aqua science engineers inc.

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June 13, 2002

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WORKPLAN
for a
SOIL AND GROUNDWATER ASSESSMENT
at
Former Chan's Shell Station
726 Harrison Street
Oakland, California

Submitted by:
AQUA SCIENCE ENGINEERS, INC.
208 W. El Pintado
Danville, CA 94526
(925) 820-9391

1.0 INTRODUCTION

This submittal outlines Aqua Science Engineers, Inc. (ASE's) workplan for additional soil and groundwater assessment at the former Chan's Shell Station located at 726 Harrison Street in Oakland, California (Figure 1). The proposed site assessment activities were initiated by Daisy and Kin Chan, owners of the property, as required by the Alameda County Health Care Services Agency (ACHCSA) in their letter dated May 21, 2002 (Appendix A). The proposed site assessment activities have been designed to further define the extent of soil and groundwater in the former tank backfill and excavation area and in Harrison Street downgradient of the site. This work is to supplement the work presented in ASE's Corrective Action Plan dated December 21, 2001.

2.0 PROPOSED SCOPE OF WORK (SOW)

ASE has prepared the following scope of work (SOW) to further define the extent of elevated hydrocarbon concentrations in the former tank backfill and excavation area and in Harrison Street downgradient of the site.

1) Obtain a drilling permit from the Alameda County Public Works Agency (ACPWA). Obtain an excavation permit from the City of Oakland.

2) Drill five (5) soil borings to approximately 25-feet below ground surface (bgs) and collect soil and groundwater samples from the borings for analysis.

3) Analyze one soil and one groundwater sample from each soil boring at a CAL-EPA certified environmental laboratory for total petroleum hydrocarbons as gasoline (TPH-G), benzene, toluene, ethylbenzene and total xylenes (collectively known as BTEX) and methyl tertiary butyl ether (MTBE) by EPA Method 8260.

4) Backfill the borings with neat cement.

5) Prepare a report detailing the methods and findings of the soil and groundwater assessment.

3.0 DETAILS OF PROPOSED SOW

Details of the assessment are presented below.

TASK 1 - OBTAIN NECESSARY PERMITS

ASE will obtain a drilling permit from the ACPWA and a excavation permit from the City of Oakland. ASE will also notify Underground Service Alert (USA) to have underground utility lines marked in the site vicinity.

TASK 2 - DRILL FIVE SOIL BORINGS AT THE SITE

ASE will drill five (5) soil borings at the locations shown on Figure 2. The borings will be drilled using a Geoprobe or similar type drill rig. A qualified ASE geologist will direct the drilling.

Undisturbed soil samples will be collected continuously for subsurface hydrogeologic description and possible chemical analysis. An ASE geologist will describe the samples according to the Unified Soil Classification System (USCS). 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, 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 Hydropunch 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, and sealed without

headspace. The samples will then be labeled with the site location, sample designation, date and time the samples were collected, and the initials of the person collecting the samples, placed in protective foam sleeves, 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 trisodium phosphate (TSP) or Alconox solution, then rinsed twice with tap water. Rinsates will be contained on-site in 55-gallon steel drums until off-site disposal can be arranged.

TASK 3 - ANALYZE AT LEAST ONE SOIL AND ONE GROUNDWATER SAMPLE FROM EACH BORING

At least one soil and one groundwater sample from each boring will be analyzed at a CAL-EPA certified environmental laboratory for TPH-G, BTEX and MTBE by EPA Method 8260. The soil sample to be analyzed from each boring will be the sample that appears to be most contaminated based on odors, staining and OVM readings. If there is no indication of contamination, then the soil sample collected from just above the water table (the capillary zone) will be analyzed.

TASK 4 - 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 5 - 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.

