Texaco Refining
and Marketing Inc.

108 Cutting Boulevard
Richmond CA 94804

April 20, 1992

STID1109

Mr. Paul Smith
Alameda County Environmental
Health Department
Hazardous Materials Division
80 Swan Way, Room 200
Oakland, CA 94621

Dear Mr. Smith:

Enclosed is a copy of our Quarterly Technical Report dated March 2, 1992 for our former Texaco Service Station located at 2225 Telegraph Avenue in Oakland, California. This report covers the period from October through December, 1991.

Please call me at (510) 236-3541 if you have any questions.

Best Regards,

R.R. Zielinski
Area Supervisor

RRZ:pap

Enclosure

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

pr:QRT

KEG

2225TA.PS

A Report Prepared for

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

STID 1109

QUARTERLY TECHNICAL REPORT
FOURTH QUARTER OF 1991
FORMER TEXACO STATION NO. 6248800235
500 GRAND AVENUE
OAKLAND, CALIFORNIA

9410
STID 1109

HLA Job No. 2251,169.03
March 4, 1992
1991 Report No. 4

by

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INTRODUCTION

This Quarterly Technical Report (QTR) presents the results of investigation activities by Harding Lawson Associates (HLA) during the fourth quarter of 1991 at the former site of Texaco service station No. 6248800235, 500 Grand Avenue, Oakland, California (Plate 1). This station has been operated by Exxon Company U.S.A. (Exxon) since 1988. During the fourth quarter 1991, Exxon's lease expired and the station was closed. The site is currently enclosed by a locked chain-link fence. This report summarizes previous work at the site, presents fourth quarter activities, and describes planned activities for the first quarter of 1992.

SUMMARY OF PREVIOUS WORK

Texaco Refining and Marketing Inc. retained HLA to conduct a sensitive receptor survey at the subject location in May 1988. In June 1988, Texaco Refining and Marketing Inc. requested that HLA proceed with a subsurface investigation to evaluate whether hydrocarbons had affected shallow soil or groundwater. By the end of the second quarter of 1991, HLA had completed the following tasks in the site investigation:

- Conducted a soil-gas survey consisting of 18 soil-gas probe locations on or near the site.
- Installed and developed four 2-inch-diameter groundwater monitoring wells (MW-8A, MW-8B, MW-8C, and MW-8D) and six 4-inch-diameter monitoring wells (MW-8E, MW-8F, MW-8G, MW-8H, MW-8I, and MW-8J). Locations are shown on Plate 2.

- Obtained groundwater samples from each well on a quarterly basis and analyzed them for benzene, toluene, ethylbenzene, and total xylenes (BTEX), and total petroleum hydrocarbons (TPH) as gasoline and as diesel fuel.

- Gauged water levels and estimated the direction of groundwater flow.

- Performed slug tests in MW-8C and MW-8E to estimate hydraulic conductivity.

- Drilled and sampled 15 soil borings to delineate the extent of hydrocarbons in the vadose zone (Plate 2).

- Analyzed soil samples for BTEX and TPH as gasoline.

- Analyzed soil samples from B-6, B-7, B-8, B-9, B-10, B-11, B-12, B-13, B-14, and B-8K for TPH as diesel fuel.

- Analyzed a soil sample from B-13 for halogenated volatile organics, semi-volatile organics, oil and grease, and selected metals.

- Pumped and disposed of 5,000 gallons of water from the tank backfill as an interim remedial measure.

- Submitted an Environmental Assessment Report, dated September 22, 1989, to Texaco.

- Issued an Interim Remedial Plan, dated December 7, 1990, in lieu of a Third Quarter Technical Report.

- Excavated the clay sewer pipes and contaminated soil from an abandoned utility trench near the former waste oil tank location. Analyzed soil and water for hydrocarbons.

RESULTS OF PREVIOUS WORK

The results of the soil-gas survey indicated petroleum hydrocarbon vapors in the unsaturated zone near the underground storage tanks and dispenser islands. Analyses of water samples from the four observation wells in the storage tank backfill

showed the presence of dissolved petroleum hydrocarbons in groundwater adjacent to the underground tanks.

Soil samples and drill cuttings indicate that the subsurface materials at the site consist of clay and minor amounts of interbedded clayey sand. Analysis of slug test data obtained from MW-3C and MW-3E indicate a hydraulic conductivity of 0.02 to 0.03 foot/day. Groundwater would be expected to move through the soils relatively slowly.

Local groundwater flow is to the south and southeast, toward Lake Merritt (Plate 3). Historical water-level data from monitoring wells across the site show that, in most wells, the water table has fluctuated 2.5 to 3.0 feet since early 1988. Water levels in MW-8A fluctuated as much as 8 feet; those data are suspect and are often not used in contouring the potentiometric groundwater surface.

Results of Soil Analyses

Samples from 15 soil borings and seven monitoring well locations were chemically analyzed to evaluate the horizontal and vertical extent of petroleum hydrocarbons in the subsurface. The analytical data are summarized in Tables 1 and 2. A contour map showing concentrations of TPH as gasoline in the vadose-zone soil is presented on Plate 4. For this map, the vadose zone was defined by comparing sample depths to static water levels at the time of sampling.

Plate 4 depicts a vadose-zone hydrocarbon plume that apparently originates near the underground tanks and extends off site to MW-8J. Significant concentrations of TPH as gasoline are also found in the area of the dispenser islands. The highest concentration, 2900 parts per million (ppm), was found in a soil sample collected at a depth of 1.5 feet in B-11. In general, BTEX concentrations in the soil are either below detection limits or very low (Table 1).

The results of soil analyses for TPH as diesel fuel indicate concentrations ranging from nondetectable to 460 ppm (B-9); most of the soil samples with detectable concentrations contained less than 100 ppm TPH as diesel fuel.

One soil sample collected at 2.5 feet below grade in B-13 was analyzed for semi-volatile organic compounds, halogenated volatile organics, total oil and grease, and selected metals. A summary of the analytical results are presented in Table 2.

Results of Previous Groundwater Analyses

Table 3 presents the results of groundwater analyses obtained since 1988. Groundwater from monitoring wells MW-8E, MW-8H, MW-8I, and MW-8J, and observation wells OB-3 and OB-4 contained benzene in concentrations that exceed the Department of Health Services Drinking Water Action Levels (DWALs). In groundwater samples from wells MW-8A, MW-8B, and MW-8C, BTEX concentrations have typically been either nondetectable or below the DWALs.

A contour map showing benzene concentrations in groundwater is presented on Plate 5; Plate 6 is a contour map showing concentrations of TPH as gasoline. These maps suggest that hydrocarbons in groundwater may have originated near the dispenser islands. Water from monitoring well MW-8E, cross-gradient and down-gradient of the dispenser islands, has the highest concentrations of BTEX, TPH as gasoline, and TPH as diesel fuel.

TPH as gasoline was detected in groundwater downgradient of MW-8E in samples from MW-8H, MW-8I, and MW-8J. Samples from MW-8F and MW-8G typically contained nondetectable concentrations of BTEX and TPH as gasoline. However, TPH as diesel fuel and "heavy" hydrocarbons, above the range of diesel fuel, have been detected in groundwater from these downgradient locations since the second quarter 1990.

Waste Oil Tank Removal

In the third quarter 1990, workers installing overfill containment devices on the underground storage tanks discovered floating hydrocarbons around the waste oil tank. Exxon removed this tank in September 1990. Waste oil and water were pumped from the tank backfill and disposed of by Exxon. Tank backfill material and affected soil were also excavated and disposed of by Exxon. Two vitrified clay sewer lines, apparently containing petroleum hydrocarbon products, were discovered adjacent to the tank pit during the excavation process. Texaco Environmental

Services excavated the clay lines and contaminated soil from the surrounding utility trench during the first quarter of 1991.

ACCOMPLISHMENTS DURING FOURTH QUARTER OF 1991

During the fourth quarter of 1991, HLA accomplished the following tasks at the 500 Grand Avenue site:

- Purged and sampled four on-site monitoring wells, and five off-site monitoring wells. Water samples were analyzed for BTEX, TPH as gasoline, TPH as diesel fuel, and TPH as motor oil.
- Measured water levels in nine monitoring wells (Table 4).

Groundwater Sampling

HLA continued to monitor water levels and groundwater quality at the subject location during the fourth quarter of 1991. Each well was purged while monitoring temperature, conductivity, and pH of the water. The water samples were collected and transported, under chain-of-custody, to NET Pacific, Inc. in Santa Rosa, California. All of the water samples were analyzed for BTEX and TPH as gasoline. All samples except MW-8G were analyzed for TPH as diesel fuel and TPH as motor oil; because of slow recharge, samples for diesel fuel and motor oil were not obtained from MW-8G.

