aqua science engineers inc.

July 12, 1993

Alameda County Health Care Services Agency
80 Swan Way, Room 350
Oakland, California 94621

Tom Peacock STID ~~3797~~ 379

ATTENTION: ~~Ms. Susan Hugo~~
Hazardous Materials Specialist

SUBJECT: WORKPLAN
1350 34th Street
Oakland, CA 94662

94608

wrong address

Dear Ms. Hugo:

Please find attached a copy of Aqua Science Engineer's subject report. We look forward to hearing your comments.

If you have any questions or comments, please feel free to give me a call at (510) 820-9391.

Respectfully submitted,

AQUA SCIENCE ENGINEERS, INC.

Robert E. Kitay
Project Geologist

WE'VE MOVED TO
2411 OLD CROW CANYON RD. #4
SAN RAMON, CA 94583
510-820-9391

Aqua Science Engineers Inc., ... A 94583 • 415-820-9391 • FAX 415-837-4853

aqua science engineers inc.

July 8, 1993

7/8/93

WORKPLAN
for
SOIL AND GROUNDWATER
ASSESSMENT, NO. 2659
at
Romak Iron Works
3250 Hollis Street
Oakland, California 94662

REGISTERED PROFESSIONAL ENGINEER
DAVID M. SCHULTZ
No. 38738
Exp 5-97
CIVIL
STATE OF CALIFORNIA

Submitted by:
AQUA SCIENCE ENGINEERS, INC.
2411 Old Crow Canyon Road, #4
San Ramon, CA 94583
(510) 820-9391

INTRODUCTION

This submittal outlines Aqua Science Engineer's, Inc. (ASE) proposed workplan for a soil and groundwater investigation at Romak Iron Works located at 3250 Hollis Street in Oakland, California (see Figure 1 - Site Location Map). The proposed site assessment activities were initiated by the property owner in accordance with a letter received from the Alameda County Health Care Services Agency (ACHCSA), dated April 29, 1993 (see Appendix A) as follow up to the January 15, 1992 underground storage tank removal. Presented below are a site history summary and an outline of ASE's proposed scope of work.

SITE HISTORY

On January 15, 1992, two underground gasoline storage tanks were removed from the site. ASE collected one soil sample from beneath each former tank location. Total petroleum hydrocarbons as gasoline (TPH-G) were detected at 180 parts per million (ppm) in one of the two samples. On January 16, 1992, approximately 20 cubic yards of soil were overexcavated and additional soil samples were collected to confirm that all hydrocarbon-bearing soil was removed from the ground. One of the confirmation samples still contained 11 ppm TPH-G. Since hydrocarbons were still detected in the soil, ACHCSA requested in a letter dated April 29, 1993 that a soil and groundwater investigation be preformed at the site. Although the April 29, 1993 letter from ACHCSA requests that three monitoring wells be installed at the site, Ms. Susan Hugo of ACHCSA, in a conversation with David Allen of ASE, stated that it would be acceptable to install only one groundwater monitoring well at the site if a reliable gradient could be established in the site vicinity. However, she also stated that additional wells may be required in the future and that she would not guarantee that closure would be granted with only one well.

ASE researched the groundwater flow direction in the site vicinity by reviewing the ACHCSA and San Francisco Bay Regional Water Quality Control Board files for the Guiton Charter Bus Company at the opposite corner of the 34th Street and Hollis Street intersection at 3421 Hollis Street in Oakland, California. ASE also contacted Epigene International and Hageman-Aguiar, Inc. (Guiton's former environmental consultants) for information in their files concerning the groundwater flow direction beneath their site. ASE also measured depths to groundwater in the Guiton wells on June 25, 1993. Groundwater appears to flow to the southwest beneath the Guiton site.

PROPOSED SCOPE OF WORK (SOW)

Based on the site history and requirements outlined in the ACHCSA April 29, 1993 letter, ASE's proposed SOW is as follows:

1) Prepare a site safety plan;

2) Obtain all necessary permits from the appropriate agencies for the installation of a monitoring well;

3) Drill one soil boring to 25 to 30 feet below ground surface (bgs) within 10-feet of the former tank in the assumed downgradient direction. Collect soil samples for subsurface hydrogeologic description and possible chemical analysis; Analyze selected soil samples for TPH-G and BTEX;

4) Complete the boring as a 2-inch diameter groundwater monitoring well;

5) Develop the well and and collect groundwater samples for analyses;

6) Analyze the groundwater samples for TPH-G and BTEX;

7) Report the subsurface investigation results.

