



Texaco USA

10 Universal City Plaza
PO Box 7812
Universal City CA 91608-7812

June 26, 1990

Mr. Tom Callaghan
California Regional Water Quality Control District
1800 Harrison Rd., Suite 700
Oakland, Ca 94607

Dear Mr. Callaghan:

Paul Smith

Enclosed, please find the Quarterly Technical Report for the former Texaco Station located at 500 Grand Ave., in Oakland, California. ⁹⁴⁶⁰⁷

If you have any questions, please feel free to contact Robert Conlon at (818) 505-2687.

Sincerely,

Kim Gumbiner

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

90 JUN 29 PM 1:20


A Report Prepared for

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

QUARTERLY TECHNICAL REPORT
FIRST QUARTER OF 1990
FORMER TEXACO STATION NO. 6248800235
500 GRAND AVENUE
OAKLAND, CALIFORNIA

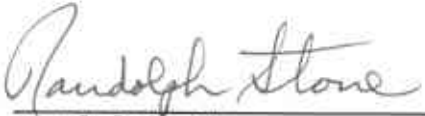
HLA Job No. 2251,114.03
June 13, 1990
1990 Report No. 2

by



Jeanna S. Hudson
Senior Geologist





Randolph Stone
Associate Hydrogeologist



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

INTRODUCTION

This Quarterly Technical Report (QTR) presents the results of investigation activities by Harding Lawson Associates (HLA) through the first quarter of 1990 at the former site of Texaco service station No. 6248800235, 500 Grand Avenue, Oakland, California (Plate 1). This report also summarizes previous work at the site and describes planned activities for the second quarter of 1990.

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 1989, HLA had completed the following tasks in the site investigation:

- Conducted a soil-gas survey at 18 locations on or near the site (survey performed by Tracer Research Corporation)
- Drilled and developed four 2-inch-diameter groundwater monitoring wells (MW-8A, MW-8B, MW-8C, and MW-8D) and three 4-inch-diameter monitoring wells (MW-8E, MW-8F and MW-8G). Locations are shown on Plate 2.
- Obtained groundwater samples from each well and analyzed them for benzene, toluene, ethylbenzene, and total xylenes (BTEX), and total petroleum hydrocarbons (TPH) as gasoline and as diesel fuel.

- Drilled and sampled nine soil borings to identify and delineate the extent of hydrocarbons in the vadose zone (Plate 2)
- Analyzed all soil samples for BTEX and TPH as gasoline
- Analyzed soil samples from B-6, B-7, B-8 and B-9 for TPH as diesel fuel
- Gauged water levels and estimated the direction of groundwater flow
- Performed slug tests on MW-8C and MW-8E to estimate hydraulic conductivity
- Submitted an Environmental Assessment Report to Texaco during the third quarter of 1989
- Pumped and disposed of 5,000 gallons of water from the tank backfill as an interim remedial measure.

The results of the soil-gas survey indicated volatile organic compounds in the soil gas near the underground storage tanks and dispenser islands. Analyses on water samples from the four observation wells showed the presence of dissolved petroleum hydrocarbons in groundwater adjacent to the underground tanks.

Table 1 presents the results of groundwater analyses obtained since 1988. Significant concentrations of BTEX have been present in water from MW-8E, and observation wells OB-3 and OB-4 contain benzene concentrations above the drinking water action level (DWAL). Analyses of groundwater from wells MW-8A, MW-8B, and MW-8C indicate BTEX concentrations that are either nondetectable or below the DWALs.

Results of chemical analyses on groundwater from off-site wells MW-8F and MW-8G indicated nondetectable concentrations of BTEX and TPH as gasoline. Because of insufficient water, MW-8D

was not sampled nor was its water level measured; the well was decommissioned in accordance with requirements set forth by the Alameda County Flood Control and Water Conservation District, Zone 7.

Local groundwater flow is to the south and southeast, toward Lake Merritt (Plate 3). Water-level data from monitoring wells across the site show that the water table fluctuates one to three feet. Data regarding the water level in MW-8A indicated fluctuations as great as 8 feet; those data were not used in contouring the phreatic surface. Slug test data from MW-8C and MW-8E indicate relatively low permeabilities (Table 2) and unconfined aquifer conditions. Groundwater would be expected to move through these soils relatively slowly.

Soil samples and drill cuttings indicate that the subsurface at the site is composed of clay and minor amounts of interbedded clayey sand. Chemical analyses of soils indicate the presence of gasoline hydrocarbons in the vadose zone (from 1 to 7 feet below grade) in B-1, B-3, B-4, B-7, B-8, B-9 and MW-8D (Table 3).

