aqua science engineers inc.

June 16, 1999

WORKPLAN
for a
SOIL AND GROUNDWATER ASSESSMENT
at
The Salvation Army
810 Clay Street
Oakland, California

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

1.0 INTRODUCTION

This report presents Aqua Science Engineers, Inc. (ASE)'s workplan for a soil and groundwater assessment at the Salvation Army property located at 810 Clay Street in Oakland, California (Figures 1 and 2). The site assessment activities were initiated by Major Al Summerfield of the Salvation Army to meet the requirements of the Alameda County Health Care Services Agency (ACHCSA) as outlined in their letter dated May 25, 1999 (Appendix A).

2.0 BACKGROUND

2.1 Site History

Prior to the construction of the current site structure in 1965, a gasoline service station was located at the site. It is believed that the former underground storage tanks (USTs) for the station were located in the area of the current basement for the building. No information regarding the condition of the USTs upon the closing of the service station was available.

2.2 Previous Environmental Assessments

In January 1999, Ceres Associates of Oakland, California drilled three (3) soil borings at the site to assess subsurface environmental conditions for a potential buyer of the site (Figure 2). Soil samples were collected from each boring at a depth of 15-feet below ground surface (bgs) and groundwater samples were collected from a depth of 28-feet bgs. The soil sample collected from 15-feet bgs in boring SB-1 contained 3,800 parts per million (ppm) total petroleum hydrocarbons as gasoline (TPH-G), 1,000 ppm total petroleum hydrocarbons as diesel (TPH-D), 22 ppm benzene, 88 ppm toluene, 28 ppm ethylbenzene and 170 ppm total xylenes. The groundwater sample collected from boring SB-1 contained 610 parts per billion (ppb) TPH-G, 610 ppb TPH-D, 47 ppb benzene, 30 ppb toluene, 26 ppb ethylbenzene and 120 ppb total xylenes. Borings SB-2 and SB-3 contained much lower concentrations of hydrocarbons, below levels that are typically of concern to regulators.

In April 1999, ASE drilled two soil borings in the sidewalk area of the site for the collection of soil and groundwater samples for analysis. These borings were located on each side of previous boring SB-1. In addition, four soil samples were collected from beneath the basement area of the site. No hydrocarbons were detected in any of the soil samples analyzed.

Moderate hydrocarbon concentrations, including a benzene concentration of 540 ppb, were detected in the groundwater sample collected from boring BH-B. Several attempts were made to drill soil borings downgradient of the site on the opposite side of Clay Street but all of these borings were met with refusal at relatively shallow depths.

3.0 PROPOSED SCOPE OF WORK (SOW)

Based on the requirements of the ACHCSA, ASE's proposed SOW is as follows:

1) Prepare a workplan and a health and safety plan for approval by the ACHCSA.

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

3) Drill one (1) soil boring to approximately 35-feet bgs at the site.

4) Analyze at least one soil sample from each boring 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 benzene, toluene, ethylbenzene and total xylenes (collectively known as BTEX) and methyl tertiary butyl ether (MTBE) by EPA Method 8020.

5) Construct a 2-inch diameter groundwater monitoring well in the boring described in task 3.

6) Develop the monitoring well.

7) Collect groundwater samples from the monitoring well for analyses.

8) Analyze the groundwater samples at a CAL-EPA certified analytical laboratory for TPH-G, TPH-D, BTEX and MTBE.

9) Prepare a report detailing the methods and findings of this assessment.

Details of the assessment are presented below.

TASK 1 - PREPARE A WORKPLAN AND HEALTH AND SAFETY PLAN

Based on the site history and the analytical results of the soil and groundwater samples collected during previous environmental assessments at the site, ASE has previously prepared a site-specific health and safety plan. A nearby hospital is 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 NECESSARY PERMITS

ASE will obtain a drilling permit from the Alameda County Public Works Agency (ACPWA), an encroachment permit from the City of Oakland, and an 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 3 - DRILL ONE SOIL BORING AT THE SITE

ASE will drill one (1) soil boring at the location shown on Figure 2. The boring will be drilled using a hollow-stem auger drill rig. The drilling will be directed by a qualified ASE geologist. Undisturbed soil samples will be collected at least every 5-feet, at lithographic changes, and from just above the water table for subsurface hydrogeologic description and possible chemical analysis. The samples will be described by the ASE geologist according to the Unified Soil Classification System. The samples will be collected in brass tubes using a split-barrel drive sampler advanced ahead of the auger tip by successive blows from a 140-lb. hammer dropped 30-inches. Each sample 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.