Results of Recent Groundwater Analyses

Table 3 and Plates 5 and 6 summarize results of the third quarter groundwater analyses. Benzene concentrations exceeded

the DWAL (1.0 parts per billion [ppb]) in groundwater from MW-8E, MW-8H and MW-8I. Groundwater from monitoring wells MW-8E and MW-8I contained the highest concentrations of benzene, 19,000 ppb and 470 ppb, respectively. TPH as gasoline was detected in groundwater from monitoring wells MW-8E, MW-8H, and MW-8I. Concentrations ranged from 120 ppb in MW-8H to 40,000 ppb in MW-8E.

TPH as diesel fuel was detected in groundwater from three of the eight monitoring wells sampled. We are not aware of records of diesel fuel being sold at the site in the past. Some of the heavier hydrocarbons detected may therefore result from the presence of aged gasoline, or from hydrocarbons originating in the area of the former waste oil tank. Laboratory reports, included in the Appendix, indicate that the petroleum hydrocarbons quantified as diesel fuel in groundwater from MW-8E appear to be lighter hydrocarbons.

Plate 3 is the most recent contour map of the potentiometric groundwater surface, based on water levels measured on October 24, 1991. No significant changes in groundwater flow direction are apparent.

ANTICIPATED ACTIVITIES FOR FIRST QUARTER, 1992

Quarterly groundwater samples will be collected and analyzed for BTEX and TPH as gasoline, as diesel fuel, and as motor oil. Water levels will be measured on a monthly basis.

LIST OF TABLES

LIST OF ILLUSTRATIONS

LIST OF APPENDICES

Table 1. Results of Soil Sample Analyses
(concentrations in mg/kg [ppm])

Boring/ Well Number	Sample Depth (feet)	Benzene	Toluene	Ethyl-benzene	Xylenes	TPH as Gasoline	TPH as Diesel	TPH Other**
B-1	6.5	ND	ND	ND	ND	12	NA	
B-3	4.0	ND	ND	ND	5	520	NA	
B-4	3.5	ND	1	3.5	13	510	NA	
B-5	5.5	ND	ND	ND	ND	<10	NA	
B-5	10.5	ND	ND	ND	ND	ND	NA	
B-5	16.0	ND	ND	ND	ND	ND	NA	
B-6	2.0	ND	0.08	ND	ND	1.0	<100*	<100*
B-6	4.5	ND	0.09	ND	ND	ND	<10	<10
B-7	3.0	ND	6.7	5.1	50	580	<100*	<100*
B-8	2.0	0.05	ND	ND	0.34	3.4	<10	<10
B-9	2.5	0.05	0.32	0.81	6.4	100	460	<100*
B-8K	1.5	ND	ND	ND	ND	2.1		ND
	3.0	ND	0.05	ND	ND	6.6		ND
	5.5	ND	ND	0.08	0.05	84		20
B-10	1.5	0.28	ND	0.20	0.18	8.4		ND
	2.5	0.09	ND	ND	ND	ND		ND
	5.5	ND	ND	ND	ND	ND		ND
	8.5	ND	ND	ND	ND	ND		ND
B-11	1.5	ND	ND	5.4	1.6	2,900		30
	2.5	ND	ND	0.31	0.12	62		11
	5.5	ND	ND	0.06	ND	17		ND
	8.5	ND	ND	ND	ND	ND		ND
B-12	1.0	0.22	0.11	0.18	0.42	13		ND
	2.5	ND	ND	0.19	0.83	49		ND
	4.5	ND	ND	1.27	0.67	1,200		94
	6.0	ND	0.06	ND	ND	ND		ND
B-13	1.5	ND	ND	ND	ND	ND	ND	ND
	2.5	ND	ND	1.7	5.4	130	ND	1,000
	3.5	ND	0.06	0.06	0.30	26	ND	250
B-14	1.5	ND	ND	ND	ND	4.8	ND	85
	3.5	ND	ND	ND	ND	2.3	ND	62
MW-8D	1.3	ND	0.40	ND	0.50	10	NA	
MW-8E	5.5	0.82	6.5	5.5	26	750	NA	
MW-8F	11.0	ND	ND	ND	ND	ND	NA	
MW-8G	6.0	ND	ND	ND	ND	ND	NA	
MW-8H	1.5	ND	0.07	ND	ND	ND		ND
	3.0	ND	0.24	ND	ND	2.6		ND
	5.5	ND	ND	0.30	0.83	550		66
	10.5	ND	ND	ND	ND	ND		ND
MW-8I	1.5	0.10	ND	ND	ND	3.0		ND
	3.5	0.06	ND	ND	0.02	ND		ND
	5.5	ND	ND	2.7	9.2	280		ND
	10.5	ND	ND	ND	ND	ND		ND
MW-8J	1.5	0.18	0.09	0.06	0.05	24		ND
	3.0	0.08	0.14	0.04	ND	13		33
	5.5	ND	ND	25	9.2	2,100		83
	10.5	ND	0.02	ND	ND	8		ND

ND = Not detected
NA = Not analyzed
* Laboratory increased reporting limits because of matrix interference.
** "Heavy" petroleum hydrocarbons such as waste oil, mineral spirits, jet fuel, or fuel oil.

Table 2. Summary of Chemical Analyses
Soil Sample B-13 (2.5 feet deep)

Semi-volatile Organics; EPA Test Method 8270

- Analyses for 55 semi-volatile organic compounds
- Results were below reporting limit on all except:

Naphthalene	0.90 ppm
2 Methylnapthalene	1.40 ppm
Bis (2-ethylhexyl) phthalate	0.26 ppm

Halogenated Volatile Organics; EPA Test Method 8010

- Analyses for 29 compounds
- Results were below reporting limits on all except:

Trichloroethane	0.06 ppm

Total Oil and Grease (IR); EPA Test Method 413.2 — [illegible] ppm

Selected heavy metals - EPA Test Method 6010

Cadmium	Below reporting limit
Chromium	36 ppm
Lead	Below reporting limit
Zinc	41 ppm

Table 3. Results of Groundwater Analyses
Concentrations in µg/l (ppb)

Well	Date Sampled	Benzene	Toluene	Ethyl-benzene	Xylenes	TPH as Gasoline	TPH as Diesel	TPH Other[2]
MW-8A	06/14/88	<0.5[1]	1.5	<2	6.6	--	--	--
	10/28/88	<0.5	<1	<2	<1	--	--	--
	09/28/89	<0.5	<0.5	<0.5	<3	<50	--	--
	11/29/89	<0.5	1.0	<0.5	<0.5	<50	1,200	<50
	01/24/90	<0.5	<0.5	<0.5	<0.5	<100	--	2,800
	04/26/90	<0.5	<0.5	<0.5	<0.5	<2,500	<50	890
	07/26/90	[illegible]	<0.5	<0.5	<0.5	<50	<50	<50
	10/18/90	<0.5	<0.5	<0.5	<0.5	<50	<50	<50
	01/08/91	<0.3	<0.3	<0.3	<0.3	<30	<50	130[3]
	04/23/91	<0.5	<0.5	<0.5	<0.5	<50	<50	<500
	07/23/91	<0.5	<0.5	<0.5	<0.5	<50	<50	<500
	10/24/91	<0.5	<0.5	<0.5	<0.5	<50	<50	<500
MW-8B	06/14/88	<0.5	<1	<2	<1	--	--	--
	10/21/88	<0.5	<1	<2	3.1	--	--	--
	09/28/89	<0.5	<0.5	<0.5	<3	<50	--	--
	11/29/89	<0.5	<0.5	<0.5	<0.5	<50	<50	380
	01/24/90	<0.5	<0.5	<0.5	<0.5	<100	--	350
	04/26/90	<0.5	<0.5	<0.5	<0.5	<50	<50	110
	07/26/90	<0.5	<0.5	<0.5	<0.5	<50	<50	<50
	10/18/90	<0.5	<0.5	<0.5	<0.5	<50	<50	<50
	01/08/91	<0.3	<0.3	<0.3	<0.3	<30	<50	180[3]
	04/23/91	[illegible]	2.5	<0.5	5.1	<50	<50	<500
	07/23/91	<0.5	1.1	<0.5	2.0	<50	<50	<500
	10/24/91	<0.5	<0.5	<0.5	<0.5	<50	<50	<500
MW-8C	06/14/88	[illegible]	3.5	2.6	13.0	--	--	--
	10/21/88	<0.5	<1	<2	<1	--	--	--
	09/28/89	<0.5	<0.5	<0.5	<3.0	<50	--	--
	11/29/89	<0.5	<0.5	<0.5	<0.5	<50	<50	190
	01/24/90	[illegible]	<0.5	<0.5	<0.5	<100	--	480
	04/26/90	<0.5	<0.5	<0.5	<0.5	<50	<50	160
	07/26/90	<0.5	<0.5	<0.5	<0.5	<50	<50	<50
	10/18/90	<0.5	<0.5	<0.5	<0.5	<50	<50	<50
	01/08/91	<0.3	<0.3	<0.3	<0.3	<30	76	110[3]
	04/23/91	[illegible]	25	3.7	19	800	<50	<500
	07/23/91	<0.5	0.6	<0.5	<0.5	<50	<50	<500
	10/24/91	<0.5	<0.5	<0.5	<0.5	<50	<50	<500