ACCOMPLISHMENTS DURING FIRST QUARTER 1990

During the first quarter of 1990, HLA implemented a plan for a supplemental soil and groundwater investigation at the site, which consisted of drilling four additional soil borings (B-8K, B-10, B-11, and B-12) and installing three monitoring wells (MW-8H, MW-8I and MW-8J, Plate 2). This supplemental investigation

was conducted in order to refine the site evaluation and aid in the selection of the most appropriate methods of groundwater and soil remediation.

Drilling and Soil Sampling

The four additional on-site soil borings were drilled to depths ranging from 6.0 feet to 9.5 feet. An 8-inch-diameter, hollow-stem auger was used. Soil samples were collected by driving a 2.5-inch-diameter, Sprague and Henwood (S&H), split-barrel sampler into the bottom of the boring. The sampler was lined with 6-inch-long stainless steel sampling tubes.

Several samples were collected from each boring and logged in accordance with the Unified Soil Classification System. Each sample was screened for volatile organic compounds, using a photoionization detector (PID); those selected for chemical analysis were sealed, labeled, and stored in an ice chest. The samples were transported under chain-of-custody to ETC Multi-Tech, in Santa Rosa, California, where they were analyzed for BTEX, TPH as diesel fuel, and TPH as gasoline.

Monitoring Well Construction

Three off-site monitoring wells were installed under permit from the Alameda County Flood Control and Water Conservation District, Zone 7 and the City of Oakland. The wells were drilled to a depth of 16.5 feet with a 10-inch-diameter, hollow-stem auger. Soil samples were collected using the previously described method. The wells were constructed using 4-inch-

diameter, Schedule 40, flush-threaded polyvinylchloride (PVC) casing and 0.020-inch screen over the bottom 10 feet of the borehole. The annular space between the screened casing and the borehole wall was filled with No. 3 Monterey sand to approximately 2 feet above the top of the screened interval. A bentonite seal was placed above the sand pack, and the remainder of the annulus was filled with cement/bentonite grout. The wells were equipped with locking, water-tight caps, and a water-tight traffic box was installed over each well.

The wells were purged by removing 10 casing volumes of water using a PVC bailer. 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 and 1-liter amber bottles. The samples were then transported, under chain-of-custody, to ETC Multi-Tech, in Santa Rosa, California, where they were analyzed for BTEX, TPH as gasoline, and TPH as diesel fuel.

Results of Analyses

Soil samples were collected from the new borings to further investigate the vertical and lateral extent of hydrocarbons in the subsurface. Table 3 includes results of soil analyses obtained during the first quarter.

A contour map of concentrations of TPH as gasoline in the vadose zone is presented on Plate 4. To define whether soil

samples represented the vadose zone, sample depths were compared with static water levels at the time of sample collection. Because the water table is very shallow and subject to frequent fluctuations, the vadose zone may be thinner during times of capillary fringe encroachment.

Plate 4 depicts a hydrocarbon plume that appears to originate at the underground tanks and extend off-site to MW-8J. Significant concentrations of TPH as gasoline are also found in the area of the dispenser islands. The highest concentration, 2,900 parts per million (ppm), was found in a soil sample collected at a depth of 1.5 foot in B-11. This boring is adjacent to and upgradient from the underground tanks. Soils collected in MW-8J at a depth of 5.5 feet during drilling contained 2,100 ppm TPH as gasoline.

In general, BTEX concentrations in the soil are either below the detection limit or very low. 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.

As shown in Table 1, results for the most recent groundwater testing indicates notable concentrations of hydrocarbons in samples from MW-8E, MW-8H, and MW-8I. A contour map of concentrations of TPH as gasoline in groundwater is presented on Plate 5, and a contour map of benzene concentrations on Plate 6. These maps suggest that the source areas of hydrocarbons in the groundwater may have been the underground tanks, as well as the dis-

dispenser islands. Monitoring well MW-8E, located cross-gradient and down-gradient of the dispenser islands, has the highest concentrations of BTEX, TPH as gasoline, and TPH as diesel fuel.

