EMCON
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June 30, 1995
Project 0805-120.02

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

Re: Fourth quarter 1994 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 fourth quarter 1994 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. A former truck manufacturing plant was located adjacent to the service station, on the property currently owned by Drake Builders and now operated as Foothill Square Shopping Center. 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. Although ARCO Products Company (ARCO) never used tetrachloroethene (perchloroethlyene [PCE]) at the site, four soil samples collected beneath the waste-oil tank were analyzed for volatile organic compounds (VOCs) including PCE. Analytical results indicated no detectable concentrations of PCE in the soil samples. 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 indicate 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 commonly been detected in well MW-6, which

is screened in the deeper water-bearing zone upgradient from the site, on the former Truck Manufacturing Plant property.

Since 1988, ARCO has conducted several on- and off-site assessment investigations to delineate the lateral and vertical extent of gasoline-impacted soils and groundwater. 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) were installed in the deeper water-bearing zone 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 sites. 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 28, 3/4-inch galvanized steel probes off site in 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) were 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. Extracted hydrocarbon vapor from these wells is drawn by using a 1.5-horsepower (hp) regenerative blower, through subsurface remediation piping, to the existing Cat-ox previously installed by PEG 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 fourth quarter 1994 groundwater monitoring event on December 6 and 7, 1994. 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. Field data sheets for the fourth quarter 1994 groundwater monitoring event are presented in Appendix A.

ANALYTICAL PROCEDURES

Groundwater samples collected during fourth quarter 1994 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 the *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 collected from well MW-4 were also analyzed for total recoverable petroleum hydrocarbons (TRPH) by USEPA method 418.1. These methods are recommended for samples from petroleum-hydrocarbon-impacted sites in the *Tri-Regional Board Staff Recommendations for Preliminary Evaluation and Investigation of Underground Tank Sites* (August 10, 1990).

MONITORING PROGRAM RESULTS

Results of the fourth quarter 1994 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 fourth quarter 1994 analytical results and chain-of-custody documentation are included in Appendix B.

Groundwater elevation data collected on December 6, 1994, were used in calculating groundwater elevations for fourth quarter 1994. 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 estimated that groundwater beneath the site flows to the west. The small variance in groundwater elevations across the site results in a relatively flat hydraulic gradient of approximately 0.001 foot per foot, which may be superimposed upon by regional groundwater flow patterns. Figure 2 illustrates groundwater elevations and TPHG and benzene concentration data for fourth quarter 1994.

Groundwater samples collected 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 less than 50 micrograms per liter (µg/L) and less than 0.5 µg/L, respectively. In wells MW-3, MW-4, MW-5, MW-6, and RW-1, detection limits were raised because of the presence of PCE in the samples. Detection limits for samples collected from well MW-7 were raised because of high analyte (TPHG) concentrations. Groundwater samples collected from wells MW-2 and MW-7, screened in the shallow water-bearing zone, contained 26,000 and 260,000 µg/L TPHG, respectively. Groundwater samples collected from well MW-2 contained 570 µg/L benzene. Samples from well MW-7 did not contain detectable concentrations of benzene (<200 µg/L, the raised MRL). Groundwater samples collected from well MW-4 contained 1,800 µg/L TRPH. Similar analytical results were reported for all wells during previous monitoring events (Tables 3 and 4).

Groundwater samples collected from wells MW-2 and MW-7 did not contain detectable concentrations of VOCs. Groundwater samples collected from wells MW-1, MW-3 through MW-6, MW-8, RW-1, and WGR-1 contained concentrations of PCE from 2 to 2,200 µg/L (Figure 3). Except for wells MW-5, MW-8, and WGR-3, similar analytical results were reported for all wells during previous monitoring events (Table 5). The 1,800 µg/L PCE reported for well MW-5 represents the highest level of PCE reported for this well. Before fourth quarter 1994, PCE had not been detected in well MW-8 since November 1992, and had never been detected in well WGR-3.

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

Description. The on- and off-site SVE systems are briefly described in the "Background" section of this report.

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 is detailed in

Tables 7 and 8. Extraction well data (i.e., which well was on-line) are summarized in Table 9. Previous operation and performance data for the on- and off-site SVE systems from September 1990 to May 1994 are summarized in Appendix C.

The SVE system operated for a total of 11.7 days (280.5 hours) during the 21-day reporting period (55.7 percent operational) from December 22, 1994, to January 12, 1995.

The system was down for 9.3 days during the 21-day period because of power failure and for system maintenance (installation of an hour meter on the blower, replacement of control panel bulbs, installation of a condensate knockout drum, replacement of strip-chart recorder paper, maintenance of the autodialer unit, etc.).

During fourth quarter 1994, several different combinations of wells were brought on-line, to maximize the SVE system's hydrocarbon removal rates. Table 9 summarizes the status of the 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 D.

In addition to the parameters described above, the SVE system is monitored once a month for (1) TVHG concentrations in vapor extracted 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 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 E). Copies of all original operation and maintenance field data sheets generated during fourth quarter 1994 are provided in Appendix E.

Air Sample Results. During the 21-day reporting period, TVHG concentrations in extracted vapor from the combined well-field, before fresh-air dilution, averaged 116 milligrams per cubic meter (mg/m^3) or 32 parts per million by volume (ppmv). Nondetectable levels of benzene were reported in air samples from the combined well-field

(less than 0.5 mg/m^3 or 0.1 ppmv). Copies of analytical results and chain-of-custody documentation are enclosed in Appendix D.

Laboratory air sample results indicated permanent gases in extracted vapor from the well-field averaged approximately 7 percent carbon dioxide and 16 percent oxygen by volume.

Effluent benzene and TVHG concentrations were below laboratory detection limits of 0.5 mg/m^3 and 60 mg/m^3, respectively, during fourth quarter 1994 .

Destruction Efficiency and Emission Rates. The destruction efficiency of the Cat-ox unit averaged 95.7 percent during the three reporting events in fourth quarter 1994 (Tables 7 and 8). This destruction efficiency demonstrates compliance with the site-specific BAAQMD air permit requirement of 90 percent minimum destruction efficiency for influent hydrocarbon concentrations less than 1,000 ppmv. Because 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 (Appendix C).

Table 7 summarizes hydrocarbon removal rates, pounds of hydrocarbons removed this period, and cumulative pounds of hydrocarbons removed since startup. Hydrocarbon removal rates averaged 0.04 pound per hour in fourth quarter 1994. The calculations and assumptions for estimating hydrocarbon removal rates for the SVE system are shown in Table 7.

Approximately 10 pounds (or 1.6 gallons) of hydrocarbons were recovered by SVE system operation during this 21-day period. A total of approximately 7,676 pounds (or 1,238 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/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 fourth quarter of 1994 and the anticipated site activities for the first quarter of 1995.

Fourth Quarter 1994 Activities

- Started up the on-site SVE system.
- Performed quarterly groundwater monitoring for fourth quarter 1994.
- Submitted workplan for additional off-site subsurface investigation and interim remediation.

Work Anticipated for First Quarter 1995

- Submit quarterly groundwater monitoring report for third quarter 1994.
- Prepare and submit quarterly groundwater monitoring and SVE system performance evaluation report for fourth quarter 1994.
- Perform quarterly groundwater monitoring for first quarter 1995.
- Pulse the off-site SVE system.

Please call if you have questions.

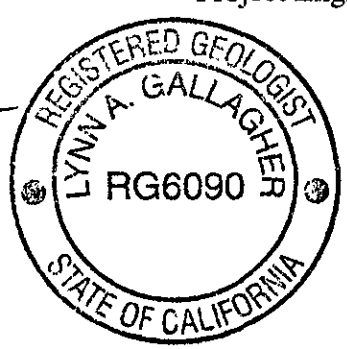
Sincerely,

EMCON

David Larsen
Project Coordinator

Valli Voruganti
Project Engineer

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



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Attachments:
- Table 1 - Groundwater Monitoring Data, Fourth Quarter 1994
- 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, Fourth Quarter 1994
- Figure 3 - Tetrachloroethene (PCE) Concentrations in Groundwater, Fourth Quarter 1994
- Appendix A - Field Data Sheets, Groundwater Monitoring, Fourth Quarter 1994
- Appendix B - Analytical Results and Chain-of-Custody Documentation, Groundwater Monitoring, Fourth Quarter 1994
- Appendix C - Copy of Historical SVE Hydrocarbon Removal Rates from EVAX, PEG, and RESNA
- Appendix D - Analytical Results and Chain-of-Custody Documentation for SVE System Air Samples, Fourth Quarter 1994
- Appendix E - Operation and Maintenance Field Data Sheets for On-Site SVE System, Fourth Quarter 1994

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

Table 1
Groundwater Monitoring Data
Fourth Quarter 1994

10600 and 10700 MacArthur Boulevard
Oakland, California

Date: 06-30-95
Project Number: 0805-120.04

Well Desig-nation	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	Water Sample Field Date	TPHG µg/L	Benzene µg/L	Toluene µg/L	Ethyl-benzene µg/L	Total Xylenes µg/L
MW-1	12-06-94	55.92	31.89	24.03	ND	W	0.001	12-06-94	<50	<0.5	<0.5	<0.5	<0.5
MW-2	12-06-94	55.10	14.74	40.36	Sheen	W	0.001	12-07-94	26000	570	43	220	1100
MW-3	12-06-94	56.55	32.46	24.09	ND	W	0.001	12-06-94	<380*	<0.5	<0.5	<0.5	<0.5
MW-4	12-06-94	55.98	31.91	24.07	ND	W	0.001	12-06-94	<970*	<2.5**	<2.5**	<2.5**	<2.5**
MW-5	12-06-94	55.43	31.44	23.99	ND	W	0.001	12-06-94	<550*	<0.5	0.6	1.1	2
MW-6	12-06-94	61.21	37.33	23.88	ND	W	0.001	12-07-94	<720*	<1**	<1**	<1**	<1**
MW-7	12-06-94	58.22	18.37	## 39.86	0.02	W	0.001	12-07-94	260000	<200***	380	2200	11000
MW-8	12-06-94	53.65	29.66	23.99	ND	W	0.001	12-07-94	<50	<0.5	<0.5	<0.5	<0.5
RW-1	12-06-94	56.32	32.24	24.08	ND	W	0.001	12-07-94	<79*	<0.5	<0.5	<0.5	<0.5
WGR-3	12-06-94	NR	17.52	NR	ND	NR	NR	12-07-94	<50	<0.5	<0.5	<0.5	0.6

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
W: west
*: 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
##: 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
***: raised method reporting limit due to high analyte concentration 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: 06-30-95
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

Table 2
Historical Groundwater Elevation Data

10600 and 10700 MacArthur Boulevard
Oakland, California

Date: 06-30-95
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

Table 2
Historical Groundwater Elevation Data

10600 and 10700 MacArthur Boulevard
Oakland, California

Date: 06-30-95
Project Number: 0805-120.04

Well Desig-nation	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

Table 2
Historical Groundwater Elevation Data

10600 and 10700 MacArthur Boulevard
Oakland, California

Date: 06-30-95
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-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

Table 2
Historical Groundwater Elevation Data

10600 and 10700 MacArthur Boulevard
Oakland, California

Date: 06-30-95
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-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

Table 2
Historical Groundwater Elevation Data

10600 and 10700 MacArthur Boulevard
Oakland, California

Date: 06-30-95
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

Table 2
Historical Groundwater Elevation Data

10600 and 10700 MacArthur Boulevard
Oakland, California

Date: 06-30-95
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

Table 2
Historical Groundwater Elevation Data

10600 and 10700 MacArthur Boulevard
Oakland, California

Date: 06-30-95
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

Table 2
Historical Groundwater Elevation Data

10600 and 10700 MacArthur Boulevard
Oakland, California

Date: 06-30-95
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
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

Table 2
Historical Groundwater Elevation Data

10600 and 10700 MacArthur Boulevard
Oakland, California

Date: 06-30-95
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
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

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
^: 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: 06-30-95
Project Number: 0805-120.04

Well Designation	Water Sample Field Date	TPHG	Benzene	Toluene	Ethyl-benzene	Total Xylenes
		µg/L	µg/L	µg/L	µg/L	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

Table 3
Historical Groundwater Analytical Data
(TPHG and BTEX)

10600 and 10700 MacArthur Boulevard
Oakland, California

Date: 06-30-95
Project Number: 0805-120.04

Well Designation	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

Table 3
Historical Groundwater Analytical Data
(TPHG and BTEX)

10600 and 10700 MacArthur Boulevard
Oakland, California

Date: 06-30-95
Project Number: 0805-120.04

Well Designation	Water Sample Field Date	TPHG	Benzene	Toluene	Ethyl-benzene	Total Xylenes
		µg/L	µg/L	µg/L	µg/L	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

Table 3
Historical Groundwater Analytical Data
(TPHG and BTEX)

10600 and 10700 MacArthur Boulevard
Oakland, California

Date: 06-30-95
Project Number: 0805-120.04

Well Designation	Water Sample Field Date	TPHG	Benzene	Toluene	Ethyl-benzene	Total Xylenes
		µg/L	µg/L	µg/L	µg/L	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**

Table 3
Historical Groundwater Analytical Data
(TPHG and BTEX)

10600 and 10700 MacArthur Boulevard
Oakland, California

Date: 06-30-95
Project Number: 0805-120.04

Well Designation	Water Sample Field Date	TPHG	Benzene	Toluene	Ethyl-benzene	Total Xylenes
		µg/L	µg/L	µg/L	µg/L	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-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**

Table 3
Historical Groundwater Analytical Data
(TPHG and BTEX)

10600 and 10700 MacArthur Boulevard
Oakland, California

Date: 06-30-95
Project Number: 0805-120.04

Well Designation	Water Sample Field Date	TPHG	Benzene	Toluene	Ethyl-benzene	Total Xylenes
		µg/L	µg/L	µg/L	µg/L	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-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
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

Table 3
Historical Groundwater Analytical Data
(TPHG and BTEX)

10600 and 10700 MacArthur Boulevard
Oakland, California

Date: 06-30-95
Project Number: 0805-120.04

Well Designation	Water Sample Field Date	TPHG	Benzene	Toluene	Ethyl-benzene	Total Xylenes
		µg/L	µg/L	µg/L	µg/L	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

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: 06-30-95
Project Number: 0805-120.04

Well Desig-nation	Water Sample Field Date	TOG or TRPH	TPHD	Cadmium by EPA 6010	Chromium by EPA 6010	Lead by EPA 7421	Nickel by EPA 6010	Zinc by EPA 6010
		µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	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

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: 06-30-95
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

Table 5
Historical Groundwater Analytical Data
(Volatile Organic Compounds)

10600 and 10700 MacArthur Boulevard
Oakland, California

Date: 06-30-95
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-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

Table 5
Historical Groundwater Analytical Data
(Volatile Organic Compounds)

10600 and 10700 MacArthur Boulevard
Oakland, California

Date: 06-30-95
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

Table 5
Historical Groundwater Analytical Data
(Volatile Organic Compounds)

10600 and 10700 MacArthur Boulevard
Oakland, California

Date: 06-30-95
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

Table 5
Historical Groundwater Analytical Data
(Volatile Organic Compounds)

10600 and 10700 MacArthur Boulevard
Oakland, California

Date: 06-30-95
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

Table 5
Historical Groundwater Analytical Data
(Volatile Organic Compounds)

10600 and 10700 MacArthur Boulevard
Oakland, California

Date: 06-30-95
Project Number: 0805-120.04

Well Desig-nation	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

Table 5
Historical Groundwater Analytical Data
(Volatile Organic Compounds)

10600 and 10700 MacArthur Boulevard
Oakland, California

Date: 06-30-95
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

Table 5
Historical Groundwater Analytical Data
(Volatile Organic Compounds)

10600 and 10700 MacArthur Boulevard
Oakland, California

Date: 06-30-95
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-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

Table 5
Historical Groundwater Analytical Data
(Volatile Organic Compounds)

10600 and 10700 MacArthur Boulevard
Oakland, California

Date: 06-30-95
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

Table 5
Historical Groundwater Analytical Data
(Volatile Organic Compounds)

10600 and 10700 MacArthur Boulevard
Oakland, California

Date: 06-30-95
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

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: 06-30-95
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
	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: 12-22-94
To: 01-12-95

Date Begin:		09-06-90	12-22-94
Date End:		12-22-94	01-12-95
Mode of Oxidation:		NA (14)	Catalytic
Days of Operation:		NA	11.7
Days of Downtime:		NA	9.3
Vapor Monitoring Concentrations			
On-site Well Field, as gasoline:	mg/m3 (1) (2)	NA	116
	ppmv (3) (4)	NA	32
Off-site Well Field, as gasoline:	mg/m3	NA	closed
	ppmv	NA	closed
System Influent, as gasoline:	mg/m3	NA	116
	ppmv	NA	32
System Effluent, as gasoline:	mg/m3	NA	<60
	ppmv	NA	<17
On-site Well Field, as benzene:	mg/m3 (5)	NA	<0.5
	ppmv (6)	NA	<0.1
Off-site Well Field, as benzene:	mg/m3	NA	closed
	ppmv	NA	closed
System Influent, as benzene:	mg/m3	NA	<0.5
	ppmv	NA	<0.1
System Effluent, as benzene:	mg/m3	NA	<0.5
	ppmv	NA	<0.1
On-site Well Field Flow Rate, scfm (7):		NA	82.6
Off-site Well Field Flow Rate, scfm:		NA	closed
System Influent Flow Rate, scfm:		NA	82.6
Total Process Flow Rate, scfm:		NA	500
Destruction Efficiency, percent (8):		NA	95.7
Emission Rates (pounds per day) (9)			
Gasoline:		NA	<0.45
Benzene:		NA	<0.00
Operating Hours This Period:		NA	280.5
Operating Hours To Date:		NA	280.5
Pounds/ Hour Removal Rate, as gasoline (10):		NA	0.04
Pounds Removed This Period, as gasoline (11):		NA	10.0
Pounds Removed To Date, as gasoline (12):		7666	7676
Gallons Removed This Period, as gasoline (13):		NA	1.6
Gallons Removed To Date, as gasoline:		1236	1238

