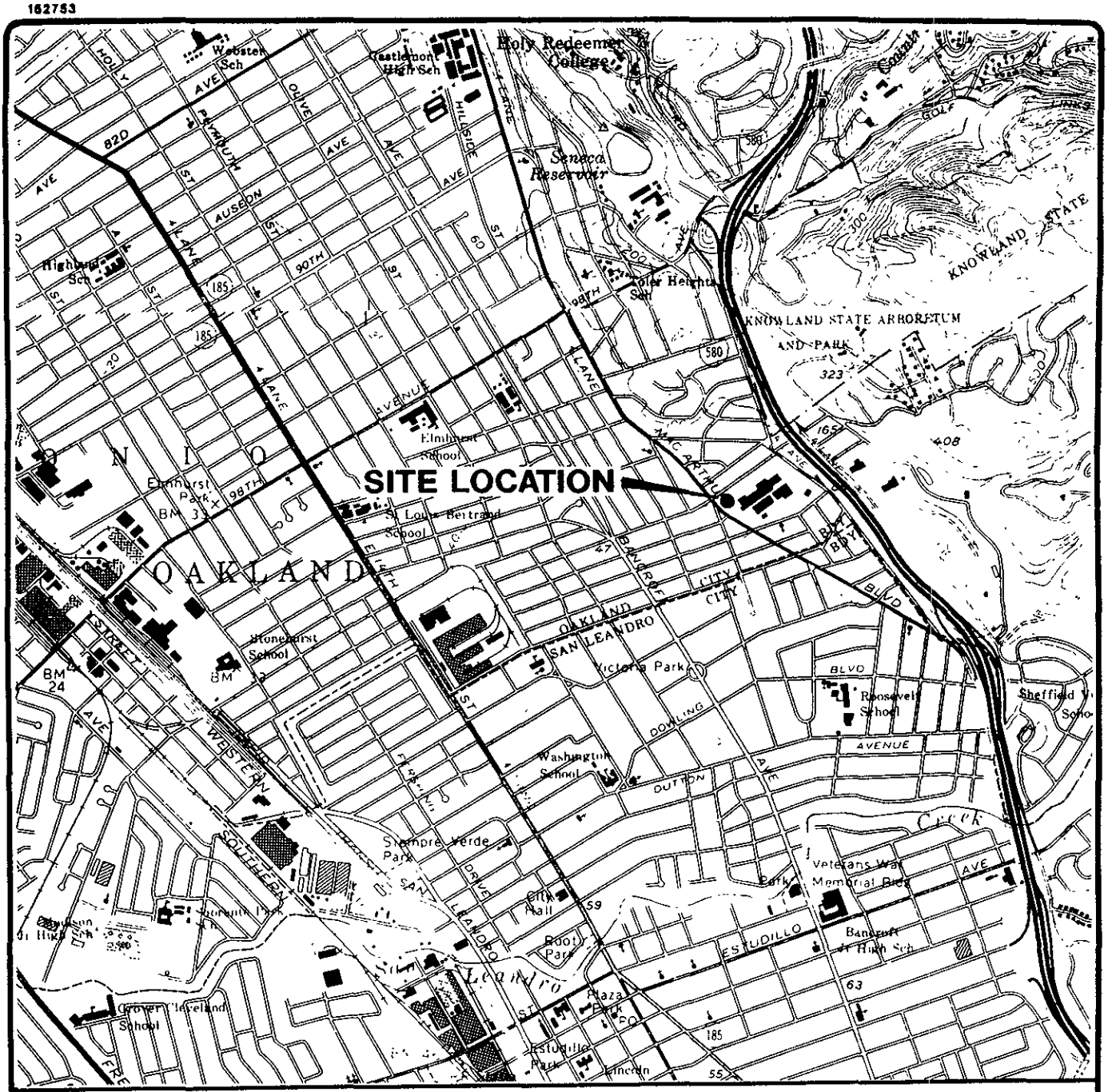
10600 and 10700 MacArthur Boulevard
Oakland, California

Date: 09-11-95
Project Number: 0805-120.04

Date	Well Identification											
	VW-5			VW-7			MW-2					
	Valve Position	TVHG ppmv	Vacuum Response in-H2O	Valve Position	TVHG ppmv	Vacuum Response in-H2O	Valve Position	TVHG ppmv	Vacuum Response in-H2O	Valve Position	TVHG ppmv	Vacuum Response in-H2O
12-22-94	open	<15 LAB	13.0	open	<15 LAB	13.1	open	<15 LAB	7.0			
01-17-95	closed	NA	NA	closed	NA	NA	open	NA	NA			
02-16-95	open	NA	NA	open	NA	NA	open	NA	NA			
03-27-95	open	NA	NA	open	NA	NA	open	NA	NA			
05-24-95	System was shut doun											

TVHG: concentration of total volatile hydrocarbons as gasoline
ppmv: parts per million by volume
in-H2O: inches of water
open: open to the system
passive: open to the atmosphere
closed: closed to the system and atmosphere
NA: not analyzed or not measured
FID: TVHG concentration was measured with a portable flame ionization detector
LAB: TVHG concentration was analyzed in the laboratory
PID: TVHG concentration was measured with a portable photoionization detector

162753



Base map from USGS 7.5' Quad. Maps:
Oakland East and San Leandro, California.
Photorevised 1980.

N

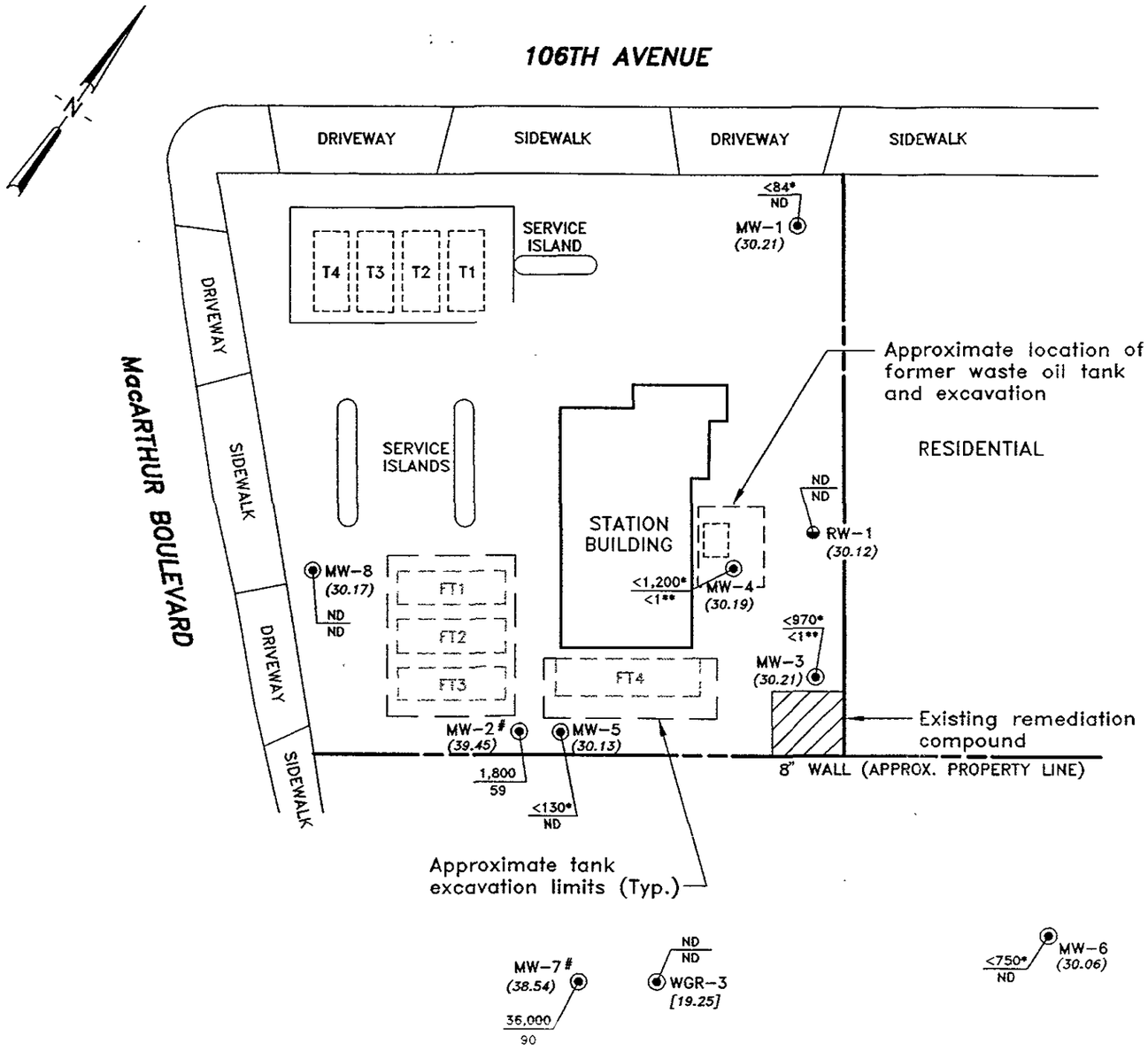
Scale : 0 2000 4000 Feet

EMCON

10600 AND 10700 MACARTHUR BLVD.
QUARTERLY GROUNDWATER MONITORING
OAKLAND, CALIFORINA

SITE LOCATION

FIGURE
1
PROJECT NO.
805-120.04



EXPLANATION

- ◉ Groundwater monitoring well
- ◒ Recovery well
- Existing underground storage tank
- Former underground storage tank
- *(30.21)* Groundwater elevation (Ft.–MSL); measured 6/5/95
- *[19.25]* Depth to water measured on 6/5/95 (WGR–3 top of casing elevation not available)
- 1,800 / 59 — TPHG concentration in groundwater (ug/L); sampled 6/5/95; Benzene concentration in groundwater (ug/L); sampled 6/5/95
- * Raised method reporting limit due to matrix interference; the sample contains a single non–fuel component eluting in the gasoline range and quantitated as gasoline (possibly PCE). The chromatogram does not match the typical gasoline fingerprint
- ** Raised method reporting limit due to matrix interference requiring sample dilution
- # Well screened in shallow water–bearing zone; not used in contouring
- ND Not detected at or above the method reporting limit for TPHG (50 ug/L) or benzene (0.5 ug/L)

NOTE: Cannot be contoured due to relatively flat gradient (<0.001) at the site.

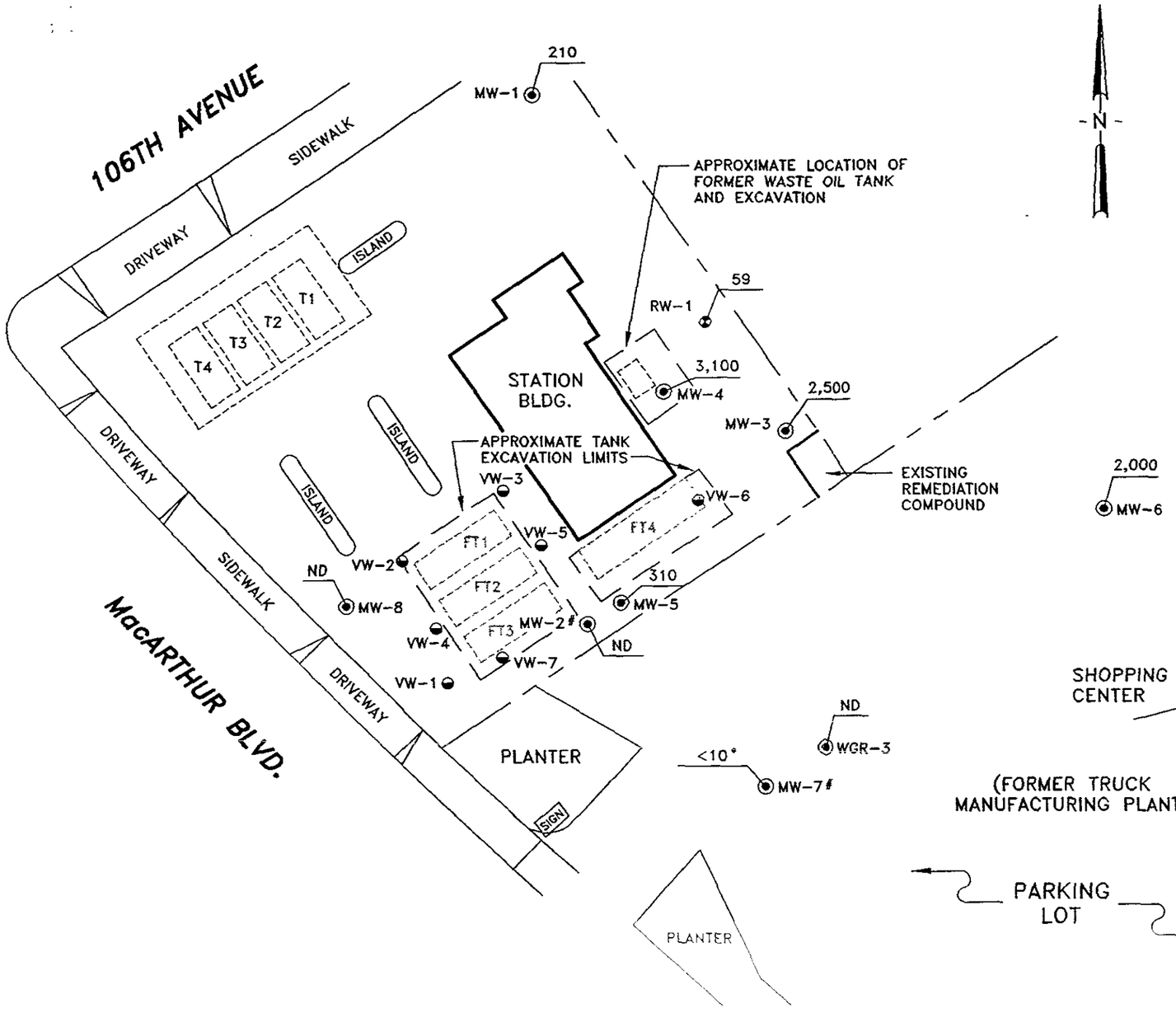
EMCON

SCALE: 0 30 60 FEET

10600 AND 10700 MACARTHUR BLVD.
QUARTERLY GROUNDWATER MONITORING
OAKLAND, CALIFORNIA

GROUNDWATER DATA
SECOND QUARTER 1995

FIGURE NO.
2
PROJECT NO.
805–120.04



EXPLANATION

- Groundwater monitoring well
- Recovery well
- Vapor extraction well
- Existing underground storage tank
- Former underground storage tank
- 210 — PCE concentration in groundwater (ug/L); sampled 6/5/95
- ND — Not detected at or above the method reporting limit for PCE (1 ug/L)
- * — Raised method reporting limit due to high analyte concentration requiring sample dilution
- # — Well screened in shallow water-bearing zone.