Table 3 (continued)

Well	Date Sampled	Benzene	Toluene	Ethyl-benzene	Xylenes	TPH as Gasoline	TPH as Diesel	TPH Other[2]
MW-8H	01/24/90	14.8	14.8	10.8	38.8	460	--	<300
	04/26/90	67	19	43	64	830	<50	820
	(07/26/90)	45	1.3	12	8.2	190	<50	<50
	10/18/90	17	2.5	14	8.5	300	<50	<50
	01/08/91	12	2.2	6.4	4.0	320	180	89[3]
	04/23/91	1.5	<0.5	<0.5	<0.5	<50	730	<500
	07/23/91	21	1.8	9.7	2.6	270	<50	<500
	10/24/91	7.6	1.0	3.5	2.4	120	70	<500
MW-8I	01/24/90	116	2.9	13	30.5	580	--	440
	04/26/90	2,400	100	230	350	4,400	<50	1,400
	(07/26/90)	<0.5	<0.5	<0.5	<0.5	<50	<50	<50
	10/18/90	92	4.1	37	21	530	<50	<50
	01/08/91	500	4.3	36	26	1,300	710	210[3]
	04/23/91	1,600	17	100	86	1,500	1,100	900
	07/23/91	1,600	30	140	63	1,700	260	<500
	10/25/91	470	6.0	76	13	760	230	<500
MW-8J	01/24/90	2.7	<0.5	1	2.6	<100	--	<300
	04/26/90	28	7.7	19	24	160	<50	320
	(07/26/90)	<0.5	<0.5	<0.5	<0.5	<50	<50	<50
	10/18/90	8.3	<0.5	2.6	1.5	<50	<50	<50
	01/08/91	0.41	<0.3	<0.3	0.52	71	<50	69[3]
	04/23/91	16	2.2	9.3	4.6	300	550	<500
	07/23/91	4.6	<0.5	3.1	<0.5	<50	<50	<500
	10/24/91	0.8	<0.5	<0.5	<0.5	<50	<50	<500
OB-3	11/06/89	420	8	6	64	4,000	--	--
	04/26/90	160	19	5	8.6	1,000	3,200	<50
	(07/26/90)	<0.5	<0.5	<0.5	0.9	68	1,200	<50
	10/18/90	260	69	35	490	3,200	2,100	<50
	01/08/91	--	--	--	--	--	--	--
	04/23/91	--	--	--	--	--	--	--
	07/23/91	--	--	--	--	--	--	--
	10/24/91	--	--	--	--	--	--	--

Table 3 (continued)

Well	Date Sampled	Benzene	Toluene	Ethyl-benzene	Xylenes	TPH as Gasoline	TPH as Diesel	TPH Other[2]
OB-4	11/06/89	500	11	10	24	4,000	--	--
	04/26/90	360	10	10	18	460	3,900	<50
	(07/26/90)	23	3.7	1.6	5.9	200	1,600	<50
	10/18/90	600	540	83	840	4,300	330	<50
	01/08/91	--	--	--	--	--	--	--
	04/23/91	--	--	--	--	--	--	--
	07/23/91	--	--	--	--	--	--	--
	10/24/91	--	--	--	--	--	--	--
DWAL			1.0	680	100	1,750		

DWAL = Drinking water action levels, State of California Department of Health Services (April, 1989).

1 <0.5 indicates that concentrations are below the reporting limit of 0.5 µg/l.
2 "Heavy" petroleum hydrocarbons such as waste oil, mineral spirits, jet fuel, or fuel oil.
3 TPH as motor oil analyses; analyst did not feel that motor oil was indicted on the chromatogram.
4 Petroleum hydrocarbons quantified as diesel appear to be light hydrocarbons

(07/26/90) Sample not analyzed for BTEX and TPH as gasoline within 14-day holding time
-- = Samples not collected/not analyzed for compound

Table 4. Historical Record of Depth to Groundwater

Well		MW-8A	MW-8B	MW-8C	MW-8E	MW-8F	MW-8G	MW-8H	MW-8I	MW-8J
Top of Casing Elev.		99.72	101.11	98.41	99.38	97.94	97.24	98.90	98.27	97.69
Date										
NOV 28, 90	GW ELEV	89.69	100.54	88.60	96.00	87.02	85.57	94.94	92.16	91.01
JAN 08, 91	GW ELEV	93.63	100.57	90.81	95.90	87.98	86.44	94.91	92.10	91.30
FEB 02, 91	GW ELEV	96.98	100.58	91.56	95.93	87.93	86.56	94.89	91.96	91.67
MAR 29, 91	GW ELEV	97.40	100.85	91.94	96.10	89.35	BLOCKED	95.20	92.12	91.98
APR 23, 91	GW ELEV	97.41	100.80	91.74	96.36	89.09	87.80	92.87	91.98	93.88
JUN 10, 91	GW ELEV	96.90	100.69	90.33	96.30	88.36	86.95	95.22	92.16	91.52
JUN 28, 91	GW ELEV	97.19	100.70	91.05	96.13	88.46	86.94	95.07	91.97	91.38
JUL 23, 91	GW ELEV	97.37	100.59	91.04	96.14	88.15	86.50	95.05	91.86	91.02
AUG 22, 91	GW ELEV	97.04	100.49	89.62	95.90	86.50	84.68	95.10	91.83	90.94
OCT 03, 91	GW ELEV	97.26	100.59	90.48	96.06	86.36	84.15	95.11	91.80	90.92
OCT 24, 91	GW ELEV	97.19	100.49	90.73	95.93	86.19	83.82	94.88	91.70	90.81
NOV 26, 91	GW ELEV	96.69	100.38	90.82	96.04	86.31	84.22	95.02	91.69	91.10
DEC 30, 91	GW ELEV	97.44	100.81	91.26	95.85	87.43	85.30	95.06	91.86	91.28

All measurements are in feet
TOC = Top of casing elevation relative to arbitrary datum of 100 feet
GW Elev = Groundwater elevation relative to arbitrary datum

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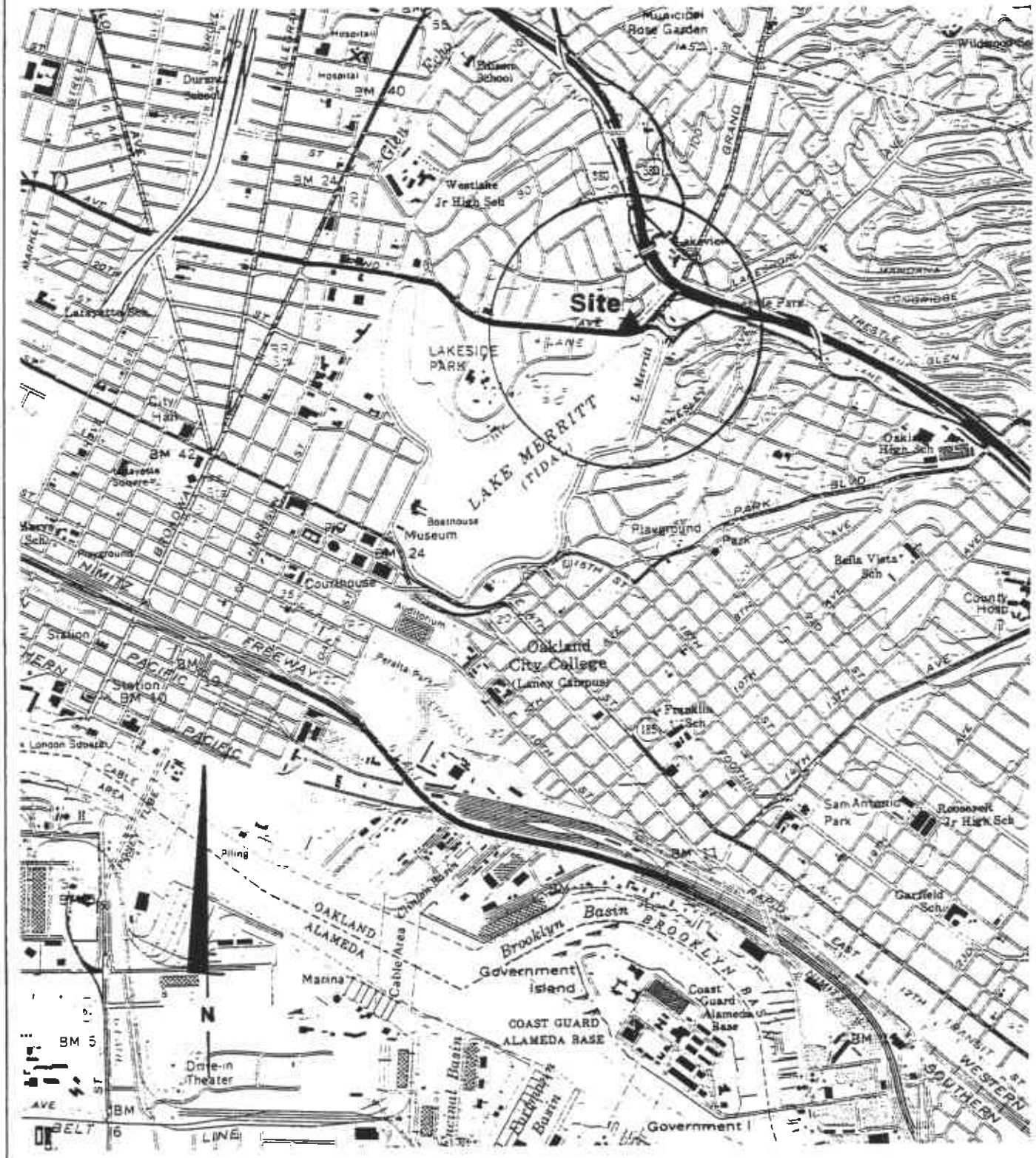