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: Reporting Period From: To:	09-06-90 12-22-94 01-12-95

CURRENT REPORTING PERIOD:	12-22-94	to	01-12-95
DAYS / HOURS IN PERIOD:	21.0	504.0	
DAYS / HOURS OF OPERATION:	11.7	280.5	
DAYS / HOURS OF DOWN TIME:	9.3	223.5	
PERCENT OPERATIONAL:		55.7 %	
PERIOD POUNDS REMOVED:	10.0		
PERIOD GALLONS REMOVED:	1.6		
AVERAGE SYSTEM INFLUENT FLOW RATE (scfm):		82.6	

1. mg/m3 = milligrams per cubic meter
2. Concentration (as gasoline in mg/m3) = [concentration (as gasoline in ppmv) x 87 lb/lb-mole / 24.05 (lb/m3/lb-mole of air)/mg]
3. ppmv = parts per million by volume
4. 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
5. Concentration (as benzene in mg/m3) = [concentration (as benzene in ppmv) x 78 lb/lb-mole / 24.05 (lb/m3/lb-mole of air)/mg]
6. 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
7. scfm = flow in standard cubic feet per minute at one atmosphere and 70 degrees Farenheit
8. 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
9. 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
10. 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
11. Pounds removed this period (as gasoline) = pounds/ hour removal rate x hours of operation
12. Pounds removed data for the period from September 6, 1990 through December 22, 1994, were reported bt EVAX, PEG, and RESNA Please refer to Appendix C for additional data from system operation before December 22, 1994.
13. Gallons removed this period (as gasoline) = pounds removed this period (as gasoline) x 0.1613 gallons/pound of gasoline
14. 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: 03-22-95
Project Number: 0805-120.02

Field Date	Field Vapor Monitoring Results (1)				Destruction Efficiency (2)
	On-Site Well Field (I-1) ppmv (3)	Off-Site Well Field (Off Site) ppmv	Total System Influent (I-2) ppmv	System Effluent (E-1) 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

1. Concentrations 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

Table 9
Soil-Vapor Extraction Well Data

10600 and 10700 MacArthur Boulevard
Oakland, California

Date: 03-22-95
Project Number: 0805-120.02

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

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

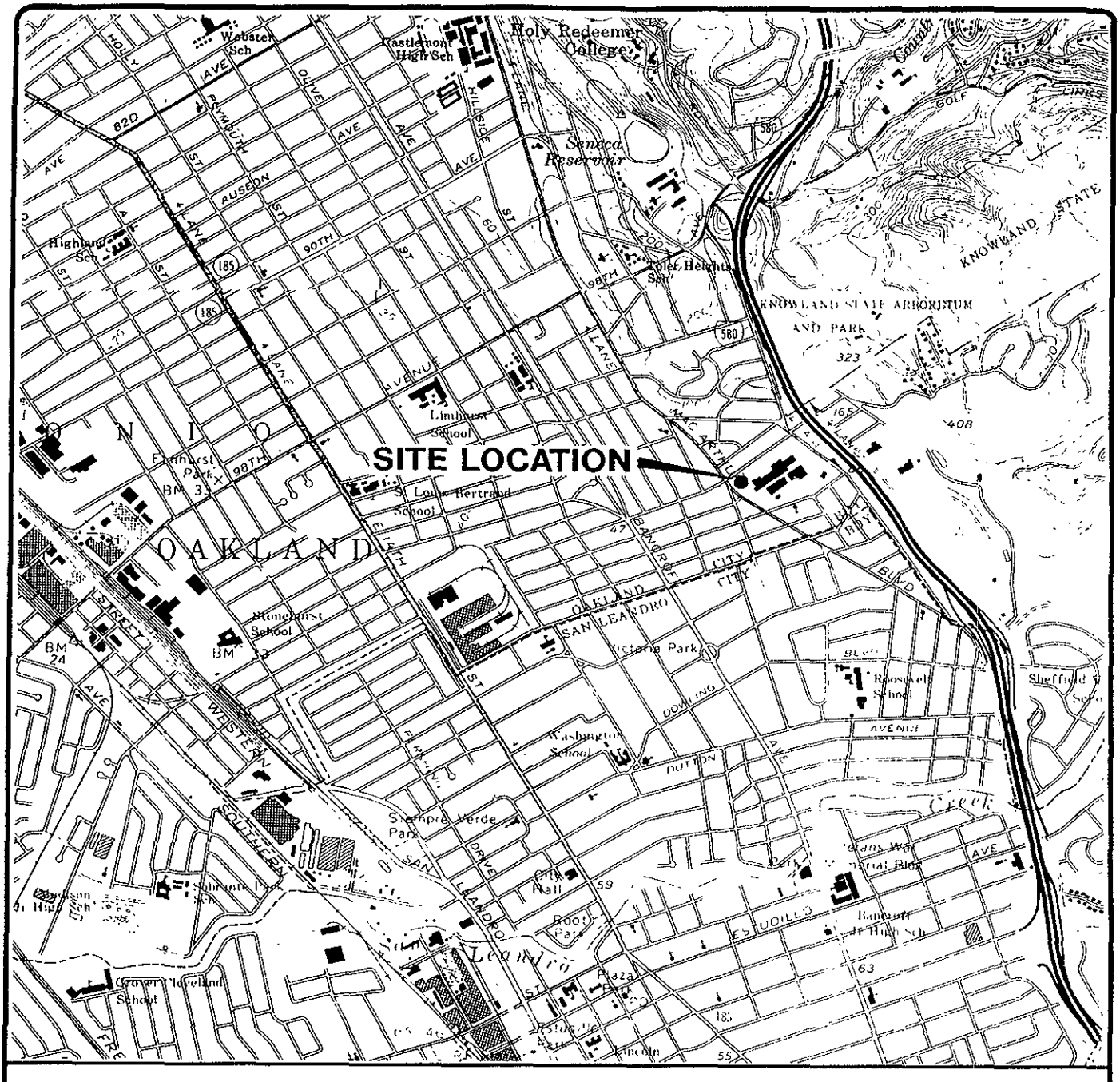
10600 and 10700 MacArthur Boulevard
Oakland, California

Date: 03-22-95
Project Number: 0805-120.02

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			

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

152753



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

N

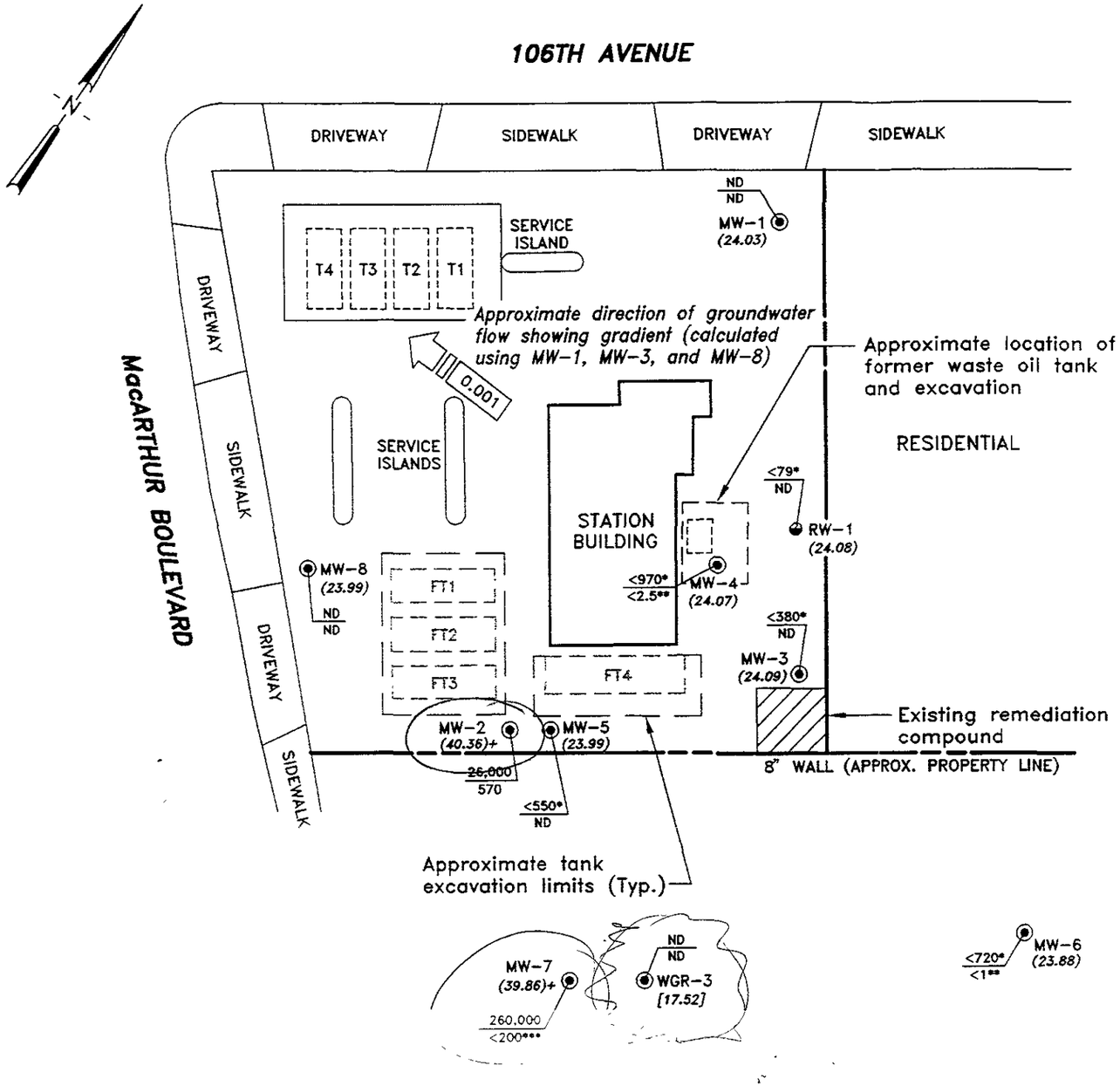
Scale · 0 2000 4000 Feet

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
- *(24.03)* Groundwater elevation (Ft.–MSL); measured 12/6/94
- *[17.52]* Depth to water measured on 12/6/94 (top of casing elevation not available)
- 26,000 / 570 — TPHG concentration in groundwater (ppb); sampled 12/6–7/94; Benzene concentration in groundwater (ppb); sampled 12/6–7/94
- + *Well screened in shallow water–bearing zone; not used in determining groundwater gradient and flow direction*
- * Raised method reporting limit due to matrix interference
- ** Raised method reporting limit due to matrix interference requiring sample dilution
- *** Raised method reporting limit due to high analyte concentration requiring sample dilution
- ND Not detected above method reporting limit for TPHG (50 ppb) and benzene (0.5 ppb)

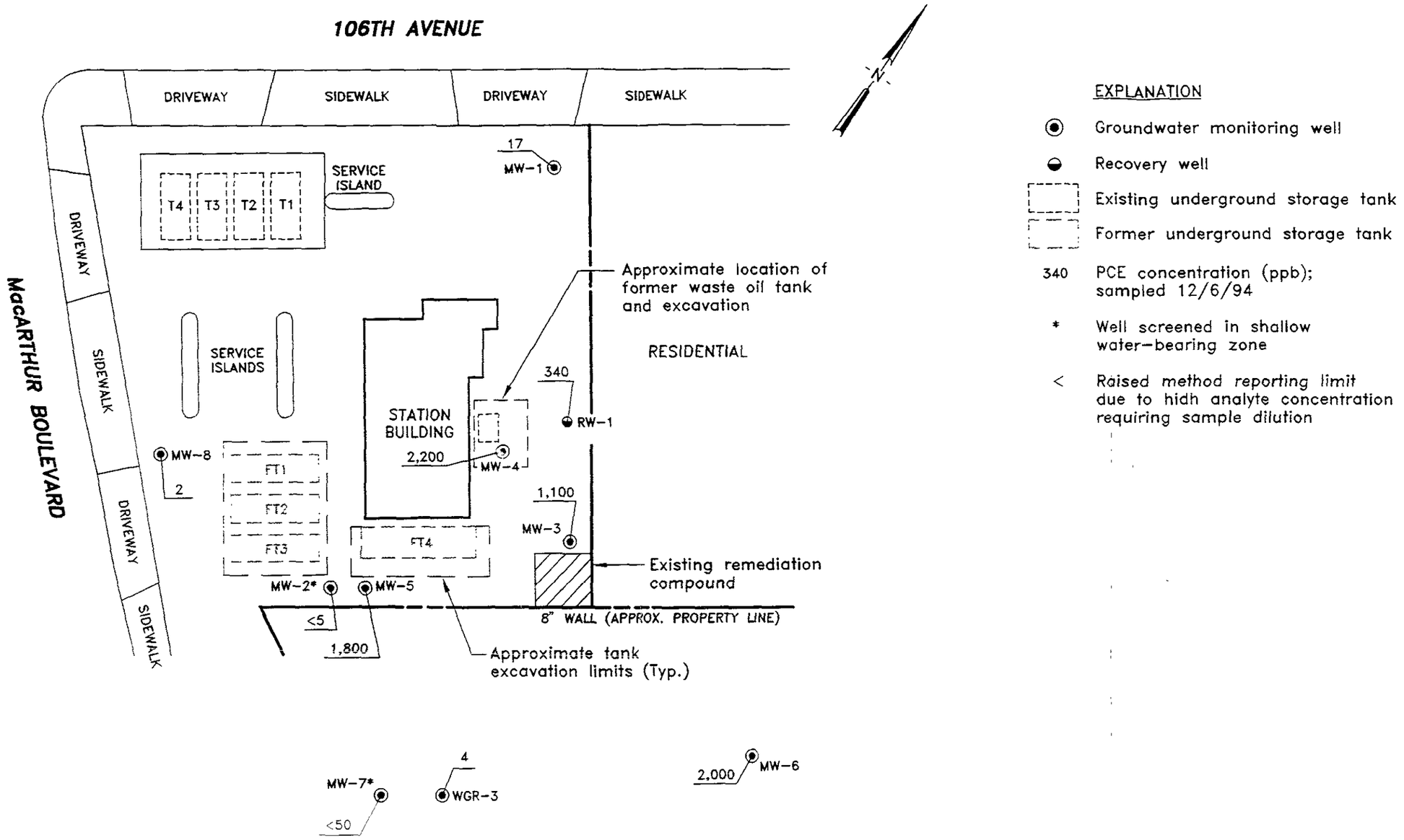
EMCON

SCALE. 0 30 60 FEET

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

GROUNDWATER DATA
FOURTH QUARTER 1994

FIGURE NO.
2
PROJECT NO.
805-120.02



EXPLANATION

- Groundwater monitoring well
- Recovery well
- Existing underground storage tank
- Former underground storage tank
- 340 PCE concentration (ppb); sampled 12/6/94
- * Well screened in shallow water-bearing zone
- < *Raised method reporting limit* due to high analyte concentration requiring sample dilution

EMCON Associates

SCALE: 0 30 60 FEET

10600 AND 10700 MACARTHUR BLVD.
QUARTERLY GROUNDWATER MONITORING
OAKLAND CALIFORNIA

TETRACHLOROETHENE (PCE) CONCENTRATIONS IN GROUNDWATER

FIGURE NO.
3

PROJECT NO.