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 4 - ANALYZE AT LEAST ONE SOIL SAMPLE FROM THE BORING

At least one (1) soil sample from the boring will be analyzed at a CAL-EPA certified environmental laboratory for TPH-G by modified EPA Method 5030/8015, TPH-D by EPA Method 3510/8015 and BTEX and MTBE by EPA Method 8020. The soil sample to be analyzed will be the sample which appears to be the most contaminated based on odors, staining and/or OVM readings. If there is no indication of contamination in any of the samples, the sample collected from just above the water table (the capillary zone) will be selected for analysis.

TASK 5 - COMPLETE THE BORING AS A MONITORING WELL

ASE will complete the boring described in task 3 as a 2-inch diameter groundwater monitoring well. The well will be constructed with 2-inch diameter, flush-threaded, schedule 40, 0.020-inch slotted PVC well screen and blank casing. The well casing will be lowered through the augers and #3 Monterey sand will be placed in the annular space between the well casing and the borehole to approximately 2-feet above the screened interval. Approximately 1-foot of bentonite pellets will be placed on top of the sand pack and hydrated with deionized water. This bentonite layer will prevent the cement sanitary seal from infiltrating into the sand pack. Cement mixed with 3 to 5 percent bentonite powder by volume will be used to fill the annular space between the bentonite layer and the surface to prevent surface water from infiltrating into the well. The well head will be protected by a locking well plug and an at-grade, traffic-rated well box (See Figure 3 - Typical Monitoring Well).

The well will be screened to monitor the first water-bearing zone encountered. Wells are typically screened with 5-feet of screen above the water table and 10 to 15-feet of screen below the water table. ASE anticipates the wells to be installed at the site will be screened between 15-feet bgs and 35-feet bgs.

TASK 6 - DEVELOP THE MONITORING WELL

The monitoring well will be developed after waiting at least 72 hours after well construction. The monitoring well will be developed using at least two episodes of surge block agitation and bailer or pump evacuation. At least ten well casing volumes of water will be removed during the development, and development will continue until the water appears to be reasonably clear. The well development purge water will be stored temporarily on-site in sealed and labeled 55-gallon steel drums until off-site disposal can be arranged.

TASK 7 - SAMPLE THE MONITORING WELL

After waiting 72 hours after the well development, ASE will sample the monitoring well. Prior to purging and sampling, the groundwater surface in the well will be checked for sheen or free-floating hydrocarbons. The thickness of any free-floating hydrocarbons will be measured with an acrylic bailer which will be lowered slowly to the groundwater surface and filled approximately half full for direct observation. ASE will also measure the depth to groundwater prior to purging. Prior to sampling, the monitoring well will be purged of at least four well casing volumes of groundwater. The temperature, pH and electrical conductivity of evacuated water will be monitored during the well purging, and purging will continue beyond four well casing volumes if these parameters have not stabilized. Groundwater samples will be collected from the monitoring well using disposable polyethylene bailers. Groundwater samples to be analyzed for TPH-G, BTEX and MTBE will be decanted from the bailer into 40-ml glass volatile organic analysis (VOA) vials, preserved with hydrochloric acid and sealed without headspace. The samples to be analyzed for TPH-D 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. The samples will then be placed on ice for transport to the analytical laboratory under chain of custody. Purged groundwater will be stored temporarily on-site in sealed and labeled 55-gallon steel drums until off-site disposal can be arranged.

TASK 8 - ANALYZE THE GROUNDWATER SAMPLES

The groundwater samples will be analyzed by 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 and MTBE by EPA Method 8020.

TASK 9 - PREPARE A SUBSURFACE ASSESSMENT REPORT

ASE will prepare a subsurface assessment report outlining the methods and findings of this assessment. This report will include a summary of the results, the site background and history, description of the well construction, development and sampling, tabulated soil and groundwater analytical results, conclusions and recommendations. Formal boring logs, analytical reports, and chain of custody documents will be included as appendices. This report will be submitted under the seal of a California registered civil engineer or geologist.

SCHEDULE

The process of obtaining the required permits will begin immediately upon approval of this workplan by the ACHCSA. Drilling will be scheduled as soon as the required permits are secured. The report should be available within one month of the drilling date.

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

Respectfully submitted,

AQUA SCIENCE ENGINEERS, INC.