Each of these tasks are described in detail below.

TASK 1 - PREPARE A SITE SAFETY PLAN

Based on the site history, previous work and analytical results of the soil samples collected during the tank removal, ASE has prepared a site-specific safety plan. The safety plan identifies potential site hazards and specifies procedures to protect site workers and the public. 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 is appended to this report (Appendix B: Health and Safety Plan)

TASK 2 - OBTAIN ALL NECESSARY PERMITS FROM THE APPROPRIATE AGENCIES FOR MONITORING WELL INSTALLATION

ASE will obtain a well construction permit from the Alameda County Flood Control and Water Conservation District (Zone 7) and will send a notification card to the California Department of Water Resources (DWR). ASE will also contact Underground Service Alert (USA) to mark all known utilities in the immediate site vicinity. After the well is completed, ASE will send well completion reports to the DWR as required.

TASK 3 - DRILL ONE SOIL BORING AND COLLECT SOIL SAMPLES

ASE will drill one soil boring with an 8-inch diameter hollow-stem auger drill rig within 10-feet of the former tank location in the assumed downgradient direction (see Figure 2 - Proposed Monitoring Well Location). 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. The samples will be immediately removed from the sampler, trimmed, sealed with either Teflon tape or aluminum foil (shiny side toward the sample) and plastic caps secured with either duct or electrical tape, labeled, placed into plastic bags and placed on ice for delivery under chain of custody to a CAL-EPA certified analytical laboratory. Soil from the remaining brass tubes not sealed for laboratory analysis will be removed for hydrogeologic description and will be screened for volatile compounds with an OVM. The soil will be screened by emptying soil from one of the brass 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 to decide which samples to analyze at the analytical laboratory. Soil cuttings will be placed in Department of Transportation approved 55-gallon (DOT 17H) drums. Soil disposal will be arranged by the client at a later date.

At least one soil sample will be analyzed at a CAL-EPA certified analytical laboratory for TPH-G and BTEX.

All sampling equipment will be cleaned in buckets with brushes and a TSP or Alconox solution, then rinsed twice with tap water. The drill rig and augers will be steam cleaned on-site before departure. Rinsates will be contained on-site in sealed and labeled Department of Transportation approved 55-gallon (DOT 17H) drums.

TASK 4 - COMPLETE THE BORING AS A MONITORING WELL

ASE will complete the soil boring as a 2-inch diameter groundwater monitoring well. The well will be constructed with 2-inch diameter, flush-threaded, schedule 40, O.020-inch slotted PVC well screen and blank casing. The well casing will be lowered through the augurs and #3 Monterey sand will be placed in the annular space between the well casing and the borehole to about 2-feet above the screened interval. Approximately 1 to 2 feet 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 will typically be screened with 5-feet of screen above the water table and 15-feet of screen below the water table. If a confining layer is encountered below the first water bearing zone, its thickness will be confirmed by sampling with decreasing diameter split barrel samplers. The sampling hole through the underlying confining layer will be sealed with bentonite pellets. ASE will not cross-screen two or more water-bearing zones separated by confining layers.

TASK 5 - DEVELOP AND SAMPLE THE MONITORING WELL

Prior to well development and sampling, the groundwater will be checked for sheen and free product prior to purging and sampling. Free product and sheen will be measured with an acrylic bailer which will be lowered slowly to the groundwater surface and filled about half full for direct observation. ASE will also measure the depth to groundwater in the well prior to the well being purged. The well will be developed using at least

two episodes of surge block agitation and bailer 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. Groundwater will be collected immediately after development using a disposable polyethylene bailer. Ground water will be decanted from the bailer into two 40-ml glass volatile organic analysis (VOA) vials. These samples will be labeled and stored on wet ice for transport to the analytical laboratory under chain of custody. Purged groundwater will be stored on-site in sealed and labeled DOT 17H drums for later disposal by the client.

TASK 6 - ANALYZE THE GROUNDWATER SAMPLES

The groundwater samples will be analyzed for TPH-G by modified EPA Method 8015 and BTEX by EPA Method 602 or 8020.

