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November 27, 1989

2251,081.03

Alameda County Department of Environmental Health
Hazardous Materials Program
80 Swan Way, Room 200
Oakland, California 94621

Attention: Mr. G. M. Wistar

Gentlemen:

Work Plan for Supplemental Soil
and Ground-water Investigation
Former Texaco Station No. 6248800235
500 Grand Avenue
Oakland, California

Transmitted herewith, on behalf of Texaco Refining and Marketing Inc., is the work plan for additional investigation at the 500 Grand Avenue site in Oakland.

We trust that this plan is adequate for the purpose of completing the site assessment to your satisfaction.

Yours very truly,

HARDING LAWSON ASSOCIATES

A handwritten signature in cursive script that reads "Randolph Stone".

Randolph Stone
Associate Hydrogeologist

RS/ly 031385L/R31

cc: Mr. R. R. Zielinski
Texaco Refining and Marketing Inc.
100 Cutting Boulevard
Richmond, California 94804

A Report Prepared for

Texaco Refining and Marketing Inc.
100 Cutting Boulevard
Richmond, California 94804

WORK PLAN FOR SUPPLEMENTAL SOIL
AND GROUND-WATER INVESTIGATION
FORMER TEXACO STATION NO. 6248800235
500 GRAND AVENUE
OAKLAND, CALIFORNIA

HLA Job No. 2251,081.03

by

Jeanne S. Hudson

Jeanne S. Hudson
Senior Geologist

Randolph Stone

Randolph Stone
Associate Hydrogeologist



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

November 27, 1989

INTRODUCTION

Harding Lawson Associates (HLA) presents this work plan for a supplemental subsurface investigation at former Texaco station No. 6248800235, 500 Grand Avenue, Oakland, California (Plate 1). HLA submitted the Environmental Assessment Report to Texaco Refining and Marketing Inc. on September 22, 1989. Since September, HLA has initiated additional site assessment associated with remediation planning. This work plan summarizes recent work and outlines additional work necessary for refining the delineation of hydrocarbons in the soil and ground water, as requested by the Alameda County Department of Environmental Health Hazardous Materials Division in a letter dated September 25, 1989.

PROJECT HISTORY

With authorization from Texaco Refining and Marketing Inc., HLA started work at the 500 Grand Avenue site in May 1988. The following tasks were completed by September 1989 when the Environmental Assessment Report was issued:

- Conducted a soil-gas survey to detect hydrocarbons in soil gas at the site and at nearby off-site locations.
- Drilled five soil borings. Obtained soil sample analyses of benzene, toluene, ethylbenzene, and xylenes (BTEX) and total petroleum hydrocarbons (TPH) as gasoline.
- Drilled and installed four 2-inch-diameter monitoring wells and three 4-inch-diameter monitoring wells. Obtained water sample analyses of BTEX from each well.

- Surveyed monitoring wells and measured water levels to estimate direction of ground-water flow.
- Continued periodic water level measurements and ground-water analyses of petroleum hydrocarbons.
- Fulfilled quarterly reporting requirements of the San Francisco Regional Water Quality Control Board (RWQCB) and the Alameda County Department of Environmental Health.

SUMMARY OF ENVIRONMENTAL ASSESSMENT

The subsurface at the site is composed of clay and minor interbedded clayey sand, as indicated by soil samples and drill cuttings. Based on water level data from monitoring wells across the site, the water table fluctuates between 1 and 8 feet below grade. Local ground-water flow is to the south and southwest, toward Lake Merritt.

Data from the soil-gas survey indicates an on-site source of volatile organic compounds. Soil samples from the vadose zone at locations B1, B3, B4, and MW-8D contain hydrocarbons (Plate 2).

Water sampled from underground tank monitoring wells and well MW-8E contain BTEX and TPH as gasoline (Table 1 and Plate 2). Two off-site monitoring wells, located downgradient of the underground tanks and across Grand Avenue, produced water with non-detectable levels of hydrocarbons.