Groundwater containing TPH as gasoline was detected downgradient from MW-8E in water from monitoring wells MW-8H, MW-8I, and MW-8J. Benzene concentrations in these wells exceed the DWALs (1.0 parts per billion [ppb]). The absence of detectable concentrations of BTEX or TPH as gasoline in MW-8F and MW-8G suggests that the edge of the hydrocarbon-bearing groundwater plume lies under Grand Avenue. Although the most recent analysis indicates 650 ppb TPH as diesel in groundwater from MW-8G, previous tests showed non-detectable concentrations. Continued quarterly sampling is necessary to confirm the presence of TPH as diesel in this downgradient location.

ANTICIPATED ACTIVITIES FOR SECOND QUARTER 1990

HLA plans to sample soil in the shallow vadose zone at two locations, B-13 and B-14, during the second quarter of 1990. The proposed borings, to be drilled near the service building (Plate 2), will provide data on the hydrocarbon content of soil on the north side of the site. When the analytical results have been evaluated, HLA will begin evaluating remedial options. In addition to these activities, we will measure groundwater levels in all wells monthly, and conduct quarterly sampling and chemical analyses of the groundwater.

LIST OF TABLES

Table	1	Results of Groundwater Analyses
Table	2	Slug Test Results
Table	3	Results of Soil Sample Analyses

LIST OF ILLUSTRATIONS

Plate	1	Regional Map
Plate	2	Site Plan
Plate	3	Phreatic Surface - February 1990
Plate	4	Contour Map of TPH (gasoline) Concentrations in Vadose Zone
Plate	5	Contour Map of TPH (gasoline) Concentrations in Groundwater
Plate	6	Contour Map of Benzene Concentrations in Groundwater

Table 1. Results of Groundwater Analyses
Concentrations in $\mu\text{g/l}$ (ppb)

Well	Depth (feet)	Date Sampled	Benzene	Toluene	Ethyl-benzene	Xylenes	TPH as Gasoline	TPH as Diesel
MW-8A	32	06/14/88	<0.5*	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
		01/24/90	<0.5	<0.5	<0.5	<0.5	<100	2,800
MW-8B	20	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
		01/24/90	<0.5	<0.5	<0.5	<0.5	<100	300
MW-8C	24.5	06/14/88	5.3	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
		01/24/90	0.9	<0.5	<0.5	<0.5	<100	480
MW-8E	20	10/25/88	1,400	510	2.9	420		
		09/28/89	5,600	3,100	<500	<3,000	22,000	
		11/29/89	4,900	2,600	<250	1,490	15,000	6,800
		01/24/90	10,100	3,340	540	1,790	36,000	4,900
MW-8F	16.5	04/14/89	<0.5	<1	<2	<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
		01/24/90	<0.5	<0.5	<0.5	<0.5	<100	<300
MW-8G	16.5	04/14/89	<0.5	<1	<2	<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
		01/24/90	<0.5	<0.5	<0.5	<0.5	<100	600
MW-8H	16.5	01/24/90	14.8	14.8	10.8	38.8	460	<300
MW-8I	16.5	01/24/90	116	2.9	13	30.5	580	400
MW-8J	16.5	01/24/90	2.7	<0.5	1	2.6	<100	<300
OB-3	11.5	11/06/89	420	8	6	64	4,000	
OB-4	10.0	11/06/89	500	11	10	24	4,000	
DWAL			1.0	680	100	1,750		

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

* <0.5 indicates that concentrations are below the reporting limit of 0.5 $\mu\text{g/l}$.

Table 2. Slug Test Results

<u>Well Number</u>	<u>Lithology of Tested Soils</u>	<u>Thickness of Tested Soils (feet)</u>	<u>Estimated Hydraulic Conductivity of Tested Soils (feet/day)</u>
MW-8C	Silty clay	13	0.03
MW-8E	Sandy clay, clayey sand	11.5	0.02

