aqua science engineers inc.

May 24, 2000

WORKPLAN
for
SOIL AND GROUNDWATER ASSESSMENT
at
1310 Central Avenue
Alameda, 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 Alaska Oil Service Station located at 1310 Central Avenue in Alameda, California (Figure 1). The proposed site assessment activities were initiated by Mr. Nissan Saidian, property owner, as required by the Alameda County Health Care Services Agency (ACHCSA).

BACKGROUND INFORMATION

The subject site is currently a small operating gasoline service station.

In May 1996, Petrotek removed one 10,000-gallon gasoline underground storage tank (UST), one 7,500-gallon gasoline UST, and one 5,000-gallon gasoline UST from the western corner of the site. All associated piping and dispensers were also removed. In addition, one 500-gallon waste-oil UST was removed from a location adjacent to the building. Soil samples collected during the UST removal contained elevated hydrocarbon concentrations, and free-product was observed on groundwater within the UST excavation. Apparently, 600 tons of contaminated soil were removed from the site and disposed of off-site, and approximately 15,000 gallons of water and product were pumped from the excavation, treated and discharged into the storm sewer. Two new USTs were installed in the former UST excavations. New dispensers and piping were also installed. It is ASE's understanding that Petrotek did not issue a report regarding these activities.

In November 1998, All Environmental, Inc. (AEI) drilled 14 soil borings at the site and collected soil and groundwater samples for analysis. Up to 5,900 parts per million (ppm) total petroleum hydrocarbons as gasoline (TPH-G) were detected in soil samples collected from the borings. Up to 120,000 parts per billion (ppb) TPH-G and 7,200 ppb benzene were detected in groundwater samples collected from the borings.

In December 1999, HerSchy Environmental of Bass Lake, California installed three groundwater monitoring wells at the site. Up to 43,000 ppb TPH-G, 8,700 ppb total petroleum hydrocarbons as diesel (TPH-D), 1,300 ppb benzene and 120,000 ppb methyl tertiary butyl ether (MTBE) were detected in groundwater samples collected from the monitoring wells. The groundwater flow direction was to the southwest at a gradient of 0.0085-feet/foot.

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On May 16, 2000, ASE collected groundwater samples from the three site monitoring wells. Groundwater samples collected from monitoring well MW-1 contained 2,000 ppb TPH-G, 38 ppb benzene, 6.3 ppb toluene, 740 ppb ethyl benzene, 1,600 ppb total xylenes. No MTBE or other oxygenates were detected in this groundwater sample. The groundwater samples collected from monitoring well MW-3 contained 17,000 ppb TPH-G, 2,800 ppb benzene, 60 ppb toluene, 380 ppb ethyl benzene, 190 ppb total xylenes, 990 ppb MTBE, 9.1 ppb tert-amyl methyl ether (TAME) and 350 ppb tert-butanol (TBA). No hydrocarbons were detected in groundwater samples collected from monitoring well MW-2. These results are significantly different to the previous results, especially in respect to hydrocarbon concentrations in monitoring well MW-2, and the MTBE concentrations throughout the site. The radically different MTBE concentrations this sampling period are probably related to the use of EPA Method 8260 this period which is a much more reliable method for MTBE identification than EPA Method 8020, which was used during the December 1999 sampling. It appears that the very high MTBE concentrations detected in December 1999 were a false positive. The groundwater flow direction on May 16, 2000 was to the west-southwest.

PROPOSED SCOPE OF WORK (SOW)

The purpose of this assessment is to further define the extent of soil and groundwater contamination on and off-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 encroachment permit from the City of Alameda to drill in city right of way areas.

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

4) Drill twelve (12) soil borings in areas both on and off the site to a depth not to exceed 12-feet below ground surface (bgs). 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-D by modified EPA Method 3510/8015, and TPH-G, benzene, toluene, ethylbenzene and

total xylenes (collectively known as BTEX) and fuel oxygenates by EPA Method 8260.

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 ENCROACHMENT PERMIT FROM THE CITY OF ALAMEDA 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 encroachment permit from the City of Alameda to allow for drilling in the city streets.

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 TWELVE SOIL BORINGS IN BOTH ON AND OFF-SITE LOCATIONS AND COLLECT SOIL AND GROUNDWATER SAMPLES FROM THE BORINGS FOR ANALYSIS*

Twelve soil borings will be drilled in the locations shown on Figure 2 to further define the soil and groundwater contamination in the site vicinity. 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 will be contained in 40-ml volatile organic analysis (VOA) vials, preserved with hydrochloric acid, sealed without headspace, 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-D by modified EPA Method 3510/8015 and TPH-G, BTEX and fuel oxygenates 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.