TASK 7 - PREPARE A SUBSURFACE INVESTIGATION REPORT

ASE will submit a subsurface investigation report outlining the methods and findings of this investigation. The report will be submitted under the seal of State Registered Civil Engineer, Mr. David Schultz (#38738). This report will include a summary of the results, the site background and history, the topographic and geologic setting, rational for well placement and design, description of the well construction, development and sampling, tabulated soil and groundwater analytical results, and data collected during the well development and sampling including estimated flow rate, pH, temperature, and electrical conductivity on the initial sampling, conclusions and recommendations. Formal boring logs, analytical reports, and chain of custodies will be included as appendices.

SCHEDULE

We anticipate beginning work at this site the week of July 19, 1993. The report will be complete by the week of August 8, 1993.

Aqua Science Engineers appreciates the opportunity to assist Romak Iron Works with its environmental needs. Should you have any questions or comments, please feel free to call us at (510) 820-9391.

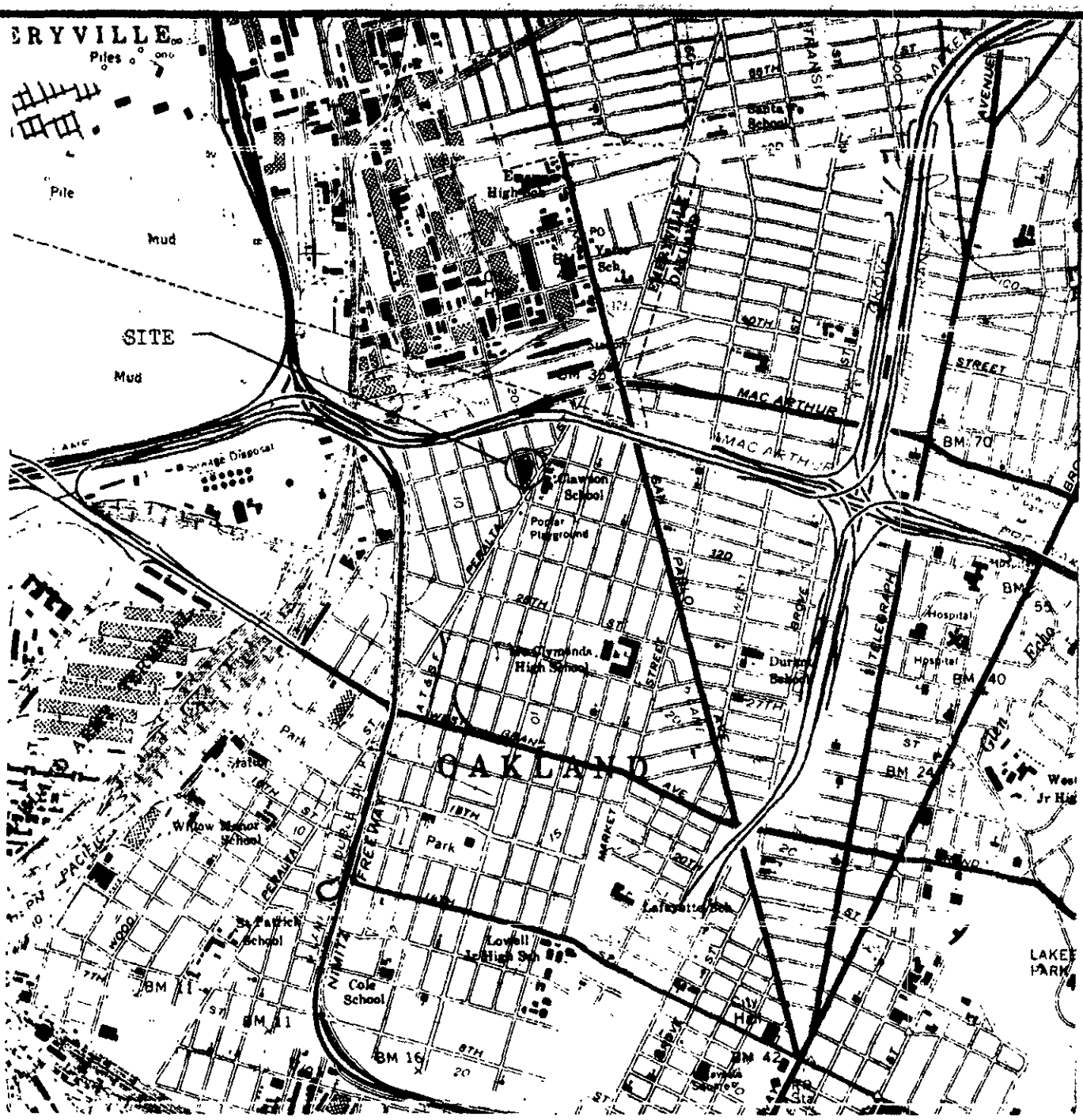
Respectfully submitted,

AQUA SCIENCE ENGINEERS, INC.

