aqua science engineers inc.

May 23, 2000

WORKPLAN
for
SOIL AND GROUNDWATER ASSESSMENT
at
Oakland Truck Stop
8255 San Leandro Street
Oakland, California

Submitted by:
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INTRODUCTION

This submittal outlines Aqua Science Engineers, Inc. (ASE)'s workplan for a soil and groundwater assessment at the Oakland Truck Stop located at 8255 San Leandro Street in Oakland, California (Figure 1). The proposed site assessment activities were initiated by Mr. Nissan Saidian, owner of the property, as requested by the Alameda County Health Care Services Agency (ACHCSA).

BACKGROUND INFORMATION

The subject site is currently a truck stop that has been in operation since the early 1960s.

In March 1998, W.A. Craig, Inc. removed one 500-gallon waste oil underground storage tank (UST) and two 4,000-gallon gasoline USTs from the site. Up to 460 parts per million (ppm) total petroleum hydrocarbons as gasoline (TPH-G), 930 ppm total petroleum hydrocarbons as diesel (TPH-D), 5.8 ppm benzene, 1.7 ppm toluene, 8.2 ppm ethyl benzene, 3.3 ppm total xylenes and 0.64 ppm methyl tertiary butyl ether (MTBE) were detected in soil samples collected from the gasoline UST excavations at the time of the removal. Up to 3,600 ppm TPH-G, 21,000 ppm TPH-D, 2.1 ppm benzene, 8 ppm toluene, 18 ppm ethyl benzene, 15 ppm total xylenes and 8.1 ppm MTBE were detected in soil samples collected from the waste oil UST excavation. Water samples collected from the UST excavations contained up to 5,500 parts per billion (ppb) TPH-G, 880,000 ppb TPH-D, 580 ppb benzene, 12 ppb toluene, 180 ppb ethyl benzene, 39 ppb total xylenes and 1,900 ppb MTBE. W.A. Craig reported that all contaminated soil from both the gasoline and waste oil UST excavations was removed based on visual, olfactory and photoionization detector readings. This contaminated soil was transported from the site for disposal in a Class II landfill. The excavations were backfilled with clean imported material.

In February 1999, Penn Environmental drilled 13 soil borings at the site and constructed groundwater monitoring wells in four of the borings (Figure 2, from Penn Environmental report). Relatively low hydrocarbon concentrations were detected in soil samples collected near the former waste oil USTs, and relatively low to moderate hydrocarbon concentrations were detected in groundwater samples collected from these borings. Soil samples collected from borings B-4, B-6, B-8 and MW-3 contained TPH-G concentrations over 100 ppm and benzene concentrations over 1 ppm. All of these borings are in the vicinity of the

existing gasoline USTs. Soil samples collected from the remaining borings contained much lower TPH-G and benzene, toluene, ethyl benzene, and total xylenes (collectively known as BTEX) concentrations in soil. Soil samples collected from all of the borings contained TPH-D concentrations over 100 ppm except for samples collected from borings B-7 and B-9, at the southern and western corners of the site. Up to 68,000 ppb TPH-G, 62,000 ppb TPH-D, 24,000 ppb benzene, 390 ppb toluene, 2,000 ppb ethyl benzene, 2,300 ppb total xylenes and 28,000 ppb MTBE were detected in groundwater samples collected from these monitoring wells/borings. Once again, the highest TPH-G and BTEX concentrations were in the wells/borings drilled near the existing USTs, although the highest TPH-D concentrations (between 25,000 ppb and 62,000 ppb) were detected in groundwater samples collected from monitoring well MW-1 and borings B-1 and B-2, all in the vicinity of the dispensers. Elevated MTBE concentrations (up to 7,800 ppb) were also detected in groundwater samples collected from borings in the dispenser area.