Base map modified from RESNA, 1993

EMCON

SCALE: 0 30 60 FEET

10600 AND 10700 MACARTHUR BLVD.
QUARTERLY GROUNDWATER MONITORING
OAKLAND, CALIFORNIA

TETRACHLOROETHENE (PCE) CONCENTRATIONS IN GROUNDWATER
SECOND QUARTER 1995

FIGURE NO.
3
PROJECT NO.
805-120.04

APPENDIX A

FIELD DATA SHEETS, SECOND QUARTER 1995 GROUNDWATER MONITORING EVENT

FIELD REPORT
DEPTH TO WATER / FLOATING PRODUCT SURVEY

PROJECT # : 1775-202.01 STATION ADDRESS : 10600 MacArthur Blvd. Oakland, CA DATE : 6/5/95

ARCO STATION # : 276 FIELD TECHNICIAN : D. Gambelin / M. Gallegos DAY : Mon

DTW Order	WELL ID	Well Box Seal	Well Lid Secure	Gasket	Lock	Locking Well Cap	FIRST DEPTH TO WATER (feet)	SECOND DEPTH TO WATER (feet)	DEPTH TO FLOATING PRODUCT (feet)	FLOATING PRODUCT THICKNESS (feet)	WELL TOTAL DEPTH (feet)	COMMENTS
1	**MW-8**	OK	OK	NA	ARCO	OK	23.43	~~47.7~~ 23.46	ND	ND	47.7	
2	**WGR-3**	OK	OK	OK	ARCO	OK	19.25	19.25	ND	ND	26.8	
3	**MW-1**	OK	OK	NA	ARCO	OK	25.71	25.71	ND	ND	38.8	
4	**MW-5**	OK	OK	OK	ARCO	OK	25.30	25.30	ND	ND	46.9	
5	**RW-1**	OK	OK	NA	ARCO	OK	26.20	26.20	ND	ND	47.6	
6	**MW-6**	OK	OK	OK	ARCO	OK	31.15	31.15	ND	ND	51.9	
7	**MW-3**	OK	OK	OK	ARCO	~~OK~~	26.34	26.34	ND	ND	38.4	
8	**MW-4**	OK	OK	OK	ARCO	OK	25.79	25.79	ND	ND	48.0	
9	**MW-2**	OK	OK	OK	ARCO	OK	15.65	15.65	ND	ND	25.2	
10	**MW-7**	OK	OK	OK	ARCO	OK	19.68	19.68	ND	ND	36.7	

SURVEY POINTS ARE TOP OF WELL CASINGS

Rev. 3, 2/94

WATER SAMPLE FIELD DATA SHEET

EMCON ASSOCIATES

PROJECT NO: 1775.202.C1 SAMPLE ID: MW-1

PURGED BY: D. Gambelin CLIENT NAME: ARCO 276

SAMPLED BY: D. Gambelin LOCATION: Oakland, CA

TYPE: Ground Water X Surface Water ___ Treatment Effluent ___ Other ___

CASING DIAMETER (inches): 2 X 3 ___ 4 ___ 4.5 ___ 6 ___ Other ___

CASING ELEVATION (feet/MSL):	NR	VOLUME IN CASING (gal.):	2.14
DEPTH TO WATER (feet):	25.71	CALCULATED PURGE (gal.):	6.41
DEPTH OF WELL (feet):	38.8	ACTUAL PURGE VOL. (gal.):	6.5

DATE PURGED: 6/5/95 Start (2400 Hr) 1118 End (2400 Hr) 1128

DATE SAMPLED: 6/5/95 Start (2400 Hr) 1134 End (2400 Hr) 1135

TIME (2400 Hr)	VOLUME (gal.)	pH (units)	E.C. (µmhos/cm @ 25° C)	TEMPERATURE (°F)	COLOR (visual)	TURBIDITY (visual)
1124	2.5	6.37	2530	68.9	Tan	Moderate
1125	4.5	6.47	2440	68.4	Tan	Moderate
1128	6.5	6.47	2380	68.2	Tan	Moderate

D. O. (ppm): NR ODOR: None COLOR: NR (COBALT 0 - 500) TURBIDITY: NR (NTU 0 - 200 or 0 - 1000)

Field QC samples collected at this well: NR

Parameters field filtered at this well: NR

PURGING EQUIPMENT		SAMPLING EQUIPMENT	
___ 2" Bladder Pump	___ Bailer (Teflon®)	___ 2" Bladder Pump	X Bailer (Teflon®)
___ Centrifugal Pump	X Bailer (PVC)	___ DDL Sampler	___ Bailer (Stainless Steel)
___ Submersible Pump	___ Bailer (Stainless Steel)	___ Dipper	___ Submersible Pump
___ Well Wizard™	___ Dedicated	___ Well Wizard™	___ Dedicated
Other: ___		Other: ___	

WELL INTEGRITY: Good LOCK #: ARCO

REMARKS: ___

Meter Calibration: Date: 6/5/95 Time: 1101 Meter Serial #: 6897472 Temperature °F: 69.4

(EC 1000 915 / 1000) (DI 4) (pH 7 6.87 / 7.00) (pH 10 9.81 / 10.00) (pH 4 3.93 / —)

Location of previous calibration: ___

Signature: Tom Rh Reviewed By: SJ Page 1 of 10

Rev. 3, 2/94

WATER SAMPLE FIELD DATA SHEET

EMCON ASSOCIATES

PROJECT NO: 1775-202.01 SAMPLE ID: MW-2

PURGED BY: M. Gallegos CLIENT NAME: ARCO # 776

SAMPLED BY: ↓ LOCATION: OAKland, CA.

TYPE: Ground Water X Surface Water ___ Treatment Effluent ___ Other ___

CASING DIAMETER (inches): 2 ___ 3 ___ 4 X 4.5 ___ 6 ___ Other ___

CASING ELEVATION (feet/MSL): NR VOLUME IN CASING (gal.): 6.23

DEPTH TO WATER (feet): 15.65 CALCULATED PURGE (gal.): 18.71

DEPTH OF WELL (feet): 25.2 ACTUAL PURGE VOL. (gal.): 19.0

DATE PURGED: 6-5-95 Start (2400 Hr) 1321 End (2400 Hr) 1332

DATE SAMPLED: 6-5-95 Start (2400 Hr) 1340 End (2400 Hr) ___

TIME (2400 Hr)	VOLUME (gal.)	pH (units)	E.C. (µmhos/cm @ 25° C)	TEMPERATURE (°F)	COLOR (visual)	TURBIDITY (visual)
1324	6.0	6.54	461	67.7	Cloudy	Moderate
1328	12.5	6.60	455	67.5	↓	Heavy
1332	19.0	6.60	449	67.2	↓	↓

D. O. (ppm): NR ODOR: Strong

COLOR (COBALT 0 - 500): NR

TURBIDITY (NTU 0 - 200 or 0 - 1000): NR

Field QC samples collected at this well: NR

Parameters field filtered at this well: NR

PURGING EQUIPMENT		SAMPLING EQUIPMENT	
___ 2" Bladder Pump	___ Bailer (Teflon®)	___ 2" Bladder Pump	X Bailer (Teflon®)
___ Centrifugal Pump	X Bailer (PVC)	___ DDL Sampler	___ Bailer (Stainless Steel)
X ~~Submersible Pump~~	___ Bailer (Stainless Steel)	___ Dipper	___ Submersible Pump
___ Well Wizard™	___ Dedicated	___ Well Wizard™	___ Dedicated
Other: ___		Other: ___	

WELL INTEGRITY: Good LOCK #: Arco Key

REMARKS: All Samples taken

Meter Calibration: Date: 6-5-95 Time: ___ Meter Serial #: 9011 Temperature °F: ___

(EC 1000 ___ / ___) (DI ___) (pH 7 ___ / ___) (pH 10 ___ / ___) (pH 4 ___ / ___)

Location of previous calibration: ___

Signature: [signature] Reviewed By: [signature] Page 2 of 10

Rev. 3, 2/94

WATE.. SAMPLE FIELD DA'.A SHEET

EMCON ASSOCIATES

PROJECT NO: 1775-202.01 SAMPLE ID: MW-3

PURGED BY: D. Gamboa CLIENT NAME: ARCO 276

SAMPLED BY: D. Gamboa LOCATION: Oakland, CA

TYPE: Ground Water X Surface Water ___ Treatment Effluent ___ Other ___

CASING DIAMETER (inches): 2 X 3 ___ 4 ___ 4.5 ___ 6 ___ Other ___

CASING ELEVATION (feet/MSL): NR VOLUME IN CASING (gal.): 1.97

DEPTH TO WATER (feet): 26.34 CALCULATED PURGE (gal.): 5.91

DEPTH OF WELL (feet): 38.4 ACTUAL PURGE VOL. (gal.): 6.0

DATE PURGED: 6/5/95 Start (2400 Hr) 1246 End (2400 Hr) 1256

DATE SAMPLED: 6/5/95 Start (2400 Hr) 1300 End (2400 Hr) 1301

TIME (2400 Hr)	VOLUME (gal.)	pH (units)	E.C. (µmhos/cm @ 25° C)	TEMPERATURE (°F)	COLOR (visual)	TURBIDITY (visual)
1249	2.0	6.59	1543	73.6	Brown	Heavy
1253	4.0	6.58	1462	71.5	Brown	Heavy
1256	6.0	6.57	1429	71.1	Brown	Heavy

D. O. (ppm): NR ODOR: None

COLOR: NR (COBALT 0 - 500)

TURBIDITY: NR (NTU 0 - 200 or 0 - 1000)

Field QC samples collected at this well: NR

Parameters field filtered at this well: NR

PURGING EQUIPMENT		SAMPLING EQUIPMENT	
___ 2" Bladder Pump	___ Bailer (Teflon®)	___ 2" Bladder Pump	X Bailer (Teflon®)
___ Centrifugal Pump	X Bailer (PVC)	___ DDL Sampler	___ Bailer (Stainless Steel)
___ Submersible Pump	___ Bailer (Stainless Steel)	___ Dipper	___ Submersible Pump
___ Well Wizard™	___ Dedicated	___ Well Wizard™	___ Dedicated
Other: ___		Other: ___	

WELL INTEGRITY: Good LOCK #: ARCO

REMARKS: ___

Meter Calibration: Date: 6/5/95 Time: 1100 Meter Serial #: 6397492 Temperature °F: ___

(EC 1000 ___ / ___) (DI ___) (pH 7 ___ / ___) (pH 10 ___ / ___) (pH 4 ___ / ___)

Location of previous calibration: MW-1

Signature: [signature] Reviewed By: SJC Page 3 of 10

Rev. 3, 2/94

WATER SAMPLE FIELD DATA SHEET

EMCON ASSOCIATES

PROJECT NO: 1775.202.01 SAMPLE ID: MW-4

PURGED BY: D. Gambelin CLIENT NAME: ARCO 276

SAMPLED BY: D. Gambelin LOCATION: Oakland, CA

TYPE: Ground Water X Surface Water ___ Treatment Effluent ___ Other ___

CASING DIAMETER (inches): 2 X 3 ___ 4 ___ 4.5 ___ 6 ___ Other ___

CASING ELEVATION (feet/MSL): NR VOLUME IN CASING (gal.): 3.63

DEPTH TO WATER (feet): 25.74 CALCULATED PURGE (gal.): 10.89

DEPTH OF WELL (feet): 48.0 ACTUAL PURGE VOL. (gal.): 11.0

DATE PURGED: 6/5/95 Start (2400 Hr) 1325 End (2400 Hr) 1339

DATE SAMPLED: 6/5/95 Start (2400 Hr) 1342 End (2400 Hr) 1345

TIME (2400 Hr)	VOLUME (gal.)	pH (units)	E.C. (µmhos/cm @ 25° C)	TEMPERATURE (°F)	COLOR (visual)	TURBIDITY (visual)
1330	4.0	6.80	1710	76.0	Tan	Moderate
1334	7.5	6.76	1733	73.4	Tan	Moderate
1339	11.0	6.75	1718	73.1	Tan	Moderate