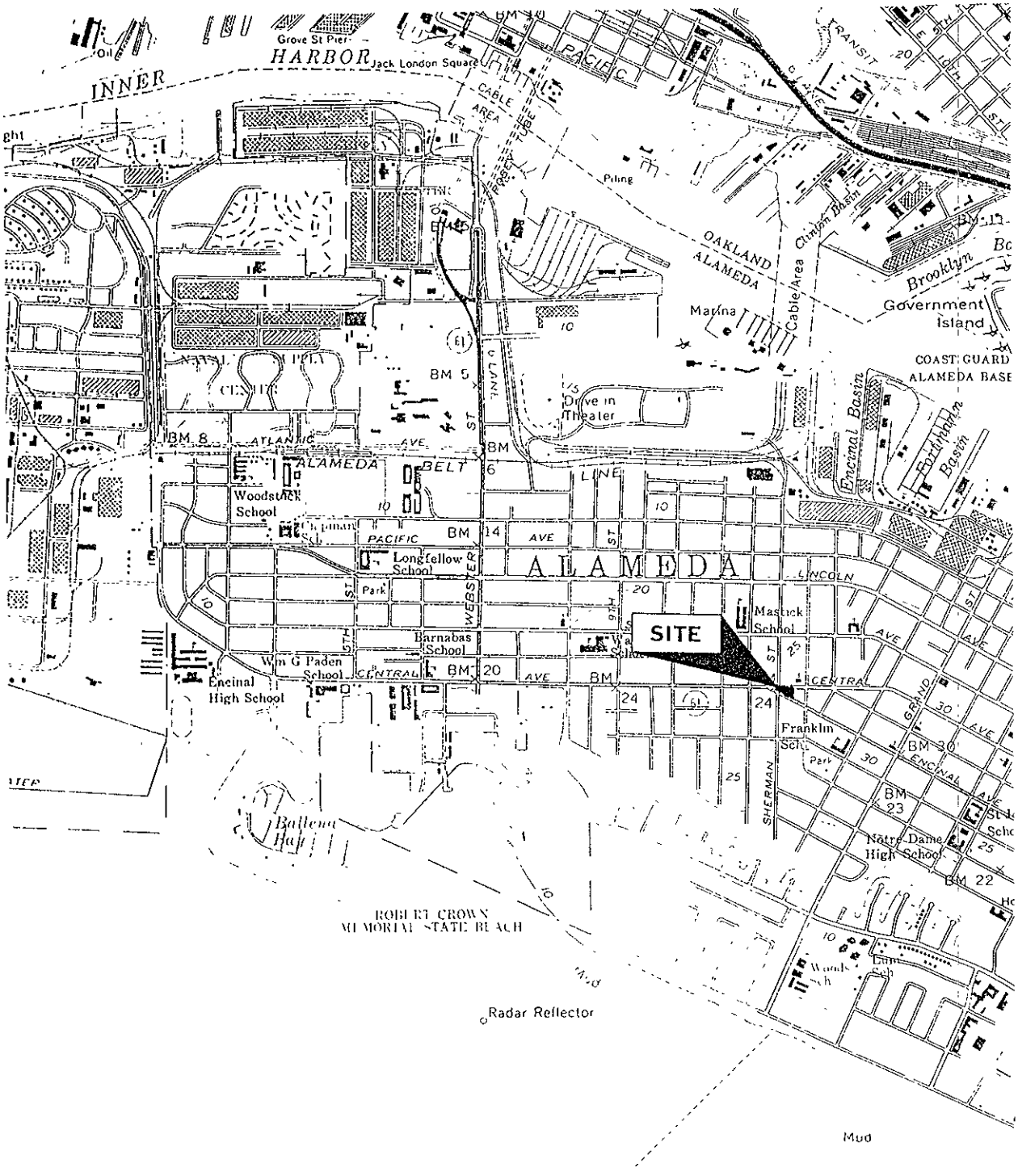
Robert E. Kitay, R.G., R.E.A.
Senior Geologist