In August 1999, ASE performed quarterly groundwater monitoring for the site. Monitoring well MW-1 contained free-floating hydrocarbons believed to be diesel. Groundwater samples collected from monitoring well MW-3 contained 56,000 ppb TPH-G, 10,000 ppb TPH-D, 17,000 ppb benzene, 2,600 ppb toluene, 2,600 ppb ethyl benzene, 1,200 ppb total xylenes and 6,100 ppb MTBE. Much lower hydrocarbon concentrations were detected in groundwater samples collected from monitoring wells MW-2 and MW-4, located near the former waste oil USTs. In addition, the groundwater samples collected from monitoring wells MW-2 and MW-4, near the former waste oil USTs were also analyzed for volatile organic compounds (VOCs), semi-volatile organic compounds (SVOCs), polychlorinated bi-phenols (PCBs), cadmium, chromium, lead, nickel and zinc. No SVOCs, PCBs or VOCs were detected in these samples other than 11 ppb isopropyl benzene. The only metal concentration which exceeded California Department of Health Services (DHS) maximum contaminant levels (MCLs) for drinking water was lead in the groundwater sample collected from monitoring well MW-4 at 260 ppb. The groundwater flow direction was to the west. See Tables One, Two and Three for tabulated results from this and subsequent groundwater samplings.

In December 1999, ASE constructed monitoring wells MW-5 and MW-6 at the site (Figure 3). Free-floating hydrocarbons were still present on the groundwater surface of monitoring well MW-1. High hydrocarbon concentrations, including benzene, ethyl benzene and MTBE concentrations exceeding DHS MCLs for drinking water, were detected in groundwater samples collected from monitoring well MW-2. Benzene

concentrations in groundwater samples collected from monitoring wells MW-2 and MW-6 exceeded DHS MCLs for drinking water. The MTBE concentration in groundwater samples collected from monitoring wells MW-3, MW-4 and MW-5 also exceeded DHS MCLs for drinking water. MTBE was confirmed in monitoring well MW-3 by EPA Method 8260. Most of these concentrations were similar to previous results. No dissolved lead was detected in groundwater samples collected from monitoring well MW-4 this quarter. The groundwater flow direction was to the southwest.

In March 2000, ASE conducted a groundwater monitoring at the site. The analytical results from this sampling showed very similar hydrocarbon concentrations to the previous sampling results except that high MTBE concentrations (12,000 ppb) were detected in the groundwater sample collected from monitoring well MW-6. Free-floating hydrocarbons were still present in monitoring well MW-1.

PROPOSED SCOPE OF WORK (SOW)

The purpose of this assessment is to further define the extent of soil and groundwater contamination at the site. The scope of work for this assessment is to:

1) Prepare a workplan and health and safety plan for submittal to the Alameda County Health Care Services Agency (ACHCSA).

2) Obtain a drilling permit from the Alameda County Public Works Agency and an excavation permit from the City of Oakland to drill in San Leandro Street.

3) Contract with a subsurface utility locator to mark underground utility lines in the site vicinity.

4) Drill eight (8) soil borings in areas both on and off the site. Collect soil and groundwater samples for analysis.

5) Analyze one soil and one groundwater sample from each boring at a CAL-EPA certified analytical laboratory for TPH-G, TPH-D, TPH-MO, BTEX and fuel oxygenates.

6) Following collection of the soil and groundwater samples, each boring will be backfilled with neat cement to the ground surface.

7) Prepare a report presenting results from this assessment.

Details of the assessment are presented below.

TASK 1 - PREPARE A HEALTH AND SAFETY PLAN

A site-specific health and safety plan will be prepared for the site. A nearby hospital will be designated in the site safety plan as the emergency medical facility of first choice. A copy of the site specific Health and Safety Plan will be available on-site at all times.

TASK 2 - OBTAIN A DRILLING PERMIT FROM THE ALAMEDA COUNTY PUBLIC WORKS AGANCY AND AN EXCAVATION PERMIT FROM THE CITY OF OAKLAND TO ALLOW FOR DRILLING IN THE CITY STREET

Prior to drilling, ASE will obtain a drilling permit from the Alameda County Public Works Agency. ASE will also obtain an excavation permit from the City of Oakland to allow for drilling in the city street.

TASK 3 - CONTRACT WITH AN UNDERGROUND UTILITY LINE LOCATING SERVICE TO ACCURATELY LOCATE UNDERGROUND UTILITY LINES IN STREET AREAS

ASE will contact Underground Service Alert (USA) at least 48 hours prior to drilling and contract with a private underground utility locating service to pinpoint the location of utility lines in the drilling locations.