D. O. (ppm): NR ODOR: ___ NR (COBALT 0 - 500) NR (NTU 0 - 200 or 0 - 1000)

Field QC samples collected at this well: NR

Parameters field filtered at this well: NR

PURGING EQUIPMENT		SAMPLING EQUIPMENT	
___ 2" Bladder Pump	___ Bailer (Teflon®)	___ 2" Bladder Pump	X Bailer (Teflon®)
___ Centrifugal Pump	X Bailer (PVC)	___ DDL Sampler	___ Bailer (Stainless Steel)
___ Submersible Pump	___ Bailer (Stainless Steel)	___ Dipper	___ Submersible Pump
___ Well Wizard™	___ Dedicated	___ Well Wizard™	___ Dedicated
Other: ___		Other: ___	

WELL INTEGRITY: Good LOCK #: ARCO

REMARKS: ___

Meter Calibration: Date: 6/5/95 Time: 1100 Meter Serial #: 6877492 Temperature °F: ___

(EC 1000 ___ / ___) (DI ___) (pH 7 ___ / ___) (pH 10 ___ / ___) (pH 4 ___ / ___)

Location of previous calibration: MW-1

Signature: [signature] Reviewed By: SJ Page 4 of 10

Rev. 3, 2/94

WATER SAMPLE FIELD DATA SHEET

EMCON ASSOCIATES

PROJECT NO: 1775-202.01 SAMPLE ID: MW-5

PURGED BY: M. Gallegos CLIENT NAME: ARCO # 2776

SAMPLED BY: " LOCATION: Oakland, CA

TYPE: Ground Water X Surface Water ___ Treatment Effluent ___ Other ___

CASING DIAMETER (inches): 2 ___ 3 ___ 4 X 4.5 ___ 6 ___ Other ___

CASING ELEVATION (feet/MSL):	NR	VOLUME IN CASING (gal.):	14.11
DEPTH TO WATER (feet):	25.50	CALCULATED PURGE (gal.):	42.33
DEPTH OF WELL (feet):	46.9	ACTUAL PURGE VOL. (gal.):	42.5

DATE PURGED: 6-5-95 Start (2400 Hr) 1236 End (2400 Hr) 1250

DATE SAMPLED: 6-5-95 Start (2400 Hr) 1300 End (2400 Hr) ___

TIME (2400 Hr)	VOLUME (gal.)	pH (units)	E.C. (µmhos/cm @ 25° C)	TEMPERATURE (°F)	COLOR (visual)	TURBIDITY (visual)
1241	14.0	6.20	730	68.8	Clear	Clear
1245	28.0	6.23	707	69.4	"	"
1250	42.5	6.23	703	69.5	"	"

D. O. (ppm): NR ODOR: None. NR (COBALT 0 - 500) NR (NTU 0 - 200 or 0 - 1000)

Field QC samples collected at this well: NR

Parameters field filtered at this well: NR

PURGING EQUIPMENT		SAMPLING EQUIPMENT	
___ 2" Bladder Pump	___ Bailer (Teflon®)	___ 2" Bladder Pump	X Bailer (Teflon®)
___ Centrifugal Pump	___ Bailer (PVC)	___ DDL Sampler	___ Bailer (Stainless Steel)
X Submersible Pump	___ Bailer (Stainless Steel)	___ Dipper	___ Submersible Pump
___ Well Wizard™	___ Dedicated	___ Well Wizard™	___ Dedicated
Other: ___		Other: ___	

WELL INTEGRITY: Good LOCK #: Arco Key

REMARKS: All Samples taken

Meter Calibration: Date: 6-5-95 Time: ___ Meter Serial #: 9011 Temperature °F: ___

(EC 1000 ___ / ___) (DI ___) (pH 7 ___ / ___) (pH 10 ___ / ___) (pH 4 ___ / ___)

Location of previous calibration: MW-8

Signature: [signature] Reviewed By: [signature] Page 5 of 10

Rev. 3, 2/94

WATER SAMPLE FIELD DATA SHEET

EMCON ASSOCIATES

PROJECT NO: 1775-202.01 SAMPLE ID: MW-6

PURGED BY: D. Gambelin CLIENT NAME: ARCO 276

SAMPLED BY: D. Gambelin LOCATION: Oakland, CA

TYPE: Ground Water X Surface Water ___ Treatment Effluent ___ Other ___

CASING DIAMETER (inches): 2 X 3 ___ 4 ___ 4.5 ___ 6 ___ Other ___

CASING ELEVATION (feet/MSL): NR VOLUME IN CASING (gal.): 3.39

DEPTH TO WATER (feet): 31.15 CALCULATED PURGE (gal.): 10.17

DEPTH OF WELL (feet): 51.9 ACTUAL PURGE VOL. (gal.): 10.5

DATE PURGED: 6/5/95 Start (2400 Hr) 1154 End (2400 Hr) 1210

DATE SAMPLED: 6/5/95 Start (2400 Hr) 1213 End (2400 Hr) 1214

TIME (2400 Hr)	VOLUME (gal.)	pH (units)	E.C. (µmhos/cm @ 25° C)	TEMPERATURE (°F)	COLOR (visual)	TURBIDITY (visual)
1200	3.5	6.94	1549	70.9	Brown	Heavy
1205	7.0	6.90	1522	69.7	Brown	Heavy
1210	10.5	6.86	1538	69.3	Brown	Heavy

D. O. (ppm): NR ODOR: None COLOR (COBALT 0 - 500): NR TURBIDITY (NTU 0 - 200 or 0 - 1000): NR

Field QC samples collected at this well: NR

Parameters field filtered at this well: NR

PURGING EQUIPMENT		SAMPLING EQUIPMENT	
___ 2" Bladder Pump	___ Bailer (Teflon®)	___ 2" Bladder Pump	X Bailer (Teflon®)
___ Centrifugal Pump	X Bailer (PVC)	___ DDL Sampler	___ Bailer (Stainless Steel)
___ Submersible Pump	___ Bailer (Stainless Steel)	___ Dipper	___ Submersible Pump
___ Well Wizard™	___ Dedicated	___ Well Wizard™	___ Dedicated
Other: ___		Other: ___	

WELL INTEGRITY: Good LOCK #: ARCO

REMARKS: ___

Meter Calibration: Date: 6/5/95 Time: 1102 Meter Serial #: 6897A972 Temperature °F: ___

(EC 1000 ___ / ___) (DI ___) (pH 7 ___ / ___) (pH 10 ___ / ___) (pH 4 ___ / ___)

Location of previous calibration: MW-1

Signature: [signature] Reviewed By: [signature] Page 6 of 10

Rev. 3, 2/94

WATER SAMPLE FIELD DATA SHEET

EMCON ASSOCIATES

PROJECT NO: 1775-202.01 SAMPLE ID: MW-7

PURGED BY: D. Gambelin CLIENT NAME: ARCO 276

SAMPLED BY: D. Gambelin LOCATION: Oakland, CA

TYPE: Ground Water X Surface Water ___ Treatment Effluent ___ Other ___

CASING DIAMETER (inches): 2 X 3 ___ 4 ___ 4.5 ___ 6 ___ Other ___

CASING ELEVATION (feet/MSL): NR VOLUME IN CASING (gal.): 2.78

DEPTH TO WATER (feet): 19.68 CALCULATED PURGE (gal.): 8.34

DEPTH OF WELL (feet): 36.7 ACTUAL PURGE VOL. (gal.): 8.5

DATE PURGED: 6/5/95 Start (2400 Hr) 1411 End (2400 Hr) 1423

DATE SAMPLED: 6/5/95 Start (2400 Hr) 1426 End (2400 Hr) 1427

TIME (2400 Hr)	VOLUME (gal.)	pH (units)	E.C. (µmhos/cm @ 25° C)	TEMPERATURE (°F)	COLOR (visual)	TURBIDITY (visual)
1415	3.0	6.31	464	74.6	Grey	Moderate
1419	6.0	6.31	427	71.8	Grey	Moderate
1422	8.5	6.31	421	70.9	Grey	Moderate

D. O. (ppm): NR ODOR: Strong NR (COBALT 0 - 500) NR (NTU 0 - 200 or 0 - 1000)

Field QC samples collected at this well: NR

Parameters field filtered at this well: NR

PURGING EQUIPMENT

- ___ 2" Bladder Pump
- ___ Centrifugal Pump
- ___ Submersible Pump
- ___ Well Wizard™
- ___ Bailer (Teflon®)
- X Bailer (PVC)
- ___ Bailer (Stainless Steel)
- ___ Dedicated
- Other: ___

SAMPLING EQUIPMENT

- ___ 2" Bladder Pump
- ___ DDL Sampler
- ___ Dipper
- ___ Well Wizard™
- X Bailer (Teflon®)
- ___ Bailer (Stainless Steel)
- ___ Submersible Pump
- ___ Dedicated
- Other: ___

WELL INTEGRITY: Good LOCK #: ARCO

REMARKS: Sheen on purgewater

Meter Calibration: Date: 6/5/95 Time: 1100 Meter Serial #: 6897407.2 Temperature °F: ___

(EC 1000 ___ / ___) (DI ___) (pH 7 ___ / ___) (pH 10 ___ / ___) (pH 4 ___ / ___)

Location of previous calibration: MW-1

Signature: [signature] Reviewed By: [signature] Page 1 of 10

Rev. 3, 2/94

WATER SAMPLE FIELD DATA SHEET

EMCON ASSOCIATES

PROJECT NO: 1775-202.01 SAMPLE ID: MW-8

PURGED BY: M. Gallegos CLIENT NAME: ARCO # 776

SAMPLED BY: ↓ LOCATION: Oakland, CA.

TYPE: Ground Water X Surface Water ___ Treatment Effluent ___ Other ___

CASING DIAMETER (inches): 2 ___ 3 ___ 4 X 4.5 ___ 6 ___ Other ___

CASING ELEVATION (feet/MSL):	NR	VOLUME IN CASING (gal.):	15.82
DEPTH TO WATER (feet):	23.48	CALCULATED PURGE (gal.):	47.47
DEPTH OF WELL (feet):	47.7	ACTUAL PURGE VOL. (gal.):	47.5

DATE PURGED: 6-5-95 Start (2400 Hr) 1104 End (2400 Hr) 1119

DATE SAMPLED: 6-5-95 Start (2400 Hr) 1125 End (2400 Hr) ___

TIME (2400 Hr)	VOLUME (gal.)	pH (units)	E.C. (µmhos/cm @ 25° C)	TEMPERATURE (°F)	COLOR (visual)	TURBIDITY (visual)
1109	15.5	6.19	556	69.9	clear	light
1114	31.5	6.24	549	69.7	1	[redacted] clear
1119	47.5	6.29	551	69.4	clear	light

D. O. (ppm): NR ODOR: none

COLOR (COBALT 0 - 500): NR

TURBIDITY (NTU 0 - 200 or 0 - 1000): NR

Field QC samples collected at this well: NR

Parameters field filtered at this well: NR

PURGING EQUIPMENT		SAMPLING EQUIPMENT	
___ 2" Bladder Pump	___ Bailer (Teflon®)	___ 2" Bladder Pump	X Bailer (Teflon®)
___ Centrifugal Pump	___ Bailer (PVC)	___ DDL Sampler	___ Bailer (Stainless Steel)
X Submersible Pump	___ Bailer (Stainless Steel)	___ Dipper	___ Submersible Pump
___ Well Wizard™	___ Dedicated	___ Well Wizard™	___ Dedicated
Other: ___		Other: ___	

WELL INTEGRITY: Good LOCK #: Arco Key

REMARKS: All Samples Teflon

Meter Calibration: Date: 6-5-95 Time: 1100 Meter Serial #: 9011 Temperature °F: 64.3

(EC 1000 978 / 1000) (DI ___) (pH 7 700 / 700) (pH 10 1000 / 1000) (pH 4 398 / ___)

Location of previous calibration: ___

Signature: [signature] Reviewed By: [signature] Page 8 of 10

Rev. 3, 2/94

WATER SAMPLE FIELD DATA SHEET

EMCON ASSOCIATES

PROJECT NO: 1775-202.01 SAMPLE ID: RW-1

PURGED BY: M. Gallegos CLIENT NAME: ARCO # 776

SAMPLED BY: ↓ LOCATION: Oakland, CA.