APPENDIX A

FIELD DATA SHEETS, GROUNDWATER MONITORING, FOURTH QUARTER 1994

Rev. 3, 2/94

EMCON ASSOCIATES

WATER SAMPLE FIELD DATA SHEET

PROJECT NO: C[illegible] 120.01 SAMPLE ID: MW-1 (38)

PURGED BY: [illegible] CLIENT NAME: ARCO 276

SAMPLED BY: " LOCATION: Oakland

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

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

CASING ELEVATION (feet/MSL): ___ VOLUME IN CASING (gal.): ~~.85~~ 1.14

DEPTH TO WATER (feet): 31.90 CALCULATED PURGE (gal.): 3.43

DEPTH OF WELL (feet): 38.9 ACTUAL PURGE VOL. (gal.): 3.5

DATE PURGED: 12-6-94 Start (2400 Hr) 13:40 End (2400 Hr) 13:51

DATE SAMPLED: " Start (2400 Hr) 13:54 End (2400 Hr) 13:55

TIME (2400 Hr)	VOLUME (gal.)	pH (units)	E.C. (µmhos/cm @ 25° C)	TEMPERATURE (°F)	COLOR (visual)	TURBIDITY (visual)
13:43	1.5	6.50	244	60.9	Light Brn	Heavy
13:47	2.5	6.50	240	62.8	"	"
13:51	3.5	6.50	241	63.1	"	"

D. O. (ppm): — ODOR: NONE — —

(COBALT 0 - 500) (NTU 0 - 200 or 0 - 1000)

Field QC samples collected at this well: — Parameters field filtered at this well: —

PURGING EQUIPMENT

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

Other: ___

SAMPLING EQUIPMENT

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

Other: ___

WELL INTEGRITY: Good LOCK #: ___

REMARKS: ___

Meter Calibration: Date: 12-6 Time: ___ Meter Serial #: ___ Temperature °F: ___

(EC 1000 1011 / 1000) (DI ___) (pH 7 701 / 700) (pH 10 991 / 1000) (pH 4 394 / ___)

Location of previous calibration: ___

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

Rev. 3, 2/94

WATER SAMPLE FIELD DATA SHEET

EMCON ASSOCIATES

PROJECT NO: 0805-120-01 SAMPLE ID: MW-2

PURGED BY: J. Williams CLIENT NAME: ARCO 276

SAMPLED BY: J. Williams LOCATION: Oakland, Ca

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

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

CASING ELEVATION (feet/MSL): WL VOLUME IN CASING (gal.): 6.95

DEPTH TO WATER (feet): 14.86 CALCULATED PURGE (gal.): 20.85

DEPTH OF WELL (feet): 25.5 ACTUAL PURGE VOL. (gal.): 21

DATE PURGED: 12-7-94 Start (2400 Hr) 1308 End (2400 Hr) 1323

DATE SAMPLED: 12-7-94 Start (2400 Hr) — End (2400 Hr) 1326

TIME (2400 Hr)	VOLUME (gal.)	pH (units)	E.C. (µmhos/cm @ 25° C)	TEMPERATURE (°F)	COLOR (visual)	TURBIDITY (visual)
1314	7	6.33	566	69.1	GRAY	MOD
1318	14	6.21	554	70.0	GRAY	MOD
1323	21	6.19	552	70.1	GRAY	HEAVY

D. O. (ppm): WL ODOR: STRONG

COLOR (COBALT 0 - 500): WR

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

Field QC samples collected at this well: WL

Parameters field filtered at this well: WO

PURGING EQUIPMENT

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

SAMPLING EQUIPMENT

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

WELL INTEGRITY: GOOD LID LOCK #: None

REMARKS: SHEEN

Meter Calibration: Date: 12-7-94 Time: 1036 Meter Serial #: 9016 Temperature °F: ___

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

Location of previous calibration: MW-8

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

Rev. 3, 2/94

WATER SAMPLE FIELD DATA SHEET

EMCON ASSOCIATES

PROJECT NO: 0805-120.01 SAMPLE ID: MW-3 (38)

PURGED BY: Chaco CLIENT NAME: ARCO 276

SAMPLED BY: Chaco LOCATION: Oakland

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

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

CASING ELEVATION (feet/MSL): NM VOLUME IN CASING (gal.): ≈98

DEPTH TO WATER (feet): 32.45 CALCULATED PURGE (gal.): 296

DEPTH OF WELL (feet): 38.5 ACTUAL PURGE VOL. (gal.): 3.0

DATE PURGED: 12-6-94 Start (2400 Hr) 14:11 End (2400 Hr) 14:21

DATE SAMPLED: 12-6-94 Start (2400 Hr) 14:21 End (2400 Hr) 14:25

TIME (2400 Hr)	VOLUME (gal.)	pH (units)	E.C. (µmhos/cm @ 25° C)	TEMPERATURE (°F)	COLOR (visual)	TURBIDITY (visual)
14:15	1.0	6.53	1166	60.7	Brn	Heavy
14:18	2.0	6.51	1168	61.1	Brn	Hvy
14:21	3.0	6.52	1160	61.5	Brn	Hvy

D. O. (ppm): — ODOR: None

Field QC samples collected at this well: NA

Parameters field filtered at this well: —

(COBALT 0 - 500) (NTU 0 - 200 or 0 - 1000)

PURGING EQUIPMENT		SAMPLING EQUIPMENT	
___ 2" Bladder Pump	___ Bailer (Teflon®)	___ 2" Bladder Pump	✓ Bailer (Teflon®)
___ Centrifugal Pump	✓ 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 #: ___

REMARKS: ___

Meter Calibration: Date: ___ Time: ___ Meter Serial #: ___ Temperature °F: ___

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

Location of previous calibration: MW-1

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

Rev. 3, 2/94

WATER SAMPLE FIELD DATA SHEET

EMCON ASSOCIATES

PROJECT NO: 0805-120.01 SAMPLE ID: MW-4

PURGED BY: C. Chico CLIENT NAME: Arco 276

SAMPLED BY: " LOCATION: Oakland

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

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

CASING ELEVATION (feet/MSL): NR VOLUME IN CASING (gal.): 2.64

DEPTH TO WATER (feet): 31.91 CALCULATED PURGE (gal.): 7.9?

DEPTH OF WELL (feet): 48.1 ACTUAL PURGE VOL. (gal.): 8

DATE PURGED: 12-6-94 Start (2400 Hr) 15:09 End (2400 Hr) 15:26

DATE SAMPLED: 12-6-94 Start (2400 Hr) — End (2400 Hr) 15:27

TIME (2400 Hr)	VOLUME (gal.)	pH (units)	E.C. (µmhos/cm @ 25° C)	TEMPERATURE (°F)	COLOR (visual)	TURBIDITY (visual)
15:13	3.0	6.80	1790	66.4	BRN	HVY
15:21	5.5	6.85	1752	62.5	BRN	HVY
15:24	8.0	6.87	1750	62.4	BRN	HVY

D. O. (ppm): N/A ODOR: None N/A

(COBALT 0 - 500)

N/A

(NTU 0 - 200 or 0 - 1000)

Field QC samples collected at this well: YES

Parameters field filtered at this well: NO

PURGING EQUIPMENT

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

Other: ___

SAMPLING EQUIPMENT

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

Other: ___

WELL INTEGRITY: Fair LOCK #: ___

REMARKS: DTW - 31.90 QC samples collected

First sample collected at 31.90 feet

Second sample collected at 48.0 feet

Then purged and sampled well as normal

Meter Calibration: Date: ___ Time: ___ Meter Serial #: ___ Temperature °F: ___

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

Location of previous calibration: ___

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

Rev. 3, 2/94

WATER SAMPLE FIELD DATA SHEET

EMCON ASSOCIATES

PROJECT NO: 0805-120-01 SAMPLE ID: MW-5

PURGED BY: J. Williams CLIENT NAME: ARCO 276

SAMPLED BY: J. Williams LOCATION: Oakland, CA

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

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

CASING ELEVATION (feet/MSL):	NA	VOLUME IN CASING (gal.):	10.16
DEPTH TO WATER (feet):	31.40	CALCULATED PURGE (gal.):	30.49
DEPTH OF WELL (feet):	47.0	ACTUAL PURGE VOL. (gal.):	30.5

DATE PURGED: 12-6-94 Start (2400 Hr) 1345 End (2400 Hr) 1356

DATE SAMPLED: 12-6-94 Start (2400 Hr) ___ End (2400 Hr) 1400

TIME (2400 Hr)	VOLUME (gal.)	pH (units)	E.C. (µmhos/cm @ 25° C)	TEMPERATURE (°F)	COLOR (visual)	TURBIDITY (visual)
1349	10.5	6.26	1317	67.8	CLEAR	TRACE
1352	20.5	6.26	1168	68.7	CLEAR	TRACE
1356	30.5	6.29	1165	67.5	CLEAR	TRACE

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

Field QC samples collected at this well: FB-1

Parameters field filtered at this well: NO

PURGING EQUIPMENT

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

Other: ___

SAMPLING EQUIPMENT

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

Other: ___

WELL INTEGRITY: GOOD LOCK #: 3499

REMARKS: ___

Meter Calibration: Date: 12-6-94 Time: 1313 Meter Serial #: 9010 Temperature °F: 60.9

(EC 1000 929 / 1000) (DI ___) (pH 7 7.14 / 7.00) (pH 10 9.99 / 10.00) (pH 4 3.99 / ___)

Location of previous calibration: ___

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

Rev. 3, 2/94

WATER SAMPLE FIELD DATA SHEET

.49

EMCON ASSOCIATES

PROJECT NO: 0805-120-01 SAMPLE ID: MW-6

PURGED BY: J. Williams CLIENT NAME: ARCO 276

SAMPLED BY: J. Williams LOCATION: Oakland, Ca

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

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

CASING ELEVATION (feet/MSL): NA VOLUME IN CASING (gal.): 2.48

DEPTH TO WATER (feet): 37.37 CALCULATED PURGE (gal.): 7.31

DEPTH OF WELL (feet): 52.3 ACTUAL PURGE VOL. (gal.): 7.5

DATE PURGED: 12-7-94 Start (2400 Hr) 1237 End (2400 Hr) 1242

DATE SAMPLED: 12-7-94 Start (2400 Hr) ___ End (2400 Hr) 1246

TIME (2400 Hr)	VOLUME (gal.)	pH (units)	E.C. (µmhos/cm @ 25° C)	TEMPERATURE (°F)	COLOR (visual)	TURBIDITY (visual)
1240	2.5	6.72	1984	62.2	BROWN	HEAVY
1241	5	6.71	1966	64.2	BROWN	HEAVY
1242	7.5	6.69	1864	64.5	BROWN	HEAVY

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

Field QC samples collected at this well: NA

Parameters field filtered at this well: NO

PURGING EQUIPMENT

___ 2" Bladder Pump ___ Bailer (Teflon®)

___ Centrifugal Pump ___ Bailer (PVC)

✓ Submersible Pump ___ Bailer (Stainless Steel)

___ Well Wizard™ ___ Dedicated

Other: ___

SAMPLING EQUIPMENT

___ 2" Bladder Pump ✓ Bailer (Teflon®)

___ DDL Sampler ___ Bailer (Stainless Steel)

___ Dipper ___ Submersible Pump

___ Well Wizard™ ___ Dedicated

Other: ___

WELL INTEGRITY: NEED LOCKING WELLCAP LOCK #: BALCH

REMARKS: WATER IN BOX

Meter Calibration: Date: 12-7-94 Time: 1655 Meter Serial #: 9010 Temperature °F: ___

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

Location of previous calibration: MW-5

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

Rev. 3, 2/94

WATER SAMPLE FIELD DATA SHEET

EMCON ASSOCIATES

PROJECT NO: 0805-120-01 SAMPLE ID: MW-7

PURGED BY: J. Williams CLIENT NAME: ARCO 276

SAMPLED BY: J. Williams LOCATION: Oakland, Ca

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

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

CASING ELEVATION (feet/MSL): N/A VOLUME IN CASING (gal.): 3.02

DEPTH TO WATER (feet): 18.50 CALCULATED PURGE (gal.): 9.06

DEPTH OF WELL (feet): 37.0 ACTUAL PURGE VOL. (gal.): 9.5

DATE PURGED: 12-7-94 Start (2400 Hr) 1355 End (2400 Hr) 1410

DATE SAMPLED: 12-7-94 Start (2400 Hr) ___ End (2400 Hr) 1415

TIME (2400 Hr)	VOLUME (gal.)	pH (units)	E.C. (µmhos/cm @ 25° C)	TEMPERATURE (°F)	COLOR (visual)	TURBIDITY (visual)
1402	3	6.14	491	66.1	BROWN	HEAVY
1406	6	6.12	560	66.7	Brown	MOD
1410	9	6.19	550	66.0	Brown	MOD

D. O. (ppm): N/A ODOR: STRONG

N/A (COBALT 0 - 500)

N/A (NTU 0 - 200 or 0 - 1000)

Field QC samples collected at this well: NO

Parameters field filtered at this well: NO

PURGING EQUIPMENT

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

Other: ___

SAMPLING EQUIPMENT

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

Other: ___

WELL INTEGRITY: OK LOCK #: ___

REMARKS: .02 Product but purged and sampled well.

Meter Calibration: Date: 12-7-94 Time: 1035 Meter Serial #: 6010 Temperature °F: ___

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

Location of previous calibration: MW-8

Signature: [signature] Reviewed By: JB Page 7 of 10

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WATER SAMPLE FIELD DATA SHEET

EMCON ASSOCIATES

PROJECT NO: 0805-120-01 SAMPLE ID: MW-8

PURGED BY: J Williams CLIENT NAME: ARCO 276

SAMPLED BY: J Williams LOCATION: Oakland Ca

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

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

CASING ELEVATION (feet/MSL): WK VOLUME IN CASING (gal.): 11.85

DEPTH TO WATER (feet): 29.66 CALCULATED PURGE (gal.): 35.55

DEPTH OF WELL (feet): 47.8 ACTUAL PURGE VOL. (gal.): 22

DATE PURGED: 12-7-94 Start (2400 Hr) 1056 End (2400 Hr) 1107

DATE SAMPLED: 12-7-94 Start (2400 Hr) — End (2400 Hr) 1120

TIME (2400 Hr)	VOLUME (gal.)	pH (units)	E.C. (µmhos/cm @ 25° C)	TEMPERATURE (°F)	COLOR (visual)	TURBIDITY (visual)
1102	12	6.72	550	66.3	BRown	MOD
	WELL DRIED AFTER 22 GALLONS TIME 1107					
Well	Recharge				Brown	MOD
1122	↓	6.55	546	68.8	"	"

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: NO

PURGING EQUIPMENT		SAMPLING EQUIPMENT	
___ 2" Bladder Pump	___ Bailer (Teflon®)	___ 2" Bladder Pump	✓ Bailer (Teflon®)
___ Centrifugal Pump	___ 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 #: None

REMARKS: ___

Meter Calibration: Date: 12-7-94 Time: 1035 Meter Serial #: 9010 Temperature °F: 58.0

(EC 1000 929/1000) (DI ___) (pH 7 7.16/7.00) (pH 10 10.10/10.00) (pH 4 3.92/ ___)

Location of previous calibration: ___

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

Rev. 3, 2/94

WATER SAMPLE FIELD DATA SHEET

4.41

EMCON ASSOCIATES

PROJECT NO: 0805-120-01 SAMPLE ID: RW-1

PURGED BY: S. W. Hunter CLIENT NAME: ARCO 276

SAMPLED BY: S. W. Hunter LOCATION: Oakland, Ca

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

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

CASING ELEVATION (feet/MSL): NA VOLUME IN CASING (gal.): 24.43

DEPTH TO WATER (feet): 32.28 CALCULATED PURGE (gal.): 73.29

DEPTH OF WELL (feet): 48.9 ACTUAL PURGE VOL. (gal.): 74

DATE PURGED: 12-7-94 Start (2400 Hr) 1140 End (2400 Hr) 1157

DATE SAMPLED: 12-7-94 Start (2400 Hr) ___ End (2400 Hr) 1159

TIME (2400 Hr)	VOLUME (gal.)	pH (units)	E.C. (µmhos/cm @ 25° C)	TEMPERATURE (°F)	COLOR (visual)	TURBIDITY (visual)
1147	24.5	6.70	1599	62.7	CLEAR	TRACE
1153	49	6.72	1568	63.9	CLEAR	CLEAR
1157	74	6.77	1564	63.8	CLEAR	CLEAR

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

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

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

Field QC samples collected at this well: NO

Parameters field filtered at this well: NO

PURGING EQUIPMENT

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

SAMPLING EQUIPMENT

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

WELL INTEGRITY: GOOD KMD LOCK #: None

REMARKS: ___

Meter Calibration: Date: 12-7-94 Time: 1035 Meter Serial #: 90/C Temperature °F: ___

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

Location of previous calibration: MW-8

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

Rev. 3, 2/94

WATER SAMPLE FIELD DATA SHEET MW-3

EMCON ASSOCIATES

PROJECT NO: 0805-120-01 SAMPLE ID: [illegible]

PURGED BY: J. Williams CLIENT NAME: ARCO 276

SAMPLED BY: J Williams LOCATION: Oakland Ca

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

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

CASING ELEVATION (feet/MSL):	N/A	VOLUME IN CASING (gal.):	5.99
DEPTH TO WATER (feet):	17.73	CALCULATED PURGE (gal.):	17.97
DEPTH OF WELL (feet):	26.9	ACTUAL PURGE VOL. (gal.):	13.5

DATE PURGED: 12-7-94 Start (2400 Hr) 1425 End (2400 Hr) 1441

DATE SAMPLED: 12-7-94 Start (2400 Hr) ___ End (2400 Hr) 1500

TIME (2400 Hr)	VOLUME (gal.)	pH (units)	E.C. (µmhos/cm @ 25° C)	TEMPERATURE (°F)	COLOR (visual)	TURBIDITY (visual)
1435	6	6.22	378	62.7	GRAY	HEAVY
1440	12	6.09	460	63.8	GRAY	HEAVY
___	WELL	DRIED	AFTER 13.5 GALLON	___	___	___
1505	Recharge	6.07	456	64.1	GRAY	HEAVY
___	___	___	___	___	___	___

D. O. (ppm): N/A ODOR: STRONG

COLOR (COBALT 0 - 500): N/A

TURBIDITY (NTU 0 - 200 or 0 - 1000): N/A

Field QC samples collected at this well: MW-3 EB-1

Parameters field filtered at this well: N.O

PURGING EQUIPMENT

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

Other: ___

SAMPLING EQUIPMENT

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

Other: ___

WELL INTEGRITY: OK LOCK #: BALCK

REMARKS: ___

Meter Calibration: Date: 12-7-94 Time: 1035 Meter Serial #: 9010 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, FOURTH QUARTER 1994

Columbia Analytical Services, Inc.

January 12, 1995

Service Request No. S941593

John Young
EMCON Associates
1921 Ringwood Avenue
San Jose, CA 95131

Re: **ARCO Facility No. 276**

Dear Mr. Young:

Attached are the results of the water samples submitted to our lab on December 8, 1994. For your reference, these analyses have been assigned our service request number S941593.

