January 10, 1991

Mr. Tom Callaghan
California Regional Water Quality Control District
1800 Harrison Rd., Suite 700
Oakland, Ca 94612

Dear Mr. Callaghan:

Enclosed, please find the 1990 Third Quarter Report for the Texaco Station located at 2200 East 12th St., in Oakland, California.

If you have any questions, please feel free to contact Tony Palagyi at (818) 505-2701.

Sincerely,

Kim Gumbiner
Texaco Environmental Services
Administrative Asst.

KEG:kg

Enclosure

cc: Mr. Rafat Shahid
Alameda County Environmental Health Department
Hazardous Materials Division
80 Swan Way, Room 200
Oakland, CA 94621

A Report Prepared for

Texaco Refining and Marketing Inc.
10 Universal City Plaza
Universal City, California 91608

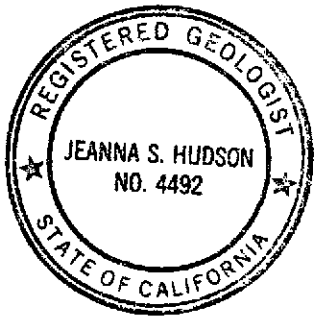
QUARTERLY TECHNICAL REPORT
FIRST QUARTER OF 1991
FORMER TEXACO STATION
2200 EAST 12TH STREET
OAKLAND, CALIFORNIA

HLA Job No. 2251,175.03
June 11, 1991
1991 Report No. 1

by

Marlene K. Watson
Project Engineer

Jeanna S. Hudson
Registered Geologist



Harding Lawson Associates
1355 Willow Way, Suite 109
Concord, California 94520
415/687-9660

INTRODUCTION

This quarterly technical report (QTR) presents the results of site investigation and remediation activities conducted by Harding Lawson Associates (HLA) at a service station site formerly owned by Texaco Refining and Marketing Inc. The station, at 2200 East 12th Street, Oakland, California (Plate 1), is currently owned and operated by Exxon Company U.S.A. This QTR summarizes HLA's work at the site, ongoing since May 1988, and presents results of the recent quarter's work.

SITE DESCRIPTION

The site is on the southeast corner of the intersection of East 12th Street and 22nd Avenue; the surrounding area is occupied by commercial/retail businesses, including a Shell Oil Company (Shell) service station immediately across 22nd Avenue (Plate 2). The site is bordered on the west by East 12th Street, on the north by 22nd Avenue, and on the east by a building occupied by a mattress manufacturer. Adjacent to the site on the south is a parcel owned by M.C.B. Industries and currently used for automobile storage.

The topography is relatively flat, sloping gently southwest toward East 12th Street and the Brooklyn Basin Tidal Canal. The site's surface is approximately 20 feet above Mean Sea Level, and drainage is toward East 12th Street. This area has been

Texaco Refining
and Marketing Inc

108 Cutting Boulevard
Richmond CA 94804

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July 19, 1991

Mr. Tom Callaghan
California Regional Water
Quality Control Board
San Francisco Bay Area Region
2101 Webster Street, Ste. 500
Oakland, CA 94612

Dear Mr. Callaghan:

Enclosed is a copy of our Quarterly Technical Report dated June 11, 1991 for our former Texaco Service Station located at 2200 East 12th Street in Oakland, California. This report covers the period from January, 1991 through March, 1991.

Please call me at (415) 236-1770 if you have any questions.

Best Regards,

R.R. Zielinski
Area Supervisor

RRZ:pap

Enclosure

cc: Mr. Barney Chan
Alameda County Environmental
Health Department
80 Swan Way, Room 200
Oakland, CA 94621

pr: 6RT

KEG

2200EAST12.TC2

extensively developed, and surface runoff is mainly controlled by the municipal storm sewer system.

At the station, leaded and unleaded gasoline are dispensed and automotive repair services are provided. Structures include a building, three fuel pump islands, one underground waste oil tank, and three underground fuel storage tanks (Plate 3).

HYDROGEOLOGIC SETTING

The East Bay Plain is divided into seven groundwater subareas, defined by the California Department of Water Resources (DWR) on the basis of areal differences (i.e., faults and geologic conditions). The site lies within the Oakland Upland and Alluvial Plain subarea. The groundwater reservoir is made up of the Alameda and Temescal Formations, along with the Merritt Sand, with an aggregate thickness of more than 1,100 feet. Regionally, groundwater flows west-southwest, toward San Francisco Bay.

Most uses of groundwater in the East Bay Plain are related to irrigation or industrial needs; the majority of domestic water is supplied by the East Bay Municipal Utility District (EBMUD) from surface sources.

Soils at the site to the maximum depth explored (20 feet) generally consist of unconsolidated, stiff, sandy clay interbedded with silty sand and gravel lenses. During HLA's investigation, groundwater was initially encountered between 11

and 13 feet below grade and stabilized in the wells at approximately 6.5 feet below grade.

The tops of well casings were surveyed relative to an arbitrary datum with an assumed elevation of 100.0 feet. The HLA datum is located at the western end of the dispenser island nearest the underground storage tanks (Plate 3). Water level measurements and survey data are presented in Table 1. The general direction of groundwater flow is to the west-northwest, with a gradient of about 0.007 foot per foot across the site, as shown on the Groundwater Surface Map, Plate 4. Estimates of the hydraulic conductivity of the slightly confined shallow soils range from 0.4 to 0.5 foot per day.

SUMMARY OF PREVIOUS WORK

Previous Reports

Since May 1988, HLA has investigated soil and groundwater conditions at this site. To date, the investigation and remediation plan have been presented in the following reports:

1.	Sensitive Receptor Study	May 24, 1988
2.	Subsurface Investigation	July 20, 1988
3.	Environmental Assessment	September 19, 1989
4.	Soil and Groundwater Remediation Plan	May 11, 1990

Previous Field Operations

During previous quarters, HLA completed the following field operations:

- Conducted a soil-gas survey on site and in city streets near the site. Probe locations are shown on Plate 5 and soil-gas survey results are presented in Table 2.
- Drilled and sampled 20 shallow soil borings (B-1 through B-20); locations are shown on Plate 3.
- Drilled, constructed, developed, and sampled five on-site monitoring wells (MW-9A through MW-9E) and three off-site wells (MW-9F through MW-9H); locations are shown on Plate 3.
- Obtained chemical analyses on soil and water samples to determine concentrations of petroleum hydrocarbons; results of analyses are presented in Tables 3 and 4, respectively.
- Conducted slug tests in MW-9B and MW-9E to estimate hydraulic conductivity and transmissivity values for the shallow aquifer; slug test results are presented in Table 5.
- Replaced Emco-Wheaton traffic boxes in public right-of-way with Phoenix Iron Works Model P-2001 traffic boxes, as specified by the City of Oakland.
- Implemented the remediation plan which consisted of excavating hydrocarbon-bearing soils with concentrations greater than 100 ppm from the vadose zone in the vicinity of MW-9E, and monitoring the groundwater for dissolved hydrocarbons for one-year after completion of the remediation. The remediation plan was approved by Alameda County Health Care Services on October 22, 1990. Soil samples were taken from the walls and bottom of the excavation to confirm that hydrocarbon concentrations in the remaining soil were below 100 ppm (Table 6). The location of soil excavation and confirmation soil samples are shown on Plate 3. The excavated soils were systematically spread three feet thick over the space available behind the station office and garage, in compliance with Bay Area Air Quality Management District Regulation 8, Rule 40, and agitated periodically with mechanical equipment. The treated soils were transported from the site to the Redwood Landfill in Novato in December 1990.

- MW-9E (located inside the excavation boundaries) was abandoned and a new monitoring well (MW-9I) was installed in approximately the same location after backfilling the excavation.