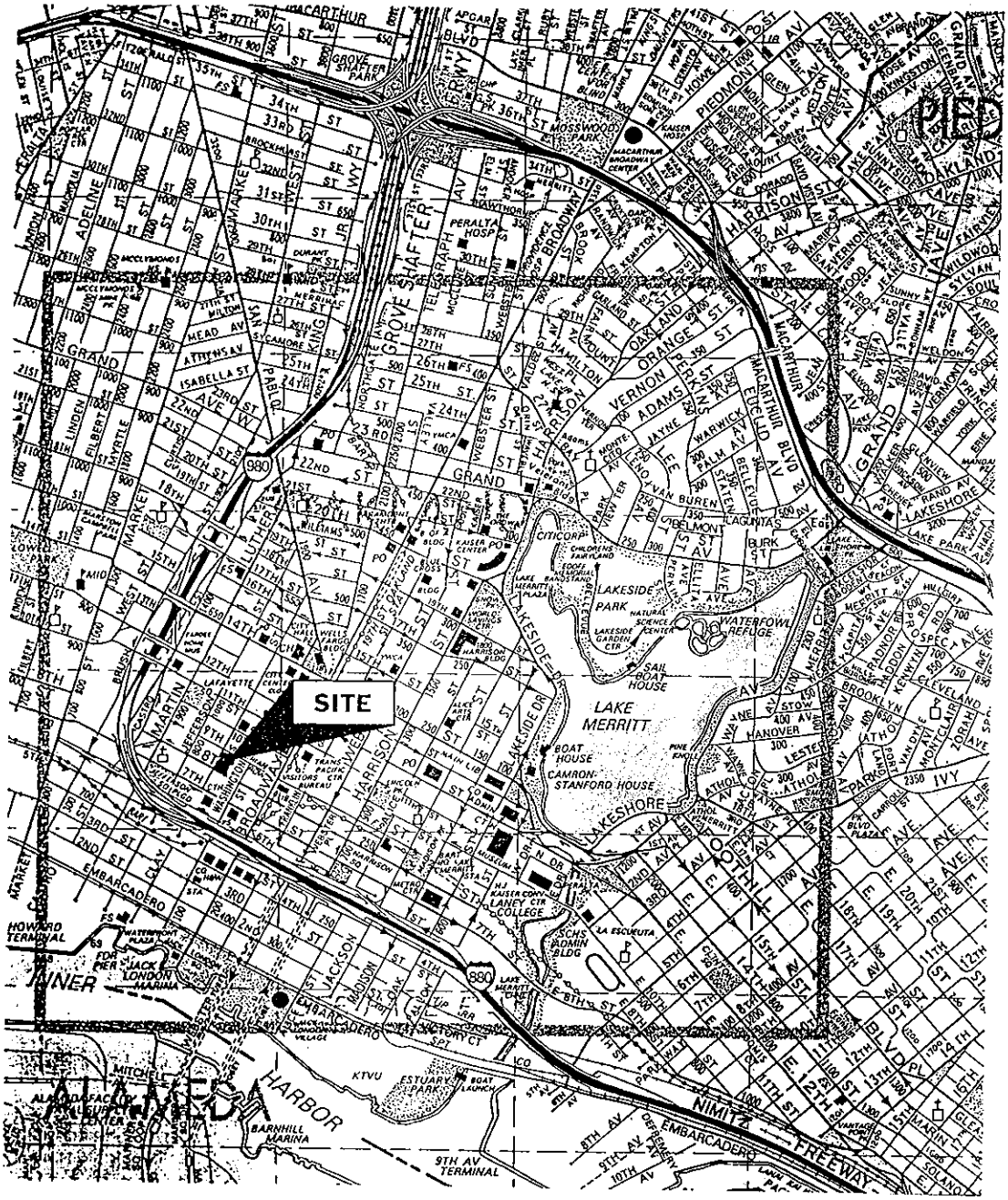
Robert E. Kitay, R.G., R.E.A.
Senior Geologist

cc: Major Al Summerfield, The Salvation Army, 810 Clay Street, P.O. Box 12397, Oakland, CA 94604