TYPE: Ground Water X Surface Water ___ Treatment Effluent ___ Other ___

CASING DIAMETER (inches): 2 ___ 3 ___ 4 ___ 4.5 ___ 6 X Other ___

CASING ELEVATION (feet/MSL): NR VOLUME IN CASING (gal.): 31.45

DEPTH TO WATER (feet): 26.20 CALCULATED PURGE (gal.): 94.37

DEPTH OF WELL (feet): 47.6 ACTUAL PURGE VOL. (gal.): 94.5

DATE PURGED: 6-5-95 Start (2400 Hr) 1413 End (2400 Hr) 1435

DATE SAMPLED: 6-5-95 Start (2400 Hr) 1442 End (2400 Hr) ___

TIME (2400 Hr)	VOLUME (gal.)	pH (units)	E.C. (µmhos/cm @ 25° C)	TEMPERATURE (°F)	COLOR (visual)	TURBIDITY (visual)
1421	31.5	6.70	1825	67.9	Clear	Clear
1428	63.0	6.79	1844	67.3	↓	↓
1435	94.5	6.80	1850	67.3	↓	↓

D. O. (ppm): NR ODOR: None.

COLOR (visual): NR (COBALT 0 - 500)

TURBIDITY (visual): NR (NTU 0 - 200 or 0 - 1000)

Field QC samples collected at this well: NR

Parameters field filtered at this well: NR

PURGING EQUIPMENT

- ___ 2" Bladder Pump
- ___ Centrifugal Pump
- X Submersible Pump
- ___ Well Wizard™
- ___ Bailer (Teflon®)
- ___ Bailer (PVC)
- ___ Bailer (Stainless Steel)
- ___ Dedicated
- Other: ___

SAMPLING EQUIPMENT

- ___ 2" Bladder Pump
- ___ DDL Sampler
- ___ Dipper
- ___ Well Wizard™
- X Bailer (Teflon®)
- ___ Bailer (Stainless Steel)
- ___ Submersible Pump
- ___ Dedicated
- Other: ___

WELL INTEGRITY: Good LOCK #: Arco Key

REMARKS: all Samples taken

Meter Calibration: Date: 6-5-95 Time: ___ Meter Serial #: 9011 Temperature °F: ___

(EC 1000 ___ / ___) (DI ___) (pH 7 ___ / ___) (pH 10 ___ / ___) (pH 4 ___ / ___)

Location of previous calibration: MW-5

Signature: [signature] Reviewed By: SVE Page 9 of 10

Rev. 3, 2/94

WATER SAMPLE FIELD DATA SHEET

EMCON ASSOCIATES

PROJECT NO: 1775-202.01 SAMPLE ID: MGR-3

PURGED BY: M. Gallegos CLIENT NAME: ARCO # 7760

SAMPLED BY: ↓ LOCATION: OAKland, CA

TYPE: Ground Water X Surface Water ___ Treatment Effluent ___ Other ___

CASING DIAMETER (inches): 2 ___ 3 ___ 4 X 4.5 ___ 6 ___ Other ___

CASING ELEVATION (feet/MSL): NR VOLUME IN CASING (gal.): 4.93

DEPTH TO WATER (feet): 19.25 CALCULATED PURGE (gal.): 14.79

DEPTH OF WELL (feet): 26.8 ACTUAL PURGE VOL. (gal.): 8.0

DATE PURGED: 6-5-95 Start (2400 Hr) 1158 End (2400 Hr) 1202

DATE SAMPLED: 6-5-95 Start (2400 Hr) 1210 End (2400 Hr) ___

TIME (2400 Hr)	VOLUME (gal.)	pH (units)	E.C. (µmhos/cm @ 25° C)	TEMPERATURE (°F)	COLOR (visual)	TURBIDITY (visual)
1200	5.0	6.20	453	66.8	Lt-BRN	HEAVY
	well Dried at 8.0 gallons					
1210	recharge	6.19	459	67.4	BRN	Heavy

D. O. (ppm): NR ODOR: moderate

COLOR: NR (COBALT 0 - 500) TURBIDITY: NR (NTU 0 - 200 or 0 - 1000)

Field QC samples collected at this well: NR

Parameters field filtered at this well: NR

PURGING EQUIPMENT		SAMPLING EQUIPMENT	
___ 2" Bladder Pump	___ Bailer (Teflon®)	___ 2" Bladder Pump	X Bailer (Teflon®)
___ Centrifugal Pump	X Bailer (PVC)	___ DDL Sampler	___ Bailer (Stainless Steel)
~~X Submersible Pump~~	___ Bailer (Stainless Steel)	___ Dipper	___ Submersible Pump
___ Well Wizard™	___ Dedicated	___ Well Wizard™	___ Dedicated
Other: ___		Other: ___	

WELL INTEGRITY: Good LOCK #: Arco Key

REMARKS: well dried at 8.0 gallons

QA/QC samples taken

Meter Calibration: Date: 6-5-95 Time: ___ Meter Serial #: 9011 Temperature °F: ___

(EC 1000 ___ / ___) (DI ___) (pH 7 ___ / ___) (pH 10 ___ / ___) (pH 4 ___ / ___)

Location of previous calibration: MW-8

Signature: [signature] Reviewed By: [signature] Page 10 of 10

APPENDIX B

ANALYTICAL RESULTS AND CHAIN-OF-CUSTODY DOCUMENTATION, GROUNDWATER MONITORING, SECOND QUARTER 1995

Columbia Analytical Services, Inc.

May 10, 1995

Service Request No.: S950517

Ms. Sailaja Yelamanchili
EMCON
1921 Ringwood Avenue
San Jose, California 95131

RE: **ARCO Facility No. 276 / EMCON Project No. 0805-120.04**

Dear Ms. Yelamanchili:

Attached are the results of the air samples submitted to our laboratory on April 26, 1995. For your information, these analyses have been assigned our service request number S950517.

All analyses were performed consistent with our laboratory's quality assurance program. All results are intended to be considered in their entirety, and Columbia Analytical Services, Inc. (CAS) is not responsible for use of less than the complete report. Results apply only to the samples analyzed.

Please call if you have any questions.

Respectfully submitted,

Columbia Analytical Services, Inc.

L J Hawley for

Steven L. Green
Project Chemist

1921 Ringwood Avenue • San Jose, California 95131 • Telephone 408/437-2400 • Fax 408/437-9356

Acronyms

ASTM	American Society for Testing and Materials
A2LA	American Association for Laboratory Accreditation
CARB	California Air Resources Board
CAS Number	Chemical Abstract Service registry Number
CFC	Chlorofluorocarbon
CFU	Colony-Forming Unit
DEC	Department of Environmental Conservation
DEQ	Department of Environmental Quality
DHS	Department of Health Services
DOE	Department of Ecology
DOH	Department of Health
EPA	U. S. Environmental Protection Agency
ELAP	Environmental Laboratory Accreditation Program
GC	Gas Chromatography
GC/MS	Gas Chromatography/Mass Spectrometry
LUFT	Leaking Underground Fuel Tank
M	Modified
MCL	Maximum Contaminant Level is the highest permissible concentration of a substance allowed in drinking water as established by the U. S. EPA.
MDL	Method Detection Limit
MPN	Most Probable Number
MRL	Method Reporting Limit
NA	Not Applicable
NAN	Not Analyzed
NC	Not Calculated
NCASI	National Council of the paper industry for Air and Stream Improvement
ND	Not Detected at or above the MRL
NIOSH	National Institute for Occupational Safety and Health
PQL	Practical Quantitation Limit
RCRA	Resource Conservation and Recovery Act
SIM	Selected Ion Monitoring
TPH	Total Petroleum Hydrocarbons

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COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client:	EMCON	**Service Request:**	S950517
Project:	ARCO Facility No.276 / EMCON Project No. 0805-120.04	**Date Collected:**	4/26/95
Sample Matrix:	Vapor	**Date Received:**	4/26/95
		Date Extracted:	NA

BTEX and Total Volatile Hydrocarbons

Units: mg/m^3

Sample Name:	**E-1**	**OFF-SITE**	**I-2**
Lab Code:	S950517-001	S950517-002	S950517-003
Date Analyzed:	4/26/95	4/26/95	4/26/95

Analyte	**MRL**			
Benzene	0.5	ND	ND	ND
Toluene	0.5	ND	ND	ND
Ethylbenzene	0.5	ND	ND	ND
Total Xylenes	1	ND	ND	ND
Total Volatile Hydrocarbons				
C_1 - C_4 Hydrocarbons	20	ND	ND	ND
C_5 - C_8 Hydrocarbons	20	ND	ND	ND
C_9 - C_{12} Hydrocarbons	20	ND	ND	ND
Gasoline Fraction (C_5-C_{12})	60	ND	ND	ND

Approved By: L Hawley Date: 5/8/95

3S22/060194

0517 XLS - Gbtx-au 5/4/95

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COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: EMCON
Project: ARCO Facility No.276 / EMCON Project No. 0805-120.04
Sample Matrix: Vapor

Service Request: S950517
Date Collected: 4/26/95
Date Received: 4/26/95
Date Extracted: NA

BTEX and Total Volatile Hydrocarbons

Units: mg/m^3

Sample Name:	**I-1**	**Method Blank**
Lab Code:	S950517-004	S950426-VB1
Date Analyzed:	4/26/95	4/26/95

Analyte	**MRL**		
Benzene	0.5	ND	ND
Toluene	0.5	ND	ND
Ethylbenzene	0.5	ND	ND
Total Xylenes	1	ND	ND
Total Volatile Hydrocarbons			
C_1 - C_4 Hydrocarbons	20	ND	ND
C_5 - C_8 Hydrocarbons	20	ND	ND
C_9 - C_{12} Hydrocarbons	20	ND	ND
Gasoline Fraction (C_5-C_{12})	60	ND	ND

Approved By: L J Hawley Date: 5/8/95

3S22/060194

0517 XLS - Gbtx-air (2) 5/4/95

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COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client: EMCON
Project: ARCO Facility No.276 / EMCON Project No. 0805-120.04
Sample Matrix: Vapor

Service Request: S950517
Date Collected: 4/26/95
Date Received: 4/26/95
Date Extracted: NA
Date Analyzed: 4/26/95

Duplicate Summary
BTEX and Total Volatile Hydrocarbons

Units: mg/m^3

Sample Name: Batch QC
Lab Code: S950513-001

Analyte	MRL	Sample Result	Duplicate Sample Result	Average	Relative Percent Difference
Benzene	0.5	50.2	46.9	48.6	7
Toluene	0.5	79.8	81.4	80.6	2
Ethylbenzene	0.5	9.6	9.0	9.3	6
Total Volatile Hydrocarbons					
C_1 - C_4 Hydrocarbons	20	<200*	<200*	ND	<1
C_5 - C_8 Hydrocarbons	20	6,770	7,030	6,900	4
C_9 - C_{12} Hydrocarbons	20	827	838	832	1
Gasoline Fraction (C_5-C_{12})	60	7,600	7,870	7,740	3

* RRL conc.

Approved By: L J Hardy Date: 5/8/95

DUP1S/060194

950517 XLS - DUPgbtx-air 5/9/95

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COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client: EMCON
Project: ARCO Facility No.276 / EMCON Project No. 0805-120.04

Service Request: S950517
Date Analyzed: 4/26/95

Initial Calibration Verification (ICV) Summary
BTEX and Total Volatile Hydrocarbons

Units: ppb

Analyte	True Value	Result	Percent Recovery	CAS Percent Recovery Acceptance Limits
Benzene	16	15.2	95	85-115
Toluene	16	14.9	93	85-115
Ethylbenzene	16	14.2	89	85-115
Xylenes, Total	48	43.1	90	85-115
Gasoline	200	199	100	90-110

Approved By: L J Farooly Date: 5/8/95

ICV25AL/060194
0517 XLS - agbtxcal 5/4/95

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ARCO Products Company
Division of AtlanticRichfieldCompany

Chain of Custody

Task Order No. 2452.00

ARCO Facility no. 276	City (Facility) Oakland	Project manager (Consultant) Sailaja Yelamanchili	Laboratory name CAS
ARCO engineer Mike Whelan	Telephone no. (ARCO) 4083778697	Telephone no. (Consultant) 4084537300	Fax no. (Consultant) 4084530452
Consultant name EMCON	Address (Consultant) 1921 Ringwood San JOSE, CA.		Contract number 07077

Method of shipment: Tech

Sample I.D.	Lab no.	Container no.	Matrix: Soil	Matrix: Water	Matrix: Other (Vapor)	Preservation: Ice	Preservation: Acid	Sampling date	Sampling time	BTEX 602/EPA 8020	BTEX/TPH EPA M602/8020/8015	TPH Modified 8015 Gas ☐ Diesel ☐	Oil and Grease 413.1 ☐ 413.2 ☐	TPH EPA 418.1/SM5030E	EPA 601/8010	EPA 624/8240	EPA 625/8270	TCLP Metals ☐ Semi VOA ☐ VOA ☐	CAM Metals EPA 6010/7000 TTLC ☐ STLC ☐	Lead Org./DHS ☐ Lead EPA 7420/7421 ☐		
E-1	1	1			X			4-26-95	1256		X											
OFFSite	2	1			X				1306		X											
I-2	3	1			X				1317		X											
I-1	4	1			X			↓	1311		X											

Special detection Limit/reporting: please report results in mg/m3

Special QA/QC

Remarks: 0805-120.04

Lab number: S950517

Condition of sample: Inflated

Temperature received:

Relinquished by sampler	Date 4-26-95	Time 1433	Received by
Relinquished by	Date	Time	Received by
Relinquished by	Date	Time	Received by laboratory: Joann Brown — Date 4-26-95 — Time 1433

Turnaround time

- Priority Rush 1 Business Day ☐
- Rush 2 Business Days ☐
- Expedited 5 Business Days ☐
- Standard 10 Business Days ☒

Distribution: White copy — Laboratory; Canary copy — ARCO Environmental Engineering; Pink copy — Consultant

APPC-3292 (2-91)

APPENDIX C

ANALYTICAL RESULTS AND CHAIN-OF-CUSTODY DOCUMENTATION FOR SVE SYSTEM AIR SAMPLES, SECOND QUARTER 1995

Columbia Analytical Services, Inc.