SUMMARY OF PREVIOUS FINDINGS

Vadose-zone Soil Condition

The area where detectable concentrations of petroleum products were found in vadose-zone soils and soil gas is near the pump islands on the west side of the station. Soil samples were collected from 11 borings (MW-9E, SB-4, and SB-12 through SB-20) to delineate the extent of hydrocarbons in the vadose zone around the pump island. Results of chemical analyses on soil samples from these borings are presented in Table 3.

Only two samples contained total petroleum hydrocarbons (TPH) at concentrations exceeding 100 parts per million (ppm). These samples were from borings MW-9E and SB-4, on the west and east sides, respectively, of the pump island. The soil sample from a depth of 5.5 feet in MW-9E represents the only significant hydrocarbon concentration (1,900 ppm TPH). We concluded that MW-9E and SB-4 are in two isolated occurrences of vadose-zone soil with TPH concentrations above 100 ppm. Correspondingly high concentrations of benzene, toluene, ethylbenzene, and xylenes (BTEX) and TPH were detected in soil-gas samples from Probe Locations SG-01 and SG-03.

Groundwater Condition

Shallow groundwater in the site vicinity contains detectable quantities of BTEX and TPH as gasoline, as shown in Table 4. The extent of organic hydrocarbons in the groundwater is well delineated and the plume (as delineated by October 1989 chemical analyses) appears to be extending downgradient, toward utility lines in East 12th Street and 22nd Avenue. The bottom of the storm drain in East 12th Street is approximately 8.5 feet below grade, approximately 2 feet below the water table.

The lateral limits of the plume are delineated by MW-9A, MW-9C, MW-9D, MW-9F, MW-9G and MW-9H; samples from these wells indicate no detectable hydrocarbon concentrations. Samples from MW-9B and MW-9E exhibited benzene concentrations in groundwater (27 and 4 parts per billion [ppb], respectively) that exceed Maximum Contaminant Levels (MCLs). No other constituent analyzed in these two samples exceeds the MCLs or Drinking Water Action Levels (DWALs).*

WORK PERFORMED DURING THE FIRST QUARTER OF 1991

On January 11, 1991, HLA initiated the one year quarterly monitoring program scheduled to follow soil remediation. The

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* The California Department of Health Services issued an action list for chemical contaminants of drinking water. Acceptable drinking water concentrations are specified for four gasoline constituents: benzene, toluene, ethylbenzene, and xylenes (BTEX). MCLs are drinking water standards enforced by law under California Code of Regulations, Title 22. DWALs are recommended levels, but are not enforced by law.

five on-site and three off-site monitoring wells were purged by removing 3 casing volumes of water using a 12-volt pump. Groundwater temperature, pH, and conductivity were monitored prior to sampling. When these parameters had stabilized, groundwater samples were collected in a clean stainless steel bailer and decanted into 40-ml volatile organic analysis (VOA) vials. The samples were then transported, under chain-of-custody, to Chemwest Analytical Laboratories, Inc. in Sacramento, California, where they were analyzed for BTEX (EPA Test Method 602) and TPH as gasoline (DHS Method). The laboratory analysis reports are in Appendix A and summarized in Table 4. The results of the analyses are discussed below.

DISCUSSION OF FIRST QUARTER 1991 TEST RESULTS

Benzene was detected in MW-9B and MW-9I in concentrations of 4.3 and 6.1 ppb, respectively. Ethylbenzene and xylenes were detected in MW-9B at concentrations of 1.1 and 1.0 ppb, respectively; TPH as gasoline was detected at a concentration of 100 ppb. Petroleum hydrocarbons were not detected in any of the other monitoring wells. The observed concentrations are comparable to or lower than those from previous testing results, but are still above the DWALs.

ANTICIPATED ACTIVITIES FOR THE SECOND QUARTER OF 1991

HLA plans to continue the quarterly monitoring program by purging and sampling each of the eight monitoring wells on- and off-site. The groundwater samples will be analyzed for BTEX and TPH as gasoline. Chemical test results will be presented in the second quarter 1991 Quarterly Technical Report.

LIST OF TABLES

LIST OF ILLUSTRATIONS

APPENDIX

Table 1. Water Level Measurements and Survey Data
2200 East 12th Street
Oakland, California

Well No.	Date	Top of Casing Elevation[1] (feet)	Depth to Groundwater (feet)	Groundwater Surface Elevation[2] (feet)	Incremental Water Elevation Change[3] (feet)	Total Water Elevation Change Since 10/12/89[4] (feet)
MW-9A	10/12/89	100.07	7.25	92.82	--	--
	09/20/90		--	--	--	--
	10/19/90		7.23	92.84	+0.02	+0.02
	01/11/91		6.96	93.11	+0.27	+0.29
MW-9B	10/12/89	98.41	6.14	92.27	--	--
	09/20/90		6.28	92.13	-0.14	-0.14
	10/19/90		6.21	92.20	+0.07	-0.07
	01/11/91		6.21	92.20	0	-0.07
MW-9C	10/12/89	99.73	6.99	92.74	--	--
	09/20/90		--	--	--	--
	10/19/90		6.96	92.77	+0.03	+0.03
	01/11/91		6.60	93.13	+0.36	+0.39
MW-9D	10/12/89	101.46	8.40	93.06	--	--
	09/20/90		8.47	92.99	-0.07	-0.07
	10/19/90		8.43	93.03	+0.04	-0.03
	01/11/91		7.97	93.49	+0.46	+0.43
MW-9E	10/12/89	98.41	5.70	92.71	--	--
	09/20/90		5.84	92.57	-0.14	-0.14
	10/19/90		5.78	92.63	+0.06	-0.08
	11/02/90	Well Abandoned				
MW-9F	10/12/89	96.96	6.07	90.89	--	--
	09/20/90		5.97	90.99	+0.10	+0.10
	10/19/90		5.94	91.02	+0.03	+0.13
	01/11/91		5.72	91.24	+0.22	+0.35
MW-9G	10/12/89	98.51	6.01	92.50	--	--
	09/20/90		6.03	92.48	-0.02	-0.02
	10/19/90		5.92	92.59	+0.11	+0.09
	01/11/91		5.72	92.79	+0.20	+0.29
MW-9H	10/12/89	97.14	8.35	88.79	--	--
	09/20/90		8.25	88.89	+0.10	+0.10
	10/19/90		8.17	88.97	+0.08	+0.18
	01/11/91		7.55	89.59	+0.62	+0.80
MW-91	11/15/90	98.66	6.01	92.65	--	--
	01/11/91		5.80	92.86	--	--

Notes:

1 Elevation relative to HLA temporary benchmark located at the western corner of the dispenser island nearest the underground storage tanks, with an arbitrary elevation of 100.0 feet (see Plate 3).