TASK 4 - *DRILL EIGHT SOIL BORINGS IN BOTH ON AND OFF-SITE LOCATIONS AND COLLECT SOIL AND GROUNDWATER SAMPLES FROM THE BORINGS FOR ANALYSIS*

Eight soil borings will be drilled in the locations shown on Figure 3 to further define the extent of soil and groundwater contamination at the site. The borings will be drilled using a Geoprobe or similar type drill rig. The drilling will be directed by a qualified geologist.

Undisturbed soil samples will be collected continuously for subsurface hydrogeologic description and possible chemical analysis. The samples will be described by the geologist according to the Unified Soil Classification System. The samples will be collected in acetate tubes using a drive sampler advanced as the boring progresses. Samples to be retained for analysis will be immediately removed from the sampler, trimmed, sealed with Teflon tape and plastic caps, secured with duct tape,

labeled with the site location, sample designation, date and time the sample was collected, and the initials of the person collecting the sample. The samples will be placed into an ice chest containing wet ice for delivery under chain of custody to a CAL-EPA certified analytical laboratory.

Soil from the remaining tubes not sealed for analysis will be removed for hydrogeologic description and will be screened for volatile compounds with an organic vapor meter (OVM). The soil will be screened by emptying soil from one of the tubes into a plastic bag. The bag will be sealed and placed in the sun for approximately 10 minutes. After the hydrocarbons have been allowed to volatilize, the OVM will measure the vapor through a small hole, punched in the bag. These OVM readings will be used as a screening tool only since these procedures are not as rigorous as those used in an analytical laboratory.

A groundwater sample will be collected from each boring. Drilling will be halted at the water table and a Powerpunch or similar type device will be utilized to collect groundwater samples from the borings. The groundwater samples to be analyzed for volatile compounds will be contained in 40-ml volatile organic analysis (VOA) vials, preserved with hydrochloric acid and sealed without headspace. The samples to be analyzed for non-volatile compounds will be contained in 1-liter amber glass containers. All of the samples will be labeled with the site location, sample designation, date and time the samples were collected, and the initials of the person collecting the samples, sealed in plastic bags, and cooled in an ice chest with wet ice for transport to a state-certified analytical laboratory under chain-of-custody.

All sampling equipment will be cleaned in buckets with brushes and a TSP or Alconox solution, then rinsed twice with tap water. Rinsates will be contained on-site in 55-gallon steel drums and stored on-site until off-site disposal can be arranged.

TASK 5 - ANALYZE THE SOIL AND GROUNDWATER SAMPLES

At least one soil sample from each boring, as well as each groundwater sample, will be analyzed at a CAL-EPA certified analytical laboratory for TPH-G by modified EPA Method 5030/8015, TPH-D by modified EPA Method 3510/8015, and BTEX by EPA Method 8020 and oxygenates (including MTBE) by EPA Method 8260. The soil samples analyzed will be chosen based on field observations such as odors, staining and OVM readings. If no field indications of contamination are present, the

unsaturated sample closest to the water table (capillary zone) will be analyzed.

TASK 6 - BACKFILL THE BORINGS WITH NEAT CEMENT

Following collection of the soil and groundwater samples, the boreholes will be backfilled with neat cement placed by tremie pipe.

TASK 7 - PREPARE A SUBSURFACE ASSESSMENT REPORT

A report will be prepared outlining the methods and findings of this assessment. The report will be submitted under the seal of state registered civil engineer or geologist. This report will include a summary of all work completed during this assessment including tabulated soil and groundwater analytical results, conclusions and recommendations. Copies of the analytical reports and chain of custody documents will be included as appendices.

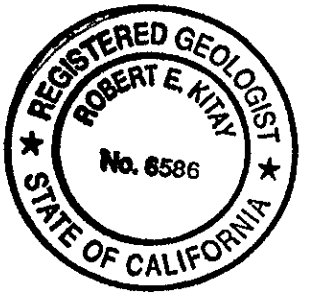
SCHEDULE

ASE will proceed with this project immediately upon approval of this workplan by the ACHCSA.

Should you have any questions or comments, please call us at (925) 820-9391.

Respectfully submitted,

AQUA SCIENCE ENGINEERS, INC.