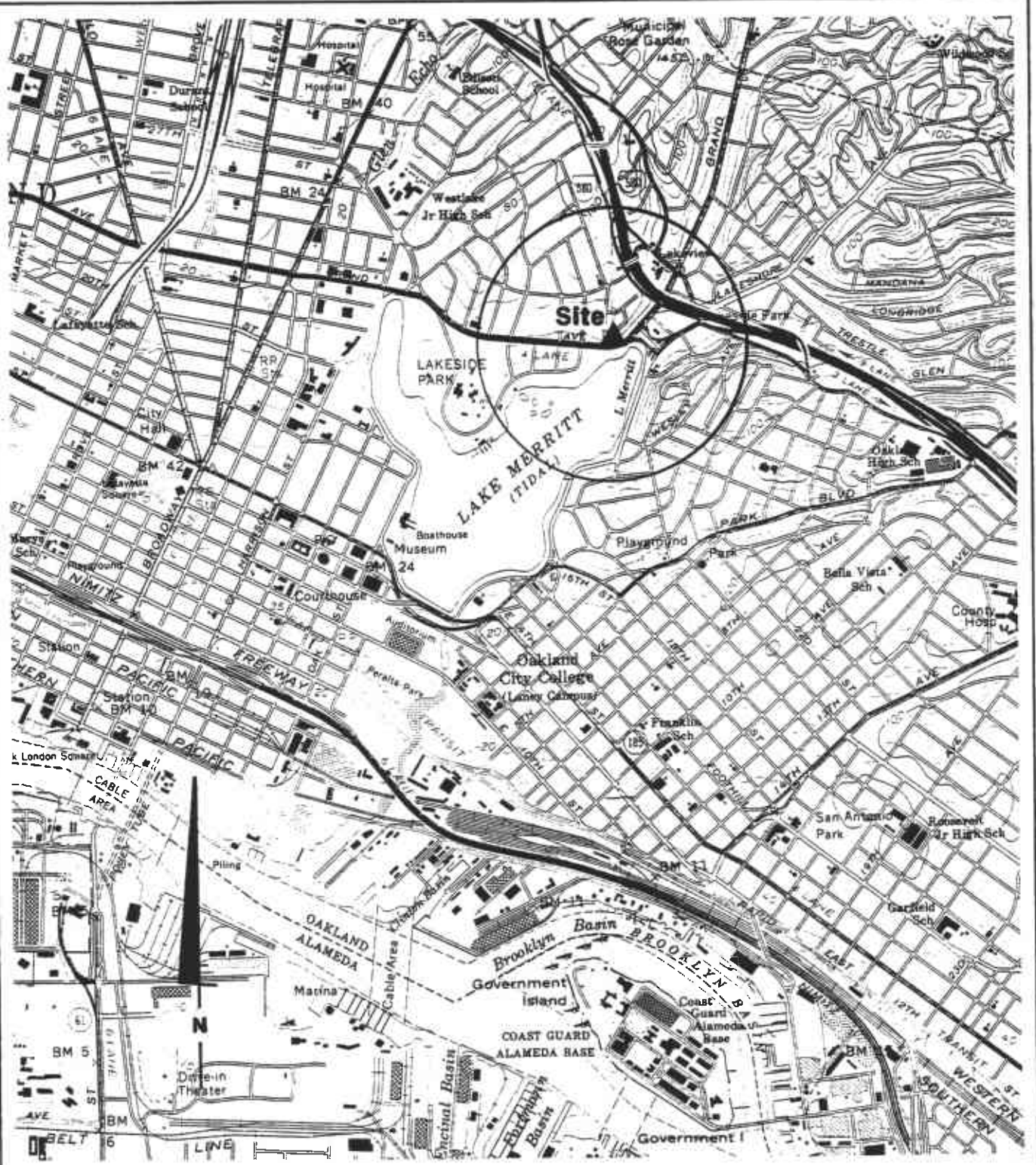
Table 3. Results of Soil Sample Analyses
(concentrations in mg/kg [ppm])

Boring/ Well Number	Sample Depth (feet)	Benzene	Toluene	Ethyl- benzene	Xylenes	TPH (gasoline)	TPH (diesel)
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	ND	ND	ND	ND	ND	NA
B-6	2.0	ND	0.08	ND	ND	1.0	<100*
B-6	4.5	ND	0.09	ND	ND	ND	<10
B-7	3.0	ND	6.7	5.1	50	580	<100*
B-8	2.0	0.05	ND	ND	0.34	3.4	<10
B-9	2.5	0.05	0.32	0.81	6.4	100	460
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
B12	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
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	ND	ND	ND	ND	ND	NA
MW-8G	6	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.