2 Groundwater surface elevation = top of casing elevation - depth to water.

3 Incremental groundwater elevation change = groundwater elevation - previous groundwater elevation.

4 Total groundwater elevation change = groundwater elevation - groundwater elevation on 10/12/89.

Table 2. Results of Soil-gas Survey
2200 East 12th Street
Oakland, California

Conducted on September 20, 1988
Concentrations in micrograms per liter (μg/L)

Sample	Depth (ft)	Benzene	Ethyl-benzene	Toluene	Xylenes	Total Petroleum Hydrocarbons
Air	N/A	<0.8	<0.8	<0.7	<0.8	<0.8
SG-01	5.0	320,000	620	1	2,200	700,000
WS-02	5.0	12,000	<80	<73	<80	25,000
SG-03	4.0	32,000	<8	<28,000	800	96,000
SG-04	5.0	<0.8	<0.8	<0.7	<0.8	<0.8
MW-9A	6.0	<76	<80	<73	<80	<76
SG-05	2.0	<0.8	<0.8	<0.7	<0.8	<0.8
SG-06	--	--	--	--	--	--
SG-07	--	--	--	--	--	--
SG-08	5.0	<0.8	<0.8	<0.7	<0.8	<0.8
SG-09	6.0	<0.8	<0.8	<0.7	<0.8	<0.8
WS-10	6.0	<76	<80	<73	<80	<76
SG-11	4.0	<0.8	<0.8	<0.7	<0.8	<0.8
SG-12	5.0	<0.8	<0.8	<0.7	<0.8	<0.8
SG-13	5.0	<0.8	<0.8	<0.7	<0.8	23
Air	N/A	<0.7	<0.8	<0.8	<0.8	<0.7

-- = Not able to obtain sample

N/A = Not applicable

Air = ambient air sample

Table 3. Results of Soil Analyses from Soil Borings
2200 East 12th Street
Oakland, California

Concentrations in milligrams per kilogram (mg/kg)

Sample Number	Depth (ft)	Benzene[1]	Ethyl-benzene[2]	Toluene[3]	Xylenes[3]	TPH as Gasoline[4]	TPH as Diesel[4]
SB-1	4.8	0.30	ND	0.2	ND	ND	NT
B-9-1	5.0	ND	ND	ND	ND	ND	NT
B-9-1	9.0	ND	ND	ND	ND	ND	NT
B-9-1	12.0	ND	ND	ND	ND	ND	NT
B-9-2	5.0	ND	ND	ND	ND	ND	NT
B-9-2	9.0	ND	ND	ND	ND	ND	NT
B-9-2	10.5	ND	ND	ND	ND	ND	NT
B-9-2	13.0	ND	ND	ND	ND	ND	NT
SB-4	4.0	1.0	2.3	0.9	5.8	160	NT
SB-4	9.0	ND	ND	ND	ND	ND	NT
SB-5	4.0	0.33	ND	ND	ND	ND	NT
SB-5	9.0	ND	ND	ND	ND	ND	NT
SB-6	5.0	ND	ND	ND	ND	ND	NT
SB-6	5.5	ND	ND	ND	ND	ND	NT
SB-7	4.0	ND	ND	ND	ND	ND	NT
SB-7	8.5	ND	ND	ND	ND	ND	NT
SB-8	5.5	0.43	ND	ND	ND	ND	NT
SB-8	9.0	ND	ND	ND	ND	ND	NT
SB-9	4.0	ND	ND	ND	ND	ND	NT
SB-9	9.0	ND	0.4	ND	1.1	39	NT
SB10-1	5.0	ND	ND	ND	ND	ND	NT
SB10-2	10.0	ND	ND	ND	ND	ND	NT
SB11-1	5.0	ND	ND	0.1	ND	ND	NT
SB11-2	10.0	ND	ND	ND	ND	ND	NT
SB-12	3.5	0.09	0.07	0.2	0.09	11 (1)	NT
SB-13	4.0	ND	ND	0.1	ND	1.7 (1)	NT
SB-14	4.5	ND	ND	ND	ND	3.5 (1)	NT
SB-15	3.5	0.07	ND	ND	ND	6.3 (1)	NT
SB-16	4.5	0.21	0.08	ND	ND	9.0 (1)	NT
SB-17	5.0	0.093 (.01)	0.139 (.01)	0.043 (.01)	ND (.01)	42 (2)	NT
SB-18	5.0	ND (.01)	0.021 (.01)	0.245 (.01)	0.015 (.01)	5 (2)	NT
SB-19	5.0	ND (.01)	0.022 (.01)	0.078 (.01)	ND (.01)	6 (2)	NT
SB-20	5.0	0.035 (.01)	0.017 (.01)	0.038 (.01)	ND (.01)	7 (2)	NT
MW-9D	6.0	ND	ND	ND	ND	ND	NT
MW-9D	10.5	ND	ND	ND	ND	ND	NT
MW-9E	5.5	ND	18	ND	ND	1,900	NT
MW-9E	9.0	ND	ND	ND	ND	ND	NT
MW-9G	4.0	ND	ND	0.2	ND	ND	NT
MW-9I	15.0	ND	ND (0.05)	ND (0.05)	ND (0.05)	ND (1)	ND

ND = Not detected. NT = Not tested.

1 Detection limit 0.05 mg/kg except as noted in parentheses.
2 Detection limit 0.2 mg/kg except as noted in parentheses.
3 Detection limit 0.1 mg/kg except as noted in parentheses.
4 Detection limit 10 mg/kg except as noted in parentheses.

Table 6. Results of Soil Analysis from Excavation Boundaries
2200 East 12th Street
Oakland, California

Concentrations in milligrams per kilogram (mg/kg)

Sample Number	Depth (ft)	Benzene[1]	Ethyl-benzene[1]	Toluene[1]	Xylenes[1]	TPH as Gasoline[2]	TPH as Diesel[2]
S-1	5-W	0.66	0.77	0.038	0.076	9.5	1.4
S-2	5-W	0.32	1.5	0.15	0.17	40	6.1
S-3	6-W	0.49	0.15	0.028	0.16	2.3	ND
S-4	5-W	1.2	1.7	0.056	0.052	16	1.3
S-5	5-W	2.8	12	1.5	ND	290*	22
S-6	6-W	0.28	0.52	0.028	0.21	7.7	10
S-7	7-B	0.30	0.68	0.070	0.36	17	1.4
S-8	7-W	0.068	0.20	0.19	0.27	52	2.2

W = Sample taken from wall of excavation
B = Sample taken from base of excavation
ND = Not detected.
1 Detection Limit 0.0050 mg/kg.
2 Detection Limit 1.0 mg/kg.
* Excavation extended beyond this sample both horizontally and vertically. Hydrocarbon concentrations less than 100 ppm are confirmed in samples S-7 and S-8

Table 4. Results of Groundwater Analyses
2200 East 12th Street
Oakland, California

Concentrations in micrograms per liter (μg/L)

Well Number	Date Sampled	EPA TEST METHOD 602 Benzene	Ethyl-benzene	Toluene	Xylenes	TPH as (Gasoline)
MW-9A	06/13/88	ND	ND	ND	ND	NT
	10/24/88	ND	ND	ND	ND	NT
	10/13/89	ND	ND[1]	ND[1]	ND[2]	NT
	10/19/90	ND	ND[1]	ND[1]	ND[1]	ND
	01/11/91	ND	ND[1]	ND[1]	ND[1]	ND
MW-9B	06/13/88	350	66	7.8	160	NT
	10/24/88	84	3.1	ND	3.2	NT
	10/13/89	4.1	ND[1]	ND[1]	ND[2]	NT
	10/19/90	27	2.3[1]	ND[1]	ND[1]	62
	01/11/91	4.3	1.1[1]	ND[1]	1.0[1]	100
MW-9C	06/13/88	ND	ND	ND	ND	NT
	10/28/88	ND	ND	ND	ND	NT
	10/13/89	ND	ND[1]	ND[1]	ND[2]	NT
	10/19/90	ND	ND[1]	ND[1]	ND[1]	ND
	01/11/91	ND	ND[1]	ND[1]	ND[1]	ND
MW-9D	10/24/88	ND	ND	ND	ND	NT
	10/13/89	ND	ND[1]	ND[1]	ND[2]	NT
	10/19/90	ND	ND[1]	ND[1]	ND[1]	ND
	01/11/91	ND	ND[1]	ND[1]	ND[1]	ND
MW-9E	10/24/88	1.3	ND	ND	ND	NT
	10/13/89	15	2.1[1]	ND[1]	ND[2]	NT
	10/19/90	4.0	0.9[1]	ND[1]	ND[1]	ND
	11/02/90	WELL ABANDONED				
MW-9F	12/06/88	ND	ND	ND	ND	NT
	10/13/89	ND	ND[1]	ND[1]	ND[2]	NT
	10/19/90	ND	ND[1]	ND[1]	ND[1]	ND
	01/11/91	ND	ND[1]	ND[1]	ND[1]	ND
MW-9G	12/06/88	0.8	ND	ND	ND	NT
	10/13/89	ND	ND[1]	ND[1]	ND[2]	NT
	10/19/90	ND	ND[1]	ND[1]	ND[1]	ND
	01/11/91	ND	ND[1]	ND[1]	ND[1]	ND
MW-9H	12/06/88	ND	ND	ND	ND	NT
	10/13/89	ND	ND[1]	ND[1]	ND[2]	NT
	10/19/90	ND	ND[1]	ND[1]	ND[1]	ND
	01/11/91	ND	ND[1]	ND[1]	ND[1]	ND
MW-9I	11/15/90	4.0	1.1[1]	1.2[1]	2.2[1]	55
	01/11/91	6.1	ND[1]	ND[1]	ND[1]	ND
Detection limits		0.5	2.0	1.0	1.0	50