Ref: USGS, 7.5 Minute Topographic Map, Oakland West, California, Photo revised 1980.

Harding Lawson Associates
Engineers and Geoscientists

Regional Map
Former Texaco Service Station
500 Grand Avenue
Oakland, California

PLATE **1**

DRAWN	JOB NUMBER	APPROVED	DATE	REVISED	DATE
YC	2251,114.03	AK	5/89		

EXPLANATION

- Monitoring Well
- Observation Well
- Soil Boring
- Decommissioned Monitoring Well
- Ground-Water flow direction
- Bench Mark (HLA datum el. = 100 Feet)

UTILITIES

- Electrical
- Telephone
- Gas
- Sanitary
- Water
- Air
- Approximate location of vent lines
- Anode line

EUCLID AVENUE

GRAND AVENUE

NOTE:
Gas lines and cable TV.
under sidewalk/landscaping

8-inch
sewer main

Unknown
utility

Post
Box

30'

Sidewalk

Landscaping

Apartments

MW-8A

B-5

B-10

MW-8H

B-8

B-12

B-9

MW-8B

MW-8E

Canopy

Office

B-3

Dispensers

B-13

MW-8I

Landscaping

B-7

Service Area

OB-4

OB-1

Tanks

B-11

Former waste
oil tank

B-2

B-14

Property
Boundary

B-1

OB-2

OB-3

MW-8D

B-6

B-4

MW-8C

Concrete
Retaining
Wall

MW-8J

MW-8F

MW-8G

B-8K

0 20 40

SCALE IN FEET

Harding Lawson Associates
Engineering and
Environmental Services

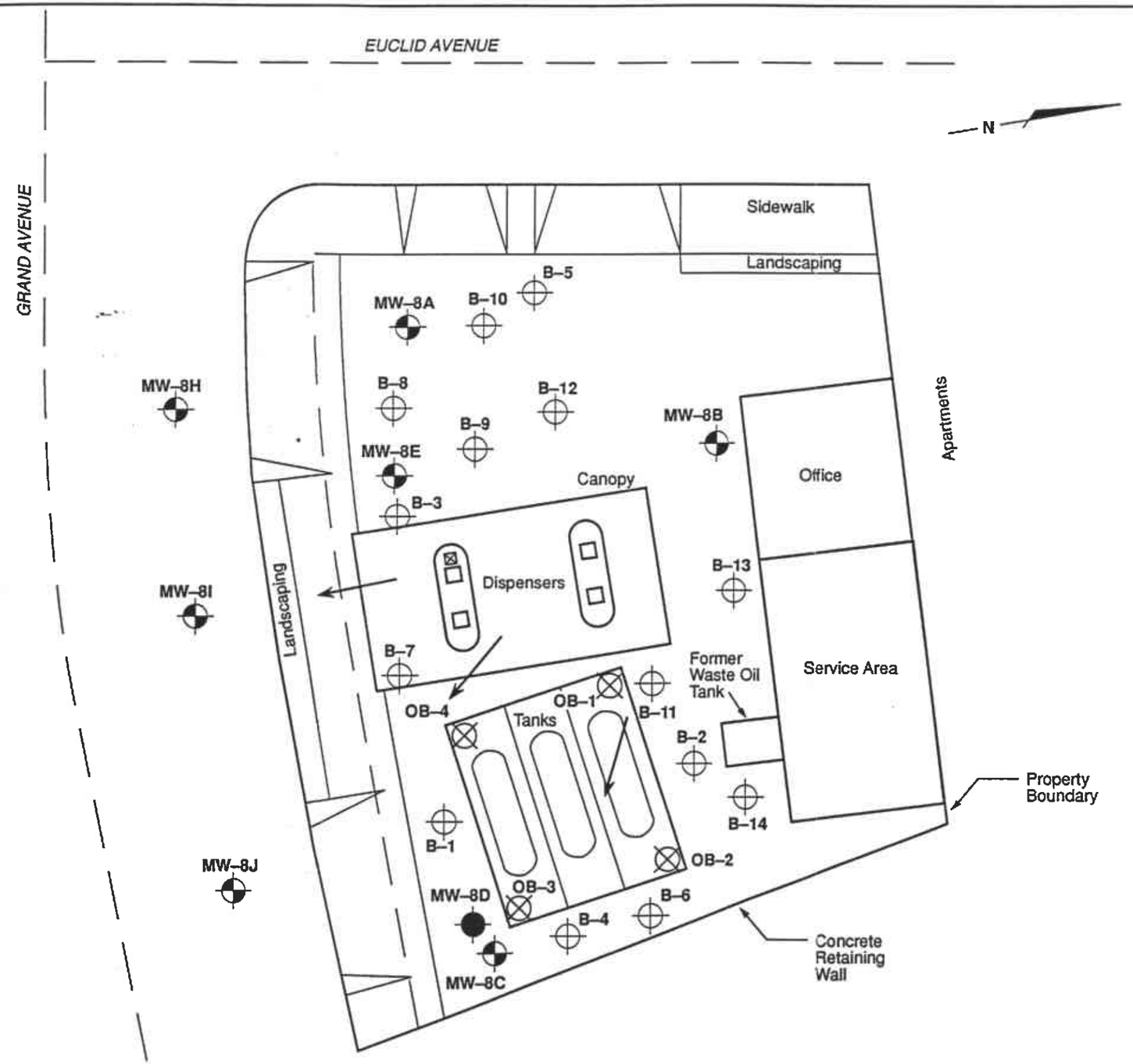
Site Plan Showing Utilities
Former Texaco Station
500 Grand Avenue
Oakland, California

PLATE **2**

DRAWN	JOB NUMBER	APPROVED	DATE	REVISED DATE
SP/RHC	2251,114.03		11/09/90	01/30/91

LEGEND

- Monitoring Well
- Observation Well
- Soil Boring
- Decommissioned Monitoring Well
- Ground-Water flow direction
- Bench Mark (HLA datum el. = 100 Feet)