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.

Lawrence Hardy for

Keoni A. Murphy
Program Director

Annelise Jade Bazar

Annelise J. Bazar
Regional QA Coordinator

KAM/ajb

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

Acronyms

ASTM	American Society for Testing and Materials
CARB	California Air Resources Board
CAS Number	Chemical Abstract Service registry Number
CFC	Chlorofluorocarbon
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
GC	Gas Chromatography
GC/MS	Gas Chromatography/Mass Spectrometry
LUFT	Leaking Underground Fuel Tank
MCL	Maximum Contaminant Level is the highest permissible concentration of a substance allowed in drinking water as established by the USEPA.
MDL	Method Detection Limit
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
NR	Not Requested
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
VPH	Volatile Petroleum Hydrocarbons

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Analytical Report

Client:	EMCON Associates	**Service Request:**	S941593
Project:	ARCO Facility No. 276 / EMCON Project No. 0805-120.01	**Date Collected:**	12/6,7/94
Sample Matrix:	Water	**Date Received:**	12/8/94
		Date Extracted:	12/15/94
		Date Analyzed:	12/16/94

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

Sample Name	Lab Code	MRL	Result
MW-4 (47)	S941593-004	0.5	1.8
Method Blank	S941215-WB	0.5	ND

Approved By: L L Hawley Date: 1/12/95

1AMRL/060194

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COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client:	EMCON Associates	**Service Request:**	S941593
Project:	ARCO Facility No. 276 / EMCON Project No. 0805-120.01	**Date Collected:**	12/6,7/94
Sample Matrix:	Water	**Date Received:**	12/8/94
		Date Extracted:	NA
		Date Analyzed:	12/16-21/94 (a)

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-1 (38)	S941593-001	ND	ND	ND	ND	ND (b)
MW-2 (24)	S941593-002	26,000	570	43	220	1,100
MW-3 (38)	S941593-003	<380 (c)	ND	ND	ND	ND
MW-4 (47)	S941593-004	<970 (c)	<2.5 (d)	<2.5 (d)	<2.5 (d)	<2.5 (d)
MW-5 (46)	S941593-007	<550 (c)	ND	0.6	1.1	2.0
MW-6 (51)	S941593-008	<720 (c)	<1 (d)	<1 (d)	<1 (d)	<1 (d)
MW-7 (36)	S941593-009	260,000	<200 (e)	380	2,200	11,000
MW-8 (47)	S941593-010	ND	ND	ND	ND	ND
RW-1 (48)	S941593-011	<79 (c)	ND	ND	ND	ND
WGR-3 (26)	S941593-012	ND	ND	ND	ND	0.6
TB-1	S941593-013	ND	ND	ND	ND	ND
FB-1	S941593-014	ND	ND	ND	ND	ND
EB-1	S941593-015	ND	ND	ND	ND	ND
Method Blank	S941216-WB	ND	ND	ND	ND	ND
Method Blank	S941219-WB	ND	ND	ND	ND	ND
Method Blank	S941220-WB	ND	ND	ND	ND	ND
Method Blank	S941221-WB	ND	ND	ND	ND	ND

(a) Except as noted all samples were analyzed within holding time.
(b) This sample was originally analyzed within holding time and all analytes were ND, except for xylenes due to carryover. This sample was reanalyzed one day past holding time and the xylenes were also ND. The sample aliquot was headspace free, preserved to a pH of less than 2, and kept cold.
(c) 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.
(d) Raised MRL due to matrix interference requiring sample dilution.
(e) Raised MRL due to high analyte concentration requiring sample dilution.

Approved By: _____ Date: 3/7/95

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COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: EMCON Associates
Project: ARCO Facility No. 276 / EMCON Project No. 0805-120.01
Sample Matrix: Water

Service Request: S941593
Date Collected: 12/6,7/94
Date Received: 12/8/94
Date Extracted: NA

Volatile Organic Compounds
EPA Method 8240
Units: ug/L (ppb)

	Sample Name:	MW-1 (38)	MW-2 (24) *	MW-3 (38) *
	Lab Code:	S941593-001	S941593-002	S941593-003
	Date Analyzed:	12/14/94	12/15/94	12/14/94
Analyte	**MRL**			
Chloromethane	10	ND	<50	<250
Vinyl Chloride	10	ND	<50	<250
Bromomethane	10	ND	<50	<250
Chloroethane	10	ND	<50	<250
Trichlorofluoromethane (CFC 11)	1	ND	<5	<25
Trichlorotrifluoroethane (CFC 113)	10	ND	<50	<250
1,1-Dichloroethene	1	ND	<5	<25
Acetone	20	ND	<100	<500
Carbon Disulfide	1	ND	<5	<25
Methylene Chloride	10	ND	<50	<250
trans-1,2-Dichloroethene	1	ND	<5	<25
cis-1,2-Dichloroethene	1	ND	<5	<25
2-Butanone (MEK)	10	ND	<50	<250
1,1-Dichloroethane	1	ND	<5	<25
Chloroform	1	ND	<5	<25
1,1,1-Trichloroethane (TCA)	1	ND	<5	<25
Carbon Tetrachloride	1	ND	<5	<25
Benzene	1	ND	620	<25
1,2-Dichloroethane	1	ND	<5	<25
Vinyl Acetate	10	ND	<50	<250
Trichloroethene (TCE)	1	ND	<5	<25
1,2-Dichloropropane	1	ND	<5	<25
Bromodichloromethane	1	ND	<5	<25
2-Chloroethyl Vinyl Ether	10	ND	<50	<250
trans-1,3-Dichloropropene	1	ND	<5	<25
4-Methyl-2-pentanone (MIBK)	10	ND	<50	<250
2-Hexanone	10	ND	<50	<250
Toluene	1	ND	28	<25
cis-1,3-Dichloropropene	1	ND	<5	<25
1,1,2-Trichloroethane	1	ND	<5	<25
Tetrachloroethene (PCE)	1	17	<5	1,100
Dibromochloromethane	1	ND	<5	<25
Chlorobenzene	1	ND	<5	<25
Ethylbenzene	1	ND	220	<25
Styrene	1	ND	<5	<25
Total Xylenes	5	ND	1,200	<125
Bromoform	1	ND	<5	<25
1,1,2,2-Tetrachloroethane	1	ND	<5	<25
1,3-Dichlorobenzene	1	ND	<5	<25
1,4-Dichlorobenzene	1	ND	<5	<25
1,2-Dichlorobenzene	1	ND	<5	<25

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

Approved By: L J Hawley Date: 1/12/95

3S44/060194

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COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: EMCON Associates
Project: ARCO Facility No. 276 / EMCON Project No. 0805-120.01
Sample Matrix: Water

Service Request: S941593
Date Collected: 12/6,7/94
Date Received: 12/8/94
Date Extracted: NA

Volatile Organic Compounds
EPA Method 8240
Units: ug/L (ppb)

	Sample Name:	MW-4 (47) *	MW-5 (46) *	MW-6 (51) *
	Lab Code:	S941593-004	S941593-007	S941593-008
	Date Analyzed:	12/14/94	12/15/94	12/15/94
Analyte	**MRL**			
Chloromethane	10	<200	<200	<500
Vinyl Chloride	10	<200	<200	<500
Bromomethane	10	<200	<200	<500
Chloroethane	10	<200	<200	<500
Trichlorofluoromethane (CFC 11)	1	<20	<20	<50
Trichlorotrifluoroethane (CFC 113)	10	<200	<200	<500
1,1-Dichloroethene	1	<20	<20	<50
Acetone	20	<400	<400	<1,000
Carbon Disulfide	1	<20	<20	<50
Methylene Chloride	10	<200	<200	<500
trans-1,2-Dichloroethene	1	<20	<20	<50
cis-1,2-Dichloroethene	1	<20	<20	<50
2-Butanone (MEK)	10	<200	<200	<500
1,1-Dichloroethane	1	<20	<20	<50
Chloroform	1	<20	<20	<50
1,1,1-Trichloroethane (TCA)	1	<20	<20	<50
Carbon Tetrachloride	1	<20	<20	<50
Benzene	1	<20	<20	<50
1,2-Dichloroethane	1	<20	<20	<50
Vinyl Acetate	10	<200	<200	<500
Trichloroethene (TCE)	1	<20	<20	<50
1,2-Dichloropropane	1	<20	<20	<50
Bromodichloromethane	1	<20	<20	<50
2-Chloroethyl Vinyl Ether	10	<200	<200	<500
trans-1,3-Dichloropropene	1	<20	<20	<50
4-Methyl-2-pentanone (MIBK)	10	<200	<200	<500
2-Hexanone	10	<200	<200	<500
Toluene	1	<20	<20	<50
cis-1,3-Dichloropropene	1	<20	<20	<50
1,1,2-Trichloroethane	1	<20	<20	<50
Tetrachloroethene (PCE)	1	2,200	1,800	2,000
Dibromochloromethane	1	<20	<20	<50
Chlorobenzene	1	<20	<20	<50
Ethylbenzene	1	<20	<20	<50
Styrene	1	<20	<20	<50
Total Xylenes	5	<100	<100	<250
Bromoform	1	<20	<20	<50
1,1,2,2-Tetrachloroethane	1	<20	<20	<50
1,3-Dichlorobenzene	1	<20	<20	<50
1,4-Dichlorobenzene	1	<20	<20	<50
1,2-Dichlorobenzene	1	<20	<20	<50

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

Approved By: L L Faculty Date: 1/12/95

3S44/060194

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COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: EMCON Associates
Project: ARCO Facility No. 276 / EMCON Project No. 0805-120.01
Sample Matrix: Water

Service Request: S941593
Date Collected: 12/6,7/94
Date Received: 12/8/94
Date Extracted: NA

Volatile Organic Compounds
EPA Method 8240
Units: ug/L (ppb)

	Sample Name:	MW-7 (36) *	MW-8 (47)	RW-1 (48) *
	Lab Code:	S941593-009	S941593-010	S941593-011
	Date Analyzed:	12/14/94	12/15/94	12/14/94
Analyte	**MRL**			
Chloromethane	10	<500	ND	<50
Vinyl Chloride	10	<500	ND	<50
Bromomethane	10	<500	ND	<50
Chloroethane	10	<500	ND	<50
Trichlorofluoromethane (CFC 11)	1	<50	ND	<5
Trichlorotrifluoroethane (CFC 113)	10	<500	ND	<50
1,1-Dichloroethene	1	<50	ND	<5
Acetone	20	<1,000	ND	<100
Carbon Disulfide	1	<50	ND	<5
Methylene Chloride	10	<500	ND	<50
trans-1,2-Dichloroethene	1	<50	ND	<5
cis-1,2-Dichloroethene	1	<50	ND	<5
2-Butanone (MEK)	10	<500	ND	<50
1,1-Dichloroethane	1	<50	ND	<5
Chloroform	1	<50	ND	<5
1,1,1-Trichloroethane (TCA)	1	<50	ND	<5
Carbon Tetrachloride	1	<50	ND	<5
Benzene	1	230	ND	<5
1,2-Dichloroethane	1	<50	ND	<5
Vinyl Acetate	10	<500	ND	<50
Trichloroethene (TCE)	1	<50	ND	<5
1,2-Dichloropropane	1	<50	ND	<5
Bromodichloromethane	1	<50	ND	<5
2-Chloroethyl Vinyl Ether	10	<500	ND	<50
trans-1,3-Dichloropropene	1	<50	ND	<5
4-Methyl-2-pentanone (MIBK)	10	<500	ND	<50
2-Hexanone	10	<500	ND	<50
Toluene	1	180	ND	<5
cis-1,3-Dichloropropene	1	<50	ND	<5
1,1,2-Trichloroethane	1	<50	ND	<5
Tetrachloroethene (PCE)	1	<50	2	340
Dibromochloromethane	1	<50	ND	<5
Chlorobenzene	1	<50	ND	<5
Ethylbenzene	1	750	ND	<5
Styrene	1	<50	ND	<5
Total Xylenes	5	4,800	ND	<25
Bromoform	1	<50	ND	<5
1,1,2,2-Tetrachloroethane	1	<50	ND	<5
1,3-Dichlorobenzene	1	<50	ND	<5
1,4-Dichlorobenzene	1	<50	ND	<5
1,2-Dichlorobenzene	1	<50	ND	<5

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

Approved By: L J Farley Date: 1/12/95

3S44/060194

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

Analytical Report

Client: EMCON Associates
Project: ARCO Facility No. 276 / EMCON Project No. 0805-120.01
Sample Matrix: Water

Service Request: S941593
Date Collected: 12/6,7/94
Date Received: 12/8/94
Date Extracted: NA

Volatile Organic Compounds
EPA Method 8240
Units: ug/L (ppb)

	Sample Name:	WGR-3 (26)	TB-1	FB-1
	Lab Code:	S941593-012	S941593-013	S941593-014
	Date Analyzed:	12/14/94	12/15/94	12/15/94
Analyte	**MRL**			
Chloromethane	10	ND	ND	ND
Vinyl Chloride	10	ND	ND	ND
Bromomethane	10	ND	ND	ND
Chloroethane	10	ND	ND	ND
Trichlorofluoromethane (CFC 11)	1	ND	ND	ND
Trichlorotrifluoroethane (CFC 113)	10	ND	ND	ND
1,1-Dichloroethene	1	ND	ND	ND
Acetone	20	ND	ND	ND
Carbon Disulfide	1	ND	ND	ND
Methylene Chloride	10	ND	ND	ND
trans-1,2-Dichloroethene	1	ND	ND	ND
cis-1,2-Dichloroethene	1	ND	ND	ND
2-Butanone (MEK)	10	ND	ND	ND
1,1-Dichloroethane	1	ND	ND	ND
Chloroform	1	ND	ND	ND
1,1,1-Trichloroethane (TCA)	1	ND	ND	ND
Carbon Tetrachloride	1	ND	ND	ND
Benzene	1	ND	ND	ND
1,2-Dichloroethane	1	ND	ND	ND
Vinyl Acetate	10	ND	ND	ND
Trichloroethene (TCE)	1	ND	ND	ND
1,2-Dichloropropane	1	ND	ND	ND
Bromodichloromethane	1	ND	ND	ND
2-Chloroethyl Vinyl Ether	10	ND	ND	ND
trans-1,3-Dichloropropene	1	ND	ND	ND
4-Methyl-2-pentanone (MIBK)	10	ND	ND	ND
2-Hexanone	10	ND	ND	ND
Toluene	1	ND	ND	ND
cis-1,3-Dichloropropene	1	ND	ND	ND
1,1,2-Trichloroethane	1	ND	ND	ND
Tetrachloroethene (PCE)	1	4	ND	ND
Dibromochloromethane	1	ND	ND	ND
Chlorobenzene	1	ND	ND	ND
Ethylbenzene	1	ND	ND	ND
Styrene	1	ND	ND	ND
Total Xylenes	5	ND	ND	ND
Bromoform	1	ND	ND	ND
1,1,2,2-Tetrachloroethane	1	ND	ND	ND
1,3-Dichlorobenzene	1	ND	ND	ND
1,4-Dichlorobenzene	1	ND	ND	ND
1,2-Dichlorobenzene	1	ND	ND	ND

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

Approved By: L J Healey Date: 1/12/95

3S44/060194

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Analytical Report

Client: EMCON Associates
Project: ARCO Facility No. 276 / EMCON Project No. 0805-120.01
Sample Matrix: Water

Service Request: S941593
Date Collected: 12/6,7/94
Date Received: 12/8/94
Date Extracted: NA

Volatile Organic Compounds
EPA Method 8240
Units: ug/L (ppb)

	Sample Name:	**EB-1**	**Method Blank**	**Method Blank**
	Lab Code:	S941593-015	S941214-WB	S941215-WB
	Date Analyzed:	12/15/94	12/14/94	12/15/94
Analyte	**MRL**			
Chloromethane	10	ND	ND	ND
Vinyl Chloride	10	ND	ND	ND
Bromomethane	10	ND	ND	ND
Chloroethane	10	ND	ND	ND
Trichlorofluoromethane (CFC 11)	1	ND	ND	ND
Trichlorotrifluoroethane (CFC 113)	10	ND	ND	ND
1,1-Dichloroethene	1	ND	ND	ND
Acetone	20	ND	ND	ND
Carbon Disulfide	1	ND	ND	ND
Methylene Chloride	10	ND	ND	ND
trans-1,2-Dichloroethene	1	ND	ND	ND
cis-1,2-Dichloroethene	1	ND	ND	ND
2-Butanone (MEK)	10	ND	ND	ND
1,1-Dichloroethane	1	ND	ND	ND
Chloroform	1	ND	ND	ND
1,1,1-Trichloroethane (TCA)	1	ND	ND	ND
Carbon Tetrachloride	1	ND	ND	ND
Benzene	1	ND	ND	ND
1,2-Dichloroethane	1	ND	ND	ND
Vinyl Acetate	10	ND	ND	ND
Trichloroethene (TCE)	1	ND	ND	ND
1,2-Dichloropropane	1	ND	ND	ND
Bromodichloromethane	1	ND	ND	ND
2-Chloroethyl Vinyl Ether	10	ND	ND	ND
trans-1,3-Dichloropropene	1	ND	ND	ND
4-Methyl-2-pentanone (MIBK)	10	ND	ND	ND
2-Hexanone	10	ND	ND	ND
Toluene	1	ND	ND	ND
cis-1,3-Dichloropropene	1	ND	ND	ND
1,1,2-Trichloroethane	1	ND	ND	ND
Tetrachloroethene (PCE)	1	ND	ND	ND
Dibromochloromethane	1	ND	ND	ND
Chlorobenzene	1	ND	ND	ND
Ethylbenzene	1	ND	ND	ND
Styrene	1	ND	ND	ND
Total Xylenes	5	ND	ND	ND
Bromoform	1	ND	ND	ND
1,1,2,2-Tetrachloroethane	1	ND	ND	ND
1,3-Dichlorobenzene	1	ND	ND	ND
1,4-Dichlorobenzene	1	ND	ND	ND
1,2-Dichlorobenzene	1	ND	ND	ND