ND = Not detected NT = Not Tested
[1] Detection limit = 0.5
[2] Detection limit = 3.0

Table 5. Slug Test Results
2200 East 12th Street
Oakland, California

Well Number	Lithology of Tested Zone	Thickness of Zone (feet)	Estimated Hydraulic Conductivity of Zone (feet/day)
MW-9B	Clayey sand	2.5	0.42
MW-9E	Sandy clay with gravel	13.0	0.52

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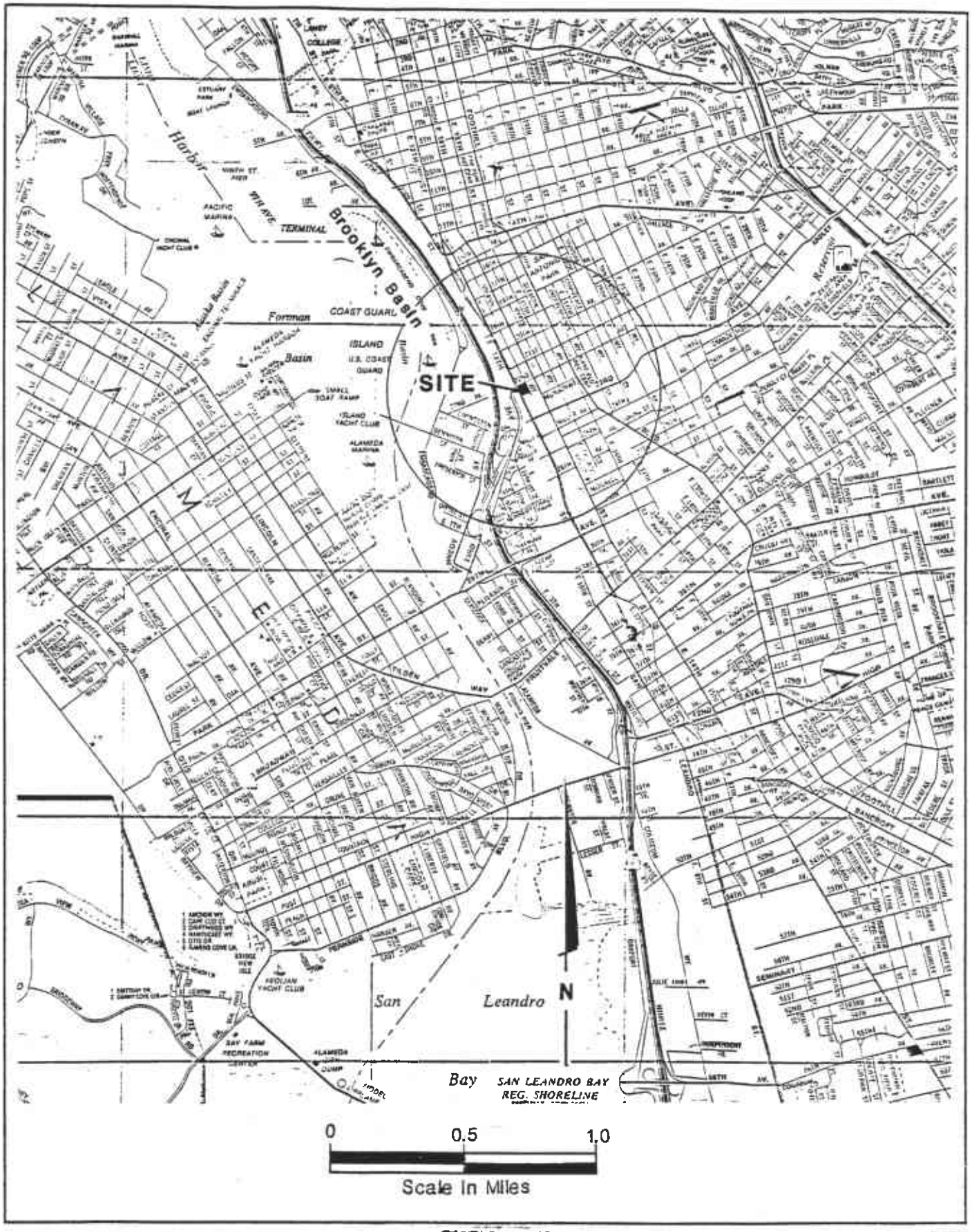
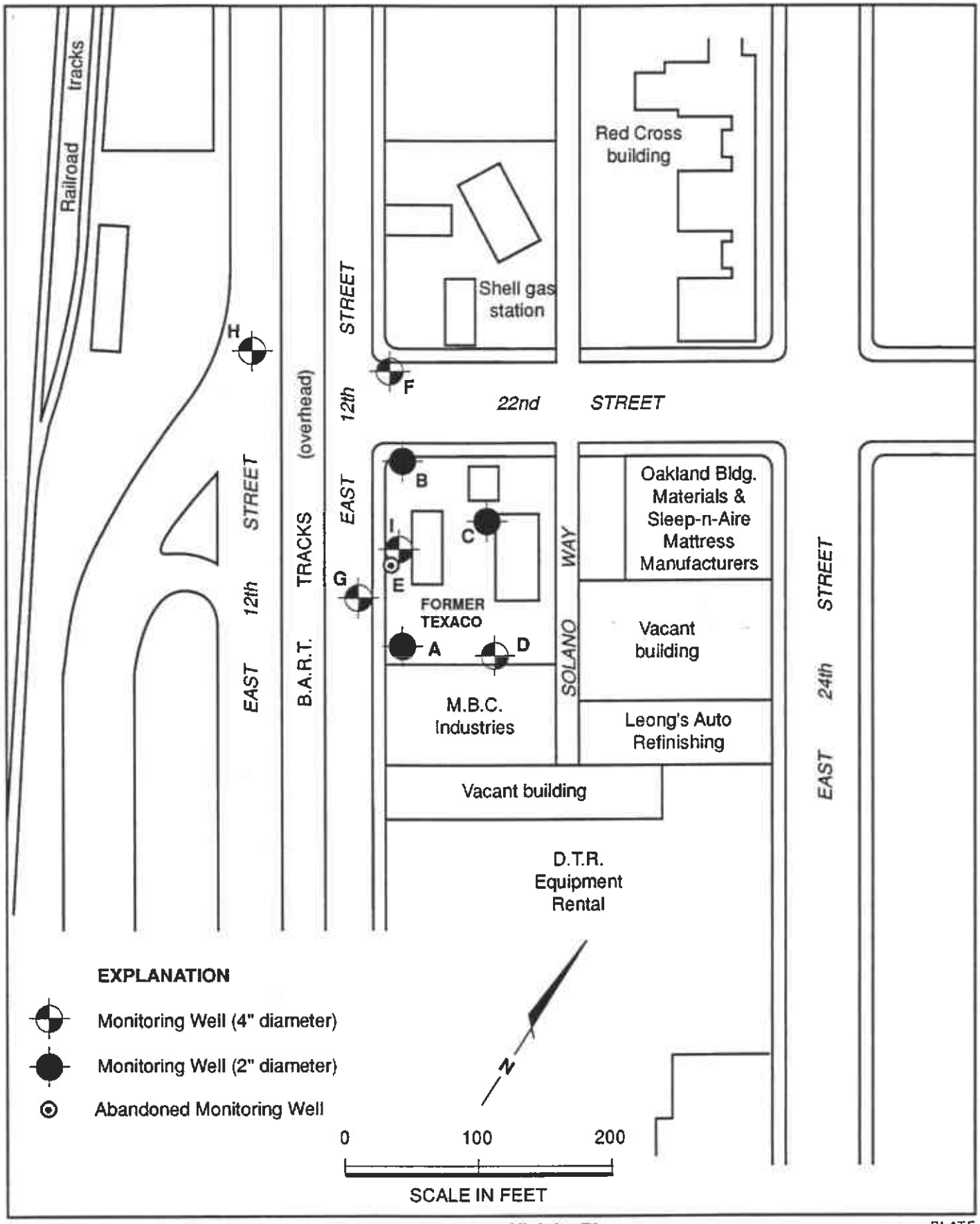