May 22, 1995

Service Request No.: S950577

Valli Voraganti
EMCON
1921 Ringwood Ave.
San Jose, Ca 95131

RE: **ARCO # 276 / Project No. 0805-120.04**

Dear Valli:

Attached are the results of the sample(s) submitted to our laboratory on May 8, 1995. For your information, these analyses have been assigned our service request number S950577.

All analyses were performed consistent with our laboratory's quality assurance program. All results are intended to be considered in their entirety, and Columbia Analytical Services, Inc. (CAS) is not responsible for use of less than the complete report. Results apply only to the samples analyzed.

Please call if you have any questions.

Respectfully submitted,

Columbia Analytical Services, Inc.

Steven L. Green
Project Chemist

Annelise J. Bazar
Regional QA Coordinator

CVR_PG DOC 1/26/95

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COLUMBIA ANALYTICAL SERVICES, Inc.

Acronyms

ASTM	American Society for Testing and Materials
A2LA	American Association for Laboratory Accreditation
CARB	California Air Resources Board
CAS Number	Chemical Abstract Service registry Number
CFC	Chlorofluorocarbon
CFU	Colony-Forming Unit
DEC	Department of Environmental Conservation
DEQ	Department of Environmental Quality
DHS	Department of Health Services
DOE	Department of Ecology
DOH	Department of Health
EPA	U. S. Environmental Protection Agency
ELAP	Environmental Laboratory Accreditation Program
GC	Gas Chromatography
GC/MS	Gas Chromatography/Mass Spectrometry
LUFT	Leaking Underground Fuel Tank
M	Modified
MCL	Maximum Contaminant Level is the highest permissible concentration of a substance allowed in drinking water as established by the U. S. EPA.
MDL	Method Detection Limit
MPN	Most Probable Number
MRL	Method Reporting Limit
NA	Not Applicable
NAN	Not Analyzed
NC	Not Calculated
NCASI	National Council of the paper industry for Air and Stream Improvement
ND	Not Detected at or above the MRL
NIOSH	National Institute for Occupational Safety and Health
NR	Not Requested
PQL	Practical Quantitation Limit
RCRA	Resource Conservation and Recovery Act
SIM	Selected Ion Monitoring
TPH	Total Petroleum Hydrocarbons

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COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: EMCON
Project: ARCO Facility No. 276/EMCON Project No. 0805-120.04
Sample Matrix: Vapor

Service Request: S950577
Date Collected: 5/8/95
Date Received: 5/9/95
Date Extracted: NA

BTEX and Total Volatile Hydrocarbons

Units: mg/m^3

Sample Name:	**E-1**	**Offsite**	**I-1**
Lab Code:	S950577-001	S950577-002	S950577-003
Date Analyzed:	5/10/95	5/10/95	5/10/95

Analyte	**MRL**			
Benzene	0.5	ND	ND	ND
Toluene	0.5	ND	ND	ND
Ethylbenzene	0.5	ND	ND	ND
Total Xylenes	1	ND	ND	ND
Total Volatile Hydrocarbons				
C_1 - C_4 Hydrocarbons	20	ND	ND	ND
C_5 - C_8 Hydrocarbons	20	ND	ND	ND
C_9 - C_{12} Hydrocarbons	20	ND	ND	ND
Gasoline Fraction (C_5-C_{12})	60	ND	ND	ND

Approved By: Steve Sheen Date: 5/22/95

3S22/060194

950577 XLS - Gbtx-air 5/22/95

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COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: EMCON
Project: ARCO Facility No. 276/EMCON Project No. 0805-120.04
Sample Matrix: Vapor

Service Request: S950577
Date Collected: 5/8/95
Date Received: 5/9/95
Date Extracted: NA

BTEX and Total Volatile Hydrocarbons

Units: mg/m^3

Sample Name:	**I-2**	**Method Blank**
Lab Code:	S950577-004	S950510-VB1
Date Analyzed:	5/10/95	5/10/95

Analyte	**MRL**		
Benzene	0.5	ND	ND
Toluene	0.5	ND	ND
Ethylbenzene	0.5	ND	ND
Total Xylenes	1	ND	ND
Total Volatile Hydrocarbons			
C_1 - C_4 Hydrocarbons	20	ND	ND
C_5 - C_8 Hydrocarbons	20	ND	ND
C_9 - C_{12} Hydrocarbons	20	ND	ND
Gasoline Fraction (C_5-C_{12})	60	ND	ND

Approved By: Steve Vheen Date: 5/22/95

3S22/060194

950577 XLS - Gbtx-air (2) 5/22/95

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COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client: EMCON
Project: ARCO Facility No. 276/EMCON Project No. 0805-120.04
Sample Matrix: Vapor

Service Request: S950577
Date Collected: 5/8/95
Date Received: 5/9/95
Date Extracted: NA
Date Analyzed: 5/10/95

Duplicate Summary
BTEX and Total Volatile Hydrocarbons

Units: mg/m^3

Sample Name: Batch QC
Lab Code: S950597-001

Analyte	MRL	Sample Result	Duplicate Sample Result	Average	Relative Percent Difference
Benzene	0.5	43.3	43.9	43.6	1
Toluene	0.5	73.8	73.6	73.7	<1
Ethylbenzene	0.5	9.1	9.7	9.4	6
Total Volatile Hydrocarbons					
C_1 - C_4 Hydrocarbons	20	<200*	<200*	<200*	<1
C_5 - C_8 Hydrocarbons	20	8350	8110	8230	3
C_9 - C_{12} Hydrocarbons	20	884	889	886.5	1
Gasoline Fraction (C_5-C_{12})	60	9230	9000	9115	3

*Raised MRL due to high analyte concentration requiring sample dilution.

Approved By: _____ Date: 5/22/95

DUP1S/060194

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COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client: EMCON **Service Request:** S950577
Project: ARCO Facility No. 276/EMCON Project No. 0805-120.04 **Date Analyzed:** 5/10/95

Initial Calibration Verification (ICV) Summary
BTEX and Total Volatile Hydrocarbons

Units: ppb

Analyte	True Value	Result	Percent Recovery	CAS Percent Recovery Acceptance Limits
Benzene	16	14.1	88	85-115
Toluene	16	13.9	87	85-115
Ethylbenzene	16	13.6	85	85-115
Xylenes, Total	48	40.7	85	85-115
Gasoline	200	201	101	90-110

Approved By: _____ Date: 5/22/95

ICV25AL/060194
950577.XLS - agbtxcal 5/22/95

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ARCO Products Company
Division of AtlanticRichfieldCompany

Task Order No. 2452.00

Chain of Custody

ARCO Facility no. 276	City (Facility) Oakland	Project manager (Consultant) V. Voraganti	Laboratory name CAS
ARCO engineer Mike Whelan	Telephone no. (ARCO) 4083778697	Telephone no. (Consultant) 4084537300	Fax no. (Consultant) 4084537319
Consultant name EMCON	Address (Consultant) 1921 Ringwood San JOSE, CA.		Contract number 07077

Method of shipment: Tech.

Sample I.D.	Lab no.	Container no.	Matrix: Soil	Matrix: Water	Matrix: Other (Vapor)	Preservation: Ice	Preservation: Acid	Sampling date	Sampling time	BTEX 602/EPA 8020	BTEX/TPH EPA M8020/8015	TPH Modified 8015 Gas ☐ Diesel ☐	Oil and Grease 413.1 ☐ 413.2 ☐	TPH EPA 418.1/SM503E	EPA 601/8010	EPA 624/8240	EPA 625/8270	TCLP Metals ☐ Semi VOA ☐ VOA ☐	CAM Metals EPA 6010/7000 TTLC ☐ STLC ☐	Lead Org./DHS ☐ Lead EPA 7420/7421 ☐		
E-1	1	1			X			5-8-95	1302		X											
OFFSite	2	1			X				1308		X											
I-1	3	1			X				1313		X											
I-2	4	1			X				1320		X											

Special detection Limit/reporting: please report in mg/m^3

Special QA/QC

Remarks: 0805-120.04

Lab number: 9950577

Turnaround time

Priority Rush 1 Business Day	☐	
Rush 2 Business Days	☐	
Expedited 5 Business Days	☐	
Standard 10 Business Days	☒	

Condition of sample: Inflated

Temperature received:

Relinquished by sampler	Date 5-8-95	Time 1518	Received by
Relinquished by	Date	Time	Received by
Relinquished by	Date	Time	Received by laboratory CAS-SJ Josie Brown

Date: 5-8-95 Time: 1518

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APPC-3292 (2-91)

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Due 5/22

Columbia Analytical Services, Inc.

June 19, 1995 Service Request No. S950701

John Young
EMCON
1921 Ringwood Avenue
San Jose, CA 95131

Re: **ARCO Facility No. 0276 / EMCON Project No. 0805-120.04**

Dear Mr. Young:

Attached are the results of the water sample(s) submitted to our lab on June 5, 1995. For your reference, these analyses have been assigned our service request number S950701.

All analyses were performed consistent with our laboratory's quality assurance program. All results are intended to be considered in their entirety, and CAS is not responsible for use of less than the complete report. Results apply only to the samples analyzed.

Please call if you have any questions.

Respectfully submitted:

COLUMBIA ANALYTICAL SERVICES, INC.

Steven L. Green
Project Chemist

Annelise J. Bazar
Regional QA Coordinator

SLG/ajb

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COLUMBIA ANALYTICAL SERVICES, Inc.

Acronyms

ASTM	American Society for Testing and Materials
A2LA	American Association for Laboratory Accreditation
CARB	California Air Resources Board
CAS Number	Chemical Abstract Service registry Number
CFC	Chlorofluorocarbon
CFU	Colony-Forming Unit
DEC	Department of Environmental Conservation
DEQ	Department of Environmental Quality
DHS	Department of Health Services
DOE	Department of Ecology
DOH	Department of Health
EPA	U. S. Environmental Protection Agency
ELAP	Environmental Laboratory Accreditation Program
GC	Gas Chromatography
GC/MS	Gas Chromatography/Mass Spectrometry
LUFT	Leaking Underground Fuel Tank
M	Modified
MCL	Maximum Contaminant Level is the highest permissible concentration of a substance allowed in drinking water as established by the U. S. EPA.
MDL	Method Detection Limit
MPN	Most Probable Number
MRL	Method Reporting Limit
NA	Not Applicable
NAN	Not Analyzed
NC	Not Calculated
NCASI	National Council of the paper industry for Air and Stream Improvement
ND	Not Detected at or above the MRL
NIOSH	National Institute for Occupational Safety and Health
PQL	Practical Quantitation Limit
RCRA	Resource Conservation and Recovery Act
SIM	Selected Ion Monitoring
TPH	Total Petroleum Hydrocarbons

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client:	EMCON	**Service Request:**	S950701
Project:	ARCO Facility No. 0276 / EMCON Project No. 0805-120.04	**Date Collected:**	6/5/95
Sample Matrix:	Water	**Date Received:**	6/5/95
		Date Extracted:	NA
		Date Analyzed:	6/14,15/95

BTEX and TPH as Gasoline
EPA Methods 5030/8020/California DHS LUFT Method

Analyte:	**TPH as Gasoline**	**Benzene**	**Toluene**	**Ethyl-benzene**	**Xylenes, Total**
Units:	ug/L (ppb)	ug/L (ppb)	ug/L (ppb)	ug/L (ppb)	ug/L (ppb)
Method Reporting Limit:	50	0.5	0.5	0.5	0.5
Sample Name	**Lab Code**				
MW-8 (47)	S950701-001	ND	ND	ND	ND	ND
WGR-3 (26)	S950701-002	ND	ND	ND	ND	ND
MW-1 (38)	S950701-003	<84 *	ND	ND	ND	ND
MW-5 (46)	S950701-004	<130 *	ND	ND	ND	ND
RW-1 (47)	S950701-005	ND	ND	ND	ND	ND
MW-6 (51)	S950701-006	<750 *	ND	ND	ND	ND
MW-3 (38)	S950701-007	<970 *	<1 **	<1 **	1.1	1.8
MW-4 (47)	S950701-008	<1,200 *	<1 **	<1 **	<1 **	<1 **
MW-2 (25)	S950701-009	1,800	59	10	53	130
MW-7 (36)	S950701-010	36,000	90	51	450	2,000
Method Blank	S950614-WB	ND	ND	ND	ND	ND
Method Blank	S950615-WB	ND	ND	ND	ND	ND

* Raised MRL due to matrix interference. The sample contains a single non-fuel component eluting in the gasoline range, quantified as gasoline. The chromatogram does not match the typical gasoline fingerprint.