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

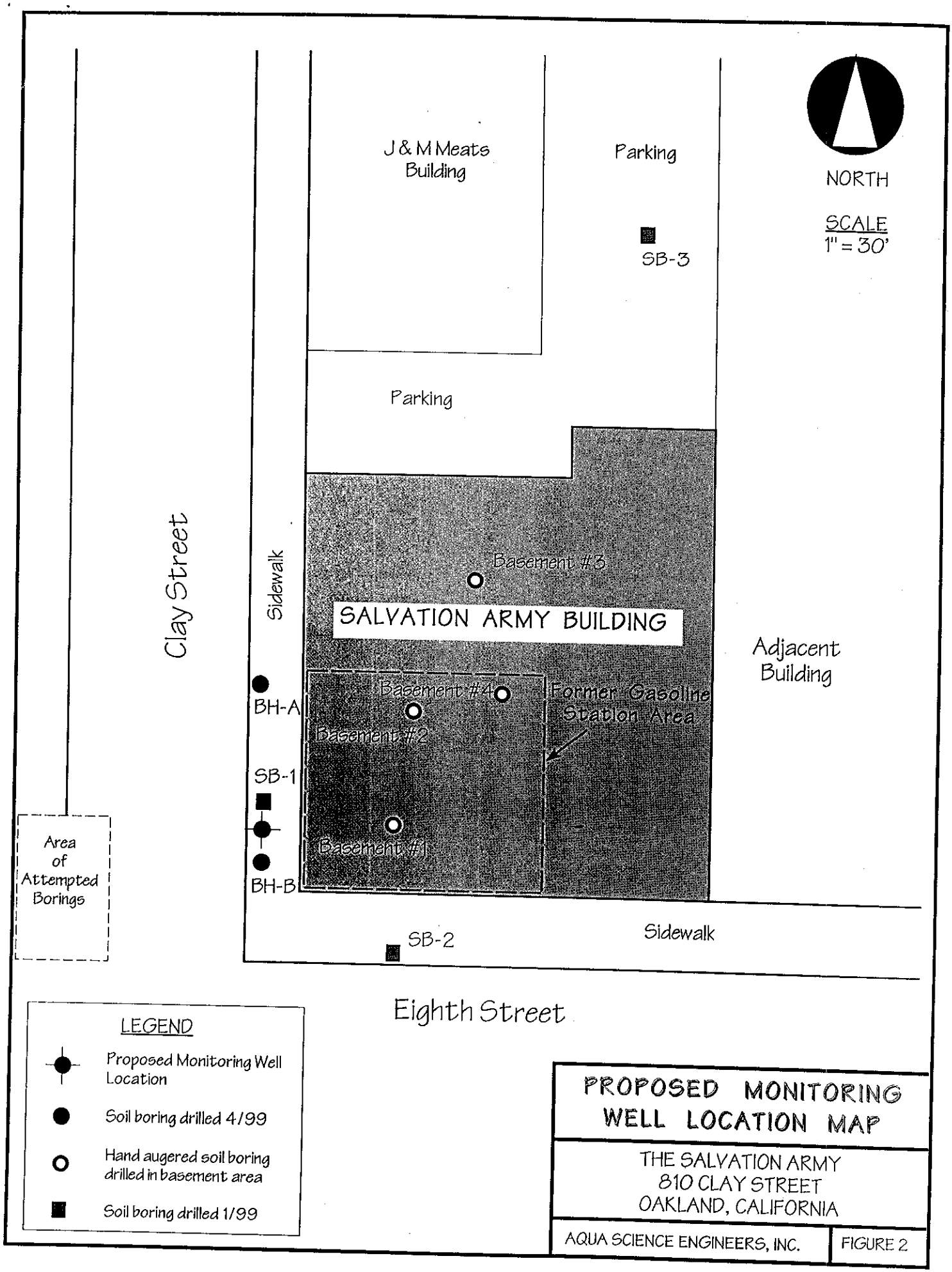
FIGURES



SITE LOCATION MAP

THE SALVATION ARMY
810 CLAY STREET
OAKLAND, CALIFORNIA

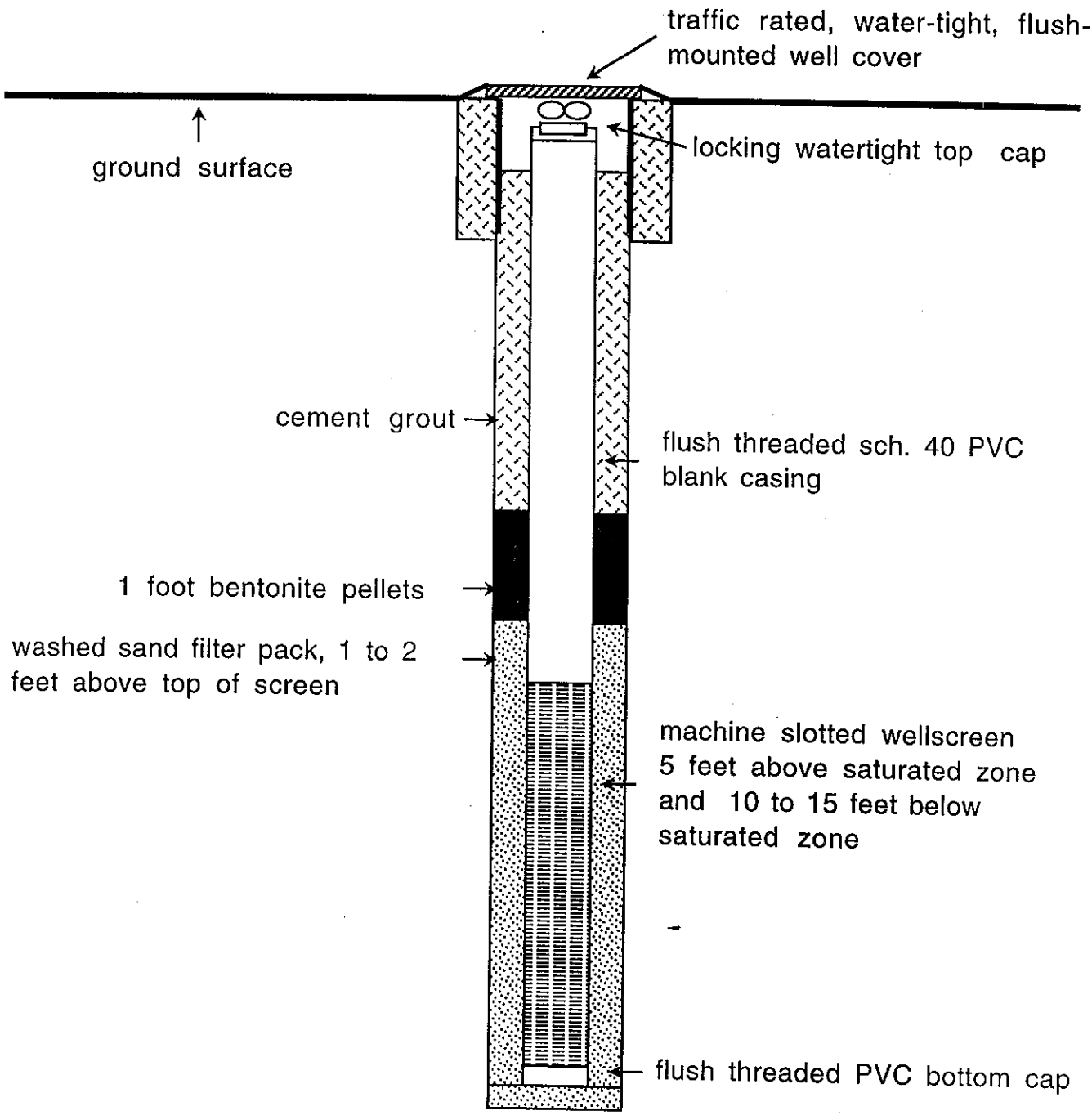
AQUA SCIENCE ENGINEERS, INC. | Figure 1



PROPOSED MONITORING WELL LOCATION MAP

THE SALVATION ARMY
810 CLAY STREET
OAKLAND, CALIFORNIA

AQUA SCIENCE ENGINEERS, INC. | FIGURE 2



TYPICAL
MONITORING WELL CONSTRUCTION
IN CROSS SECTION

Aqua Science Engineers | Figure 3

APPENDIX A

Letter from the ACHCSA

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

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

May 25, 1999

Mr. Robert Kitay
Aqua Science Engineers
208 W. El Pintado Road
Danville, CA 94526
STID 6638

RE: 810 Clay Street, Oakland, CA 94604

Dear Mr. Kitay:

As per our conversation today, the subsurface investigation for the above site must include the installation of at least one groundwater monitoring well in the verified downgradient direction.

If you have any questions, please contact me at (510) 567-6774.

Sincerely,

Larry Seto
Sr. Hazardous Materials Specialist

Cc: Major Al Summerfield, The Salvation Army, 810 Clay Street, P.O. Box 12397, Oakland, CA 94604
Leroy Griffin, City of Oakland Fire Department, 505-14th Street, 7th Floor, Oakland, CA 94612
Files