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

Mr. Larry Seto, 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

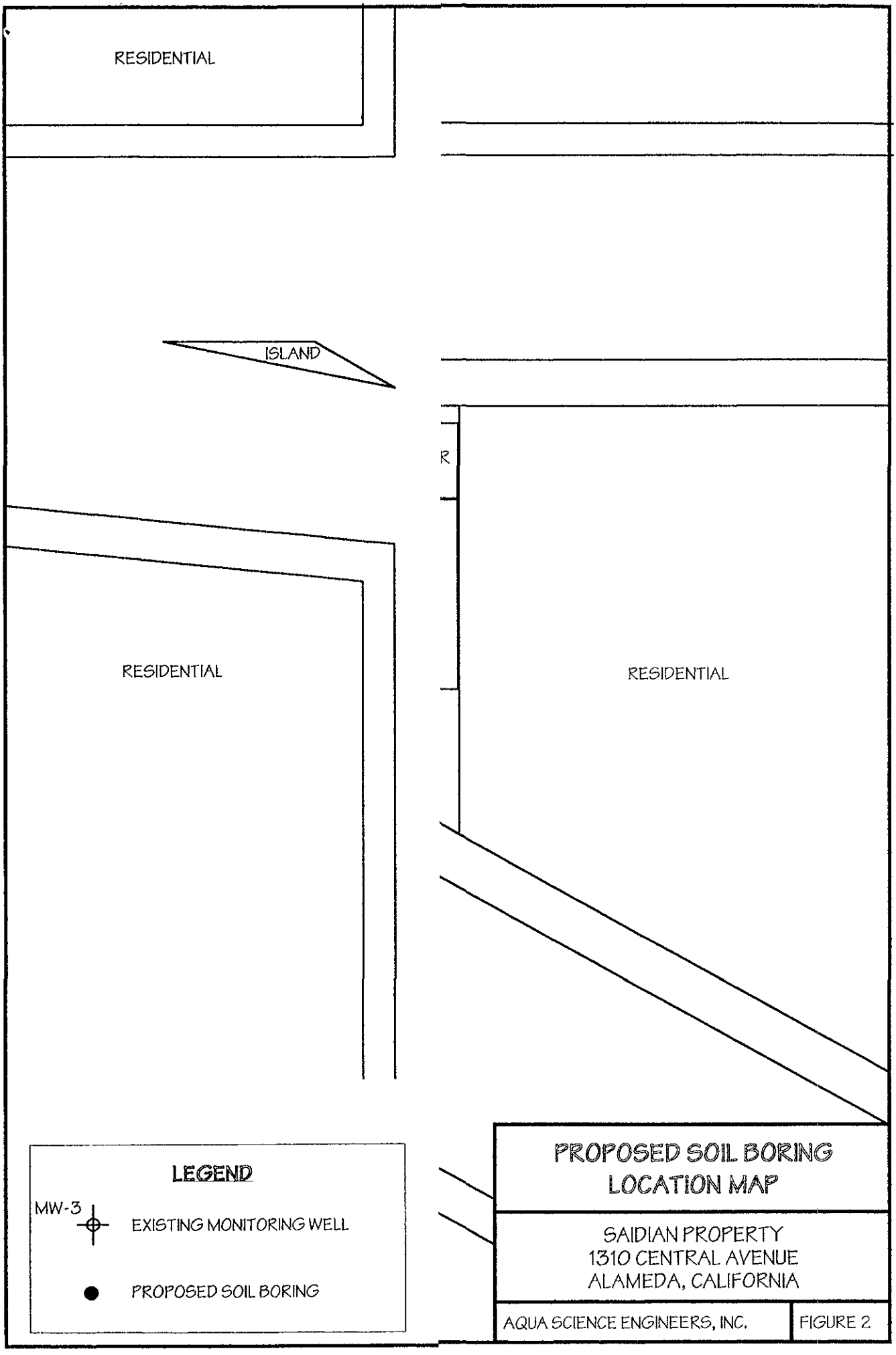


NORTH

LOCATION MAP

SAIDIAN PROPERTY
1310 CENTRAL AVENUE
ALAMEDA, CALIFORNIA

AQUA SCIENCE ENGINEERS, INC. | Figure 1


RESIDENTIAL
ISLAND
R
RESIDENTIAL
RESIDENTIAL
LEGEND
MW-3
EXISTING MONITORING WELL
PROPOSED SOIL BORING
PROPOSED SOIL BORING LOCATION MAP
SAIDIAN PROPERTY
1310 CENTRAL AVENUE
ALAMEDA, CALIFORNIA
AQUA SCIENCE ENGINEERS, INC.
FIGURE 2