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

Well	Date Sampled	Benzene	Toluene	Ethyl-benzene	Xylenes	TPH (gasoline)
OB-3	11/06/89	420	8	6	64	4
OB-4	11/06/89	500	11	10	24	4
MW-8A	09/28/89	<0.5*	<0.5	<0.5	<3	<50
MW-8B	09/28/89	<0.5	<0.5	<0.5	<3	<50
MW-8C	09/28/89	<0.5	<0.5	<0.5	<3	<50
MW-8E	09/28/89	5,600	3,100	<500	<3,000	22,000
MW-8F	09/28/89	<0.5	<0.5	<0.5	<3	<50
MW-8G	09/28/89	<0.5	<0.5	<0.5	<3	<50
DWAL		1.0	680	100	1,750	

ppb = parts per billion

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

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

RECENT WORK

The following tasks have been accomplished since the Environmental Assessment Report was issued in September:

- Water samples were collected from six monitoring wells and analyzed for BTEX and TPH as gasoline.
- Four soil borings (B-6, B-7, B-8, and B-9) were drilled and sampled to further delineate the distribution of hydrocarbons in the vadose zone. Samples were analyzed for BTEX, TPH as gasoline, and TPH as diesel.
- Water levels were measured in observation wells OB-3 and OB-4 and samples were analyzed for BTEX and TPH as gasoline.

Water samples from observation well OB-3, OB-4, and monitoring well MW-8E contain hydrocarbons, confirming results of past analyses.

Soil borings B-6, B-7, B-8, and B-9 ranged from 3.5 to 5.5 feet total depth. Of these borings, soil samples from B-7 and B-

9 contain 100 parts per million (ppm) or more TPH as gasoline. Soil from boring B-9 also contains 460 ppm TPH as diesel. These results are summarized in Table 2 on Plate 2.

Table 2. Results of Soil Analyses
Concentrations in mg/kg (ppm)

Boring	Total	Sample					TPH	TPH
	Depth (feet)	Depth (feet)	Benzene	Toluene	Ethyl- benzene	Xylenes	gasoline	diesel
B-7	4.5	3.0	<0.5*	6.7	5.1	ND	580	<100**
B-8	3.5	2.0	0.05	<0.05	<0.05	0.34	3.4	<10
B-9	3.5	2.5	0.05	0.32	0.81	6.4	100	460
B-6	5.5	2.0	<0.05	0.08	<0.05	ND	1.0	<100**
B-8	5.5	4.5	<0.05	0.09	<0.05	<0.05	<1.0	<10

TPH = Total petroleum hydrocarbons

* <0.5 indicates the concentrations are below the reporting limit of 0.5 mg/kg.

** Laboratory increased reporting limits because of sample matrices (difficult to concentrate, highly colored).

SCOPE OF PROPOSED WORK

HLA proposes additional site assessment at the former Texaco station to further characterize the lateral and vertical distribution of hydrocarbons in the subsurface. This work will be done in conjunction with remediation planning.

Soil Borings

HLA proposes to drill three additional soil borings (B-10, B-11, and B-12) to evaluate the hydrocarbon content of soils in the vadose zone (Plate 2). The borings will be drilled to a depth of approximately 4 feet or to the depth at which ground water is encountered. Soil samples will be taken at 1.5-foot

intervals and submitted for analysis of BTEX, TPH as gasoline, and TPH as diesel. The vadose zone will also be sampled in each of four proposed monitoring wells.

Monitoring Wells

Four additional monitoring wells (MW-8H, MW-8I, MW-8J, and MW-8K) will be located downgradient of the underground tanks and well MW-8E (Plate 2). The exact locations are dependent upon obtaining clearance from underground utility companies and obtaining permits from the City of Oakland.

HLA will drill and sample soils every 5 feet to a depth of 15 to 20 feet, then construct the monitoring wells using 4-inch-diameter, slotted Schedule 40 PVC casing. Each well will be developed and the ground water sampled. The water samples will be submitted for analysis of BTEX, TPH as gasoline, and TPH as diesel.

not below water table?

Water levels will be measured on a monthly basis in all monitoring wells and ground-water samples will be collected and analyzed on a quarterly basis.

Schedule

We anticipate that the field work will be completed in January 1990, providing that permits from the City of Oakland and the Alameda County Flood Control District can be obtained during this period.