Harding Lawson Associates
Engineering and Environmental Services

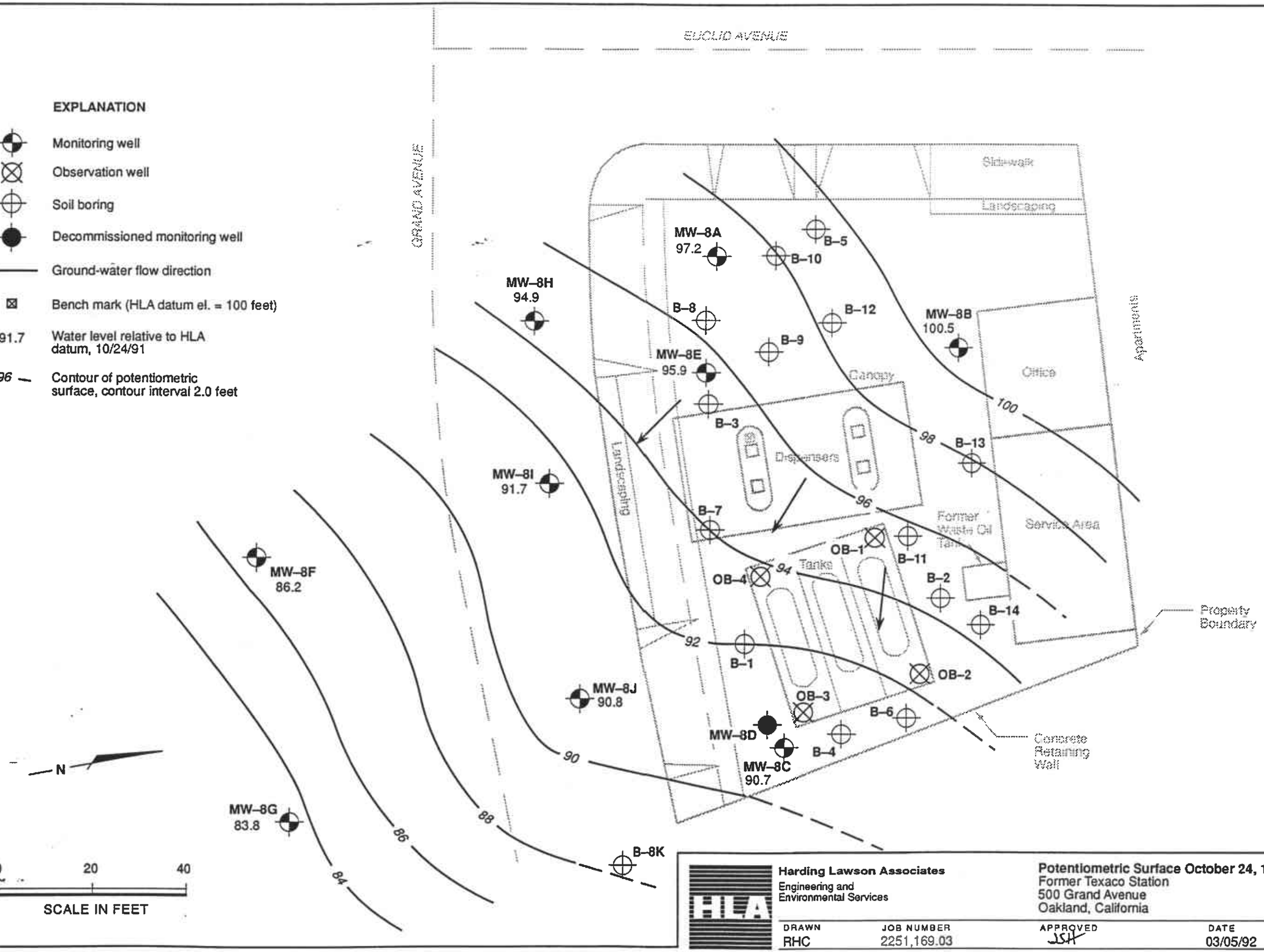
Site Plan
Former Texaco Station
500 Grand Avenue
Oakland, California

PLATE **2**

DRAWN	JOB NUMBER	APPROVED	DATE	REVISED DATE
S. Patel	2251,114.03	JSH	11/09/90	

EXPLANATION

- Monitoring well
- Observation well
- Soil boring
- Decommissioned monitoring well
- Ground-water flow direction
- Bench mark (HLA datum el. = 100 feet)
- 91.7 — Water level relative to HLA datum, 10/24/91
- 96 — Contour of potentiometric surface, contour interval 2.0 feet



Harding Lawson Associates
Engineering and Environmental Services

HLA

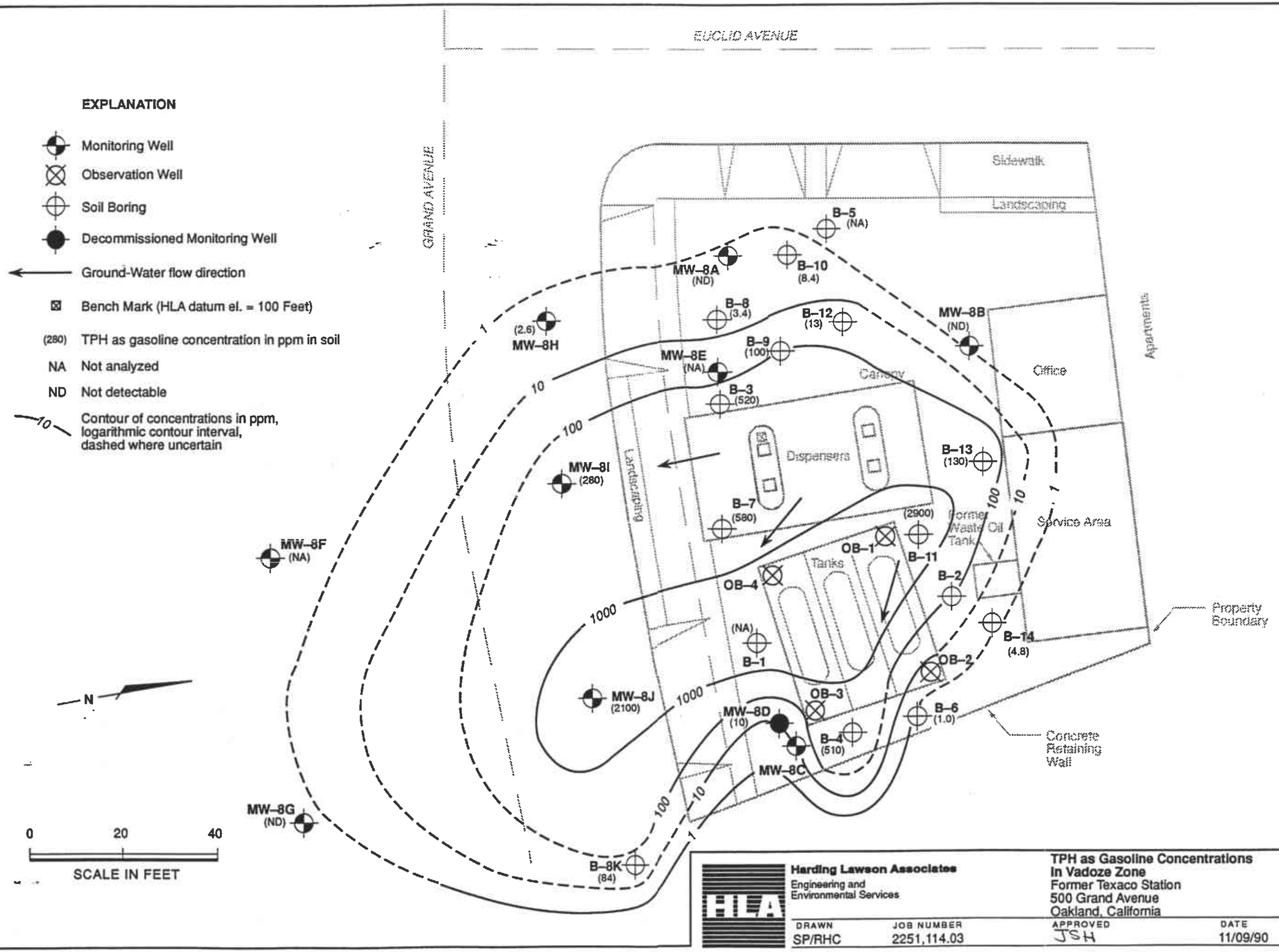
Potentiometric Surface October 24, 1991
Former Texaco Station
500 Grand Avenue
Oakland, California

PLATE **3**

DRAWN	JOB NUMBER	APPROVED	DATE	REVISED DATE
RHC	2251,169.03	JSH	03/05/92	

EXPLANATION

- Monitoring Well
- Observation Well
- Soil Boring
- Decommissioned Monitoring Well
- Ground-Water flow direction
- Bench Mark (HLA datum el. = 100 Feet)
- (280) TPH as gasoline concentration in ppm in soil
- NA Not analyzed
- ND Not detectable
- 10 Contour of concentrations in ppm, logarithmic contour interval, dashed where uncertain