Approved By: L J Hanley Date: 1/12/95

3S44/060194

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APPENDIX A

LABORATORY QC RESULTS

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COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client: EMCON Associates **Service Request:** S941593
Project: ARCO Facility No. 276 / EMCON Project No. 0805-120.01 **Date Analyzed:** 12/16/94

Initial Calibration Verification (ICV) Summary
Total Recoverable Petroleum Hydrocarbons
EPA Method 418.1
Units: ppm

Analyte	True Value	Result	Percent Recovery	CAS Percent Recovery Acceptance Limits
Hydorcarbon Mixture	40	43.8	110	90-110

Approved By: L J Hanley Date: 1/12/95

ICV25AL/060194

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COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client:	EMCON Associates	**Service Request:**	S941593
Project:	ARCO Facility No. 276 / EMCON Project No. 0805-120.01	**Date Collected:**	12/6/94
Sample Matrix:	Water	**Date Received:**	12/8/94
		Date Extracted:	12/15/94
		Date Analyzed:	12/16/94

Matrix Spike/Duplicate Matrix Spike Summary
Total Recoverable Petroleum Hydrocarbons
EPA Method 418.1
Units: mg/L (ppm)

Sample Name: Batch QC
Lab Code: S941549-016

	Spike Level		Sample	Spike Result		Percent Recovery		CAS Acceptance	Relative Percent
Analyte	MS	DMS	**Result**	MS	DMS	MS	DMS	Limits	**Difference**
Hydrocarbon Mixture	8.0	8.0	0.7	8.58	10.31	98	120	57-127	18

Approved By: L Hanley Date: 1/12/95

DMS1S/060194

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COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client:	EMCON Associates	**Service Request:**	S941593
Project:	ARCO Facility No. 276 / EMCON Project No. 0805-120.01	**Date Collected:**	12/6,7/94
Sample Matrix:	Water	**Date Received:**	12/8/94
		Date Extracted:	NA
		Date Analyzed:	12/16-21/94

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-1 (38)	S941593-001	99
MW-2 (24)	S941593-002	98
MW-3 (38)	S941593-003	94
MW-4 (47)	S941593-004	96
MW-5 (46)	S941593-007	93
MW-6 (51)	S941593-008	80
MW-7 (36)	S941593-009	97 *
MW-8 (47)	S941593-010	86
RW-1 (48)	S941593-011	93
WGR-3 (26)	S941593-012	92
TB-1	S941593-013	97
FB-1	S941593-014	96
EB-1	S941593-015	105
MW-1 (38) MS	S941593-001MS	107
MW-1 (38) DMS	S941593-001DMS	112
Method Blank	S941216-WB	95
Method Blank	S941219-WB	91
Method Blank	S941220-WB	94
Method Blank	S941221-WB	87

CAS Acceptance Limits: 69-116

* The surrogate used for 4-Bromofluorobenzene

Approved By: _____ Date: 1/12/95

SUR1/062994

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Client: EMCON Associates
Project: ARCO Facility No 276 / EMCON Project No. 0805-120.01

Service Request: S941593
Date Analyzed: 12/16/94

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	22.2	89	85-115
Toluene	25	27.3	97	85-115
Ethylbenzene	25	24.0	96	85-115
Xylenes, Total	75	67.0	89	85-115
Gasoline	250	470	94	90-110

Approved By: L.J. Hacoby Date: 1/12/95

ICV25AL/060194

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COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client:	EMCON Associates	**Service Request:**	S941593
Project:	ARCO Facility No. 276 / EMCON Project No. 0805-120.01	**Date Collected:**	12/6,7/94
Sample Matrix:	Water	**Date Received:**	12/8/94
		Date Extracted:	NA
		Date Analyzed:	12/16/94

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

Sample Name: MW-1 (38)
Lab Code: S941593-001

	Spike Level		Sample	Spike Result		Percent Recovery		CAS Acceptance	Relative Percent
Analyte	MS	DMS	**Result**	MS	DMS	MS	DMS	Limits	**Difference**
Gasoline	250	250	ND	240	261	96	104	67-121	8

Approved By: L. Hardy Date: 1/12/95

DMS1S/060194

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QA/QC Report

Client: EMCON Associates
Project: ARCO Facility No. 276 / EMCON Project No. 0805-120.01
Sample Matrix: Water

Service Request: S941593
Date Collected: 12/6,7/94
Date Received: 12/8/94
Date Extracted: NA
Date Analyzed: 12/14,15/94

Surrogate Recovery Summary
Volatile Organic Compounds
EPA Method 8240

Sample Name	Lab Code	Percent Recovery 1,2-Dichloroethane-D_4	Toluene-D_8	4-Bromofluorobenzene
MW-1 (38)	S941593-001	99	95	98
MW-2 (24)	S941593-002	97	97	100
MW-3 (38)	S941593-003	102	99	99
MW-4 (47)	S941593-004	103	102	100
MW-5 (46)	S941593-007	101	98	98
MW-6 (51)	S941593-008	102	102	99
MW-7 (36)	S941593-009	102	99	99
MW-8 (47)	S941593-010	96	94	98
RW-1 (48)	S941593-011	101	97	99
WGR-3 (26)	S941593-012	96	98	97
TB-1	S941593-013	99	98	98
FB-1	S941593-014	99	99	98
EB-1	S941593-015	99	93	99
MW-1 (38) MS	S941593-001MS	96	94	93
MW-1 (38) DMS	S941593-001DMS	93	97	96
Method Blank	S941214-WB	103	98	98
Method Blank	S941215-WB	98	100	98
CAS Acceptance Limits:		76-114	88-110	86-115

Approved By: L Hawley Date: 1/12/95

SUR3/060194

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

Client: EMCON Associates
Project: ARCO Facility No. 276 / EMCON Project No. 0805-120.01

Service Request: S941593
Date Analyzed: 12/13/94

Initial Calibration Verification (ICV) Summary
Volatile Organic Compounds
EPA Method 8240
Units: ppb

Analyte	True Value	Result	Percent Recovery	CAS Percent Recovery Acceptance Limits
Chloromethane	50	44 8	90	70-130
Vinyl Chloride	50	41.6	83	70-130
Bromomethane	50	48.2	96	70-130
Chloroethane	50	47 4	95	70-130
Acetone	50	46.1	92	70-130
1,1-Dichloroethene	50	41.2	82	70-130
Carbon Disulfide	50	40.9	82	70-130
Methylene Chloride	50	46.0	92	70-130
trans-1,2-Dichloroethene	50	43.7	87	70-130
cis-1,2-Dichloroethene	50	45.7	91	70-130
1,1-Dichloroethane	50	44.1	88	70-130
Vinyl Acetate	50	47.0	94	70-130
2-Butanone (MEK)	50	49.9	100	70-130
Chloroform	50	45.1	90	70-130
1,1,1-Trichloroethane (TCA)	50	41.6	83	70-130
Carbon Tetrachloride	50	38.6	77	70-130
Benzene	50	44.3	89	70-130
1,2-Dichloroethane	50	47.2	94	70-130
Trichloroethene (TCE)	50	42.5	85	70-130
1,2-Dichloropropane	50	46.4	93	70-130
Bromodichloromethane	50	45.9	92	70-130
2-Chloroethyl Vinyl Ether	50	48.1	96	70-130
2-Hexanone	50	51.7	103	70-130
trans-1,3-Dichloropropene	50	45.2	90	70-130
Toluene	50	43.8	88	70-130
cis-1,3-Dichloropropene	50	44.5	89	70-130
1,1,2-Trichloroethane	50	48.3	97	70-130
Tetrachloroethene (PCE)	50	40.1	80	70-130
Dibromochloromethane	50	48.2	96	70-130
Chlorobenzene	50	43.9	88	70-130
Ethylbenzene	50	43.6	87	70-130
o- Xylene	50	44.1	88	70-130
Styrene	50	44.2	88	70-130
Bromoform	50	49.1	98	70-130
1,1,2,2-Tetrachloroethane	50	52.0	104	70-130

Approved By: L. Hawley Date: 1/12/95

ICV41/060194

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

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client:	EMCON Associates	**Service Request:**	S941593
Project:	ARCO Facility No. 276 / EMCON Project No. 0805-120.01	**Date Collected:**	12/6,7/94
Sample Matrix:	Water	**Date Received:**	12/8/94
		Date Extracted:	NA
		Date Analyzed:	12/14/94

Matrix Spike/Duplicate Matrix Spike Summary
Volatile Organic Compounds
EPA Method 8240
Units: ug/L (ppb)

Sample Name: MW-1 (38)
Lab Code: S941593-001

	Spike Level		Sample	Spike Result		Percent Recovery		CAS Acceptance	Relative Percent
Analyte	MS	DMS	**Result**	MS	DMS	MS	DMS	Limits	**Difference**
1,1-Dichloroethene	50	50	ND	44.6	40.8	89	82	61-145	9
Trichloroethene	50	50	ND	46.5	46.7	93	93	71-120	<1
Chlorobenzene	50	50	ND	49.6	48.6	99	97	75-130	2
Toluene	50	50	ND	43.1	43.0	86	86	76-125	<1
Benzene	50	50	ND	43.7	43.8	87	88	76-127	<1

Approved By: L J Hendy Date: 1/12/95

DMS1S/060194

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

APPENDIX B

CHAIN OF CUSTODY

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

FIELD REPORT
DEPTH TO WATER / FLOATING PRODUCT SURVEY

PROJECT # : 0805-120.01 STATION ADDRESS : 10600 MacArthur Blvd. Oakland DATE : ~~12-7-94~~ 12-6-94 JB

ARCO STATION # : 276 FIELD TECHNICIAN : J. Williams DAY : Wednesday

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-5	~~OK~~ yes	Hex	yes	Balch	yes	31.44	31.44	ND	NA	47.0	
2	MW-8	OK	VAULT	NO	Balch	NO	24.66	24.66	ND	NA	47.8	Need LWC
3	MW-1	OK	Hex	yes	Balch	yes	31.89	31.89	ND	NA	38.9	
4	RW-1	OK	VAULT	NO	Balch	Slip cap	32.24	32.24	ND	NA	48.9	
5	MW-3	OK	9/16	NO	Balch	yes	32.46	32.46	ND	NA	38.5	
6	MW-4	OK	9/16	NO	Balch	yes	31.91	31.91	ND	NA	48.1	
7	MW-6	OK	15/16	NO	Balch	yes	37.33	~~37~~ 37.33	ND	NA	52.3	Need LWC
8	MW-2	OK	VAULT	NO	Balch	yes	14.74	14.74	sheen	sheen	25.9	Strong odor
9	MW-7	OK	yes	NO	Balch	yes	18.37	18.37	18.35	0.02	37.0	Strong odor
10	WGR-3	OK	~~VAULT~~	NO	Balch	yes	17.52	17.52	ND	NA	26.9	
11	VW-1	OK	Vault	NO	NA	NA	14.20	14.20	NA	NA	NA	

SURVEY POINTS ARE TOP OF WELL CASINGS

ARCO Products Company
Division of AtlanticRichfieldCompany

Task Order No. 276-94-SA

Chain of Custody

ARCO Facility no. 276	City (Facility) OAKLAND	Project manager (Consultant) John Young	Laboratory name CAS
ARCO engineer Michael Whelan	Telephone no. (ARCO) 571-2434	Telephone no. (Consultant) 453-7300	Fax no. (Consultant) 453-0452
Consultant name EMCON Associates	Address (Consultant) 1921 Ringwood Avenue		Contract number 07077

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 M602/8020/8015	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 ☐
MW-1(38)	1			X		X	HCl	12-6-94	1354		X					X				
MW-2(94)	2			X		X	HCl	12-7-94	1326		X					X				
MW-3(38)	3			X		X	HCl	12-6-94	1424		X					X				
MW-4(47)	4			X		X	HCl	12-6-94	1527		X			X		X				
MW-4(48)	5			X		X	HCl	12-6-94	1505							X				
MW-4(49)	6			X		X	HCl	12-6-94	1500							X				
MW-5(46)	7			X		X	HCl	12-6-94	1400		X					X				
MW-6(51)	8			X		X	HCl	12-7-94	1246		X					X				
MW-7(36)	9			X		X	HCl	12-7-94	1415		X					X				
MW-8(47)	10			X		X	HCl	12-7-94	1120		X					X				
PW-1(48)	11			X		X	HCl	12-7-94	1159		X					X				
MGP-3(26)	12			X		X	HCl	12-7-9	1500		X					X				
TB-1	13			X		X	HCl	12-7-94			X					X				
FB-1	14			X		X	HCl	12-6-94	1406		X					X				
EB-1	15			X		X	HCl	12-8-94	0900		X					X				

Special detection Limit/reporting: Lowest Possible

Special QA/QC: AS Normal

Remarks: 0805-120.01

Lab number: 5941593

Condition of sample: Good		Temperature received: Cool	
Relinquished by sampler	Date 12-8-94 Time 910	Received by	
Relinquished by	Date Time	Received by	12/8/94 910
Relinquished by	Date Time	Received by laboratory	Date Time

Turnaround time

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

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

APPENDIX C

COPY OF HISTORICAL SVE HYDROCARBON REMOVAL RATES FROM EVAX, PEG, AND RESNA

PACIFIC
ENVIRONMENTAL
GROUP INC.

FACSIMILE TRANSMITTAL

DATE: 9/14/93 PROJ. # #276 (330 ADMN)

TO: Mike whelan FAX: 5/15 571 2410

Arco

FROM: Kelly C. Brown

IF YOU HAVE ANY PROBLEMS RECEIVING THIS FACSIMILE, PLEASE CALL (408) 441-7500

SHEETS TO FOLLOW COVER PAGE

7

COMMENTS: Mike - Here is some of the data you requested yesterday. Between 3/4/91 → 10/16/90 Erax operated the system. I hunted high & low and this is all we have. Here is the 9/92 - 9/92 data.

Kelly

2025 Gateway Place, Suite 440, San Jose, California 95110 (408) 441-7500 FAX (403) 441-7539
620 Contra Costa Blvd., Suite 209, Pleasant Hill, California 94523 (510) 825-0855 FAX (510) 825-0882

EVAX TECHNOLOGIES, INC.
869 Mount Herman Rd
Suite 101
Scotts Valley, CA 95066
(408) 438-7511
FAX (408) 438-7515

26 September 1990

Pacific Environmental Group
1601 Civic Center Drive
Santa Clara, California 95050

TO: Mr. Dan Landry

SUBJECT: Arco Station #0276 at 10600 MacArthur
Oakland, California

The system was monitored at the subject site on 7 September 1990. The results are presented in the attached table for your review.

Since the system began operation on 6 September 1990, approximately 700 pounds of hydrocarbons and 30 pounds of benzene have been removed.

Please feel free to call if you have any questions.

Sincerely,

Toni Washuta

Toni Washuta
Project Manager

SYSTEM MONITORING SUMMARY
EVAX TECHNOLOGIES, INC.

Site: Arco Station #0276
10600 MacArthur
Oakland, California

EVAX Job No: 00740
Start date: 9/6/90

Phase System Test Date	Initial Combustor 9/7/90					
EXTRACTION POINT	TVH	VP	TVH	VP	TVH	VP
MW-4	24	0				
A	ND	0				
B	24	0				
C	50	0				
D	56	0				
E	1,400	0				
F	3,000	0				
G	25,000	0				
H	2,500	0				
I	200	0				
J	165	0				
K	ND	0				
L	620	0				
M	7,000	0				
N	3,200	0				
O	660	0				
P	140	0				
Q	ND	0				
R	7,600	0				
S	240	0				
T	3,400	0				
U	3,600	0				
V	6,500	0				
W	300	0				
X	3,600	0				
Y	5,200	0				
Z	2,000	0				

Job No. 00740

System	Combustor			
Test Date	9/7/90			
TOTAL SYSTEM				
Vacuum ("Hg)	7.0			
Inflow (scfm)	34.1			
Inflow TVH (ppm)	5,000			
Inflow TVH Rate (lb/day)	55.7	---		---
Detection Limit (ppm)	1.0	1.0		---
Method	TLV	TLV		
BENZENE				
Inflow (scfm)	34.1			
Benzene Influent Conc. (ppm)	260.0	---		---
Benzene Influent Rate (lb/day)	2.6	---		---
Benzene Effluent Conc. (ppm)	11.0	---		---
Benzene Emission Rate (lb/day)	0.10	---		---
Detection Limit (ppm)	0.5	0.5		0.5
*Method	GC PID	GC PID		GC PID

EXTRACTION POINT - Extraction probe/well identification as indicated on site plan.
TVH - Total volatile hydrocarbons in parts per million (ppm) on a volume/volume basis as hexane.
VP - Manifold valve position. (O=Open) (C=Closed)
Vacuum - System vacuum in inches of Mercury.
scfm - Standard cubic feet per minute.
* - Modified EPA Method 8020

EVAX TECHNOLOGIES, INC.
269 Mount Harmon Rd.
Suite 101
Scotts Valley, CA 95066
(408) 438-7511
FAX (408) 438-7515

15 October 1990

Pacific Environmental Group
1601 Civic Center Drive
Santa Clara, California 95050

TO: Mr. Dan Landry

SUBJECT: Arco Station #0276 at 10600 MacArthur
Oakland, California

The system was monitored at the subject site on 9 October 1990. The results are presented in the attached table for your review.