Robert E. Kitay, R.G., R.E.A.
Senior Geologist

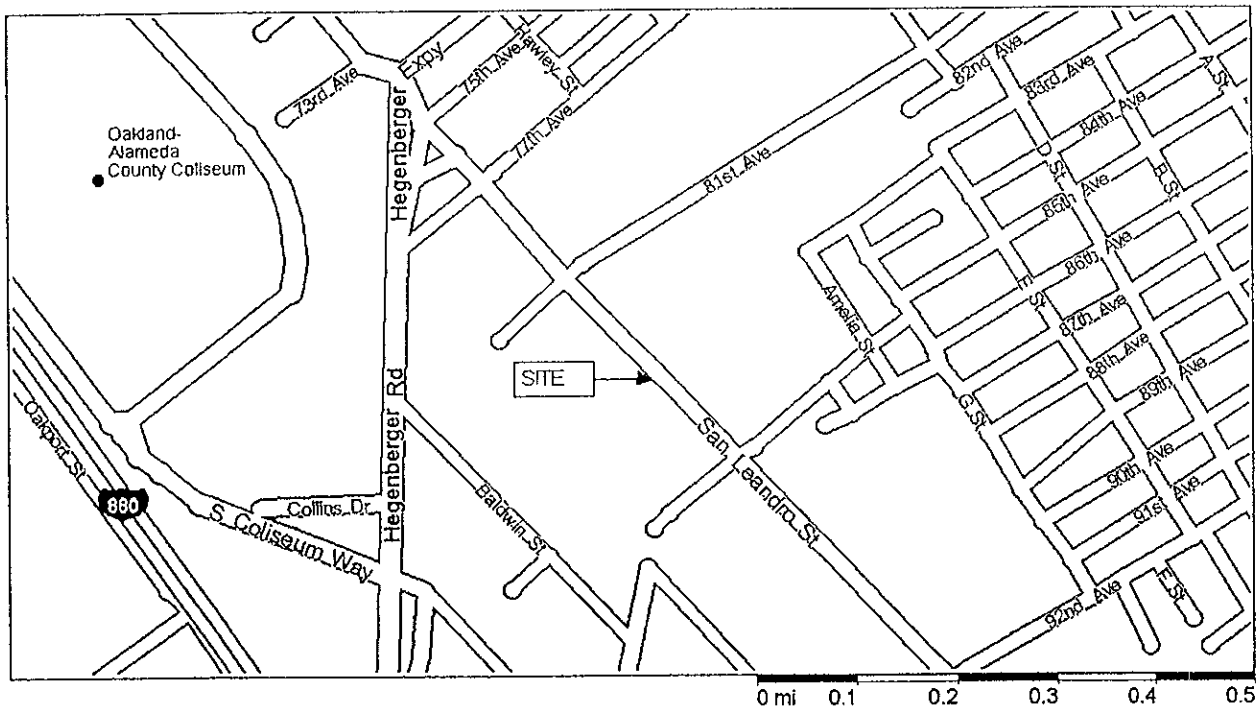
cc: Mr. Nissan Saidian, 5733 Medallion Court, Castro Valley, CA 94522

Mr. Barney Chan, Alameda County Health Care Services Agency, 1131 Harbor Bay Parkway, Suite 250, Alameda, CA 94502

Mr. Chuck Headlee, California Regional Water Quality Control Board, San Francisco Bay Region, 1515 Clay Street, Suite 1400, Oakland, CA 94612