Harding Lawson Associates
Engineering and Environmental Services

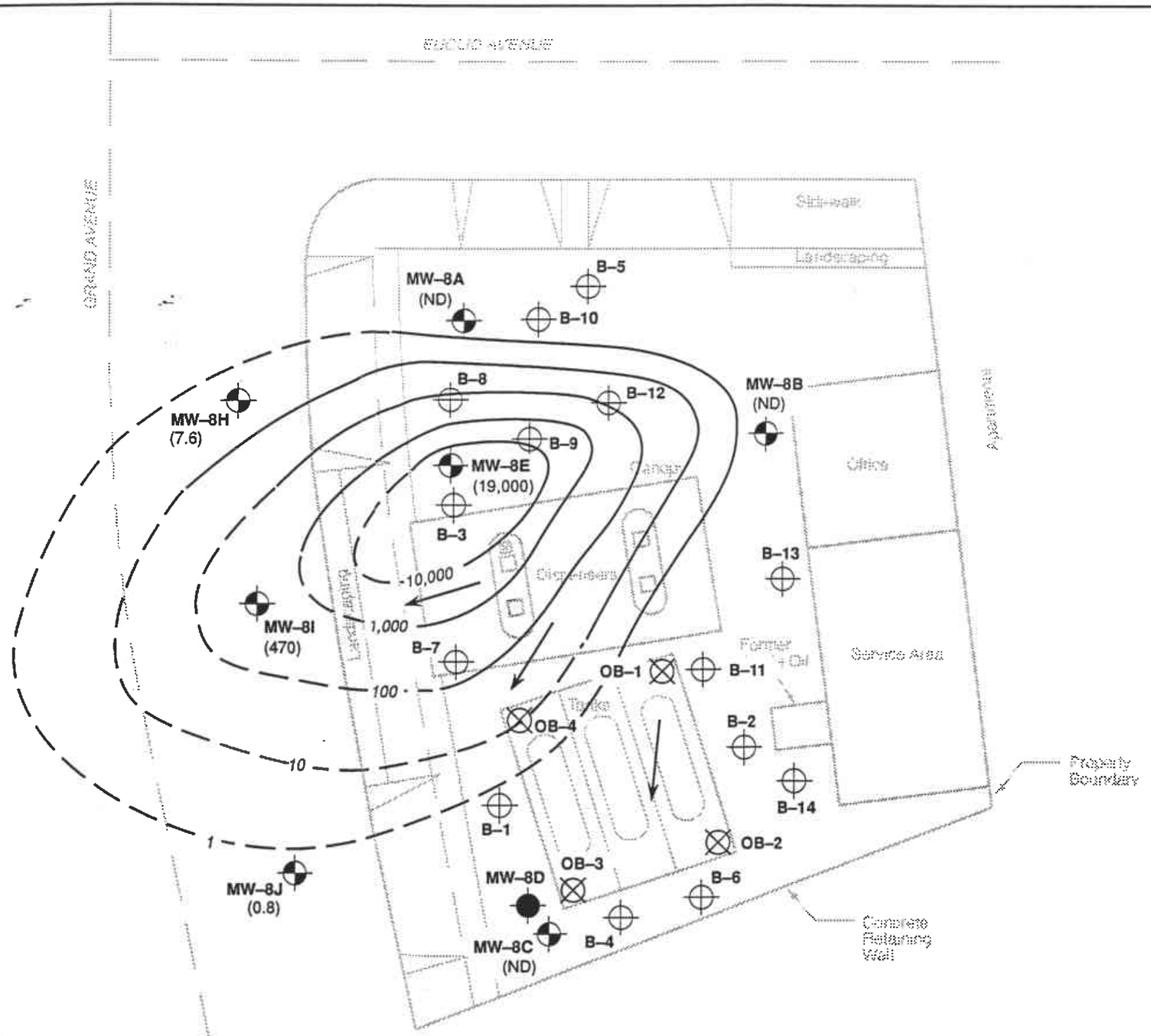
TPH as Gasoline Concentrations In Vadoze Zone
Former Texaco Station
500 Grand Avenue
Oakland, California

PLATE **4**

DRAWN	JOB NUMBER	APPROVED	DATE	REVISED DATE
SP/RHC	2251,114.03	JSH	11/09/90	5/10/91

EXPLANATION

- Monitoring well
- Observation well
- Soil boring
- Decommissioned monitoring well
- Ground-water flow direction
- Bench mark (HLA datum el. = 100 feet)
- (7.6) Benzene concentration in ppb 10/24/91
- ND Not detectable (concentration < 0.5 ppb)
- 10 Contour of concentrations in ppb, logarithmic contour interval, dashed where uncertain



Harding Lawson Associates
Engineering and Environmental Services

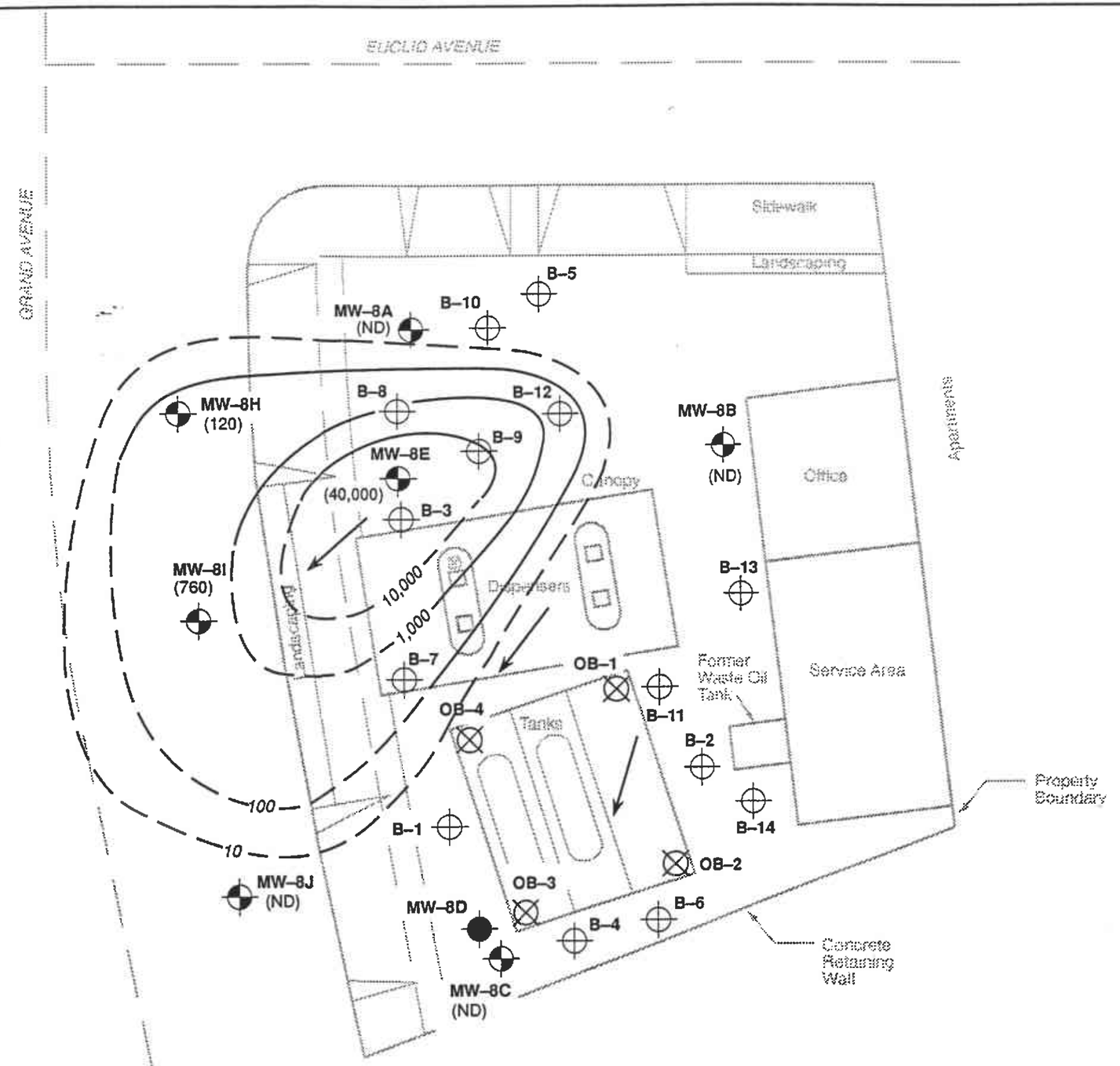
Benzene Concentrations In Groundwater
Former Texaco Station
500 Grand Avenue
Oakland, California

PLATE **5**

DRAWN	JOB NUMBER	APPROVED	DATE	REVISED DATE
S. Patel	2251,169.03	JSH	2/13/92	

EXPLANATION

- Monitoring well
- Observation well
- Soil boring
- Decommissioned monitoring well
- Ground-water flow direction
- Bench mark (HLA datum el. = 100 feet)
- (760) TPH as gasoline concentration in ppb 10/24/91
- ND Not detectable (concentration < 50 ppb)
- 10 Contour of concentrations in ppb, logarithmic contour interval, dashed where uncertain



Harding Lawson Associates
Engineering and Environmental Services

HLA

TPH as Gasoline Concentrations in Groundwater
Former Texaco Station
500 Grand Avenue
Oakland, California

PLATE **6**

DRAWN	JOB NUMBER	APPROVED	DATE	REVISED DATE
RHC	2251,169.03	JSH	03/05/92	

APPENDIX

LABORATORY RESULTS OF GROUNDWATER ANALYSES

NATIONAL
ENVIRONMENTAL
TESTING, INC.

NET Pacific, Inc.
435 Tesconi Circle
Santa Rosa, CA 95401
Tel: (707) 526-7200
Fax: (707) 526-9623

HARDING ASSOC.