4.0 SCHEDULE

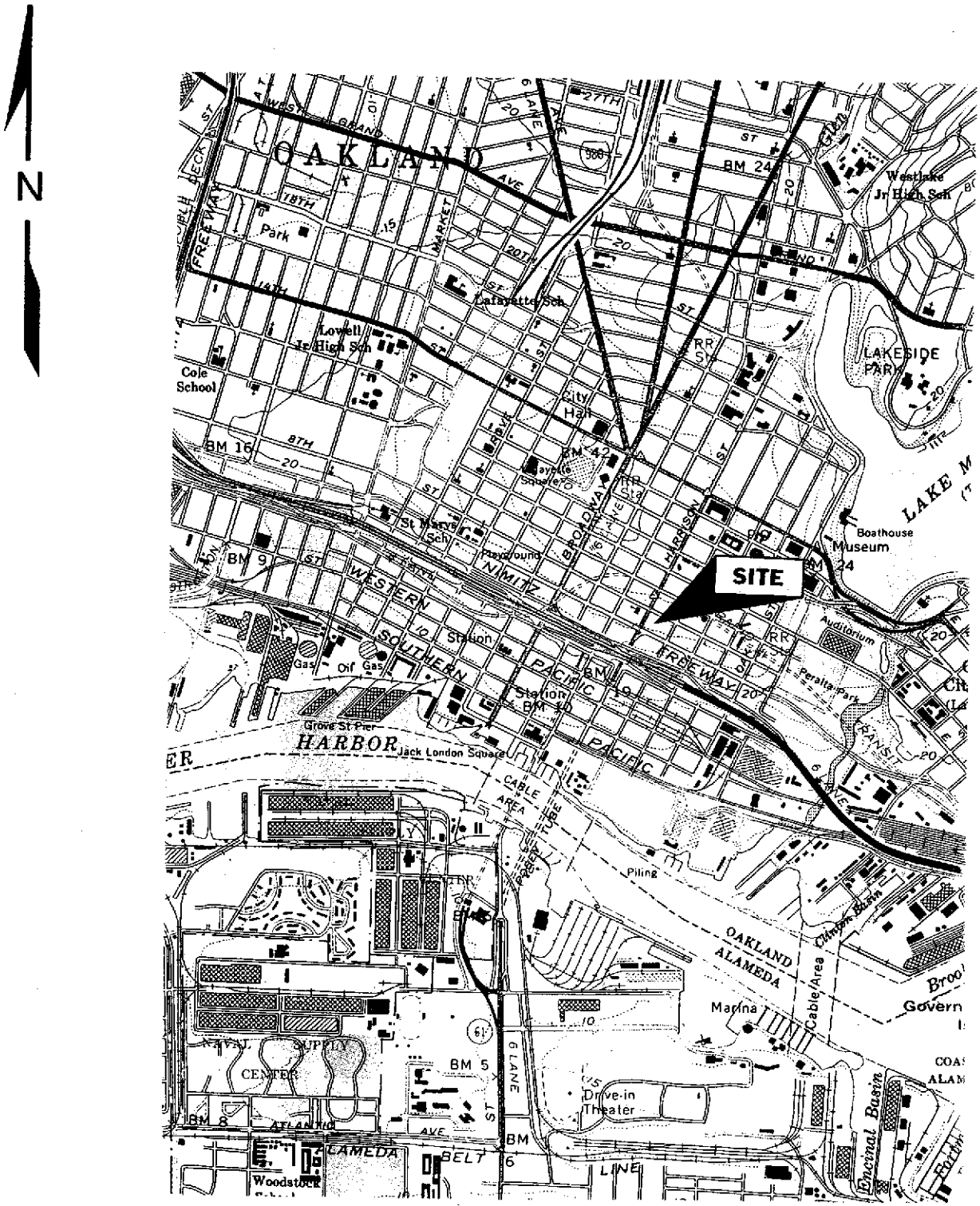
ASE will begin work on this project immediately upon approval of this workplan from the ACHCSA, pre-approval of the costs from the Underground Storage Tank Cleanup Fund (USTCF) and obtaining the required permits.

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

Respectfully submitted,

AQUA SCIENCE ENGINEERS, INC.

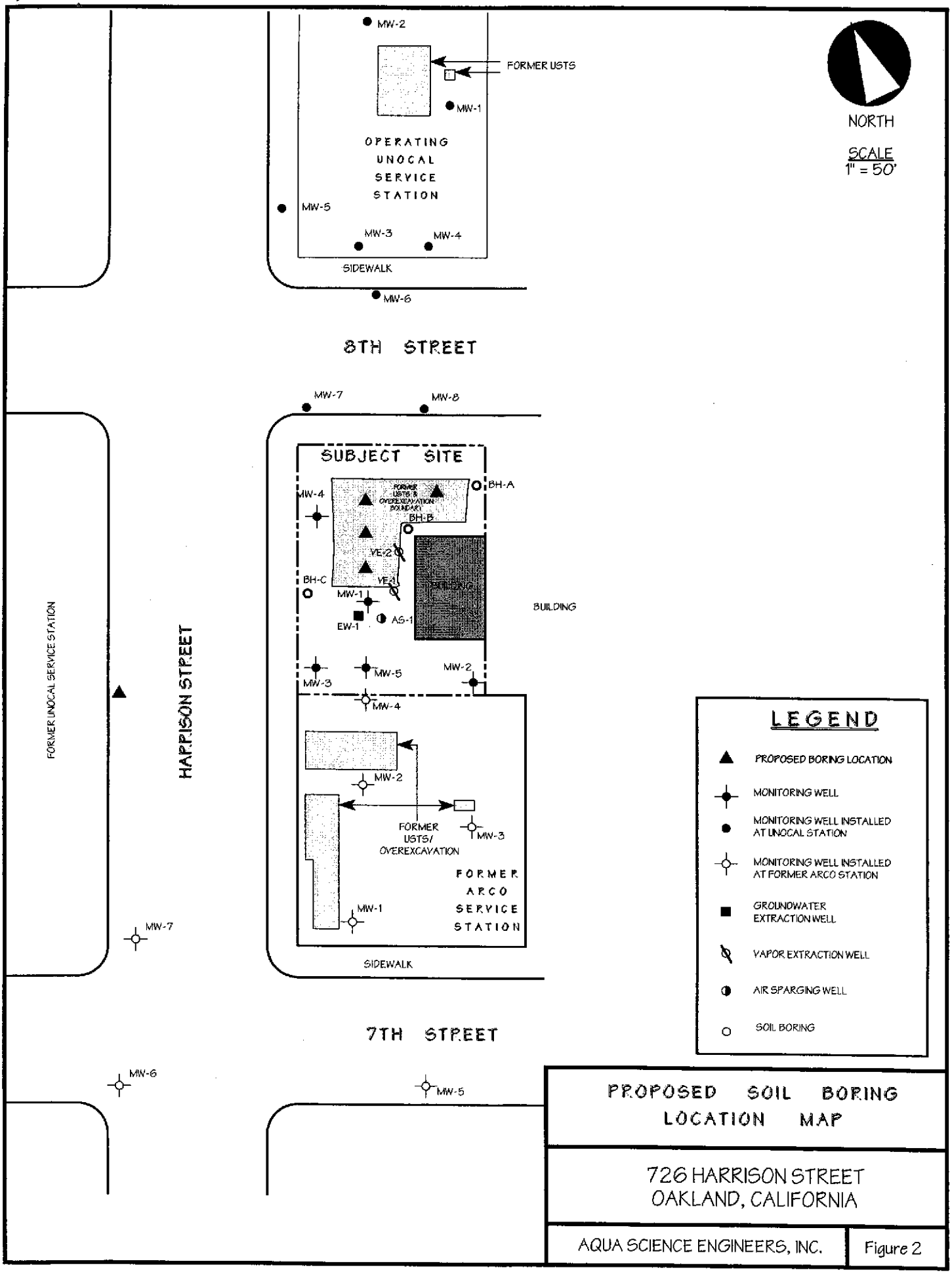
Robert E. Kitay, R.G., R.E.A.
Senior Geologist