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



HLA **Harding Lawson Associates**
 Engineers and Geoscientists

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

PLATE
1

DRAWN YC	JOB NUMBER 2251,081.03	APPROVED AK	DATE 5/89	REVISED	DATE
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EUCLID AVENUE

GRAND AVENUE



- LEGEND**
- Monitoring well
 - Observation well
 - Soil boring
 - Decommissioned monitoring well
 - Ground-water flow direction
 - Bench mark (HLA datum el.=100 feet)

MW-8F

MW-8G

MW-8H

MW-8I

MW-8J

MW-8A

B-8

MW-8E

B-3

B-7

B-1

MW-8D

MW-8C

B-5

B-10

B-12

B-9

B-4

OB-4

OB-3

B-4

Waste Oil Tank

MW-8B

B-13

B-2

B-14

OB-1

B-11

OB-2

B-6

Sidewalk

Landscaping

Canopy

Dispensers

Tanks

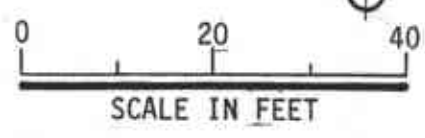
Office

Service Area

Apartments

Property Boundary

Concrete Retaining Wall



Harding Lawson Associates
Engineering and
Environmental Services

DRAWN YC
JOB NUMBER 2251,081.03

Site Plan
Former Texaco Station
500 Grand Avenue
Oakland, California

APPROVED
[Signature]