** Raised MRL due to matrix interference requiring sample dilution.

Approved By: _____ Date: 6/19/95

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client: EMCON
Project: ARCO Facility No. 0276 / EMCON Project No. 0805-120.04
Sample Matrix: Water

Service Request: S950701
Date Collected: 6/5/95
Date Received: 6/5/95
Date Extracted: NA
Date Analyzed: 6/14,15/95

Surrogate Recovery Summary
BTEX and TPH as Gasoline
EPA Methods 5030/8020/California DHS LUFT Method

Sample Name	Lab Code	Percent Recovery α,α,α-Trifluorotoluene
MW-8 (47)	S950701-001	93
WGR-3 (26)	S950701-002	92
MW-1 (38)	S950701-003	93
MW-5 (46)	S950701-004	94
RW-1 (47)	S950701-005	93
MW-6 (51)	S950701-006	97
MW-3 (38)	S950701-007	94
MW-4 (47)	S950701-008	93
MW-2 (25)	S950701-009	95
MW-7 (36)	S950701-010	109 *
MW-2 (25) MS	S950701-009MS	104
MW-2 (25) DMS	S950701-009DMS	105
Method Blank	S950614-WB	93
Method Blank	S950615-WB	95

CAS Acceptance Limits: 69-116

* The surrogate used for this sample was 4-bromofluorobenzene.

Approved By: _____ Date: 6/19/95

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client:	EMCON	**Service Request:**	S950701
Project:	ARCO Facility No. 0276 / EMCON Project No. 0805-120.04	**Date Collected:**	6/5/95
Sample Matrix:	Water	**Date Received:**	6/5/95
		Date Extracted:	NA
		Date Analyzed:	6/15/95

Matrix Spike/Duplicate Matrix Spike Summary
TPH as Gasoline
EPA Methods 5030/California DHS LUFT Method
Units: ug/L (ppb)

Sample Name: MW-2 (25)
Lab Code: S950701-009

						Percent Recovery			
	Spike Level		Sample	Spike Result				CAS Acceptance	Relative Percent
Analyte	MS	DMS	**Result**	MS	DMS	MS	DMS	Limits	**Difference**
Gasoline	2,500	2,500	1,840	4,270	4,310	97	99	67-121	1

Approved By: _____ Date: 6/19/95

DMS1S/060194
950701 XLS - wgasms 6/19/95

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client: EMCON
Project: ARCO Facility No. 0276 / EMCON Project No. 0805-120.04

Service Request: S950701
Date Analyzed: 6/14/95

Initial Calibration Verification (ICV) Summary
BTEX and TPH as Gasoline
EPA Methods 5030/8020/California DHS LUFT Method
Units: ppb

Analyte	True Value	Result	Percent Recovery	CAS Percent Recovery Acceptance Limits
Benzene	25	24.2	97	85-115
Toluene	25	23.0	92	85-115
Ethylbenzene	25	23.2	93	85-115
Xylenes, Total	75	66.7	89	85-115
Gasoline	250	238	95	90-110

Approved By: _____ Date: 6/19/95

ICV25AL/060194
950701 XLS - wgbtxcal 6/19/95

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: EMCON
Project: ARCO Facility No. 0276 / EMCON Project No. 0805-120.04
Sample Matrix: Water

Service Request: S950701
Date Collected: 6/5/95
Date Received: 6/5/95
Date Extracted: NA

Volatile Organic Compounds
EPA Method 624
Units: ug/L (ppb)

	Sample Name:	MW-8 (47)	WGR-3 (26)	MW-1 (38) *
	Lab Code:	S950701-001	S950701-002	S950701-003
	Date Analyzed:	6/7/95	6/7/95	6/8/95
Analyte	**MRL**			
Chloromethane	10	ND	ND	<50
Vinyl Chloride	10	ND	ND	<50
Bromomethane	10	ND	ND	<50
Chloroethane	10	ND	ND	<50
Trichlorofluoromethane (CFC 11)	1	ND	ND	<5
Trichlorotrifluoroethane (CFC 113)	10	ND	ND	<50
1,1-Dichloroethene	1	ND	ND	<5
Acetone	20	ND	ND	<100
Carbon Disulfide	1	ND	ND	<5
Methylene Chloride	10	ND	ND	<50
trans-1,2-Dichloroethene	1	ND	ND	<5
cis-1,2-Dichloroethene	1	ND	ND	<5
2-Butanone (MEK)	10	ND	ND	<50
1,1-Dichloroethane	1	ND	ND	<5
Chloroform	1	ND	ND	<5
1,1,1-Trichloroethane (TCA)	1	ND	ND	<5
Carbon Tetrachloride	1	ND	ND	<5
Benzene	1	ND	ND	<5
1,2-Dichloroethane	1	ND	ND	<5
Vinyl Acetate	10	ND	ND	<50
Trichloroethene (TCE)	1	ND	ND	<5
1,2-Dichloropropane	1	ND	ND	<5
Bromodichloromethane	1	ND	ND	<5
2-Chloroethyl Vinyl Ether	10	ND	ND	<50
trans-1,3-Dichloropropene	1	ND	ND	<5
4-Methyl-2-pentanone (MIBK)	10	ND	ND	<50
2-Hexanone	10	ND	ND	<50
Toluene	1	ND	ND	<5
cis-1,3-Dichloropropene	1	ND	ND	<5
1,1,2-Trichloroethane	1	ND	ND	<5
Tetrachloroethene (PCE)	1	ND	ND	210
Dibromochloromethane	1	ND	ND	<5
Chlorobenzene	1	ND	ND	<5
Ethylbenzene	1	ND	ND	<5
Styrene	1	ND	ND	<5
Total Xylenes	5	ND	ND	<25
Bromoform	1	ND	ND	<5
1,1,2,2-Tetrachloroethane	1	ND	ND	<5
1,3-Dichlorobenzene	1	ND	ND	<5
1,4-Dichlorobenzene	1	ND	ND	<5
1,2-Dichlorobenzene	1	ND	ND	<5

* Raised MRL due to high analyte concentration requiring sample dilution.

Approved By: _____ Date: 7/7/95

3S44/060194

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: EMCON
Project: ARCO Facility No. 0276 / EMCON Project No. 0805-120.04
Sample Matrix: Water

Service Request: S950701
Date Collected: 6/5/95
Date Received: 6/5/95
Date Extracted: NA

Volatile Organic Compounds
EPA Method 624
Units: ug/L (ppb)

	Sample Name:	MW-5 (46) *	RW-1 (47)	MW-6 (51) *
	Lab Code:	S950701-004	S950701-005	S950701-006
	Date Analyzed:	6/8/95	6/9/95	6/8/95
Analyte	**MRL**			
Chloromethane	10	<50	ND	<200
Vinyl Chloride	10	<50	ND	<200
Bromomethane	10	<50	ND	<200
Chloroethane	10	<50	ND	<200
Trichlorofluoromethane (CFC 11)	1	<5	ND	<20
Trichlorotrifluoroethane (CFC 113)	10	<50	ND	<200
1,1-Dichloroethene	1	<5	ND	<20
Acetone	20	<100	ND	<400
Carbon Disulfide	1	<5	ND	<20
Methylene Chloride	10	<50	ND	<200
trans-1,2-Dichloroethene	1	<5	ND	<20
cis-1,2-Dichloroethene	1	<5	ND	<20
2-Butanone (MEK)	10	<50	ND	<200
1,1-Dichloroethane	1	<5	ND	<20
Chloroform	1	<5	ND	<20
1,1,1-Trichloroethane (TCA)	1	<5	ND	<20
Carbon Tetrachloride	1	<5	ND	<20
Benzene	1	<5	ND	<20
1,2-Dichloroethane	1	<5	ND	<20
Vinyl Acetate	10	<50	ND	<200
Trichloroethene (TCE)	1	<5	ND	<20
1,2-Dichloropropane	1	<5	ND	<20
Bromodichloromethane	1	<5	ND	<20
2-Chloroethyl Vinyl Ether	10	<50	ND	<200
trans-1,3-Dichloropropene	1	<5	ND	<20
4-Methyl-2-pentanone (MIBK)	10	<50	ND	<200
2-Hexanone	10	<50	ND	<200
Toluene	1	<5	ND	<20
cis-1,3-Dichloropropene	1	<5	ND	<20
1,1,2-Trichloroethane	1	<5	ND	<20
Tetrachloroethene (PCE)	1	310	59	2,000
Dibromochloromethane	1	<5	ND	<20
Chlorobenzene	1	<5	ND	<20
Ethylbenzene	1	<5	ND	<20
Styrene	1	<5	ND	<20
Total Xylenes	5	<25	ND	<100
Bromoform	1	<5	ND	<20
1,1,2,2-Tetrachloroethane	1	<5	ND	<20
1,3-Dichlorobenzene	1	<5	ND	<20
1,4-Dichlorobenzene	1	<5	ND	<20
1,2-Dichlorobenzene	1	<5	ND	<20

* Raised MRL due to high analyte concentration requiring sample dilution.

Approved By: Steve Green Date: 7/12/95

3S44/060194

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: EMCON
Project: ARCO Facility No. 0276 / EMCON Project No. 0805-120.04
Sample Matrix: Water

Service Request: S950701
Date Collected: 6/5/95
Date Received: 6/5/95
Date Extracted: NA

Volatile Organic Compounds
EPA Method 624
Units: ug/L (ppb)

		Sample Name:	**MW-3 (38) ***	**MW-4 (47) ***	**MW-2 (25)**
		Lab Code:	S950701-007	S950701-008	S950701-009
		Date Analyzed:	6/9/95	6/8/95	6/7/95
Analyte	**MRL**				
Chloromethane	10		<200	<200	ND
Vinyl Chloride	10		<200	<200	ND
Bromomethane	10		<200	<200	ND
Chloroethane	10		<200	<200	ND
Trichlorofluoromethane (CFC 11)	1		<20	<20	ND
Trichlorotrifluoroethane (CFC 113)	10		<200	<200	ND
1,1-Dichloroethene	1		<20	<20	ND
Acetone	20		<400	<400	ND
Carbon Disulfide	1		<20	<20	ND
Methylene Chloride	10		<200	<200	ND
trans-1,2-Dichloroethene	1		<20	<20	ND
cis-1,2-Dichloroethene	1		<20	<20	ND
2-Butanone (MEK)	10		<200	<200	ND
1,1-Dichloroethane	1		<20	<20	ND
Chloroform	1		<20	<20	ND
1,1,1-Trichloroethane (TCA)	1		<20	<20	ND
Carbon Tetrachloride	1		<20	<20	ND
Benzene	1		<20	<20	83
1,2-Dichloroethane	1		<20	<20	ND
Vinyl Acetate	10		<200	<200	ND
Trichloroethene (TCE)	1		<20	<20	ND
1,2-Dichloropropane	1		<20	<20	ND
Bromodichloromethane	1		<20	<20	ND
2-Chloroethyl Vinyl Ether	10		<200	<200	ND
trans-1,3-Dichloropropene	1		<20	<20	ND
4-Methyl-2-pentanone (MIBK)	10		<200	<200	ND
2-Hexanone	10		<200	<200	ND
Toluene	1		<20	<20	14
cis-1,3-Dichloropropene	1		<20	<20	ND
1,1,2-Trichloroethane	1		<20	<20	ND
Tetrachloroethene (PCE)	1		2,500	3,100	ND
Dibromochloromethane	1		<20	<20	ND
Chlorobenzene	1		<20	<20	ND
Ethylbenzene	1		<20	<20	72
Styrene	1		<20	<20	ND
Total Xylenes	5		<100	<100	190
Bromoform	1		<20	<20	ND
1,1,2,2-Tetrachloroethane	1		<20	<20	ND
1,3-Dichlorobenzene	1		<20	<20	ND
1,4-Dichlorobenzene	1		<20	<20	ND
1,2-Dichlorobenzene	1		<20	<20	ND

* Raised MRL due to high analyte concentration requiring sample dilution.