The system will be adjusted to remain in compliance with permitted emission conditions.

Since the system began operation on 6 September 1990, approximately 1,690 pounds of hydrocarbons and 60 pounds of benzene have been removed.

Please feel free to call if you have any questions.

Sincerely,

Toni Washuta

Toni Washuta
Project Manager

Project 00740.01

15 October 1990

SYSTEM MONITORING SUMMARY
EVAX TECHNOLOGIES, INC.

Site: Arco Station #0276
10600 MacArthur
Oakland, California

System Start Up: 9/6/90

System Phase Test Date	Combustor Bimonthly 10/8/90		Combustor Bimonthly 9/17/90		Combustor Initial 9/7/90	
EXTRACTION POINT	TVH	VP	TVH	VP	TVH	VP
MW-4	460	0	240	0	24	0
A	10,000+	0	620	0	ND	0
B	1,000	0	980	0	24	0
C	50	0	60	0	50	0
D	160	0	200	0	56	0
E	720	0	1,200	0	1,400	0
F	10,000+	0	3,000	0	3,000	0
G	7,400	0	25,000	0	25,000	0
H	1,500	0	2,000	0	2,500	0
I	1,600	0	260	0	200	0
J	2,600	0	220	0	165	0
K	160	0	160	0	ND	0
L	3,000	0	700	0	620	0
M	3,200	0	7,400	0	7,000	0
N	10,000+	0	3,000	0	3,200	0
O	260	0	780	0	660	0
P	200	0	200	0	140	0
Q	140	0	140	0	ND	0
R	1,600	0	8,000	0	7,600	0
S	260	0	300	0	240	0
T	3,400	0	4,000	0	3,400	0
U	2,000	0	3,400	0	3,600	0
V	3,000	0	6,800	0	6,500	0
W	440	0	340	0	300	0
X	500	0	3,400	0	3,600	0
Y	10,000+	0	5,000	0	5,200	0
Z	1,800	0	2,000	0	2,000	0

System Phase Test Date	Combustor Bimonthly 10/8/90	Combustor Bimonthly 9/27/90	Combustor Initial 9/17/90
TOTAL SYSTEM			
Hours of Operation	24	24	24
Vacuum ("Hg)	4.0	6.0	6.0
Inflow (scfm)	33.1	34.8	34.8
Inflow TVH (ppm)	3,000		5,000
Inflow TVH	---	---	---
Rate (lb/day)	32.4		56.8
Detection Limit	---	---	---
(ppm)	1.0	1.0	1.0
Method	TLV	TLV	TLV
BENZENE			
Inflow (scfm)	33.1	34.8	
Benzene Influent	---	---	---
Conc. (ppm)		106.0	
Benzene Influent	---	---	---
Rate (lb/day)		1.1	
Benzene Effluent	---	---	---
Conc. (ppm)	19.0	17.0	
Benzene Emission	---	---	---
Rate (lb/day)	0.18	0.17	
Detection Limit	---	---	---
(ppm)	0.5	0.5	0.5
*Method	GC PID	GC PID	GC PID

EXTRACTION POINT - Extraction probe/well identification as indicated on site plan.
TVH - Total volatile hydrocarbons in parts per million (ppm) on a volume/volume basis as hexane.
VP - Manifold valve position. (O=Open) (C=Closed)
Vacuum - System vacuum in inches of Mercury.
scfm - Standard cubic feet per minute.
* - Modified EPA Method 8020.

Table 1

Soil Vapor Extraction Data Evaluation

ARCO Service Station 276 Offsite
10600 MacArthur Boulevard
Oakland, California

Sample Date	t (days)	td (days)	TVH–g (ug/L)	Benzene (ug/L)	Sample Flow Rate (scfm)	Well Flow Rate (scfm)	TVH–g (lb/day)	Benzene (lb/day)	Hours of Operation	TVH–g Net (lb)	Benzene Net (lb)	TVH–g Total (lb)	Benzene Total (lb)
06/12/91	0	0	0	0.1	500	25	0.00	0.00	0.0	0.0	0.0	0.0	0.0
06/19/91	7	0	140	2.8	500	25	3.15	0.06	168.0	22.1	0.9	22.1	0.9
07/11/91	22	0	140	4.0	500	25	6.30	0.15	528.0	138.6	4.0	160.7	4.8
08/22 91	42	0	130	3.4	500	25	6.07	0.17	1008.0	255.1	6.4	415.8	11.3
09/05/91	14	0	86	3.2	500	25	4.86	0.15	336.0	68.0	2.0	483.8	13.3
11/22/91	78	48	130	2.5	500	25	4.86	0.13	720.0	145.8	3.4	629.6	16.7
12/06/91	14	2	35	0.5	500	25	3.71	0.07	288.0	44.6	0.5	674.2	16.9
12/20/91	14	0	32	0.4	500	25	1.51	0.02	336.0	21.1	0.3	695.3	17.2
01/03/92	14	0	7.5	0.1	500	25	0.89	0.01	336.0	12.4	0.1	707.7	17.2
01/17/92	14	0	6	0.1	500	25	0.90	0.00	336.0	4.3	0.0	712.0	17.3
02/03/92	17	0	7.5	0.1	500	25	0.90	0.00	408.0	5.2	0.1	717.2	17.4
02/18/92	15	0	6	0.1	500	25	0.90	0.00	360.0	4.6	0.0	721.7	17.4
03/02/92	13	13	9.7	0.1	500	25	0.35	0.00	0.0	0.0	0.0	721.7	17.4
03/17/92	15	0	6	0.1	500	25	0.55	0.00	360.0	5.3	0.0	727.0	17.4
03/31/92	14	6	6	0.1	500	25	0.27	0.00	144.0	1.6	0.0	728.6	17.5
04/27/92	27	6	6	0.1	500	25	0.27	0.00	504.0	5.7	0.1	734.3	17.5
05/11/92	14	8	8.2	0.1	500	25	0.32	0.00	144.0	1.9	0.0	736.2	17.5
05/27/92	16	16	0	0.0	500	25	0.18	0.00	0.0	0.0	0.0	736.2	17.5
06/08/92	12	12	7.8	0.2	500	25	0.18	0.00	0.0	0.0	0.0	736.2	17.5
06/24/92	16	4	6.5	0.1	500	25	0.32	0.01	288.0	3.9	0.0	740.1	17.5
07/06/92	12	0	5	0.1	500	25	0.26	0.00	288.0	3.1	0.0	743.2	17.5
08/03/92	28	0	12	0.2	500	25	0.38	0.00	672.0	10.7	0.2	753.9	17.8
09/09/92	37	0	1200	13.0	500	25	27.27	0.30	888.0	1009.0	21.8	1762.9	39.5
09/21/92	12	0	610	6.5	500	25	40.73	0.44	288.0	488.7	3.5	2251.6	43.0
TOTAL POUNDS REMOVED:												2251.6	43.0
TOTAL GALLONS REMOVED:												337.4	
TOTAL HOURS OF OPERATION:									8400				
% OF OPERABLE HOURS:									73%				

t = time of period since last sampling
td = down time during period since last sampling
TVH–g = total volatile hydrocarbons (calculated as gasoline)
ug/L = micrograms per liter
scfm = standard cubic feet per minute
lb/day = pounds per day
Net = net pounds removed during period
Total = total pounds removed to date

TABLE 5
VAPOR EXTRACTION SYSTEM OPERATION DATA
ARCO STATION 276
Oakland, California
(Page 1 of 2)

DATE	VAPOR EXTRACTION WELLS ON LINE STATUS								COMB WELL FLOW (scfm)	DILUT FLOW (scfm)	INF FLOW (scfm)	INF VAC ("WC)	TPHg WELL CONC (mg/m³)	TPHg INF CONC (mg/m³)	TPHg EFF CONC (mg/m³)
	VW-1	VW-2	VW-3	VW-4	VW-5	VW-6	VW-7	MW-2							
8/25/92			✓	✓					80	420	500	NM	NS	NS	NS
9/09/92			✓	✓					80	420	500	NM	9,500	NS	NS
10/05/92			✓	✓					80	420	500	22	1,200	578	18
10/23/92			✓	✓					54	446	500	22	990	240	12
11/03/92		✓			✓				45	455	500	29	350	64	<10
11/17/92	✓								73	427	500	22	200	NS	NS
12/07/92			✓	✓					60	440	500	41	<10	<10	<10
12/21/92		✓							44	456	500	40	37	NS	NS
1/05/93		✓							30	470	500	45	34	53	17
1/05/93	SYSTEM SHUTDOWN FROM 1/05/93 TO 7/19/93 (HIGH GROUNDWATER LEVEL).														
7/19/93			✓						35	465	500	25	250	20	25
8/10/93		✓							80	420	500	40	110	8.7	10
8/25/93					✓				50	450	500	35	19	NS	NS
9/09/93								✓	47	453	500	NM	330	87	18
9/22/93	SYSTEM SHUTDOWN 9/09/93 TO 10/06/93 FOR REPAIR OF FAILED FLAME ROD.														
10/06/93		✓		✓					47	453	500	18	NS	51	5.6

SEE NOTES PAGE 2 OF 2.

TABLE 5
VAPOR EXTRACTION SYSTEM OPERATION DATA
ARCO STATION 276
Oakland, California
(Page 2 of 2)

DATE	VAPOR EXTRACTION WELLS ON LINE STATUS								COMB WELL FLOW (scfm)	DILUT FLOW (scfm)	INF FLOW (scfm)	INF VAC ("WC)	TPHg WELL CONC (mg/m^3)	TPHg INF CONC (mg/m^3)	TPHg EFF CONC (mg/m^3)
	VW-1	VW-2	VW-3	VW-4	VW-5	VW-6	VW-7	MW-2							
10/18/93	SYSTEM SHUTDOWN 10/18/93 TO 11/23/93 FOR REPAIR OF A CLOGGED FLAME ARRESTOR.														
11/23/93	✓	✓	✓	✓	✓		✓	✓	70	430	500	27	209	57	12
12/09/93	✓	✓	✓	✓	✓		✓	✓	70	430	500	54	NS	9.7	64
12/29/93	✓	✓	✓	✓	✓		✓	✓	45	455	500	34	NS	<5.0	<5.0
12/29/93	SYSTEM SHUTDOWN ON 12/29/93 DUE TO LOW TPHg VAPOR CONCENTRATIONS IN SOIL GAS.														
THE SYSTEM WAS NOT OPERATED DURING THE FIRST QUARTER 1994 DUE TO LOW TPHg CONCENTRATIONS IN SOIL GAS.															

NOTES:
COMB WELL FLOW = Combined well flow rates
DIL AIR FLOW = Dilution air flow rates
INF FLOW = Influent Flow Rate to therm-ox (well plus dilution flows)
scfm = standard cubic feet per minute
INF VAC = Influent Vacuum
"WC = inches of water column vacuum
TPHg = Total petroleum hydrocarbons as gasoline
WELL TPHg CONC = Concentration of TPHg vapor in combined well flow
TPHg INF CONC = Concentration of TPHg vapor in therm-ox influent flow
TPHg EFF CONC = Concentration of TPHg vapor in therm-ox effluent flow
mg/m^3 = milligrams per cubic meter
✓ = Vapor Extraction Well Online
NS = Not Sampled
NM = Not Measured

TABLE 6
CUMULATIVE RESULTS OF LABORATORY ANALYSES OF AIR SAMPLES
ARCO Station 276
Oakland, California
(Page 1 of 3)

Sample Location (Date)	Sample ID.	TPHg	B	T	E	X
VW-1						
11/17/92	AS-VW1	200	2	3	0.6	4
VW-2						
8/10/93	AS-VW2	110	0.95	0.48	0.56	1.8
8/25/93	AS-VW2	30	0.31	0.23	0.46	1.9
VW-3						
7/19/93	AS-VW3-14:00	250	1	2	1	2
8/10/93	AS-VW3	20	<0.05	0.20	0.73	2.2
VW-4						
8/10/93	AS-VW4	1900	7	3	3	7
9/22/93	AS-VW4	110	2.5	0.92	0.43	1.6
VW-5						
8/25/93	AS-VW5	19	0.46	0.22	0.43	1.5
9/09/93	AS-VW5	22	0.26	3.2	0.53	2.0
VW-6						
12/21/92	A-VW6	37	<0.5	5	<0.5	1
MW-2						
9/09/93	AS-MW2	330	2.9	4.5	0.47	10
9/22/93	AS-VW2#	130	0.94	1.7	0.84	2.7
COMBINED WELLS						
6/19/91	WELLS	810	22	7.6	1.2	6.6
7/11/91	WELL	960	18	8.1	<3.0	12
7/19/93	AS-VW3-14:45#	1000	3	2	2	3
8/22/91	WELLS	920	27	6.5	1.2	9.6
4/27/92	WELL FIELD	<6.0	<0.06	0.085	<0.06	0.21
5/27/92	WELL FIELD	33	<0.06	0.28	0.14	0.42
6/26/92	WELL FIELD	110	0.35	0.64	0.23	1.4
7/06/92	WELL INFL	85	1.5	0.81	0.21	1.2
8/03/92	WELL FIELD	160	2.6	0.77	0.21	1.0
9/09/92	WELL FIELD	540	7.7	18	5.5	36
10/05/92	AS-WELLSNFL	990	17	17	4	22
11/03/92	A3-AEUFEO	350	6	7	1	12
12/16/92	COMB WELLS	<10	<0.5	2	<0.5	2
1/05/93	WELL INFL	34	<0.5	0.8	,0.5	3
11/23/93	AS-COMBINE WELLS	290	2.2	1.2	0.86	5.1

SEE NOTES ON PAGE 3 OF 3.

TABLE 6
CUMULATIVE RESULTS OF LABORATORY ANALYSES OF AIR SAMPLES
ARCO Station 276
Oakland, California
(Page 2 of 3)

Sample Location (Date)	Sample ID.	TPHg	B	T	E	X
INFLUENT						
6/12/91	INFLUENT	<6.0	0.081	<0.06	<0.06	<0.06
6/19/91	INFLUENT	140	2.8	1.8	0.24	5.2
7/11/91	INFLUENT	140	4.0	1.4	0.62	4.5
8/22/91	INFLUENT	130	3.4	1.2	0.27	3.0
9/05/91	INFLUENT	86	3.2	1.0	<0.30	1.7
12/20/91	INFLUENT	32	0.40	0.20	<0.06	0.43
1/03/92	INFLUENT	7.5	0.12	<0.06	<0.06	<0.06
1/17/92	INFLUENT	<6.0	<0.06	<0.06	<0.06	<0.06
2/18/92	INFLUENT	<6.0	<0.06	<0.06	<0.06	<0.06
3/02/92	INFLUENT	9.7	0.095	0.22	0.13	1.1
3/17/92	INFLUENT	<6.0	<0.06	<0.06	<0.06	<0.06
3/31/92	INFLUENT	<6.0	<0.06	<0.06	<0.06	<0.06
4/27/92	INFLUENT	<6.0	<0.06	<0.06	<0.06	0.078
5/11/92	INFLUENT	8.2	0.068	0.23	0.064	0.44
5/27/92	INFLUENT	<6.0	<0.06	0.13	<0.06	0.097
6/08/92	INFLUENT	7.8	0.17	0.10	<0.06	<0.06
6/24/92	INFL	6.5	<0.06	0.10	0.11	0.44
7/06/92	INFL	<5.0	<0.05	<0.05	<0.05	<0.05
7/20/92	INFL	<5.0	0.13	0.078	<0.05	<0.05
8/03/92	INFL	12	0.17	0.17	<0.05	<0.05
8/18/92	INFL	<5.0	<0.05	0.37	<0.05	0.15
9/09/92	INFL	1,200	13	36	14	95
9/21/92	INFL	610	6.5	20	9.4	53
10/05/92	AS-SYSSNFL	240	3	3	0.6	5
11/04/92	A2-INF	64	1	2	<0.5	6
12/16/92	INFL	<10	<0.5	<0.5	<0.5	1
1/05/93	INFL	53	<0.5	1	<0.5	3
7/19/93	AS-SYSINF	20	<0.5	2	<0.5	<0.5
8/10/93	AS-INF	8.7	<0.05	0.061	0.33	0.79
9/09/93	AS-INFL	82	<0.125	14	0.79	3.6
10/06/93	AS-COMBINE INFLUENT	51	1.5	2.0	0.38	1.3
11/23/93	AS-INFLUENT	57	0.89	5.1	0.50	2.0
12/09/93	AS-INFLUENT	9.7	<0.050	0.73	0.73	2.2
12/29/93	AS-INFLUENT	<5.0	<0.050	<0.050	<0.050	<0.050
EFFLUENT						
6/12/91	EFFLUENT	<6.0	<0.06	<0.06	<0.06	<0.06
6/19/91	EFFLUENT	28	0.33	0.57	0.14	2.4
7/11/91	EFFLUENT	<6.0	0.063	0.077	<0.06	0.25
8/22/91	EFFLUENT	20	0.29	0.39	0.069	1.0
12/20/91	EFFLUENT	<6.0	<0.06	<0.06	<0.06	<0.06

SEE NOTES ON PAGE 3 OF 3.