Harding Lawson Associates
Engineers and Geoscientists

Site Location
Former Texaco Service Station
2200 East 12th Street
Oakland, California

PLATE
1

DRAWN	JOB NUMBER	APPROVED	DATE	REVISED	DATE
	2251,112,03		6/89		

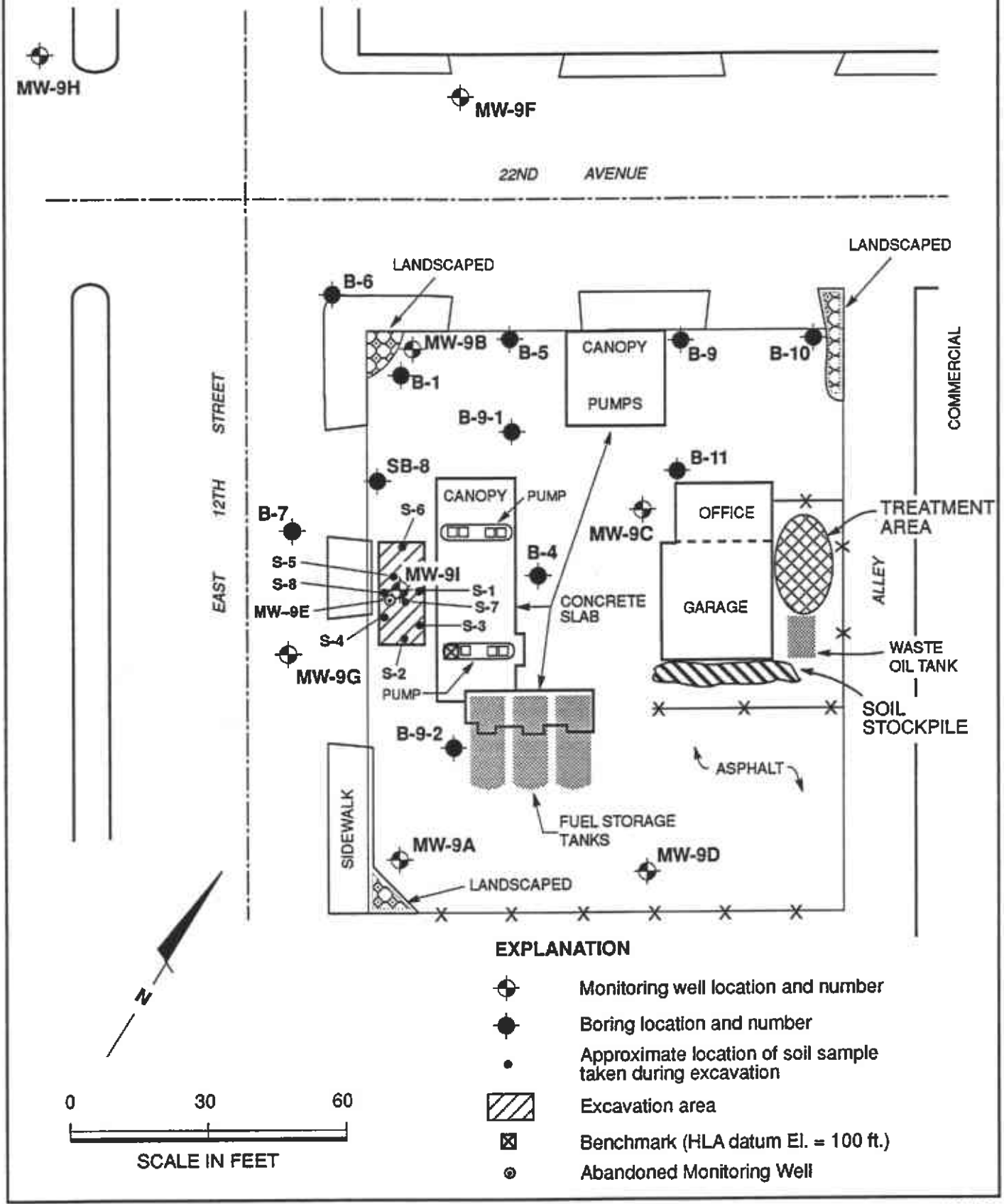


Harding Lawson Associates
Engineering and Environmental Services

Vicinity Plan
Former Texaco Service Station
2200 East 12th Street
Oakland, California