SITE LOCATION MAP

FORMER CHAN'S SHELL STATION
726 HARRISION STREET
OAKLAND, CALIFORNIA

Aqua Science Engineers | Figure 1



PROPOSED SOIL BORING LOCATION MAP

726 HARRISON STREET
OAKLAND, CALIFORNIA

AQUA SCIENCE ENGINEERS, INC. | Figure 2

Appendix A

ACHCSA Letter Dated May 21, 2002

ALAMEDA COUNTY
HEALTH CARE SERVICES
AGENCY
DAVID J. KEARS, Agency Director

May 21, 2002

ENVIRONMENTAL HEALTH SERVICES
ENVIRONMENTAL PROTECTION
1131 Harbor Bay Parkway, Suite 250
Alameda, CA 94502-6577
(510) 567-6700
FAX (510) 337-9335

Mr. and Mrs. Kin Chan
4328 Edgewood Ave.
Oakland, CA 94602

Re: Fuel Leak Case No. RO0000321, 726 Harrison St., Oakland CA 94607

Dear Mr. and Mrs. Chan:

Alameda County Environmental Health, Local Oversight Program (LOP), has received and reviewed the Quarterly Groundwater Monitoring Report April 2002 for the referenced site prepared by Aqua Science Engineers Inc.,(ASE), your consultant. I have discussed these results and the site status with Mr. Robert Kitay of ASE. There has been difficulty in finding an appropriate remediation approach for this site. Conventional pump and treatment of groundwater and vapor extraction tests have not given promising pilot test results. My last letter, January 10, 2002, suggested that you consider evaluating the alternative of enhanced bioremediation. However, since this approach requires the ability for chemicals to be transported in groundwater, it suffers from the same handicap experienced in groundwater extraction. Mr. Kitay believes that there still may be residual contamination at the site since the groundwater concentrations in the wells remain elevated. He also believes that the former tank pit may contain residual contamination in soil and groundwater. He, therefore, recommends additional investigation. Our office has the following comments:

1. **Additional Soil and Groundwater Investigation-** Approximately four borings are recommended to be advanced proximal and within the former tank pit. The borings should be screened minimally every five feet to groundwater for possible chemical analysis. A grab groundwater sample should be collected from each boring for analysis. Please run your samples for the following compounds: TPHg, BTEX and MTBE. In addition, another boring should be advanced across Harrison St. to determine the extent of the plume off-site. Please submit a work plan for this additional work as requested below.

Technical Report Request

Please submit the following technical reports to our office according to the following schedule:

- **June 21, 2002-** Work Plan
- **July 29, 2002-** Soil and Groundwater Investigation Report

Please contact me at (510) 567-6765 with any questions.

Sincerely,

Barney M. Chan
Hazardous Materials Specialist

C: B. Chan, files
Mr. R. Kitay, ASE, 208 W. Pintado Rd., Danville, CA 94526
Ms. S. Chan-Barba, 242 California Ave., San Leandro, CA 94526
Mr. Bo Gin, 288 11th St., Oakland, CA 94607
Mr. R. Scheele, Cambria Environmental, 1144 65th St., Suite B, Oakland, CA 94608

ssi726Harrison