TABLE 6
CUMULATIVE RESULTS OF LABORATORY ANALYSES OF AIR SAMPLES
ARCO Station 276
Oakland, California
(Page 3 of 3)

Sample Location (Date)	Sample ID.	TPHg	B	T	E	X
EFFLUENT						
1/17/92	EFFLUENT	<6.0	<0.06	<0.06	<0.06	<0.06
4/27/92	EFFLUENT	<6.0	<0.06	<0.06	<0.06	0.089
5/27/92	EFFLUENT	<6.0	<0.06	0.097	<0.06	0.060
6/24/92	EFFL	<6.0	<0.06	<0.06	<0.06	0.34
7/06/92	EFFL	<5.0	<0.05	0.073	<0.05	<0.05
8/03/92	EFFL	<5.0	<0.05	0.11	0.065	0.34
9/09/92	EFFL	18	0.24	0.64	0.23	1.6
10/05/92	AS-SYSEFFL	12	0.8	1	<0.5	2
11/03/92	A1-EFF	<10	<0.5	<0.5	<0.5	<0.5
12/16/92	EFFL	<10	<0.5	3	<0.5	1
1/05/93	EFFL	17	<0.5	8	<0.5	1
7/19/93	AS-SYSEFF	25	<0.5	8	<0.5	1
8/10/93	AS-EFF	10	<0.05	0.098	0.46	1.5
9/09/93	AS-EFFL	18	0.13	<0.05	0.72	2.3
10/06/93	AS-EFFLUENT 1	5.6	0.061	0.44	0.29	0.90
11/23/93	AS-EFFLUENT	12	<0.050	1.3	0.42	1.3
12/09/93	AS-EFFLUENT	64	1.2	6.1	2.9	10
12/29/93	AS-EFFLUENT	<5.0	<0.050	0.69	<0.050	0.33

NOTES:
Results in milligrams per cubic meter (mg/m^3).
BTEX and TPHg analyzed using EPA Methods 5030/8015/8020.
TPHg = Total petroleum hydrocarbons as gasoline
COMBINED WELLS = Combined well flow prior to fresh air dilution.
INFLUENT = Influent to oxidizer after fresh air dilution.
EFFLUENT = Effluent from oxidizer to atmosphere.
# = Sample labeled improperly by lab.

TABLE 7
SUMMARY OF EXTRACTION RATES AND MASS RECOVERY
ARCO STATION 276
Oakland, California
(Page 1 of 1)

OPERATING PERIOD		OPERATING HOURS	BENZENE EMISSION RATE (ppd)	MASS EXTRACTION RATE (ppd)	ESTIMATED TOTAL POUNDS REMOVED	ESTIMATED TOTAL GALLONS REMOVED
FROM	TO					
10/01/93	10/06/93	SYSTEM SHUTDOWN				
10/06/93	10/18/93	288	0.003	2.3	27	4.3
10/18/93	11/23/93	SYSTEM SHUTDOWN				
11/23/93	12/09/93	384	< 0.002	2.6	42	6.8
12/09/93	12/29/93	480	0.05	0 4	8	1.3
TOTAL THIS QUARTER		1,152	--	--	77	12
TOTAL SINCE STARTUP		5,928	--	--	3,724	600

NOTES:
ppd = Pounds per day
Estimated gallons removed based upon a density of 6.2 Pounds per gallon gasoline.

APPENDIX D

ANALYTICAL RESULTS AND CHAIN-OF-CUSTODY DOCUMENTATION FOR SVE SYSTEM AIR SAMPLES, FOURTH QUARTER 1994

GOLDEN STATE/CAS
LABORATORIES, INC.

December 28, 1994

Valli Voraganti
EMCON Associates
1921 Ringwood Avenue
San Jose, CA 95131-1721

Re: **ARCO Facility # 276-Oakland/Project # 0805-120.02**

Dear Valli:

Enclosed are the results of the samples submitted to our lab on December 23, 1994. For your reference, these analyses have been assigned our service request number L943926.

All analyses were performed in accordance with our laboratory's quality assurance program. Golden State / CAS is certified for environmental analyses by the California Department of Health Services (Certificate # 1296/Expiration - August 1996).

Please call if you have any questions.

Respectfully submitted,

Golden State / CAS Laboratories, Inc.

Eydie Schwartz for

Dr. B. Gene Bennett
Laboratory Director

Stuart Sigman
Quality Assurance Coordinator

GB/sjt

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COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client:	EMCON Associates	**Service Request:**	L943926
Project:	ARCO Products Company # 276/# 0805-120.0	**Date Collected:**	12/22/94
Sample Matrix:	Vapor	**Date Received:**	12/23/94
		Date Extracted:	NA

BTEX and Total Volatile Hydrocarbons*
Units: µL/L (ppmV)

Sample Name:	I-1	E-1	VW-1
Lab Code:	L943926-001	L943926-002	L943926-003
Date Analyzed:	12/24/94	12/25/94	12/25/94

Analyte	MRL			
Benzene[1]	0.1	ND	ND	ND
Toluene[1]	0.1	0.2	ND	ND
Ethylbenzene[2]	0.1	ND	ND	ND
Total Xylenes[2]	0.2	0.7	ND	0.6
Total Volatile Hydrocarbons**	15	64	ND	ND
C_1-C_4 Hydrocarbons*	5	32	ND	ND
C_5-C_8 Hydrocarbons*	5	24	ND	ND
C_9-C_{12} Hydrocarbons*	5	8	ND	ND
Total Volatile Hydrocarbons**[a]	15	32	ND	ND

NA	Not Applicable
1	Benzene and Toluene are included in the C_5-C_8 hydrocarbon fraction.
2	Ethylbenzene and Total Xylenes are included in the C_9-C_{12} hydrocarbon fraction due to the use of C_1-C_8 n-paraffins as the standard for Total Volatile Hydrocarbons.
*	Total Volatile Hydrocarbons quantified using n-paraffins with a range of C_1-C_8.
**	Result is rounded to two significant figures.
a	Gasoline Fraction (C_5-C_{12})
MRL	Method Reporting Limit
ND	None detected at or above the method reporting limit.

Approved By: Eydie Schwartz Date: 12/28/94

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COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client:	EMCON Associates	**Service Request:**	L943926
Project:	ARCO Products Company # 276/# 0805-120.0	**Date Collected:**	12/22/94
Sample Matrix:	Vapor	**Date Received:**	12/23/94
		Date Extracted:	NA

BTEX and Total Volatile Hydrocarbons*
Units: µL/L (ppmV)

		Sample Name:	VW-2	VW-3	VW-4
		Lab Code:	L943926-004	L943926-005	L943926-006
		Date Analyzed:	12/25/94	12/25/94	12/25/94
Analyte	**MRL**				
Benzene[1]	0.1		0.6	0.6	ND
Toluene[1]	0.1		0.1	0.3	ND
Ethylbenzene[2]	0.1		ND	0.1	ND
Total Xylenes[2]	0.2		0.5	0.9	ND
Total Volatile Hydrocarbons**	15		170	35	ND
C_1-C_4 Hydrocarbons*	5		100	7	8
C_5-C_8 Hydrocarbons*	5		68	28	ND
C_9-C_{12} Hydrocarbons*	5		ND	ND	ND
Total Volatile Hydrocarbons**[a]	15		68	28	ND

NA	Not Applicable
1	Benzene and Toluene are included in the C_5-C_8 hydrocarbon fraction.
2	Ethylbenzene and Total Xylenes are included in the C_9-C_{12} hydrocarbon fraction due to the use of C_1-C_8 n-paraffins as the standard for Total Volatile Hydrocarbons.
*	Total Volatile Hydrocarbons quantified using n-paraffins with a range of C_1-C_8.
**	Result is rounded to two significant figures.
a	Gasoline Fraction (C_5-C_{12})
MRL	Method Reporting Limit
ND	None detected at or above the method reporting limit.

Approved By: Eydie Schwartz Date: 12/28/94

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COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client:	EMCON Associates	**Service Request:**	L943926
Project:	ARCO Products Company # 276/# 0805-120.0	**Date Collected:**	12/22/94
Sample Matrix:	Vapor	**Date Received:**	12/23/94
		Date Extracted:	NA

BTEX and Total Volatile Hydrocarbons*
Units: µL/L (ppmV)

	Sample Name:	VW-5	VW-7	MW-2
	Lab Code:	L943926-007	L943926-008	L943926-009
	Date Analyzed:	12/25/94	12/25/94	12/25/94
Analyte	**MRL**			
Benzene[1]	0.1	ND	ND	ND
Toluene[1]	0.1	ND	ND	ND
Ethylbenzene[2]	0.1	ND	ND	ND
Total Xylenes[2]	0.2	ND	0.4	0.4
Total Volatile Hydrocarbons**	15	ND	ND	ND
C_1-C_4 Hydrocarbons*	5	ND	ND	ND
C_5-C_8 Hydrocarbons*	5	ND	ND	ND
C_9-C_{12} Hydrocarbons*	5	ND	ND	ND
Total Volatile Hydrocarbons**[a]	15	ND	ND	ND

NA	Not Applicable
1	Benzene and Toluene are included in the C_5-C_8 hydrocarbon fraction.
2	Ethylbenzene and Total Xylenes are included in the C_9-C_{12} hydrocarbon fraction due to the use of C_1-C_8 n-paraffins as the standard for Total Volatile Hydrocarbons.
*	Total Volatile Hydrocarbons quantified using n-paraffins with a range of C_1-C_8.
**	Result is rounded to two significant figures.
a	Gasoline Fraction (C_5-C_{12})
MRL	Method Reporting Limit
ND	None detected at or above the method reporting limit.

Approved By: Eydie Schwartz Date: 12/28/94

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COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client:	EMCON Associates	**Service Request:**	L943926
Project:	ARCO Products Company # 276/# 0805-120.0	**Date Collected:**	12/22/94
Sample Matrix:	Vapor	**Date Received:**	12/23/94
		Date Extracted:	NA

BTEX and Total Volatile Hydrocarbons*
Units: µL/L (ppmV)

Sample Name:	**Method Blank**
Lab Code:	L943926-MB
Date Analyzed:	12/24/94

Analyte	**MRL**	
Benzene[1]	0.1	ND
Toluene[1]	0.1	ND
Ethylbenzene[2]	0.1	ND
Total Xylenes[2]	0.2	ND
Total Volatile Hydrocarbons**	15	ND
C_1-C_4 Hydrocarbons*	5	ND
C_5-C_8 Hydrocarbons*	5	ND
C_9-C_{12} Hydrocarbons*	5	ND
Total Volatile Hydrocarbons**[a]	15	ND

NA	Not Applicable
1	Benzene and Toluene are included in the C_5-C_8 hydrocarbon fraction.
2	Ethylbenzene and Total Xylenes are included in the C_9-C_{12} hydrocarbon fraction due to the use of C_1-C_8 n-paraffins as the standard for Total Volatile Hydrocarbons.
*	Total Volatile Hydrocarbons quantified using n-paraffins with a range of C_1-C_8.
**	Result is rounded to two significant figures.
a	Gasoline Fraction (C_5-C_{12})
MRL	Method Reporting Limit
ND	None detected at or above the method reporting limit.

Approved By: Eydie Schwartz Date: 12/28/94

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COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client:	EMCON Associates	**Service Request:**	L943926
Project:	ARCO Products Company # 276/# 0805-120.0	**Date Collected:**	12/22/94
Sample Matrix:	Vapor	**Date Received:**	12/23/94
		Date Extracted:	NA

Permanent Gases*
Units: % (v/v)

	Sample Name:	I-1	Method Blank
	Lab Code:	L943826-001	L943926-MB
	Date Analyzed:	12/23/94	12/23/94
Analyte	**MRL**		
Carbon Dioxide	1	7	ND
Oxygen	1	16	ND

NA	Not Applicable
*	Analysis performed using gas chromatography with a thermal conductivity detector.
MRL	Method Reporting Limit
ND	None detected at or above the method reporting limit

Approved By: Eydie Schwartz Date: 12/28/94

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COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client:	EMCON Associates	**Service Request:**	L943926
Project:	ARCO Products Company # 276/# 0805-120.02	**Date Collected:**	NA
Sample Matrix:	Vapor	**Date Received:**	NA
		Date Extracted:	NA
		Date Analyzed:	12/25/94

Duplicate Summary
BTEX and Total Volatile Hydrocarbons*
Units: µL/L (ppmV)

Sample Name: MW-2
Lab Code: L943926-009

Analyte	**MRL**	**Sample Result**	**Duplicate Sample Result**	**Average**	**Relative Percent Difference**
Benzene	0.1	ND	ND	ND	NA
Toluene	0.1	ND	ND	ND	NA
Ethylbenzene	0.1	ND	ND	ND	NA
Total Xylenes	0.2	0.390	0.204	0.297	63
Total Volatile Hydrocarbon**	15	ND	ND	ND	NA
C_1-C_4 Hydrocarbons*	5	ND	ND	ND	NA
C_5-C_8 Hydrocarbons*	5	ND	ND	ND	NA
C_9-C_{12} Hydrocarbons*	5	ND	ND	ND	NA

NA	Not Applicable
*	Total Volatile Hydrocarbons quantified using n-paraffins with a range of C_1-C_8.
**	Result is rounded to two significant figures.
MRL	Method Reporting Limit
ND	None detected at or above the method reporting limit.

Approved By: Eydie Schwartz Date: 12/28/94

DUP1S/060194 L943926.XLS - 8020DA 12/28/94

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COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client:	EMCON Associates	**Service Request:**	L943926
Project:	ARCO Products Company # 276/# 0805-120.02	**Date Collected:**	NA
Sample Matrix:	Vapor	**Date Received:**	NA
		Date Extracted:	NA
		Date Analyzed:	NA

Duplicate Summary
Permanent Gases*
% (v/v)

Sample Name: I-1
Lab Code: L932926-001

Analyte	MRL	Sample Result	Duplicate Sample Result	Average	Relative Percent Difference
Carbon Dioxide	1	7.17	6.75	6.96	6
Oxygen	1	15.8	17.2	16.5	8

NA Not Applicable
* Analysis performed using gas chromatography with a thermal conductivity detector.
MRL Method Reporting Limit

Approved By: Eydie Schwartz Date: 12/28/94

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ARCO Products Company
Division of AtlanticRichfieldCompany

Task Order No. 276-94-5

Chain of Custody

ARCO Facility no. 276	City (Facility) Oakland	Project manager (Consultant) V. Voraganti / D. Larsen	Laboratory name CAS
ARCO engineer Mike Whelan	Telephone no. (ARCO) 415 571 2449	Telephone no. (Consultant) 408 453 7300	Fax no. (Consultant) 408 453 0452	Contract number 070077
Consultant name EMCON	Address (Consultant) 1921 Ringwood San Jose, CA. 95131		Method of shipment Tech.

Sample I.D.	Lab no. L943926	Container no.	Matrix: Soil	Water	Other: Vapor	Preservation: Ice	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/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 ☐	CO_2 O_2
I-1	1	1			X			12-22-94	1359		X										X
E-1	2	1			X				1405		X										
VW-1	3	1			X				1343		X										
VW-2	4	1			X				1329		X										
VW-3	5	1			X				1230		X										
VW-4	6	1			X				1330		X										
VW-5	7	1			X				1244		X										
VW-7	8	1			X				1315		X										
MW-2	9	1			X				1259		X										

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

Special QA/QC

Remarks: 0805-120,02

L943926

Lab number: 9941663

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: AMBIENT	
Relinquished by sampler	Date 12-22-94 Time 1545	Received by	
Relinquished by	Date 12-22-94 Time 1552	Received by Jean Adair 12/22/94 1546	
Relinquished by	Date Time	Received by laboratory	Date 12-23-94 Time 1545

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

APPENDIX E

OPERATION AND MAINTENANCE FIELD DATA SHEETS FOR ON-SITE SVE SYSTEM, FOURTH QUARTER 1994

Rev. 0, 10/91

EMCON ASSOCIATES

FIELD REPORT
FIELD SERVICES GROUP

PROJECT NO: 0805-120.02 DATE: 12-16-94

CLIENT NAME: ARCO 276 NAME: MARK Adler

LOCATION: Oakland, CA.

SERVICES RENDERED

GROUND WATER WELLS: ☐ Sampling ☐ Development ☐ Maintenance/Repair ☐ Water-Level Survey

SOIL SAMPLING: ☐ Excavation ☐ Borings ☐ Stockpile

OTHER: Serial # 01169107
10600 MacArthur

ELECT. 007 1647
08 241
09 501
10 501
11 1.09

13 .99
15 241
16 276

REMARKS:

CAT ox needs light bulbs - N120MB
Blower has no hour meter. BLOWER (Well field)
Rotron Model DR454W58 Ser. # 232.0018
Unit to gas pressure switch was tripped - reset
Unit fired right up - turned on fresh air/well
fed blower after catalyst was ready - OK

Full fresh air - Flow 80 CFM Ran for ½ hour - OK

Flow meter - Blue White Ind. 91001-015
SCFM AIR at 14.7 PSIA at 70° F.