DATE 12/89

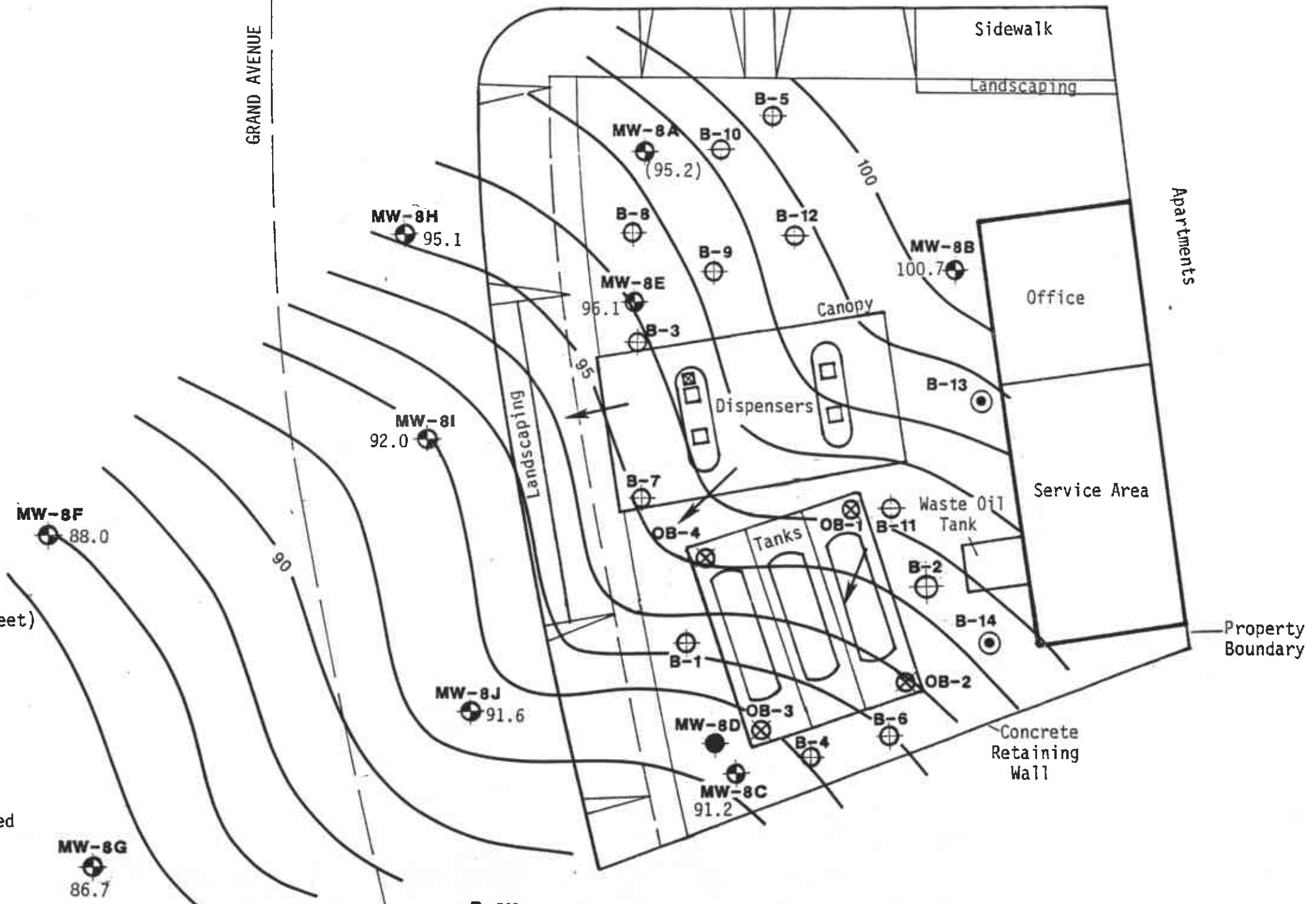
REVISED DATE

EUCLID AVENUE



GRAND AVENUE

- LEGEND**
- Monitoring well
 - Observation well
 - Soil boring
 - Decommissioned monitoring well
 - Ground-water flow direction
 - Bench mark (HLA datum el.=100 feet)
 - Proposed Soil Boring
- 92.0 Water level relative to HLA datum, 2/27/90
- 95 Contour of phreatic surface, contour interval 1.0 foot
- (95.2) Suspect data point, not contoured



Harding Lawson Associates
 Engineering and Environmental Services

DRAWN: YC JOB NUMBER: 2251,081.03

Phreatic Surface - February 1990
 Former Texaco Station
 500 Grand Avenue
 Oakland, California

APPROVED: *[Signature]* DATE: 12/89 REVISED DATE:

EUCLID AVENUE

GRAND AVENUE



- LEGEND**
- ⊕ Monitoring well
 - ⊗ Observation well
 - ⊕ Soil boring
 - Decommissioned monitoring well
 - ← Ground-water flow direction
 - ⊠ Bench mark (HLA datum el.=100 feet)
 - ⊙ Proposed Soil Boring
 - 280 TPH (gasoline) concentration in ppm
 - NA Not analyzed
 - ND Non detectable
 - - - Contour of concentrations, logarithmic contour interval, dashed where uncertain

MW-8F NA

MW-8G ND

MW-8H 2.6

MW-8I 280

MW-8J 2100

B-8K 84

MW-8A NA

B-8 3.4

MW-8E NA

B-7 580

OB-4

NA B-1

MW-8D 10

MW-8C 510

B-5 NA

B-10 8.4

B-12 13

B-9 100

B-3 520

B-7 580

NA B-1

MW-8D 10

MW-8C 510

B-5 NA

B-10 8.4

B-12 13

B-9 100

B-3 520

B-7 580

NA B-1

MW-8D 10

MW-8C 510

MW-8B NA

B-13

B-11 2900

B-14

B-6 1.0

Sidewalk

Landscaping

Canopy

Dispensers

Tanks

Waste Oil Tank

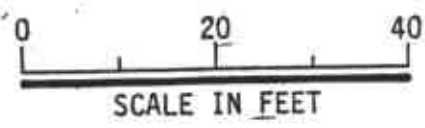
Office

Service Area

Apartments

Concrete Retaining Wall

Property Boundary



Harding Lawson Associates
Engineering and Environmental Services

DRAWN YC JOB NUMBER 2251,081.03

Contour Map of TPH (gasoline) Concentrations in Vadose Zone
Former Texaco Station
500 Grand Avenue
Oakland, California