Approved By: _____ Date: 7/12/95

3S44/060194

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: EMCON
Project: ARCO Facility No. 0276 / EMCON Project No. 0805-120.04
Sample Matrix: Water

Service Request: S950701
Date Collected: 6/5/95
Date Received: 6/5/95
Date Extracted: NA

Volatile Organic Compounds
EPA Method 624
Units: ug/L (ppb)

	Sample Name:	MW-7 (36) *	Method Blank	Method Blank
	Lab Code:	S950701-010	S950607-WB	S950608-WB
	Date Analyzed:	6/8/95	6/7/95	6/8/95
Analyte	**MRL**			
Chloromethane	10	<100	ND	ND
Vinyl Chloride	10	<100	ND	ND
Bromomethane	10	<100	ND	ND
Chloroethane	10	<100	ND	ND
Trichlorofluoromethane (CFC 11)	1	<10	ND	ND
Trichlorotrifluoroethane (CFC 113)	10	<100	ND	ND
1,1-Dichloroethene	1	<10	ND	ND
Acetone	20	<200	ND	ND
Carbon Disulfide	1	<10	ND	ND
Methylene Chloride	10	<100	ND	ND
trans-1,2-Dichloroethene	1	<10	ND	ND
cis-1,2-Dichloroethene	1	<10	ND	ND
2-Butanone (MEK)	10	<100	ND	ND
1,1-Dichloroethane	1	<10	ND	ND
Chloroform	1	<10	ND	ND
1,1,1-Trichloroethane (TCA)	1	<10	ND	ND
Carbon Tetrachloride	1	<10	ND	ND
Benzene	1	86	ND	ND
1,2-Dichloroethane	1	<10	ND	ND
Vinyl Acetate	10	<100	ND	ND
Trichloroethene (TCE)	1	<10	ND	ND
1,2-Dichloropropane	1	<10	ND	ND
Bromodichloromethane	1	<10	ND	ND
2-Chloroethyl Vinyl Ether	10	<100	ND	ND
trans-1,3-Dichloropropene	1	<10	ND	ND
4-Methyl-2-pentanone (MIBK)	10	<100	ND	ND
2-Hexanone	10	<100	ND	ND
Toluene	1	27	ND	ND
cis-1,3-Dichloropropene	1	<10	ND	ND
1,1,2-Trichloroethane	1	<10	ND	ND
Tetrachloroethene (PCE)	1	<10	ND	ND
Dibromochloromethane	1	<10	ND	ND
Chlorobenzene	1	<10	ND	ND
Ethylbenzene	1	420	ND	ND
Styrene	1	<10	ND	ND
Total Xylenes	5	1400	ND	ND
Bromoform	1	<10	ND	ND
1,1,2,2-Tetrachloroethane	1	<10	ND	ND
1,3-Dichlorobenzene	1	<10	ND	ND
1,4-Dichlorobenzene	1	<10	ND	ND
1,2-Dichlorobenzene	1	<10	ND	ND

* Raised MRL due to high analyte concentration requiring sample dilution.

Approved By: _____ Date: 6/19/95

3S44/060194

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: EMCON
Project: ARCO Facility No. 0276 / EMCON Project No. 0805-120.04
Sample Matrix: Water

Service Request: S950701
Date Collected: 6/5/95
Date Received: 6/5/95
Date Extracted: NA

Volatile Organic Compounds
EPA Method 624
Units: ug/L (ppb)

Sample Name:	**Method Blank**
Lab Code:	S950609-WB
Date Analyzed:	6/9/95

Analyte	**MRL**	
Chloromethane	10	ND
Vinyl Chloride	10	ND
Bromomethane	10	ND
Chloroethane	10	ND
Trichlorofluoromethane (CFC 11)	1	ND
Trichlorotrifluoroethane (CFC 113)	10	ND
1,1-Dichloroethene	1	ND
Acetone	20	ND
Carbon Disulfide	1	ND
Methylene Chloride	10	ND
trans-1,2-Dichloroethene	1	ND
cis-1,2-Dichloroethene	1	ND
2-Butanone (MEK)	10	ND
1,1-Dichloroethane	1	ND
Chloroform	1	ND
1,1,1-Trichloroethane (TCA)	1	ND
Carbon Tetrachloride	1	ND
Benzene	1	ND
1,2-Dichloroethane	1	ND
Vinyl Acetate	10	ND
Trichloroethene (TCE)	1	ND
1,2-Dichloropropane	1	ND
Bromodichloromethane	1	ND
2-Chloroethyl Vinyl Ether	10	ND
trans-1,3-Dichloropropene	1	ND
4-Methyl-2-pentanone (MIBK)	10	ND
2-Hexanone	10	ND
Toluene	1	ND
cis-1,3-Dichloropropene	1	ND
1,1,2-Trichloroethane	1	ND
Tetrachloroethene (PCE)	1	ND
Dibromochloromethane	1	ND
Chlorobenzene	1	ND
Ethylbenzene	1	ND
Styrene	1	ND
Total Xylenes	5	ND
Bromoform	1	ND
1,1,2,2-Tetrachloroethane	1	ND
1,3-Dichlorobenzene	1	ND
1,4-Dichlorobenzene	1	ND
1,2-Dichlorobenzene	1	ND

Approved By: _____ Date: 6/19/95

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client: EMCON
Project: ARCO Facility No. 0276 / EMCON Project No. 0805-120.04
Sample Matrix: Water

Service Request: S950701
Date Collected: 6/5/95
Date Received: 6/5/95
Date Extracted: NA
Date Analyzed: 6/7-9/95

Surrogate Recovery Summary
Volatile Organic Compounds
EPA Method 624

Sample Name	Lab Code	Percent Recovery 1,2-Dichloroethane-D_4	Toluene-D_8	4-Bromofluorobenzene
MW-8 (47)	S950701-001	102	89	100
WGR-3 (26)	S950701-002	99	104	101
MW-1 (38)	S950701-003	103	102	99
MW-5 (46)	S950701-004	102	107	101
RW-1 (47)	S950701-005	100	101	100
MW-6 (51)	S950701-006	102	105	102
MW-3 (38)	S950701-007	100	88	101
MW-4 (47)	S950701-008	99	107	102
MW-2 (25)	S950701-009	103	106	102
MW-7 (36)	S950701-010	99	88	100
MW-5 (46) MS	S950701-004MS	100	106	101
MW-5 (46) DMS	S950701-004DMS	102	107	101
Method Blank	S950607-WB	107	104	102
Method Blank	S950608-WB	101	102	101
Method Blank	S950609-WB	99	100	102
CAS Acceptance Limits:		76-114	88-110	86-115

Approved By: _____ Date: 6/19/95

SUR3/060194
950701 XLS - w624sr 6/19/95

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client:	EMCON	**Service Request:**	S950701
Project:	ARCO Facility No. 0276 / EMCON Project No. 0805-120.04	**Date Collected:**	6/5/95
Sample Matrix:	Water	**Date Received:**	6/5/95
		Date Extracted:	NA
		Date Analyzed:	6/8/95

Matrix Spike/Duplicate Matrix Spike Summary
Volatile Organic Compounds
EPA Method 624
Units: ug/L (ppb)

Sample Name: MW-5 (46)
Lab Code: S950701-004

	Spike Level		Sample	Spike Result		Percent Recovery		CAS Acceptance	Relative Percent
Analyte	MS	DMS	**Result**	MS	DMS	MS	DMS	Limits	**Difference**
1,1-Dichloroethene	250	250	ND	246	244	98	98	61-145	<1
Trichloroethene	250	250	ND	277	282	111	113	71-120	2
Chlorobenzene	250	250	ND	256	257	102	103	75-130	<1
Toluene	250	250	ND	262	270	105	108	76-125	3
Benzene	250	250	ND	269	272	108	109	76-127	1

Approved By: _____ Date: 6/19/95

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client: EMCON
Project: ARCO Facility No. 0276 / EMCON Project No. 0805-120.04

Service Request: S950701
Date Analyzed: 5/24/95

Initial Calibration Verification (ICV) Summary
Volatile Organic Compounds
EPA Method 624
Units: ppb

Analyte	True Value	Result	Percent Recovery	CAS Percent Recovery Acceptance Limits
Chloromethane	50	55.0	110	70-130
Vinyl Chloride	50	52.8	106	70-130
Bromomethane	50	52.8	106	70-130
Chloroethane	50	55.8	112	70-130
Acetone	50	65.1	130	70-130
1,1-Dichloroethene	50	46.4	93	70-130
Carbon Disulfide	50	45.8	92	70-130
Methylene Chloride	50	46.3	93	70-130
trans-1,2-Dichloroethene	50	46.3	93	70-130
cis-1,2-Dichloroethene	50	45.4	91	70-130
1,1-Dichloroethane	50	47.0	94	70-130
Vinyl Acetate	50	39.7	79	70-130
2-Butanone (MEK)	50	46.6	93	70-130
Chloroform	50	46.1	92	70-130
1,1,1-Trichloroethane (TCA)	50	47.4	95	70-130
Carbon Tetrachloride	50	46.7	93	70-130
Benzene	50	40.3	81	70-130
1,2-Dichloroethane	50	45.2	90	70-130
Trichloroethene (TCE)	50	44.6	89	70-130
1,2-Dichloropropane	50	40.2	80	70-130
Bromodichloromethane	50	41.1	82	70-130
2-Chloroethyl Vinyl Ether	50	37.8	76	70-130
2-Hexanone	50	56.6	113	70-130
trans-1,3-Dichloropropene	50	45.1	90	70-130
Toluene	50	40.6	81	70-130
cis-1,3-Dichloropropene	50	39.6	79	70-130
1,1,2-Trichloroethane	50	46.5	93	70-130
Tetrachloroethene (PCE)	50	48.9	98	70-130
Dibromochloromethane	50	46.9	94	70-130
Chlorobenzene	50	47.2	94	70-130
Ethylbenzene	50	46.8	94	70-130
o- Xylene	50	46.4	93	70-130
Styrene	50	45.0	90	70-130
Bromoform	50	41.2	82	70-130
1,1,2,2-Tetrachloroethane	50	44.8	90	70-130

Approved By: _____ Date: 6/19/95

ICV41/060194

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: EMCON
Project: ARCO Products Company 0276/#17075.00
Sample Matrix: Water

Service Request: L952493
Date Collected: 6/5/95
Date Received: 6/6/95
Date Extracted: 6/8/95
Date Analyzed: 6/8/95

Total Recoverable Petroleum Hydrocarbons
EPA Method 418.1
Units: mg/L (ppm)

Sample Name	Lab Code	MRL	Result
MW-4(47)	L952493-001	0.5	0.6
Method Blank	L952493-MB	0.5	ND

Approved By: Cydie Schwartz Date: 6/9/95

1AMRL/060194
L952493.XLS - 418w 6/9/95

6925 CANOGA AVENUE ■ CANOGA PARK, CA 91303 ■ 818 587-5550 ■ FAX 818 587-5555

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client:	EMCON	**Service Request:**	L952493
Project:	ARCO Products Company 0276/#17075.00	**Date Collected:**	NA
LCS Matrix:	Water	**Date Received:**	NA
		Date Extracted:	6/8/95
		Date Analyzed:	6/8/95

Laboratory Control Sample/Duplicate Laboratory Control Sample Summary*
Total Recoverable Petroleum Hydrocarbons (TRPH)
EPA Method 418.1
Units: mg/L (ppm)

	True Value		Result		Percent Recovery		CAS Acceptance	Relative Percent
Analyte	LCS	DLCS	LCS	DLCS	LCS	DLCS	Limits	**Difference**
TRPH	2.03	2.03	1.89	1.79	93	88	75-125	5

* Sample quantity was insufficient to perform matrix spike and matrix spike duplicate. Three separate, replicate one liter samples are required to analyze sample and spikes.

Approved By: Eydie Schwartz Date: 6/9/95

DLCS/060194
L952493 XLS - genlcs3 6/9/95

6925 CANOGA AVENUE ■ CANOGA PARK, CA 91303 ■ 818 587-5550 ■ FAX 818 587-5555

ARCO Products Company
Division of AtlanticRichfieldCompany

Chain of Custody

Task Order No. 17075.00

ARCO Facility no. #0276	City (Facility) Oakland	Project manager (Consultant) John Young	Laboratory name CAS
ARCO engineer Mike Whelan	Telephone no. (ARCO)	Telephone no. (Consultant) (408) 453-7300	Fax no. (Consultant) (408) 453-0452
Consultant name EMCON	Address (Consultant) 1921 Ringwood Ave. San Jose, CA 95131		Contract number

Method of shipment: Sampler will deliver

	Sample I.D.	Lab no.	Container no.	Matrix: Soil	Matrix: Water	Matrix: Other	Preservation: Ice	Preservation: Acid	Sampling date	Sampling time	BTEX 602/EPA 8020	BTEX/TPH EPA 8020/8015	TPH Modified 8015 Gas ☐ Diesel ☐	Oil and Grease 413.1 ☐ 413.2 ☐	TPH EPA 418.1/SM503E	EPA 601/8010	EPA 624/8240	EPA 625/8270	TCLP Metals ☐ Semi VOA ☐ VOA ☐	CAM Metals EPA 6010/7000 TTLC ☐ STLC ☐	Lead Org./DHS ☐ Lead EPA 7420/7421 ☐		
1	MW-8	(47)	4		X		X	HCL	6/5	1125		X					X						
2	WGR-3	(26)	↓		X		X	HCL		1210		X					X						
3	MW-1	(38)			X		X	HCL		1134		X					X						
4	MW-5	(46)			X		X	HCL		1300		X					X						
5	RW-1	(47)			X		X	HCL		1442		X					X						
6	MW-6	(51)			X		X	HCL		1213		X					X						
7	MW-3	(38)	↓		X		X	HCL		1300		X					X						
(1) 8	MW-4	(47)	6		X		X	HCL		1342		X			X		X						
9	MW-2	(25)	4		X		X	HCL		1340		X					X						
10	MW-7	(36)	↓		X		X	HCL	↓	1426		X					X						
										CAS-S:		GBTEX, 8240					CAS-L:	418.1					