PLATE **2**

DRAWN	JOB NUMBER	APPROVED	DATE	REVISED DATE
RHC	2251,112.03	MKW	1/91	06/11/91

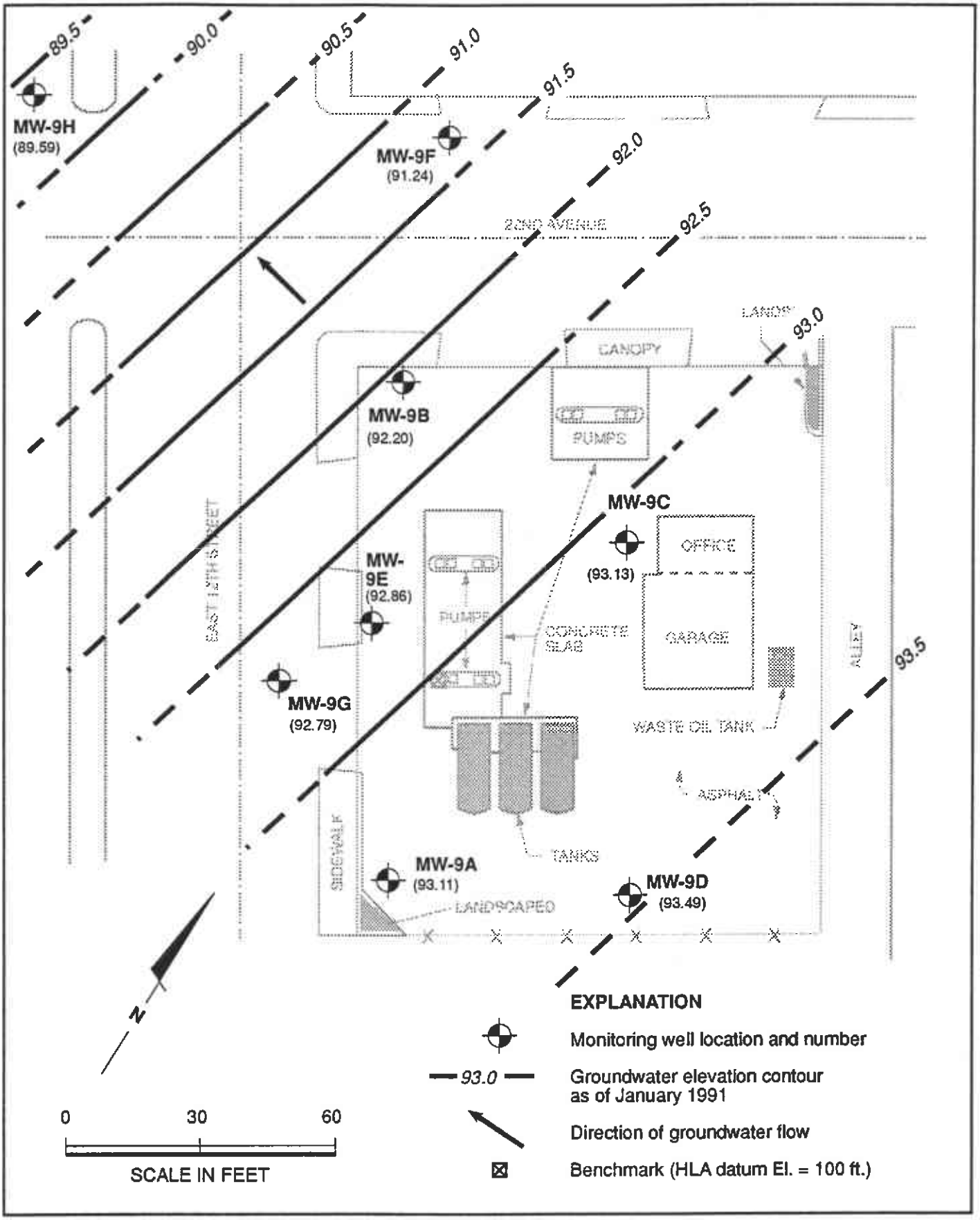


Harding Lawson Associates
Engineering and Environmental Services

Site Plan
Former Texaco Service Station
2200 East 12th Street
Oakland, California

PLATE **3**

DRAWN	JOB NUMBER	APPROVED	DATE	REVISED DATE
EH/RHC	2251,112.03	MKW	1/21/91	05/13/91



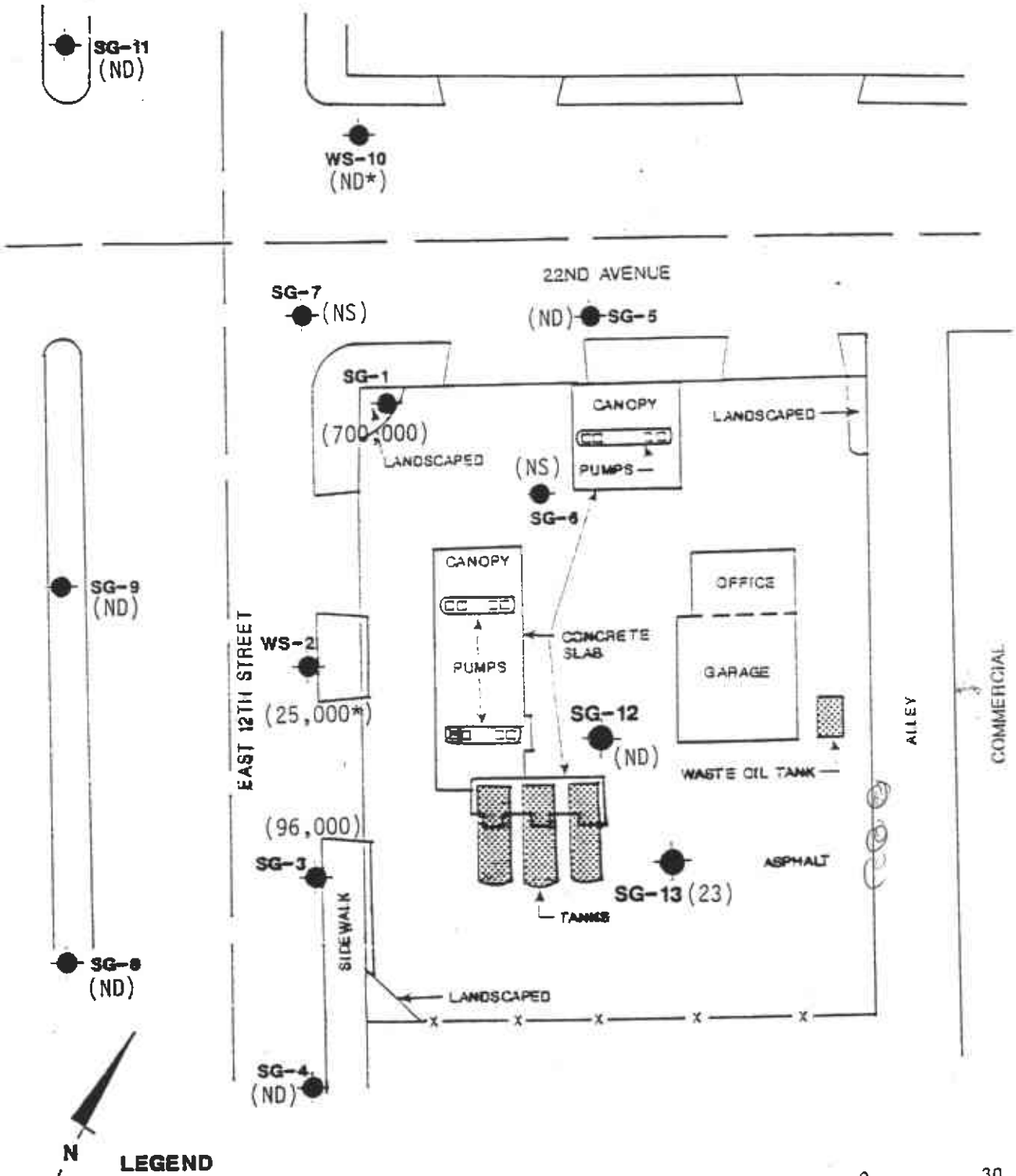
Harding Lawson Associates
Engineering and Environmental Services

Groundwater Surface Map
Former Texaco Service Station
2200 East 12th Street
Oakland, California

PLATE **4**

DRAWN	JOB NUMBER	APPROVED	DATE	REVISED DATE
RHC	2251,112.03	MKW	10/90	06/07/91

105649



LEGEND

Soil-gas probe location

(23) TPH concentration in micrograms/liter

* Water sample (NS) Not sampled (ND) Not Detected

Bench mark (HLA datum El.=100 feet)

Harding Lawson Associates
Engineers and Geoscientists

Soil-gas Probe Locations
Former Texaco Service Station
2200 East 12th Street
Oakland, California

PLATE **5**

DRAWN	JOB NUMBER	APPROVED	DATE	REVISED	DATE
YC	2251,112.03	G	6/89		

APPENDIX

LABORATORY TEST RESULTS (FIRST QUARTER)

CHEMWEST
ANALYTICAL LABORATORIES, INC.

January 29, 1991

HARDING ASSOC.
JSH
FEB 1 1991

Harding Lawson Associates
1355 Willow Way Suite 109
Concord, CA 94520

Attention: Randy Stone

Subject: Report of Data - Case Number 7448

Dear Mr. Stone:

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

Eight water samples for Project Texaco E 12th, Project Number 2251,112.03 were received January 15, 1991 in good condition. Results of the analysis, along with the analytical methodology and appropriate reporting limits, are presented on the following page(s).