APPROVED *RL*

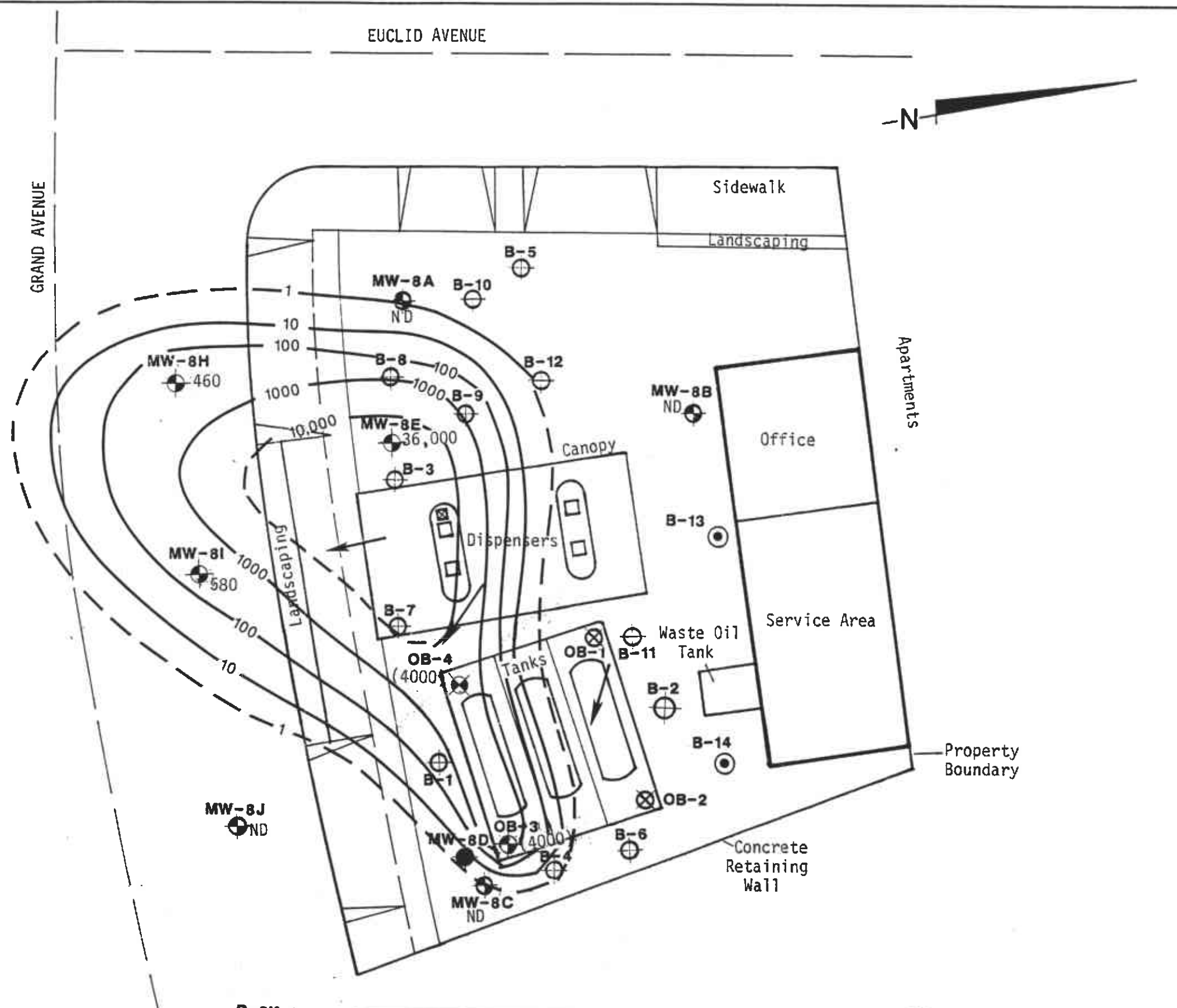
DATE 12/89

REVISED DATE

PLATE

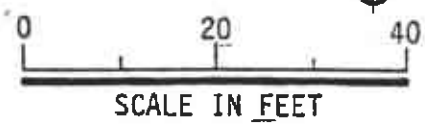
4

EUCLID AVENUE



LEGEND

- Monitoring well
- Observation well
- Soil boring
- Decommissioned monitoring well
- Ground-water flow direction
- Bench mark (HLA datum el.=100 feet)
- Proposed Soil Boring
- 460 TPH as gasoline concentration in ppb, 1/24/90
- (4000) TPH as gasoline concentration in ppb, 11/6/89
- ND Non detectable
- Contour of concentrations, logarithmic contour interval, dashed where uncertain