LIST OF ILLUSTRATIONS

Plate	1	Regional Map
Plate	2	Hydrocarbon Concentrations

DISTRIBUTION

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100 Cutting Boulevard
Richmond, California 94804

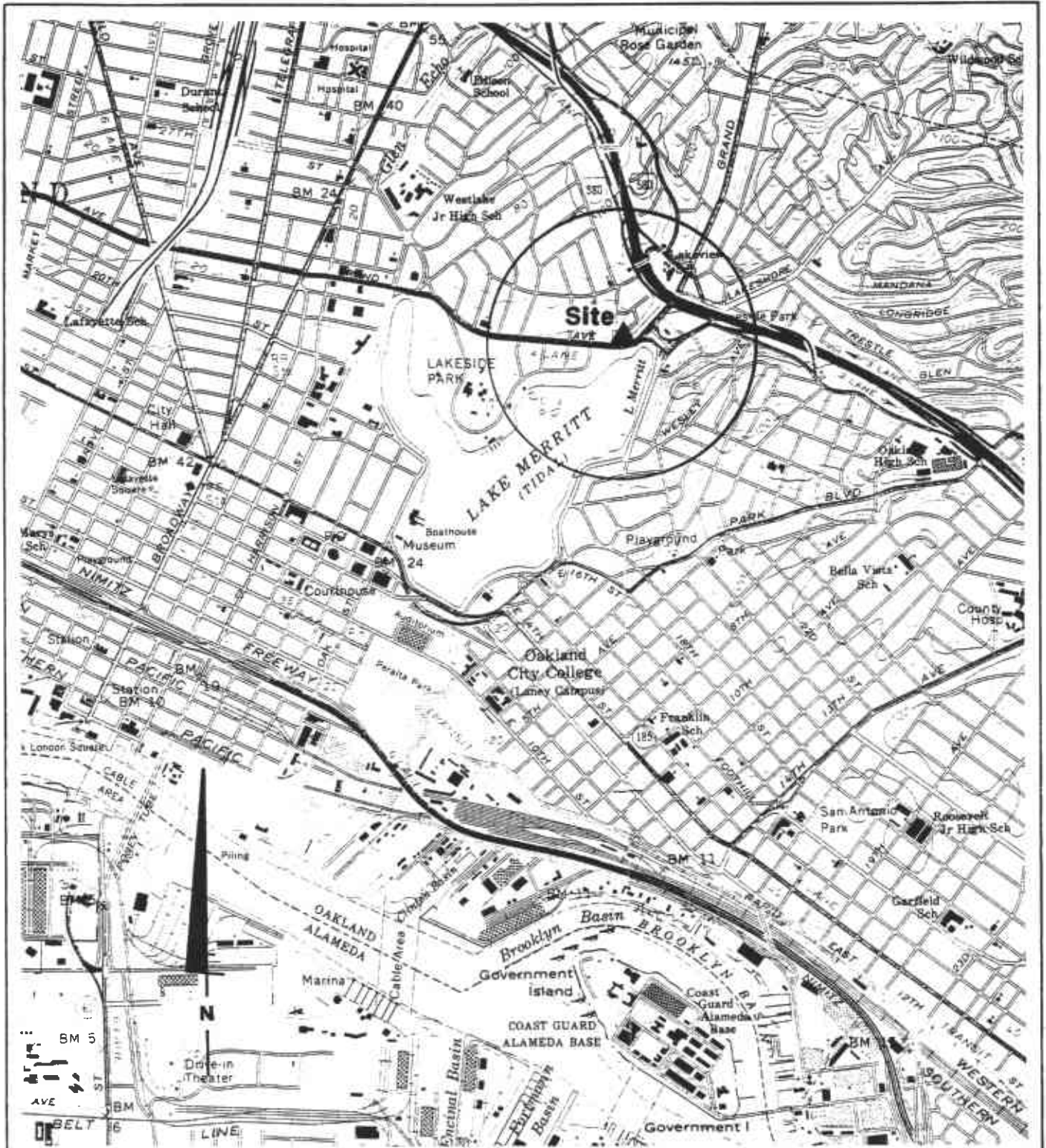
Attention: Mr. R. R. Zielinski

JSH/RS/ly 031385L/R31

QUALITY CONTROL REVIEWER



Stephen J. Osborne
Principal Engineer



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
 YC

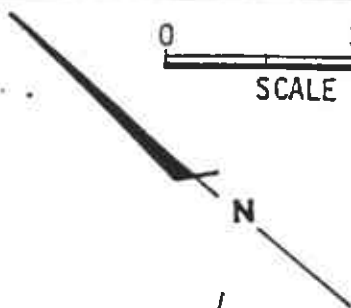
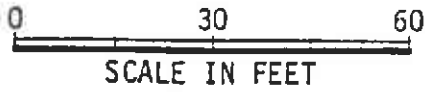
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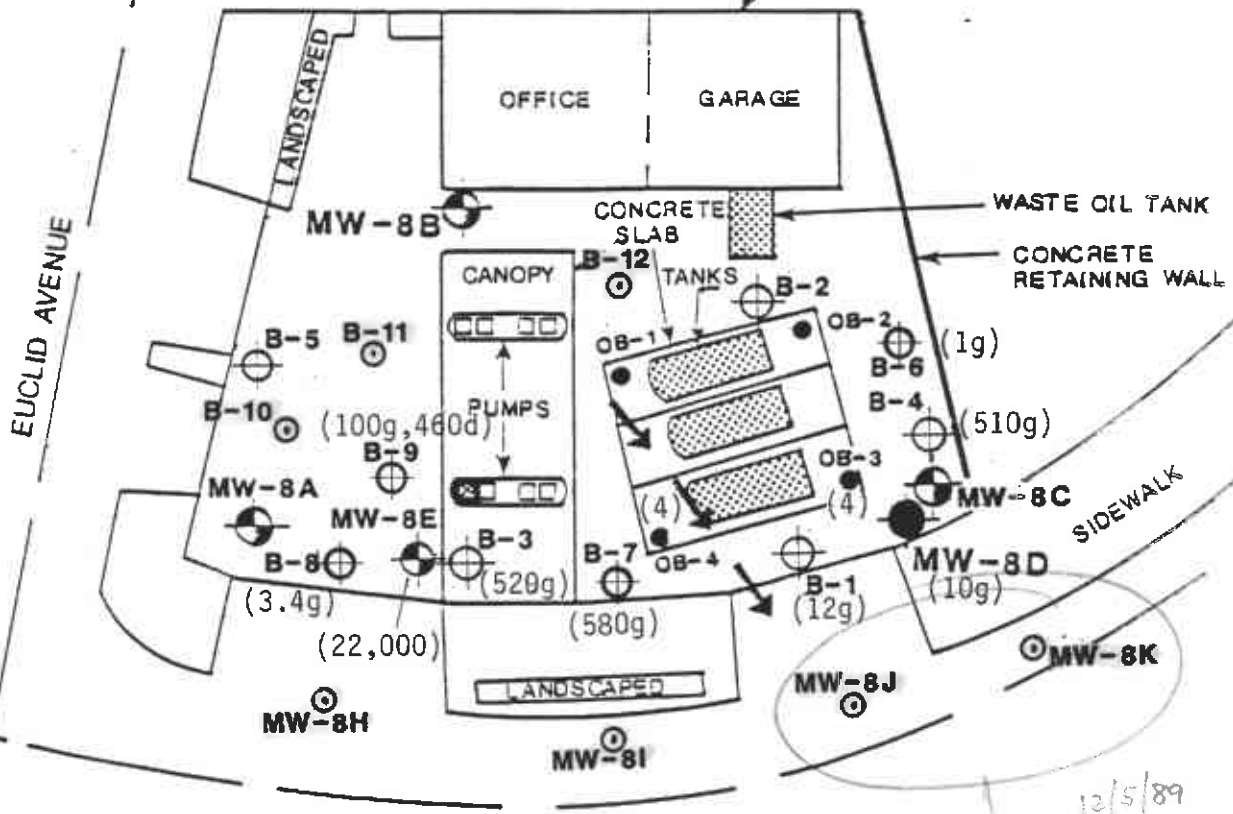
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APARTMENTS

PROPERTY BOUNDARY



LEGEND

- Monitoring Well (TPH as Gasoline Concentration in Water, ppb)
- Observation Well
- Ground-Water Flow Direction
- Soil Boring (TPH Concentration in Soil, ppm; g=gasoline, d=diesel)
- Abandoned Monitoring Well
- Bench Mark (HLA Datum El.=100 feet)
- Proposed Soil Boring (B) or Monitoring Well (MW)

*12/5/89
these will be
combined into one
well. gmw*

GRAND AVENUE

MW-8F

MW-8G



Harding Lawson Associates
Engineers and Geoscientists

Hydrocarbon Concentrations
Former Texaco Service Station
500 Grand Avenue
Oakland, California

PLATE

2

DRAWN
YC

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