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

Sincerely,

Debbie Pearce

Debbie Pearce
Project Manager

DP:kc

cc: File

600W North Market Boulevard • Sacramento, CA 95834 • Phone (916) 923-0840 • FAX (916) 923-1938

A Subsidiary of CompuChem Corporation

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

Client I.D.: MW-9A
Date(s)/Time Analyzed: 01/18/91 1834
Date Sampled: 01/11/91

CHEMWEST I.D.: 7448-1A
Matrix : Water
Dilution Factor: 1:1

Compound	Amount Detected (ug/L)	RL (ug/L)
Benzene	BRL	0.5
Toluene	BRL	0.5
Ethyl Benzene	BRL	0.5
Para-Xylene	BRL	0.5
Meta-Xylene	BRL	0.5
Ortho-Xylene	BRL	0.5
Total-Xylenes (1)	BRL	NA
Total Petroleum Hydrocarbon (Purgeable)	BRL	50

Surrogate	% Recovery	Acceptance Window
Bromofluorobenzene	116%	50-150%

BRL: Below Reporting Limit.
RL: Reporting Limit.

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

Approved by: JV

Date Reported:
01/29/91

REV5:9.90

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

Client I.D.: MW-9B
Date(s)/Time Analyzed: 01/18/91 2037
Date Sampled: 01/11/91

CHEMWEST I.D.: 7448-2A
Matrix : Water
Dilution Factor: 1:1

Compound	Amount Detected (ug/L)	RL (ug/L)
Benzene	4.3	0.5
Toluene	BRL	0.5
Ethyl Benzene	1.1	0.5
Para-Xylene	1.0	0.5
Meta-Xylene	BRL	0.5
Ortho-Xylene	BRL	0.5
Total-Xylenes (1)	1.0	NA
Total Petroleum Hydrocarbon (Purgeable)	100	50

Surrogate	% Recovery	Acceptance Window
Bromofluorobenzene	108%	50-150%

BRL: Below Reporting Limit.
RL: Reporting Limit.

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

Approved by: YY

Date Reported:
01/29/91

REV5:9.90

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

Client I.D.: MW-9C
Date(s)/Time Analyzed: 01/18/91 2113
Date Sampled: 01/11/91

CHEMWEST I.D.: 7448-3A
Matrix : Water
Dilution Factor: 1:1

Compound	Amount Detected (ug/L)	RL (ug/L)
Benzene	BRL	0.5
Toluene	BRL	0.5
Ethyl Benzene	BRL	0.5
Para-Xylene	BRL	0.5
Meta-Xylene	BRL	0.5
Ortho-Xylene	BRL	0.5
Total-Xylenes (1)	BRL	NA
Total Petroleum Hydrocarbon (Purgeable)	BRL	50

Surrogate	% Recovery	Acceptance Window
Bromofluorobenzene	106%	50-150%

BRL: Below Reporting Limit.
RL: Reporting Limit.

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

Approved by: _____

Date Reported:
01/29/91

REV5:9.90

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

Client I.D.: MW-9D
Date(s)/Time Analyzed: 01/18/91 2150
Date Sampled: 01/11/91

CHEMWEST I.D.: 7448-4A
Matrix : Water
Dilution Factor: 1:1

Compound	Amount Detected (ug/L)	RL (ug/L)
Benzene	BRL	0.5
Toluene	BRL	0.5
Ethyl Benzene	BRL	0.5
Para-Xylene	BRL	0.5
Meta-Xylene	BRL	0.5
Ortho-Xylene	BRL	0.5
Total-Xylenes (1)	BRL	NA
Total Petroleum Hydrocarbon (Purgeable)	BRL	50

Surrogate	% Recovery	Acceptance Window
Bromofluorobenzene	102%	50-150%

BRL: Below Reporting Limit.
RL: Reporting Limit.

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

Approved by: JY

Date Reported:
01/29/91

REV5:9.90

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

Client I.D.: MW-9F
Date(s)/Time Analyzed: 01/19/91 0355
Date Sampled: 01/11/91

CHEMWEST I.D.: 7448-5B
Matrix : Water
Dilution Factor: 1:2

Compound	Amount Detected (ug/L)	RL (ug/L)
Benzene	BRL	1
Toluene	BRL	1
Ethyl Benzene	BRL	1
Para-Xylene	BRL	1
Meta-Xylene	BRL	1
Ortho-Xylene	BRL	1
Total-Xylenes (1)	BRL	NA
Total Petroleum Hydrocarbon (Purgeable)	BRL	100

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

BRL: Below Reporting Limit.
RL: Reporting Limit.

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

Approved by: JP

Date Reported:
01/29/91

REV5:9.90

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

Client I.D.: MW-9G
Date(s)/Time Analyzed: 01/18/91 2303
Date Sampled: 01/11/91

CHEMWEST I.D.: 7448-6A
Matrix : Water
Dilution Factor: 1:1

Compound	Amount Detected (ug/L)	RL (ug/L)
Benzene	BRL	0.5
Toluene	BRL	0.5
Ethyl Benzene	BRL	0.5
Para-Xylene	BRL	0.5
Meta-Xylene	BRL	0.5
Ortho-Xylene	BRL	0.5
Total-Xylenes (1)	BRL	NA
Total Petroleum Hydrocarbon (Purgeable)	BRL	50

Surrogate	% Recovery	Acceptance Window
Bromofluorobenzene	100%	50-150%

BRL: Below Reporting Limit.
RL: Reporting Limit.

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

Approved by: _____

Date Reported:
01/29/91

REV5:9.90

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

Client I.D.: MW-9H
Date(s)/Time Analyzed: 01/18/91 2340
Date Sampled: 01/11/91

CHEMWEST I.D.: 7448-7A
Matrix : Water
Dilution Factor: 1:1

Compound	Amount Detected (ug/L)	RL (ug/L)
Benzene	BRL	0.5
Toluene	BRL	0.5
Ethyl Benzene	BRL	0.5
Para-Xylene	BRL	0.5
Meta-Xylene	BRL	0.5
Ortho-Xylene	BRL	0.5
Total-Xylenes (1)	BRL	NA
Total Petroleum Hydrocarbon (Purgeable)	BRL	50

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

BRL: Below Reporting Limit.
RL: Reporting Limit.

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

Approved by: _____

Date Reported:
01/29/91

REV5:9.90

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

Client I.D.: MW-9I
Date(s)/Time Analyzed: 01/19/91 0206
Date Sampled: 01/11/91

CHEMWEST I.D.: 7448-8A
Matrix : Water
Dilution Factor: 1:1

Compound	Amount Detected (ug/L)	RL (ug/L)
Benzene	6.1	0.5
Toluene	BRL	0.5
Ethyl Benzene	BRL	0.5
Para-Xylene	BRL	0.5
Meta-Xylene	BRL	0.5
Ortho-Xylene	BRL	0.5
Total-Xylenes (1)	BRL	NA
Total Petroleum Hydrocarbon (Purgeable)	BRL	50

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

BRL: Below Reporting Limit.
RL: Reporting Limit.

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

Approved by: _____

Date Reported:
01/29/91

REV5:9.90

QUALITY CONTROL

INFORMATION CONTROL INDEX

BTEX/TFH:----------METHOD BLANK

BTEX/TFH:----------LQCS;MBS/MBSD

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

Client I.D.: Method Blank
Date(s)/Time Analyzed: 01/18/91 1507

CHEMWEST I.D.: MB
Matrix : Water
Dilution Factor: 1:1

Compound	Amount Detected (ug/L)	RL (ug/L)
Benzene	BRL	0.5
Toluene	BRL	0.5
Ethyl Benzene	BRL	0.5
Para-Xylene	BRL	0.5
Meta-Xylene	BRL	0.5
Ortho-Xylene	BRL	0.5
Total-Xylenes (1)	BRL	NA
Total Petroleum Hydrocarbon (Purgeable)	BRL	50

Surrogate	% Recovery	Acceptance Window
Bromofluorobenzene	100%	50-150%

BRL: Below Reporting Limit.
RL: Reporting Limit.