Harding Lawson Associates
 Engineering and Environmental Services

DRAWN: YC
 JOB NUMBER: 2251,081.03

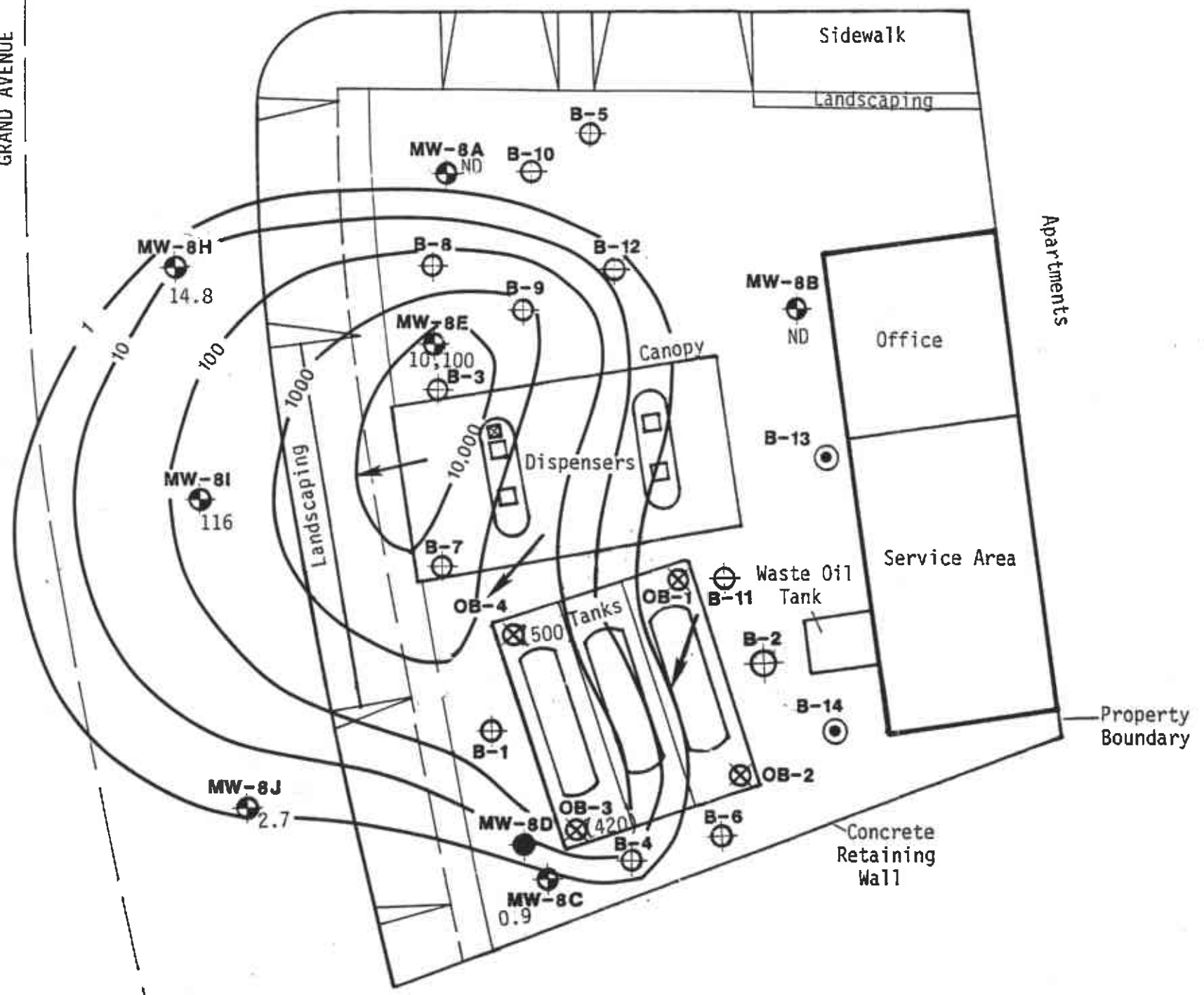
Contour Map of TPH (gasoline) Concentrations in Groundwater
 Former Texaco Station
 500 Grand Avenue
 Oakland, California

APPROVED: *[Signature]*
 DATE: 12/89
 REVISED DATE:

EUCLID AVENUE

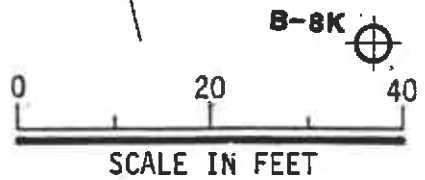


GRAND AVENUE



LEGEND

- Monitoring well
- Observation well
- Soil boring
- Decommissioned monitoring well
- Ground-water flow direction
- Bench mark (HLA datum el.=100 feet)
- Proposed Soil Boring
- 116 Benzene concentration in ppb, 1/24/90
- (500) Benzene concentration in ppb, 11/6/89
- ND Non detectable
- Contour of concentrations, logarithmic contour interval, dashed where uncertain



Harding Lawson Associates
 Engineering and
 Environmental Services

DRAWN YC JOB NUMBER 2251,081.03

**Contour Map of Benzene
 Concentrations in Groundwater**
 Former Texaco Station
 500 Grand Avenue
 Oakland, California

APPROVED [Signature] DATE 12/89

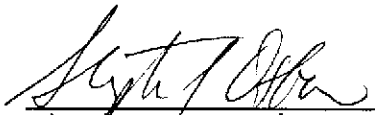
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Universal City, California 91608
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100 Cutting Boulevard
Richmond, California 94804
Attention: Mr. R. R. Zielinski

JSH/RS/mlw 031416M/R37

QUALITY CONTROL REVIEWER



Stephen J. Osborne
Principal Engineer