Special detection Limit/reporting: Lowest Possible

Special QA/QC: As Normal

Remarks: 4-40ml HCL VOAs
Add: 2 liter glass HCL for MW-4

#0805-120.04

Lab number: 2493 / 950701

Turnaround time
- Priority Rush 1 Business Day ☐
- Rush 2 Business Days ☐
- Expedited 5 Business Days ☐
- Standard 10 Business Days ☒

Condition of sample: OK		Temperature received: Cool	
Relinquished by sampler	Date 6/5/95 Time 1650	Received by Joanne Brown CAS-SJ	
Relinquished by	Date 6/5/95 Time 1700	Received by	
Relinquished by	Date Time	Received by laboratory	Date 6-6-95 Time 0900

Distribution: White copy — Laboratory; Canary copy — ARCO Environmental Engineering; Pink copy — Consultant
APC-3292 (2-91)

APPENDIX D

OPERATION AND MAINTENANCE FIELD DATA SHEETS FOR ON-SITE SVE SYSTEM, SECOND QUARTER 1995

ARCO 0276 . 10600 MacArthur Blvd.,Oakland,Ca. Soil Vapor Extraction System . EMCON Project # 0805-120.04

Remarks: System on & running upon arrival. Unit OK
Cleaned leaves & trash that blew into compound
Took readings
Took FID Readings

Met D.L. Robinson on Site for BAAQMD inspection of CAT OX
415-771-6000 FAX 415-928-0338
Had to fax extra data to her today also, Had Sailya & Valli look at before faxing

Unscheduled site visit [] Scheduled site visit [X]

SYSTEM PARAMETERS (500 SCFM Gas-Fired ANGUIL Catalytic Oxidizer/ Serial # 01169107)

Arrival Time (24:00 hour)	0725	Effluent (6") E-1 Stack Temperature (°F)	602
System Status (on or off)	ON	Total Flow (scfm) (flow meter)	67
Shutdown Time (24:00 hour)	—	Fire Box Temperature (°F)	610
Restart Time (24:00 hour)	—	Set Point (°F)	610
Reading Time (24:00 hour)	0758	**TOTAL HOURS**	2443.2
ON SITE Well Field (4") I-1		CatOx (Amps)	9.0
Vacuum (in. of H2O)	9.8-10.1	Blower (Amps)	8.8
Velocity (ft/min)	800-850	Main (Amps)	18
Temperature (°F)	64	Natural Gas (cf)	0291
OFF SITE Well Field (2") Off Site		**AIR MONITORING**	
Vacuum (in. of H2O)	10.3-10.6		
Velocity (ft/min)	350-450		
Total Influent (After Blower) (3") I-2			
Total Pressure (in. of H2O)	10.9-11.2		
Total Flow (in. of H2O)	.14-.15		
Temperature (°F)	104		
Total Vapor Condensate on site (gal)	20-25		

FID (ppm) Date: 4/14	Amb	I-2	I-1	Off Site	E-1
(without carbon filter)	1.9	2.9	3.1	1.9	2.0
(with carbon filter)	1.8	1.9	1.9	1.8	1.9
PID (ppm) CAL GAS:		Methane		10 ppm	
Date:					

Lab samples taken for analysis at: NONE

WELL FIELD

SVE WELL ID	Well Diameter	Screen Interval	DTFP (feet)	DTW (feet)	Valve Position (% open)	Vacuum (in. of H2O)	FID (ppm)	PID (ppm)	REMARKS
VW-1	4"	8'-18'							
VW-2	4"	8'-18'							
VW-3	4"	8'-18'							
VW-4	4"	9'-19'							
VW-5	4"	8'-18'							
VW-7	4"	7.5'-17.5'							
MW-2	2"	15'-25'							

Special Instructions:

Use only ARCO chain-of-custody forms. Please include all analytical method numbers as requested on the chain-of-custody form. Request all TPHG,BTEX, and Benzene results in mg/m3. Report O2 and CO2 in % by volume.

Project# 0805-120.04

Operator: MAdler **Date:** 4-14-95 **ARCO 0276 Soil Vapor Extraction System**

ARCO 0276 . 10600 MacArthur Blvd.,Oakland,Ca. Soil Vapor Extraction System . EMCON Project # 0805-120.04

Remarks: System on & running upon arrival. Delivered 1.55 gallon drum to site for condensation collection. (it's in the compound.) Cleaned pad of leaves & trash. Emptied K.O. into drum & labeled (40 gallons total). Took readings.

Took lab samples at E-1, OFF SITE, I-1

Changed chart paper.

Dilution valve is still closed

Unscheduled site visit ☐ Scheduled site visit ☒

SYSTEM PARAMETERS (500 SCFM Gas-Fired ANGUIL Catalytic Oxidizer/ Serial # 01169107)

Arrival Time (24:00 hour)	1037	**Effluent (6") E-1** Stack Temperature (°F)	605
System Status (on or off)	ON	Total Flow (scfm) (flow meter)	66
Shutdown Time (24:00 hour)	—	Fire Box Temperature (°F)	~~605~~ 611
Restart Time (24:00 hour)	—	Set Point (°F)	610
Reading Time (24:00 hour)	1125	**TOTAL HOURS**	2793.0
ON SITE Well Field (4") I-1		CatOx (Amps)	8.5
Vacuum (in. of H2O)	8.9 - 9.1	Blower (Amps)	8.5
Velocity (ft/min)	800 - 850	Main (Amps)	18
Temperature (°F)	67	Natural Gas (cf)	0518
OFF SITE Well Field (2") Off Site		**AIR MONITORING**	
Vacuum (in. of H2O)	9.6 - 9.7		
Velocity (ft/min)	400		
Total Influent (After Blower) (3") I-2			
Total Pressure (in. of H2O)	11.6 - 11.8		
Total Flow (in. of H2O)	.15"		
Temperature (°F)	111		
Total Vapor Condensate on site (gal)	40		

FID (ppm) Date:	Amb	I-2	I-1	Off Site	E-1
(without carbon filter)					
(with carbon filter)					
PID (ppm)					
Date:					

Lab samples taken for analysis at: I-1 I-2 OFF SITE E-1

WELL FIELD

SVE WELL ID	Well Diameter	Screen Interval	DTFP (feet)	DTW (feet)	Valve Position (% open)	Vacuum (in. of H2O)	FID (ppm)	PID (ppm)	REMARKS
VW-1	4"	8'-18'							
VW-2	4"	8'-18'							
VW-3	4"	8'-18'							
VW-4	4"	9'-19'							
VW-5	4"	8'-18'							
VW-7	4"	7.5'-17.5'							
MW-2	2"	15'-25'							

Special Instructions:

Use only ARCO chain-of-custody forms. Please include all analytical method numbers as requested on the chain-of-custody form. Request all TPHG,BTEX, and Benzene results in mg/m3. Report O2 and CO2 in % by volume.

Project# 0805-120.04

Operator: MAdler **Date:** 4-26-95 **ARCO 0276 Soil Vapor Extraction System**

ARCO 0276 . 10600 MacArthur Blvd.,Oakland,Ca. Soil Vapor Extraction System . EMCON Project # 0805-120.04

Remarks: System on & running upon arrival. Took readings
Sampled I-1, I-2, OFF SITE & E-1
System running hotter than usual - Vents on combustion blower housing clogged with dust. Cleaned all 6 vents - They're each covered with sections of foam.

Removed blower hour meter at 1244 Total HRS = 3140.1
STARTED new hour meter at 1244 Total HRS = 0.0
Checked HR meter at 1314 = .5 HR - Checked OK.
Cleaned blower filter & coalescing filter

Unscheduled site visit [ ] Scheduled site visit [X]

SYSTEM PARAMETERS (500 SCFM Gas-Fired ANGUIL Catalytic Oxidizer/ Serial # 01169107)

Arrival Time (24:00 hour)	1200	**Effluent (6") E-1** Stack Temperature (°F)	662
System Status (on or off)	ON	Total Flow (scfm) (flow meter)	65
Shutdown Time (24:00 hour)	—	Fire Box Temperature (°F)	665
Restart Time (24:00 hour)	—	Set Point (°F)	610
Reading Time (24:00 hour)	1237	**TOTAL HOURS**	3140.0
ON SITE Well Field (4") I-1		CatOx (Amps)	8.3
Vacuum (in. of H2O)	8.5 - 9.1	Blower (Amps)	8.4
Velocity (ft/min)	850 - 900	Main (Amps)	18
Temperature (°F)	67°	Natural Gas (cf)	1783
OFF SITE Well Field (2") Off Site		**AIR MONITORING**	
Vacuum (in. of H2O)	8.9 - 9.3		
Velocity (ft/min)	3[illegible] - 45[illegible]		
Total Influent (After Blower) (3") I-2			
Total Pressure (in. of H2O)	12.1 - 12.4		
Total Flow (in. of H2O)	.14 - .15		
Temperature (°F)	112		
Total Vapor Condensate on site (gal)	45		

FID (ppm) Date:	Amb	I-2	I-1	Off Site	E-1
(without carbon filter)					
(with carbon filter)					
PID (ppm)	CAL GAS				
Date:					

Lab samples taken for analysis at: I-1, I-2, OFF site, & E-1

WELL FIELD

SVE WELL ID	Well Diameter	Screen Interval	DTFP (feet)	DTW (feet)	Valve Position (% open)	Vacuum (in. of H2O)	FID (ppm)	PID (ppm)	REMARKS
VW-1	4"	8'-18'							
VW-2	4"	8'-18'							
VW-3	4"	8'-18'							
VW-4	4"	9'-19'							
VW-5	4"	8'-18'							
VW-7	4"	7.5'-17.5'							
MW-2	2"	15'-25'							

Special Instructions:
Use only ARCO chain-of-custody forms. Please include all analytical method numbers as requested on the chain-of-custody form. Request all TPHG,BTEX, and Benzene results in mg/m3. Report O2 and CO2 in % by volume.

Operator: MAdler Date: 5-8-95

Project# 0805-120.04
ARCO 0276 Soil Vapor Extraction System

ARCO 0276 . 10600 MacArthur Blvd.,Oakland,Ca. Soil Vapor Extraction System . EMCON Project # 0805-120.04

Remarks: System off on arrival - Chart shows unit shutdown due to high temp. Reset pressure switch & Restarted unit Changed chart. Took readings & FID's

Ran blower 2669 - 267.1

Temperature (inlet) just kept rising. I lowered set point and no results it kept rising. Checked gas pressure its between the 0 - 3.5 Kilopascals (2.5-3.0 kilopascals) set for LO & HI gas pressure Checked inlet to on board blower - good draw. Turned well field blower on @ 66 CFM still no effect on Temp. Called Valli shutoff unit to cool. Will come back to remove & inspect catalyst

Unscheduled site visit [] Scheduled site visit [X]

SYSTEM PARAMETERS (500 SCFM Gas-Fired ANGUIL Catalytic Oxidizer/ Serial # 01169107)

Arrival Time (24:00 hour)	1444	**Effluent (6") E-1** Stack Temperature (°F)	
System Status (on or off)	OFF	Total Flow (scfm) (flow meter)	66
Shutdown Time (24:00 hour)		Fire Box Temperature (°F)	796
Restart Time (24:00 hour)	1609	Set Point (°F)	610
Reading Time (24:00 hour)		**TOTAL HOURS**	266.9
ON SITE Well Field (4") I-1		CatOx (Amps)	8.5
Vacuum (in. of H2O)	8.7-9.2	Blower (Amps)	8.5
Velocity (ft/min)	900-950	Main (Amps)	18
Temperature (°F)	69°	Natural Gas (cf)	
OFF SITE Well Field (2") Off Site		**AIR MONITORING**	
Vacuum (in. of H2O)	8.9-9.4		
Velocity (ft/min)	300-400		
Total Influent (After Blower) (3") I-2			
Total Pressure (in. of H2O)	12.2-12.5		
Total Flow (in. of H2O)	.14		
Temperature (°F)	113		
Total Vapor Condensate on site (gal)	50		

FID (ppm) Date:	Amb	I-2	I-1	Off Site	E-1
(without carbon filter)	1.4	2.9	3.6	1.5	1.4
(with carbon filter)	1.4	2.1	2.2	1.4	1.4
PID (ppm)	CAL GAS: Methane 10 ppm				
Date:					

Lab samples taken for analysis at: NONE

WELL FIELD

SVE WELL ID	Well Diameter	Screen Interval	DTFP (feet)	DTW (feet)	Valve Position (% open)	Vacuum (in. of H2O)	FID (ppm)	PID (ppm)	REMARKS
VW-1	4"	8'-18'							
VW-2	4"	8'-18'							
VW-3	4"	8'-18'							
VW-4	4"	9'-19'							
VW-5	4"	8'-18'							
VW-7	4"	7.5'-17.5'							
MW-2	2"	15'-25'							

Special Instructions:

Use only ARCO chain-of-custody forms. Please include all analytical method numbers as requested on the chain-of-custody form. Request all TPHG,BTEX, and Benzene results in mg/m3. Report O2 and CO2 in % by volume.

Operator: Mahler Date: 5-24-95

Project# 0805-120.04

ARCO 0276 Soil Vapor Extraction System