FIGURES

NORTH

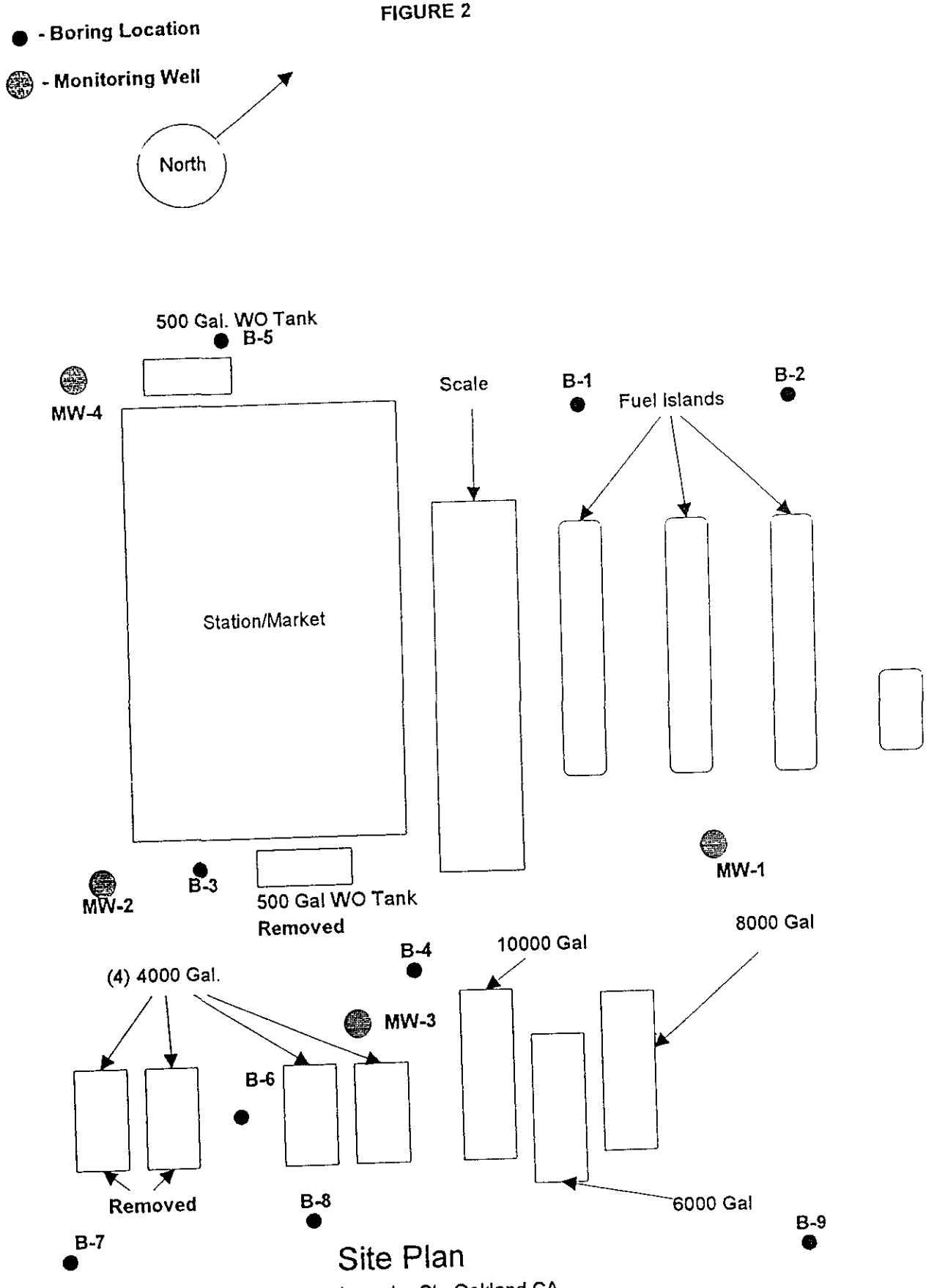


LOCATION MAP

OAKLAND TRUCK STOP
8255 SAN LEANDRO STREET
OAKLAND, CALIFORNIA

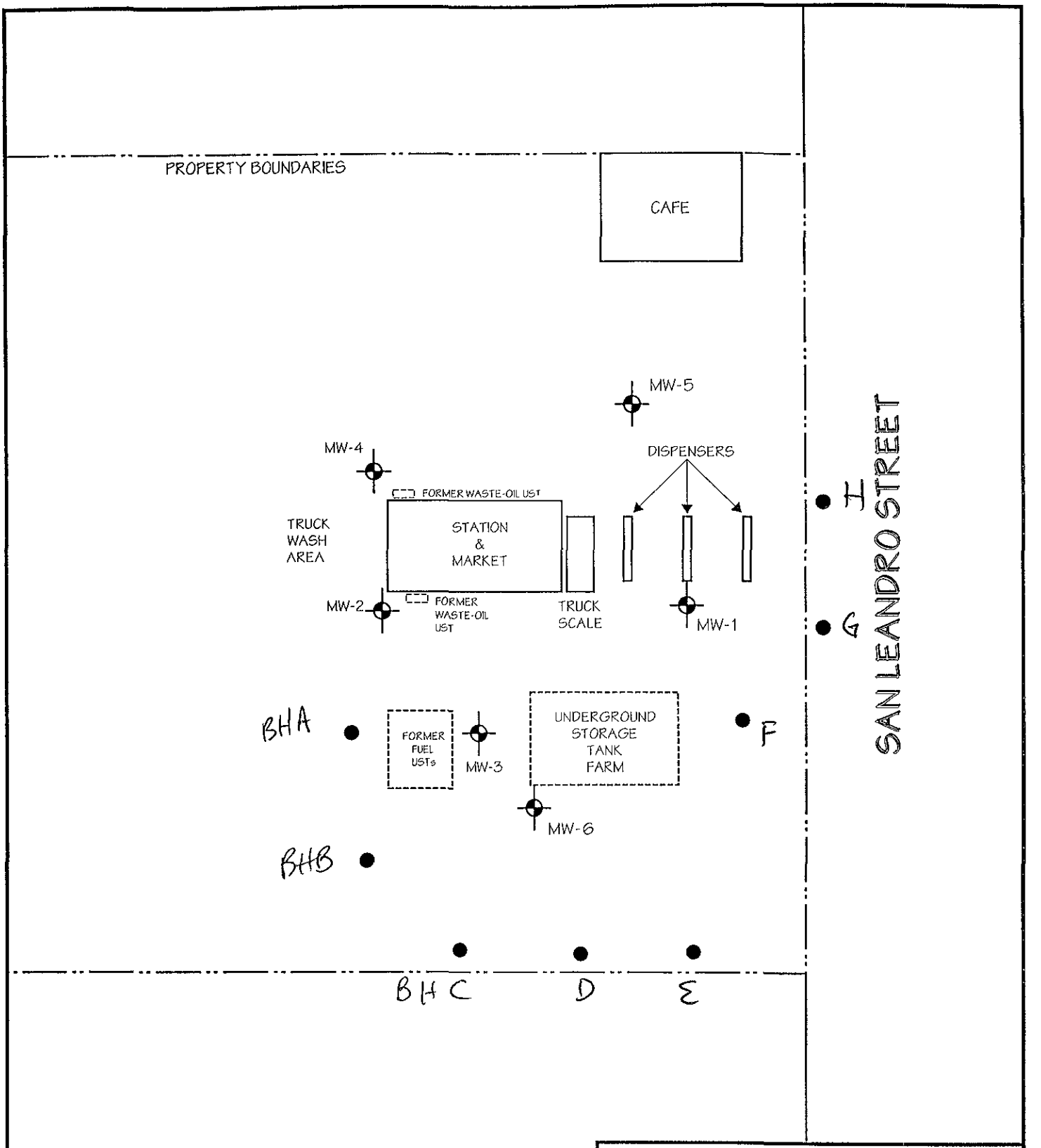
AQUA SCIENCE ENGINEERS, INC. | Figure 1

FIGURE 2



Site Plan

8255 San Leandro St., Oakland CA



LEGEND

MW-4 — MONITORING WELL

● — PROPOSED BORING LOCATION

NORTH

SCALE
1" = 50'

PROPOSED BORING LOCATION MAP

OAKLAND TRUCK STOP
8255 SAN LEANDRO STREET
OAKLAND, CALIFORNIA

AQUA SCIENCE ENGINEERS, INC. | Figure 3

TABLES

TABLE ONE
Groundwater Elevation Data

Well I.D.	Top of Casing Elevation (msl)	Depth to Water Measurement (feet)	Free-Floating Hydrocarbon Thickness (feet)	Groundwater Elevation (msl)
MW-1				
8-16-99	97.12	Unknown> 1.0	Unknown	
8-27-99		6.90	0.36	90.51*
9-10-99		6.85	0.18	90.41*
9-24-99		6.65	0.08	90.53*
10-08-99		6.87	0.28	90.47*
10-22-99		6.81	0.23	90.49*
11-02-99		6.94	0.31	90.43*
11-19-99		6.91	0.12	90.31*
12-06-99		6.93	0.12	90.29*
3-08-00		**5.93**	**0.21**	**91.36***
MW-2				
8-16-99	96.82	6.30	--	90.52
12-06-99		8.46	--	88.36
3-08-00		**9.12**	**--**	**87.70**
MW-3				
8-16-99	96.43	5.85	--	90.58
12-06-99		5.70	--	90.73
3-08-00		**5.32**	**--**	**91.11**
MW-4				
8-16-99	96.60	6.12	--	90.48
12-06-99		5.98	--	90.62
3-08-00		**4.32**		**92.28**
MW-5				
12-06-99	96.30	5.94	--	90.36
3-08-00		**4.06**	**--**	**92.24**
MW-6				
12-06-99	96.79	5.80	--	90.99
3-08-00		**4.10**	**--**	**92.69**