NOV 18 1991

Jeanna Hudson
Harding Lawson Associates
1355 Willow Way, Ste. 109
Concord, CA 94520

Date: 11/14/1991
NET Client Acct. No: 34140
NET Pacific Log No: 91.0274
Received: 10/29/1991

Client Reference Information

TEXACO, 500 Grand, Job:2251,169.03

Sample analysis in support of the project referenced above has been completed and results are presented on following pages. Please refer to the enclosed "Key to Abbreviations" for definition of terms. Should you have questions regarding procedures or results, please feel welcome to contact Client Services.

Approved by:

Jules Skamarack
Laboratory Manager

Enclosure(s)

Ref: TEXACO, 500 Grand, Job:2251,169.03

SAMPLE DESCRIPTION: MW-8A
Date Taken: 10/24/1991
Time Taken:
LAB Job No: (-103218)

Parameter	Method	Reporting Limit	Results	Units
GC Ext. (Liquid,3510)			10-31-91	
TPH (Gas/BTXE,Liquid)				
METHOD 5030 (GC,FID)			--	
DATE ANALYZED			11-06-91	
DILUTION FACTOR*			1	
as Gasoline	5030	0.05	ND	mg/L
METHOD 8020 (GC,Liquid)			--	
DATE ANALYZED			11-06-91	
DILUTION FACTOR*			1	
Benzene	8020	0.5	ND	ug/L
Ethylbenzene	8020	0.5	ND	ug/L
Toluene	8020	0.5	ND	ug/L
Xylenes (Total)	8020	0.5	ND	ug/L
METHOD 3510 (GC,FID)				
DILUTION FACTOR*			1	
DATE EXTRACTED			10-31-91	
DATE ANALYZED			11-07-91	
as Diesel	3510	0.05	ND	mg/L
as Motor Oil	3510	0.5	ND	mg/L

NET Pacific, Inc

Client Acct: 34140
Client Name: Harding Lawson Associates
NET Log No: 91.0274

Date: 11/14/1991
Page: 3

Ref: TEXACO, 500 Grand, Job:2251,169.03

SAMPLE DESCRIPTION: MW-8B
Date Taken: 10/24/1991
Time Taken:
LAB Job No: (-103219)

Parameter	Method	Reporting Limit	Results	Units
GC Ext. (Liquid,3510)			10-31-91	
TPH (Gas/BTXE,Liquid)				
METHOD 5030 (GC,FID)			--	
DATE ANALYZED			11-06-91	
DILUTION FACTOR*			1	
as Gasoline	5030	0.05	ND	mg/L
METHOD 8020 (GC,Liquid)			--	
DATE ANALYZED			11-06-91	
DILUTION FACTOR*			1	
Benzene	8020	0.5	ND	ug/L
Ethylbenzene	8020	0.5	ND	ug/L
Toluene	8020	0.5	ND	ug/L
Xylenes (Total)	8020	0.5	ND	ug/L
METHOD 3510 (GC,FID)				
DILUTION FACTOR*			1	
DATE EXTRACTED			10-31-91	
DATE ANALYZED			11-07-91	
as Diesel	3510	0.05	ND	mg/L
as Motor Oil	3510	0.5	ND	mg/L

NET Pacific, Inc

Client Acct: 34140
Client Name: Harding Lawson Associates
NET Log No: 91.0274

Date: 11/14/1991
Page: 4

Ref: TEXACO, 500 Grand, Job:2251,169.03

SAMPLE DESCRIPTION: MW-8C
Date Taken: 10/24/1991
Time Taken:
LAB Job No: (-103220)

Parameter	Method	Reporting Limit	Results	Units
GC Ext. (Liquid,3510)			10-31-91	
TPH (Gas/BTXE,Liquid)				
METHOD 5030 (GC,FID)			--	
DATE ANALYZED			11-06-91	
DILUTION FACTOR*			1	
as Gasoline	5030	0.05	ND	mg/L
METHOD 8020 (GC,Liquid)			--	
DATE ANALYZED			11-06-91	
DILUTION FACTOR*			1	
Benzene	8020	0.5	ND	ug/L
Ethylbenzene	8020	0.5	ND	ug/L
Toluene	8020	0.5	ND	ug/L
Xylenes (Total)	8020	0.5	ND	ug/L
METHOD 3510 (GC,FID)				
DILUTION FACTOR*			1	
DATE EXTRACTED			10-31-91	
DATE ANALYZED			11-07-91	
as Diesel	3510	0.05	ND	mg/L
as Motor Oil	3510	0.5	ND	mg/L

NET Pacific, Inc

Client Acct: 34140
Client Name: Harding Lawson Associates
NET Log No: 91.0274

Date: 11/14/1991
Page: 5

Ref: TEXACO, 500 Grand, Job:2251,169.03

SAMPLE DESCRIPTION: MW-8E
Date Taken: 10/24/1991
Time Taken:
LAB Job No: (-103221**)

Parameter	Method	Reporting Limit	Results	Units
GC Ext. (Liquid,3510)			10-31-91	
TPH (Gas/BTXE,Liquid)				
METHOD 5030 (GC,FID)			--	
DATE ANALYZED			11-06-91	
DILUTION FACTOR*			100	
as Gasoline	5030	0.05	40	mg/L
METHOD 8020 (GC,Liquid)			--	
DATE ANALYZED			11-06-91	
DILUTION FACTOR*			100	
Benzene	8020	0.5	19,000	ug/L
Ethylbenzene	8020	0.5	1,100	ug/L
Toluene	8020	0.5	6,100	ug/L
Xylenes (Total)	8020	0.5	4,900	ug/L
METHOD 3510 (GC,FID)				
DILUTION FACTOR*			10	
DATE EXTRACTED			10-31-91	
DATE ANALYZED			11-07-91	
as Diesel	3510	0.05	9.4	mg/L
as Motor Oil	3510	0.5	ND	mg/L

** Note: The positive result for the PETROLEUM HYDROCARBONS as Diesel analysis on this sample appears to be a lighter hydrocarbon than diesel.

NET Pacific, Inc

Client Acct: 34140
Client Name: Harding Lawson Associates
NET Log No: 91.0274

Date: 11/14/1991
Page: 8

Ref: TEXACO, 500 Grand, Job:2251,169.03

SAMPLE DESCRIPTION: MW-8F
Date Taken: 10/24/1991
Time Taken:
LAB Job No: (-103224)

Parameter	Method	Reporting Limit	Results	Units
GC Ext. (Liquid,3510)			10-31-91	
TPH (Gas/BTXE,Liquid)				
METHOD 5030 (GC,FID)			--	
DATE ANALYZED			11-06-91	
DILUTION FACTOR*			1	
as Gasoline	5030	0.05	ND	mg/L
METHOD 8020 (GC,Liquid)			--	
DATE ANALYZED			11-06-91	
DILUTION FACTOR*			1	
Benzene	8020	0.5	ND	ug/L
Ethylbenzene	8020	0.5	ND	ug/L
Toluene	8020	0.5	ND	ug/L
Xylenes (Total)	8020	0.5	ND	ug/L
METHOD 3510 (GC,FID)				
DILUTION FACTOR*			1	
DATE EXTRACTED			10-31-91	
DATE ANALYZED			11-07-91	
as Diesel	3510	0.05	ND	mg/L
as Motor Oil	3510	0.5	ND	mg/L

NET Pacific, Inc

Client Acct: 34140
Client Name: Harding Lawson Associates
NET Log No: 91.0274

Date: 11/14/1991
Page: 10

Ref: TEXACO, 500 Grand, Job:2251,169.03

SAMPLE DESCRIPTION: MW-8G
Date Taken: 10/24/1991
Time Taken:
LAB Job No: (-103226)

Parameter	Method	Reporting Limit	Results	Units
TPH (Gas/BTXE,Liquid)				
METHOD 5030 (GC,FID)			--	
DATE ANALYZED			11-06-91	
DILUTION FACTOR*			1	
as Gasoline	5030	0.05	ND	mg/L
METHOD 8020 (GC,Liquid)			--	
DATE ANALYZED			11-06-91	
DILUTION FACTOR*			1	
Benzene	8020	0.5	0.6	ug/L
Ethylbenzene	8020	0.5	ND	ug/L
Toluene	8020	0.5	ND	ug/L
Xylenes (Total)	8020	0.5	ND	ug/L

Ref: TEXACO, 500 Grand, Job:2251,169.03

SAMPLE DESCRIPTION: MW-8H
Date Taken: 10/24/1991
Time Taken:
LAB Job No: (-103222**)

Parameter	Method	Reporting Limit	Results	Units
GC Ext. (Liquid,3510)			10-31-91	
TPH (Gas/BTXE,Liquid)				
METHOD 5030 (GC,FID)			--	
DATE ANALYZED			11-06-91	
DILUTION FACTOR*			1	
as Gasoline	5030	0.05	0.12	mg/L
METHOD 8020 (GC,Liquid)			--	
DATE ANALYZED			11-06-91	
DILUTION FACTOR*			1	
Benzene	8020	0.5	7.6	ug/L
Ethylbenzene	8020	0.5	3.5	ug/L
Toluene	8020	0.5	1.0	ug/L
Xylenes (Total)	8020	0.5	2.4	ug/L
METHOD 3510 (GC,FID)				
DILUTION FACTOR*			1	
DATE EXTRACTED			10-31-91	
DATE ANALYZED			11-07-91	
as Diesel	3510	0.05	0.07	mg/L
as Motor Oil	3510	0.5	ND	mg/L

** Note: The positive result for the PETROLEUM HYDROCARBONS as Diesel analysis on this sample appears to be a lighter hydrocarbon than diesel.