Rotron blower - 1.5 HP 60/50 Hz.
3450 RPM
most of label I can't read - damaged

Anguil Energy Systems 4527 N. Lydell Ave. Milwaukee, WI 53217
414-332-0230
Ser. # CNM-051 Remedi-Cat 500 Date 11-27-90

circular charts needed gas meter = 6369

SIGNATURE:

REMARKS: Started system on fresh air dilution at 1050 then switched well field on at 1107 To keep temp above 600°F & reset controller to 610°F with a high set point of 1000°F. Dilution valve closed. There is no K.O. drum. MW-2 needs new sample cock 1/4". Took water levels, well vacs. & well samples after 1/2 hour run time. Checked amps of blower, CAT ox, and Main panel. Programmed auto dialer

Unscheduled site visit ☐ or Scheduled site visit no. _____ of 14

500 SCFM GAS-FIRED ANGUIL CATALYTIC OXIDIZER (Serial #01169107)

Arrival Time (24:00 hour)	1021
System Status (on or off)	OFF
Shutdown Time (24:00 hour)	—
Alarm Lights on ?	No
Restart Time (24:00 hour)	1107
Reading Time (24:00 hour)	1348
Well Field (I1) (before dilution)	
Vacuum (In. of H2O)	14.1
Flow (velocity: ft/min) 4" **(pipe dia. ?")**	950
Temperature (°F)	not installed

After Blower (system) (I2) **(pipe dia. ?")**	
Pressure (In. of H2O)	Dilution Closed
System Influent Flow (in. of H2O)	
Temperature (°F)	
System	
Set Point (°F)	610
Fire Box Temperature (°F)	611
Stack Temperature (°F) **(stack dia. ?")**	602
Total Hours not installed	
~~Electric Meter (kwh)~~ gas meter	6375 cubic feet
Flow Meter Reading (ft/mn)	

Do once every 2 (per BAAQMD permit conditions)

FID READINGS (ppm) PID	I-1	I-2	E-1
Date:	24.6	NA	2.1
Date:			

(air sampling to be done once a month)

Total Flow into CAT = 70 SCFM (flow meter)

CATOX amps = 8.5
BLOWER Amps = 8.5
Main Amps = 18

WELL FIELD (do monthly)

Well ID	Well Dia.	Screen interval	Pipe stub up dia	DTFP (feet)	DTW (feet)	Valve Position (% open)	Vacuum (inch. water)	Air flow (ft/min)	FID/PID Reading(ppm)
VW-1 (SVE)	4"	8 - 18	2"		13.70	Full open	13.1		
VW-2 (SVE)	4"	8 - 18	2"		12.75	Full open	13.0		
VW-3 (SVE)	4"	8 - 18	2"		13.24	Full open	12.0		
VW-4 (SVE)	4"	9 - 19	2"		14.49	Full open	13.1		
VW-5 (SVE)	4"	8 - 18	2"		13.24	Full open	13.0		
VW-6	4"	9 - 18	N/A						
VW-7 (SVE)	4"	7.5 - 17.5	2"		14.92	Full open	13.1		
MW-1	2"	19 - 39	N/A						
MW-2 (SVE)	2"	15 - 25	2"		14.96	10%	12.9/17.0		
MW-3	2"	20 - 40	N/A						
MW-4	2"	30 - 50	N/A						
MW-5	4"	32 - 58	N/A						
MW-6	2"	?	N/A						
MW-7	2"	20 - 40	N/A						
MW-8	4"	29 - 49	N/A						
RW-1	6"	36 - 51	N/A						

Special Instructions:
Remember to use ARCO chain-of-custody forms. Please include all analytical method numbers, as indicated on the O&M request forms and on the chain-of-custody forms. Request TPHG, BTEX, and benzene results in mg/m3 on the chain-of-custody forms.

Operator: MAdler Date: 12-22-94 **Project: 0805-122.01 94-5**

Rev. 0, 10/91

EMCON ASSOCIATES

FIELD REPORT
FIELD SERVICES GROUP

PROJECT NO: 0805-120.02 DATE: 12-22-94

CLIENT NAME: ARCO 276 NAME: Madler

LOCATION: Oakland, CA.

SERVICES RENDERED

GROUND WATER WELLS: ☐ Sampling ☐ Development ☐ Maintenance/Repair ☐ Water-Level Survey

SOIL SAMPLING: ☐ Excavation ☐ Borings ☐ Stockpile

OTHER:

REMARKS: started System on fresh air at 1050
Put new chart on Well field on at 1107
low set point at 610°F to keep it above 600°F
High set point at 1000°F

Line from well field comes in at 4" then 3" at shut off valve sample cock at 3" line

VW-3	13.24'	12" wtr vac.
VW-5	13.24'	13" wtr vac
MW-2	14.96'	12.9" wtr vac closed down to 7" wtr vac.
	MW-2 needs new sample cock ¼"	
VW-7	14.92'	13.1" wtr. vac
VW-2	12.35'	13.0" wtr vac
VW-4	14.49'	13.1" wtr vac.
VW-1	13.70'	13.1" wtr vac

Influent 4" AIR FLOW = 950FPM
Influent Vacuum at sample cock = 14.1" wtr.
Dilution Valve Closed
Flow meter before CAT ox = 70 SCFM

SIGNATURE: Page ___ of ___

Rev. 0, 10/91

EMCON ASSOCIATES

FIELD REPORT
FIELD SERVICES GROUP

PROJECT NO: 0805-120.02 DATE: 12-22-94

CLIENT NAME: ARCO 276 NAME: MAdler

LOCATION: Oakland, CA.

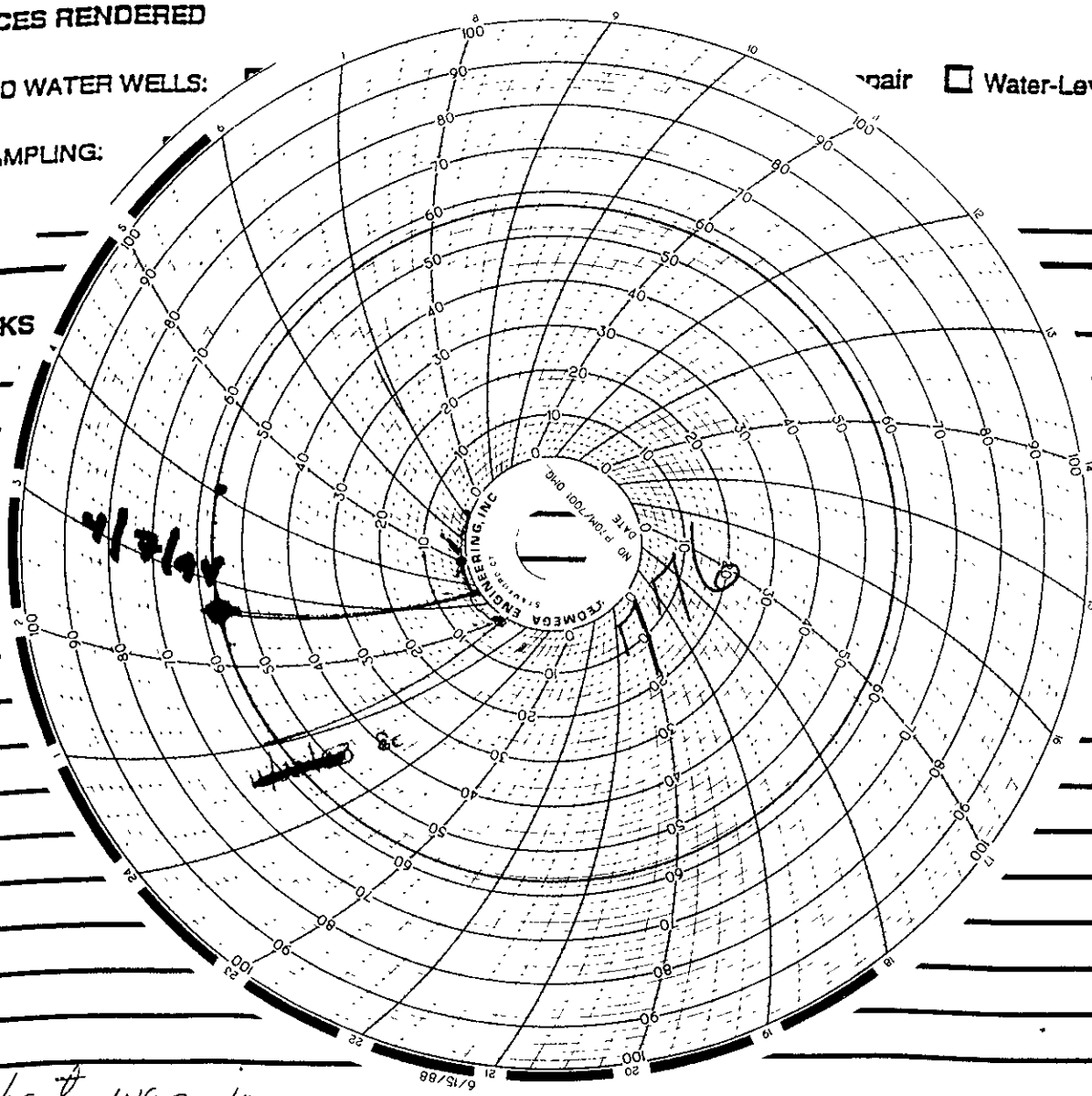
SERVICES RENDERED

GROUND WATER WELLS: [ ] ...pair [ ] Water-Level Survey

SOIL SAMPLING: [ ]

OTHER: —

REMARKS



This chart was in recorder already before starting unit.

SIGNATURE: MAdler

REMARKS: System off upon arrival - Restarted system at 1439 Possible power failure shut down the system because the auto dialer didn't retain the phone numbers in memory. Installed new light bulbs in CAT ox panel. Cleaned pad of leaves. Took PID of I-1 & E-1 The Dilution valve is closed. & left the well field the same since we only got 4.8 days of run time. Calculated Run time = 12/22/94 @1050 to 12/27@0602

Unscheduled site visit ☐ or Scheduled site visit no. 2 of 14

500 SCFM GAS-FIRED ANGUIL CATALYTIC OXIDIZER (Serial #01169107)

Arrival Time (24:00 hour)	1400
System Status (on or off)	OFF
Shutdown Time (24:00 hour)	—
Alarm Lights on ?	NONE
Restart Time (24:00 hour)	1439
Reading Time (24:00 hour)	1600
Well Field (I1) (before dilution)	
Vacuum (In. of H2O)	14.9
Flow (velocity: ft/min) 4" **(pipe dia. ?")**	950 - 1000
Temperature (°F)	55

After Blower (system) (I2) **(pipe dia. ?")**	Dilution valve closed
Pressure (In. of H2O)	N/A
System Influent Flow (in. of H2O)	
Temperature (°F)	
System	
Set Point (°F)	610
Fire Box Temperature (°F)	610
Stack Temperature (°F) 6" **(stack dia. ?")**	603
Total Hours taken from chart (approx)	115.2
~~Electric Meter (kwh)~~ Main amps	19
~~Flow Meter Reading (ft/min)~~	70

Total flow SCFM

Do once every 2 (per BAAQMD permit conditions)

~~FID~~ PID READINGS (ppm)	I-1	I-2	E-1
Date: 1-5-95	20.9	N/A	1.3
Date:			

(air sampling to be done once a month)

gas meter (CF) = 6572

WELL FIELD (do monthly)

Well ID	Well Dia.	Screen interval	Pipe stub up dia	DTFP (feet)	DTW (feet)	Valve Position (% open)	Vacuum (inch. water)	Air flow (ft/min)	FID/PID Reading(ppm)
VW-1 (SVE)	4"	8 - 18	2"						
VW-2 (SVE)	4"	8 - 18	2"						
VW-3 (SVE)	4"	8 - 18	2"						
VW-4 (SVE)	4"	9 - 19	2"						
VW-5 (SVE)	4"	8 - 18	2"						
VW-6	4"	9 - 18	N/A						
VW-7 (SVE)	4"	7.5 - 17.5	2"						
MW-1	2"	19 - 39	N/A						
MW-2 (SVE)	2"	15 - 25	2"						
MW-3	2"	20 - 40	N/A						
MW-4	2"	30 - 50	N/A						
MW-5	4"	32 - 58	N/A						
MW-6	2"	?	N/A						
MW-7	2"	20 - 40	N/A						
MW-8	4"	29 - 49	N/A						
RW-1	6"	36 - 51	N/A						

Special Instructions:

Remember to use ARCO chain-of-custody forms. Please include all analytical method numbers, as indicated on the O&M request forms and on the chain-of-custody forms. Request TPHG, BTEX, and benzene results in mg/m3 on the chain-of-custody forms.

Operator: Mulder Date: 1-5-95 **Project: 0805-122.01 94-5**

EMCON
OPERATION and MAINTENANCE FIELD REPORT

Checked Blower voltage - 235V

Blower amps = 8.5 Blower is rated 9.5 - 8.85 amps
CAT ox amps = 9.6
Main amps = 19

Checked phone line - OK

The chart recorder is set for 768 HR. per rev.

NEED TO ORDER → The pens for the recorder (Kent ClearSpan P70M)
P105M/0301
P105M/0302

Auto dialer needs 4 "C" & 3 "AA" batteries

I talked to the manager today. I informed him that we'd be figuring out the utility bills. He said that he has been paying a $100.00 gas bill but they use no gas at his station. I told him that the system has only been running 2 weeks (actually less) but that we'd look into it. He going to send the gas bills which are in our name (Emcon) and that we'd pay for the elect. we use. I gave him my card so he'd have someone to call if he's got any questions or problems.

This system has no knock out for condensate. There was a little water in the filter but not much. Air stream seems to be dry.

* There are 4 drums in fenced parking area behind the building generated on 12-7-94 by J. Williams containing groundwater *

NAME MAdler

DATE 1-5-95

PROJECT NAME ARCO 276

PROJECT NUMBER 0805-120.02

REMARKS: System was running upon arrival to the site. Cleaned compound of debris. Took PID readings but 3.1 way to low → closed VW-1, VW-4, VW-5, & VW-7 Retook PID readings after ½ hr. Total Flow ≈30 cfm
Infl. vac = 42.5" wtr Infl flow = 250-275 FPM (4") Infl PID = 2.6 PPM
Then took I-1 E-1 samples
Hour meter started at 1703 → zero

Unscheduled site visit ☐ or (Scheduled site visit no.) ______ of 14

500 SCFM GAS-FIRED ANGUIL CATALYTIC OXIDIZER (Serial #01169107)

Arrival Time (24:00 hour)	1432
System Status (on or off)	ON
Shutdown Time (24:00 hour)	
Alarm Lights on ?	
Restart Time (24:00 hour)	
Reading Time (24:00 hour)	1449
Well Field (I1) (before dilution)	Dilution valve closed
Vacuum (In. of H2O)	18.1
Flow (velocity: ft/min) (**pipe dia. 4"**)	900-950
Temperature (°F)	57

After Blower (system) (I2) (pipe dia. ~~2"~~ 4")	
Pressure (In. of H2O)	9.8
System Influent Flow (in. of H2O) Pitot	.15
Temperature (°F)	NA
System	
Set Point (°F)	610
Fire Box Temperature (°F)	611
Stack Temperature (°F) (**stack dia. 6"**)	601
Hour Meter Reading	OFF Chart = 288.2 HRS.
Gas Meter Reading (cubic feet)	6036
Total Flow to Unit (SCFM)(flow meter)	65
CatOx Amperage	~~[illegible]~~ 4.2
Blower Amperage	8.5
Total Main Amperage	19

(System air sampling to be done once every month)
Field monitoring once every 2 weeks (per BAAQMD permit conditions)

PID/FID READINGS (ppm)	I-1	I-2	E-1
Date: 1/17/95	3.1	~~[illegible]~~	
Date:			

WELL FIELD (do monthly)

Well ID	Well Dia.	Screen interval	Pipe stub up dia	DTFP (feet)	DTW (feet)	Valve Position (% open)	Vacuum (inch. water)	Air flow (ft/min)	FID/PID Reading(ppm)
VW-1 (SVE)	4"	8 - 18	2"						
VW-2 (SVE)	4"	8 - 18	2"						
VW-3 (SVE)	4"	8 - 18	2"						
VW-4 (SVE)	4"	9 - 19	2"						
VW-5 (SVE)	4"	8 - 18	2"						
VW-6	4"	9 - 18	N/A						
VW-7 (SVE)	4"	7.5 - 17.5	2"						
MW-1	2"	19 - 39	N/A						
MW-2 (SVE)	2"	15 - 25	2"						
MW-3	2"	20 - 40	N/A						
MW-4	2"	30 - 50	N/A						
MW-5	4"	32 - 58	N/A						
MW-6	2"	?	N/A						
MW-7	2"	20 - 40	N/A						
MW-8	4"	29 - 49	N/A						
RW-1	6"	36 - 51	N/A						

Special Instructions:
Remember to use ARCO chain-of-custody forms. Please include all analytical method numbers, as indicated on the O&M request forms and on the chain-of-custody forms. Request TPHG, BTEX, and benzene results in mg/m3 on the chain-of-custody forms.

Operator: M Adler Date: 1-17-95 **EMCON Project: 0805-122.01 94-5**

EMCON
OPERATION and MAINTENANCE FIELD REPORT

Installed Hour meter for blower. I had to put it inside the switch enclosure. The Fire proof conduit has plugs so I'll be able to move it I couldn't put it in the CAT ox Panel because of the way the logic is and the wires are run.

Influent air still dry

Changed batteries in auto dialer.

Ordered pens for chart recorder

NAME MAdler

DATE 1/17/94

PROJECT NAME Bladder ARCO 276

PROJECT NUMBER 0805-120 02