Notes:
* = Groundwater elevation adjusted for the presence of free-floating hydrocarbons by the equation: Adjusted groundwater elevation = Top of casing elevation – depth to groundwater + (0.8 x free-floating hydrocarbon thickness)

TABLE TWO
Summary of Chemical Analysis of **GROUNDWATER** Samples
Petroleum Hydrocarbons
All results are in **parts per billion**

Boring	TPH Gasoline	TPH Diesel	TPH Motor Oil	Benzene	Toluene	Ethyl Benzene	Total Xylenes	MTBE
MW-1								
8-16-99	Not Sampled Due to Free-Floating Hydrocarbons							
12-06-99	Not Sampled Due to Free-Floating Hydrocarbons							
3-08-00	**Not Sampled Due to Free-Floating Hydrocarbons**							
MW-2								
8-16-99	2,200	970*	< 500	3.8	< 2.0	3.0	< 4.0	< 20
12-06-99	1,900	400*	< 500	16	< 0.5	1.5	< 0.5	5.2
3-08-00	**1,600***	**530***	**< 500**	**9.7**	**< 0.5**	**2.7**	**< 0.5**	**27**
MW-3								
8-16-99	56,000	10,000**	< 500	17,000	2,600	2,600	1,200	6,100
12-06-99	40,000	9,100*	< 500	16,000	140	1,800	100	2,200/ 4,000#
3-08-00	**22,000**	**4,500***	**< 500**	**11,000**	**72**	**1,100**	**130**	**3,400**
MW-4								
8-16-99	61***	1,100*	< 500	< 0.5	< 0.5	< 0.5	< 1.0	86
12-06-99	130***	220*	< 500	< 1.0	< 1.0	< 1.0	< 1.0	130
3-08-00	**< 50**	**220***	**< 500**	**< 0.5**	**< 0.5**	**< 0.5**	**< 0.5**	**130**
MW-5								
12-06-99	450***	2,000*	< 500	< 1.0	< 1.0	< 1.0	< 1.0	21
3-08-00	**51*****	**530***	**< 500**	**< 0.5**	**< 0.5**	**< 0.5**	**<0.5**	**84**
MW-6								
12-06-99	13,000	< 50	< 500	180	21	11	24	< 100
3-08-00	**< 10,000**	**4,600***	**< 500**	**230**	**26**	**18**	**39**	**12,000**
DHS MCL	NE	NE	NE	1.0	150	700	1,750	13

Notes:

Non-detectable concentrations are noted by the less than symbol (<) followed by the detection limit.

Detectable concentrations are in bold.

DHS MCL is the California Department of Health Services maximum contaminant level for drinking water.

NE = DHS MCLs are not established.

* = Non-typical diesel pattern, hydrocarbons in early diesel range.

** = Estimated concentration due to overlapping fuel patterns in the sample.

*** = Non-typical gasoline pattern.

= MTBE concentration by EPA Method 8260

TABLE THREE

Summary of Chemical Analysis of **GROUNDWATER** Samples
HVOCs, SVOCs, PCBs and LUFT 5 Metals
All results are in **parts per billion**

Boring	Isoproyl-benzene	Other VOCs	SVOCs	PCBs	Cd	Cr	Pb	Ni	Zn
MW-2									
8-16-99	**11**	ND	ND	ND	< 2.0	**9.0**	< 5.0	**19**	< 10
MW-4									
8-16-99	< 0.5	ND	ND	ND	**2.7**	**45**	**260**	**55**	**320**
12-06-99	---	---	---	---	---	---	< 5	---	---
MCL	NE	Various	Various	0.5	5	50	15	100	5,000

Notes:
Non-detectable concentrations are noted by the less than symbol (<) followed by the detection limit or are indicated by ND if various detection limits are used for multiple compounds. Please see the original reports for detection limits for these compounds..

Detectable concentrations are in **bold**.

MCL is the California Department of Health Services maximum contaminant level for drinking water.

NE = Not established