Ref: TEXACO, 500 Grand, Job:2251,169.03

SAMPLE DESCRIPTION: MW-8I
Date Taken: 10/24/1991
Time Taken:
LAB Job No: (-103223**)

Parameter	Method	Reporting Limit	Results	Units
GC Ext. (Liquid,3510)			10-31-91	
TPH (Gas/BTXE,Liquid)				
METHOD 5030 (GC,FID)			--	
DATE ANALYZED			11-06-91	
DILUTION FACTOR*			1	
as Gasoline	5030	0.05	0.76	mg/L
METHOD 8020 (GC,Liquid)			--	
DATE ANALYZED			11-06-91	
DILUTION FACTOR*			1	
Benzene	8020	0.5	470	ug/L
Ethylbenzene	8020	0.5	76	ug/L
Toluene	8020	0.5	6.0	ug/L
Xylenes (Total)	8020	0.5	13	ug/L
METHOD 3510 (GC,FID)				
DILUTION FACTOR*			1	
DATE EXTRACTED			10-31-91	
DATE ANALYZED			11-07-91	
as Diesel	3510	0.05	0.23	mg/L
as Motor Oil	3510	0.5	ND	mg/L

** Note: The positive result for the PETROLEUM HYDROCARBONS as Diesel analysis on this sample appears to be a lighter hydrocarbon than diesel.

Ref: TEXACO, 500 Grand, Job:2251,169.03

SAMPLE DESCRIPTION: MW-8J
Date Taken: 10/24/1991
Time Taken:
LAB Job No: (-103225)

Parameter	Method	Reporting Limit	Results	Units
GC Ext. (Liquid,3510)			10-31-91	
TPH (Gas/BTXE,Liquid)				
METHOD 5030 (GC,FID)			--	
DATE ANALYZED			11-06-91	
DILUTION FACTOR*			1	
as Gasoline	5030	0.05	ND	mg/L
METHOD 8020 (GC,Liquid)			--	
DATE ANALYZED			11-06-91	
DILUTION FACTOR*			1	
Benzene	8020	0.5	0.8	ug/L
Ethylbenzene	8020	0.5	ND	ug/L
Toluene	8020	0.5	ND	ug/L
Xylenes (Total)	8020	0.5	ND	ug/L
METHOD 3510 (GC,FID)				
DILUTION FACTOR*			1	
DATE EXTRACTED			10-31-91	
DATE ANALYZED			11-07-91	
as Diesel	3510	0.05	ND	mg/L
as Motor Oil	3510	0.5	ND	mg/L

NET Pacific, Inc

Client Acct: 34140
Client Name: Harding Lawson Associates
NET Log No: 91.0274

Date: 11/14/1991
Page: 11

Ref: TEXACO, 500 Grand, Job:2251,169.03

QUALITY CONTROL DATA

Parameter	Reporting Limits	Units	Cal Verf Stand % Recovery	Blank Data	Spike % Recovery	Duplicate Spike % Recovery	RPD
Diesel	0.05	mg/L	109	ND	55	60	8.7
Motor Oil	0.5	mg/L	128	ND	N/A	N/A	N/A
Gasoline	0.05	mg/L	116	ND	99	108	< 1
Benzene	0.5	ug/L	116	ND	79	88	11
Toluene	0.5	ug/L	116	ND	88	90	2.2

COMMENT: Blank Results were ND on other analytes tested.

NET Pacific, Inc

KEY TO ABBREVIATIONS and METHOD REFERENCES

<	:	Less than; When appearing in results column indicates analyte not detected at the value following. This datum supercedes the listed Reporting Limit.
*	:	Reporting Limits are a function of the dilution factor for any given sample. To obtain the actual reporting limits for this sample, multiply the stated Reporting Limits by the dilution factor (but do not multiply reported values).
ICVS	:	Initial Calibration Verification Standard (External Standard).
mean	:	Average; sum of measurements divided by number of measurements.
mg/Kg (ppm)	:	Concentration in units of milligrams of analyte per kilogram of sample, (parts per million).
mg/L	:	Concentration in units of milligrams of analyte per liter of sample.
mL/L/hr	:	Milliliters per liter per hour.
MPN/100 mL	:	Most probable number of bacteria per one hundred milliliters of sample.
N/A	:	Not applicable.
NA	:	Not analyzed.
ND	:	Not detected; the analyte concentration is less than applicable listed reporting limit.
NTU	:	Nephelometric turbidity units.
RPD	:	Relative percent difference, 100 [Value 1 - Value 2]/mean value.
SNA	:	Standard not available.
ug/Kg (ppb)	:	Concentration in units of micrograms of analyte per kilogram of sample, (parts per billion).
ug/L	:	Concentration in units of micrograms of analyte per liter of sample.
umhos/cm	:	Micromhos per centimeter.

Method References

Methods 100 through 493: see "Methods for Chemical Analysis of Water & Wastes", U.S. EPA, 600/4-79-020, rev. 1983.

Methods 601 through 625: see "Guidelines Establishing Test Procedures for the Analysis of Pollutants" U.S. EPA, 40 CFR, Part 136, rev. 1988.

Methods 1000 through 9999: see "Test Methods for Evaluating Solid Waste", U.S. EPA SW-846, 3rd edition, 1986.

SM: see "Standard Methods for the Examination of Water & Wastewater, 17th Edition, APHA, 1989.

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

CHAIN OF CUSTODY FORM

Lab: NET (1798)

Samplers: Steve Hanson

Job Number: 2251,169.03

Name/Location: Texaco 500 Grand

Project Manager: Jeanna Hudson

Recorder: Steve B. Hanson (Signature Required)

SOURCE CODE	MATRIX: Water	Sediment	Soil	Oil	#CONTAINERS & PRESERV.: Unpres.	H_2SO_4	HNO_3	HCl	SAMPLE NUMBER OR LAB NUMBER: Yr	Wk	Seq	DATE: Yr	Mo	Dy	Time
23	X				3			3	MW	-	8A	91	10	24	
23	X				3			3	MW	-	8B				
23	X				3			3	MW	-	8C				
23	X				3			3	MW	-	8E				
23	X				3			3	MW	-	8H				
23	X				3			3	MW	-	8I				
23	X				2			3	MW	-	8F				
23	X				0			3	MW	-	8G				
23	X				3			3	MW	-	8J				

STATION DESCRIPTION/ NOTES

STANDARD TURNAROUND

ANALYSIS REQUESTED

EPA 601/8010	EPA 602/8020	EPA 624/8240	EPA 625/8270	ICP METALS	EPA 8015M/TPH	TPH gas BTEX	TPH diesel
						X	X
						X	X
						X	X
						X	X
						X	X
						X	X
						X	X
						X	X
						X	
						X	X

LAB NUMBER: Yr	Wk	Seq	DEPTH IN FEET	COL MTD CD	QA CODE	MISCELLANEOUS
						CUSTODY SEALED 10/28/91
					17:30	Tom seal intact

CHAIN OF CUSTODY RECORD

RELINQUISHED BY: (Signature)	RECEIVED BY: (Signature)	DATE/TIME
Steve B. Hanson	[illegible]	10/28/91 12:00
RELINQUISHED BY: (Signature) 10/28	RECEIVED BY: (Signature)	DATE/TIME
[illegible] 17:30		
RELINQUISHED BY: (Signature)	RECEIVED BY: (Signature)	DATE/TIME
RELINQUISHED BY: (Signature)	RECEIVED BY: (Signature)	DATE/TIME
DISPATCHED BY: (Signature) DATE/TIME	RECEIVED FOR LAB BY: (Signature)	DATE/TIME
	[illegible]	10/29/91 0800
METHOD OF SHIPMENT: UCS		

Laboratory Copy White — Project Office Copy Yellow — Field or Office Copy Pink

6533

DISTRIBUTION

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

Attention: Mr. R. R. Zielinski

JSH/SJO/mlw 032597M/R53

QUALITY CONTROL REVIEWER

Edward R. Close
Principal Geologist