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

Approved by: JC

Date Reported:
01/29/91

REV5:9.90

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

Client I.D.: Method Blank
Date(s)/Time Analyzed: 01/19/91 0053

CHEMWEST I.D.: MB
Matrix : Water
Dilution Factor: 1:1

Compound	Amount Detected (ug/L)	RL (ug/L)
Benzene	BRL	0.5
Toluene	BRL	0.5
Ethyl Benzene	BRL	0.5
Para-Xylene	BRL	0.5
Meta-Xylene	BRL	0.5
Ortho-Xylene	BRL	0.5
Total-Xylenes (1)	BRL	NA
Total Petroleum Hydrocarbon (Purgeable)	BRL	50

Surrogate	% Recovery	Acceptance Window
Bromofluorobenzene	101%	50-150%

BRL: Below Reporting Limit.
RL: Reporting Limit.

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

Approved by: _____

Date Reported:
01/29/91

REV5:9.90

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

Client I.D.: Method Blank
Date(s)/Time Analyzed: 01/23/91 1429

CHEMWEST I.D.: MB
Matrix : Water
Dilution Factor: 1:1

Compound	Amount Detected (ug/L)	RL (ug/L)
Benzene	BRL	0.5
Toluene	BRL	0.5
Ethyl Benzene	BRL	0.5
Para-Xylene	BRL	0.5
Meta-Xylene	BRL	0.5
Ortho-Xylene	BRL	0.5
Total-Xylenes (1)	BRL	NA
Total Petroleum Hydrocarbon (Purgeable)	BRL	50

Surrogate	% Recovery	Acceptance Window
Bromofluorobenzene	107%	50-150%

BRL: Below Reporting Limit.
RL: Reporting Limit.

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

Approved by: _____

Date Reported:
01/29/91

REV5:9.90

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

Client I.D.: Method Blank
Date(s)/Time Analyzed: 01/24/91 0249

CHEMWEST I.D.: MB
Matrix : Water
Dilution Factor: 1:1

Compound	Amount Detected (ug/L)	RL (ug/L)
Benzene	BRL	0.5
Toluene	BRL	0.5
Ethyl Benzene	BRL	0.5
Para-Xylene	BRL	0.5
Meta-Xylene	BRL	0.5
Ortho-Xylene	BRL	0.5
Total-Xylenes (1)	BRL	NA
Total Petroleum Hydrocarbon (Purgeable)	BRL	50

Surrogate	% Recovery	Acceptance Window
Bromofluorobenzene	63%	50-150%

BRL: Below Reporting Limit.
RL: Reporting Limit.

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

Approved by: _____

Date Reported:
01/29/91

REV5:9.90

CHEMWEST ANALYTICAL LABORATORIES
BENZENE, TOLUENE, ETHLYBENEZENE, XYLENES

Quality Control

Client I.D.: LQCS
Date Analyzed: 01/07/91

CHEMWEST I.D.: 7448-QC
Matrix : Water
Dilution Factor: 1:1

Compound	Spike Conc. (ug/L)	% Recovery 7448-MBS	% Recovery 7448-MBSD	RPD
Benzene	10	108%	110%	2%
Toluene	10	105%	108%	3%
Ethylbenzene	10	104%	105%	-1%
Para-Xylene	5	105%	104%	1%
Meta-Xylene	5	104%	104%	0%
Ortho-Xylene	10	102%	130%	24%
Total-Xylenes	20	103%	105%	2%

Surrogate	Spike Conc. (ug/L)	% Recovery 7448-MBS	% Recovery 7448-MBSD	RPD
Bromofluorobenzene	20	107%	102%	5%

Approved by: _____

Date Reported:
01/29/91

REV4:9.90

CHEMWEST ANALYTICAL LABORATORIES, INC.
600W North Market Blvd.
Sacramento, California 95834
(916) 923-0840 FAX (916) 923-1938

CLIENT

Order No. 07448
Date Rec'd. 1-15-91 @ 15:50
Compl. Date
Section Joel C Bird

CLIENT: Harding Lawson Associates
1355 Willow Way, Suite 109
Concord, CA
94520

Project Name: Texaco E 12th
Project No. 2251,112.03
P.O. NO.
Contact Randy Stone/M. Watson
Phone (415) 687-9660

ANALYSIS: Eight water samples recd under chain of custody in 40 ml voa vials (16) to be analyzed for BTEX/TPH-Gas.

	Sample Id	Date	Analysis	Matrix	Container
7448-1 A,B	MW-9A	1-11-91	BTEX/TPH-G	water	2-40ml voa vials
-2	MW-9B		same as above		
-3	MW-9C				
-4	MW-9D				
-5	MW-9F				
-6	MW-9G				
-7	MW-9H				
-8	MW-9I				

G.C.
S.G. SUSAN GILBERT

SAMPLE WILL BE HELD 30 DAYS UNLESS LONGER TIME IS ARRANGED

Harding Lawson Associates
1355 Willow Way, Suite 109
Concord, California 94520
415/687-9660
Telecopy: 415/687-9673

CHAIN OF CUSTODY FORM

Lab: Chem West

Job Number: 2251,112.03
Name/Location: Texaco E 12th
Project Manager: M. Watson

Samplers: DPM, MW

Recorder: DMeyers (Signature Required)

SOURCE CODE	MATRIX: Water	Sediment	Soil	Oil	#CONTAINERS & PRESERV.: Unpres.	H_2SO_4	HNO_3	HCl/Ag	SAMPLE NUMBER OR LAB NUMBER: Yr	Wk	Seq	DATE: Yr	Mo	Dy	Time	STATION DESCRIPTION/ NOTES	ANALYSIS REQUESTED: EPA 601/8010	EPA 602/8020	EPA 624/8240	EPA 625/8270	ICP METALS	EPA 8015M/TPH	BTEX/TPH as gasoline
2	X							2	m	w	9	A	9	1	0	1	1	1									X
2	X							2	m	w	9	B	9	1	0	1	1	1									X
2	X							2	m	w	9	C															X
2	X							2	m	w	9	D															X
2	X							2	m	w	9	F															X
2	X							2	m	w	9	G															X
2	X							2	m	w	9	H															X
2	X							2	m	w	9	I															X

SAMPLES REC'D IN GOOD CONDITION
NO LEAKAGE OR BREAKAGE - No Bubbles

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

CHAIN OF CUSTODY RECORD

RELINQUISHED BY: (Signature) DMeyer	RECEIVED BY: (Signature) GARY BIASE Gary Biase	DATE/TIME 1-15-91 10:00
RELINQUISHED BY: (Signature) Gary Biase GARY BIASE 15:50	RECEIVED BY: (Signature)	DATE/TIME
RELINQUISHED BY: (Signature)	RECEIVED BY: (Signature)	DATE/TIME
RELINQUISHED BY: (Signature)	RECEIVED BY: (Signature)	DATE/TIME
DISPATCHED BY: (Signature) DATE/TIME	RECEIVED FOR LAB BY: (Signature) SUSAN GILBERT Susan Gilbert	DATE/TIME 1/15/91 15:50
METHOD OF SHIPMENT CHEM WEST COURIER	CHEMWEST LAB	

Laboratory Copy (White) Project Office Copy (Yellow) Field or Office Copy (Pink)

DISTRIBUTION

4 copies: Texaco Refining and Marketing Inc.
108 Cutting Boulevard
Richmond, California 94804

Attention: Mr. R. R. Zielinski

MKW/JSH/bb 032274P/R45

QUALITY CONTROL REVIEWER

Stephen J. Osborne
Principal Engineer