Robert E. Kitay
Project Geologist

Attachments: Figures 1, 2 & 3
Appendices A & B

cc: Mr. Kevin Romak, Romak Iron Works
Ms. Susan L. Hugo, ACHCSA
Mr. Rich Hiett, RWQCB, San Francisco Bay Region

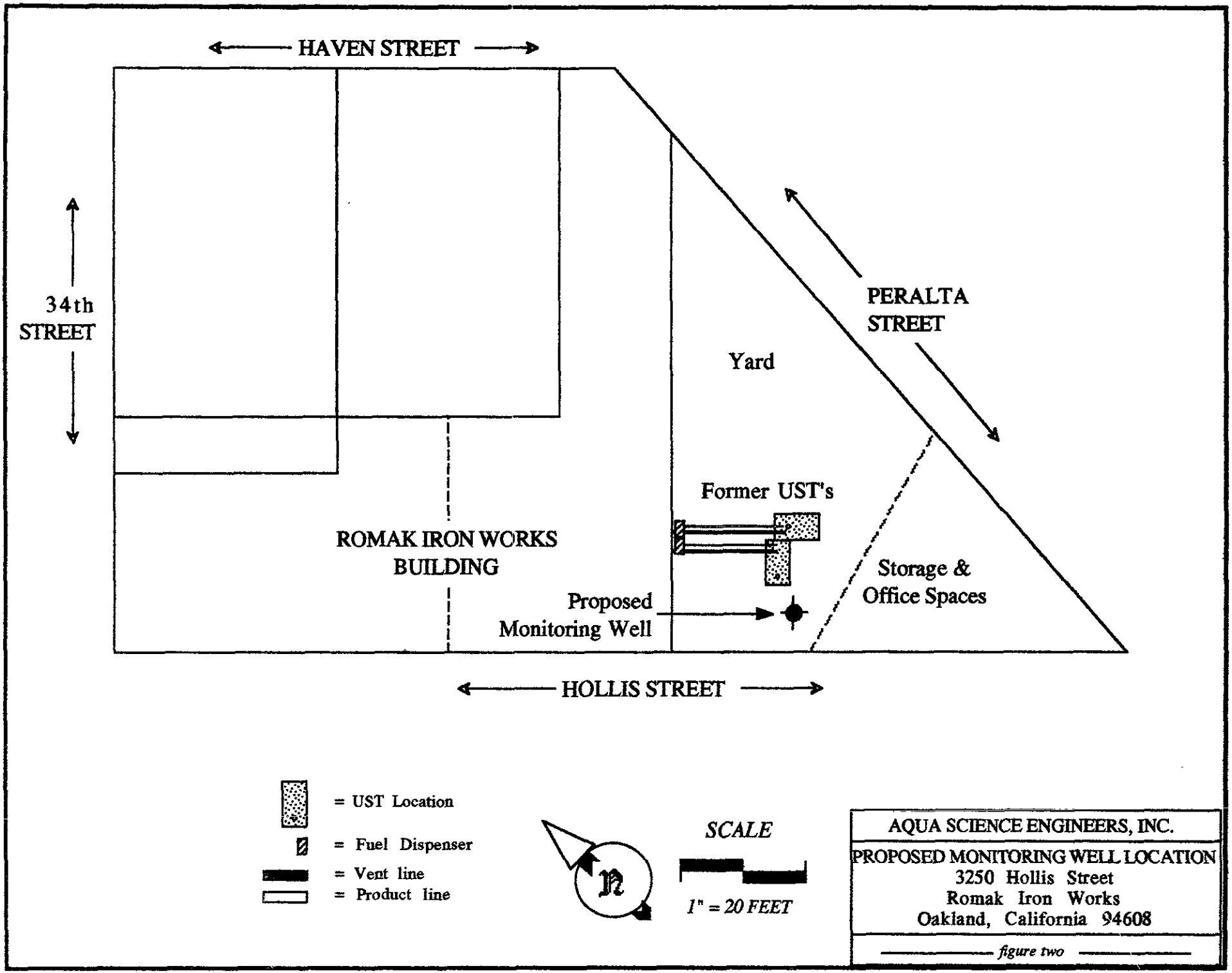


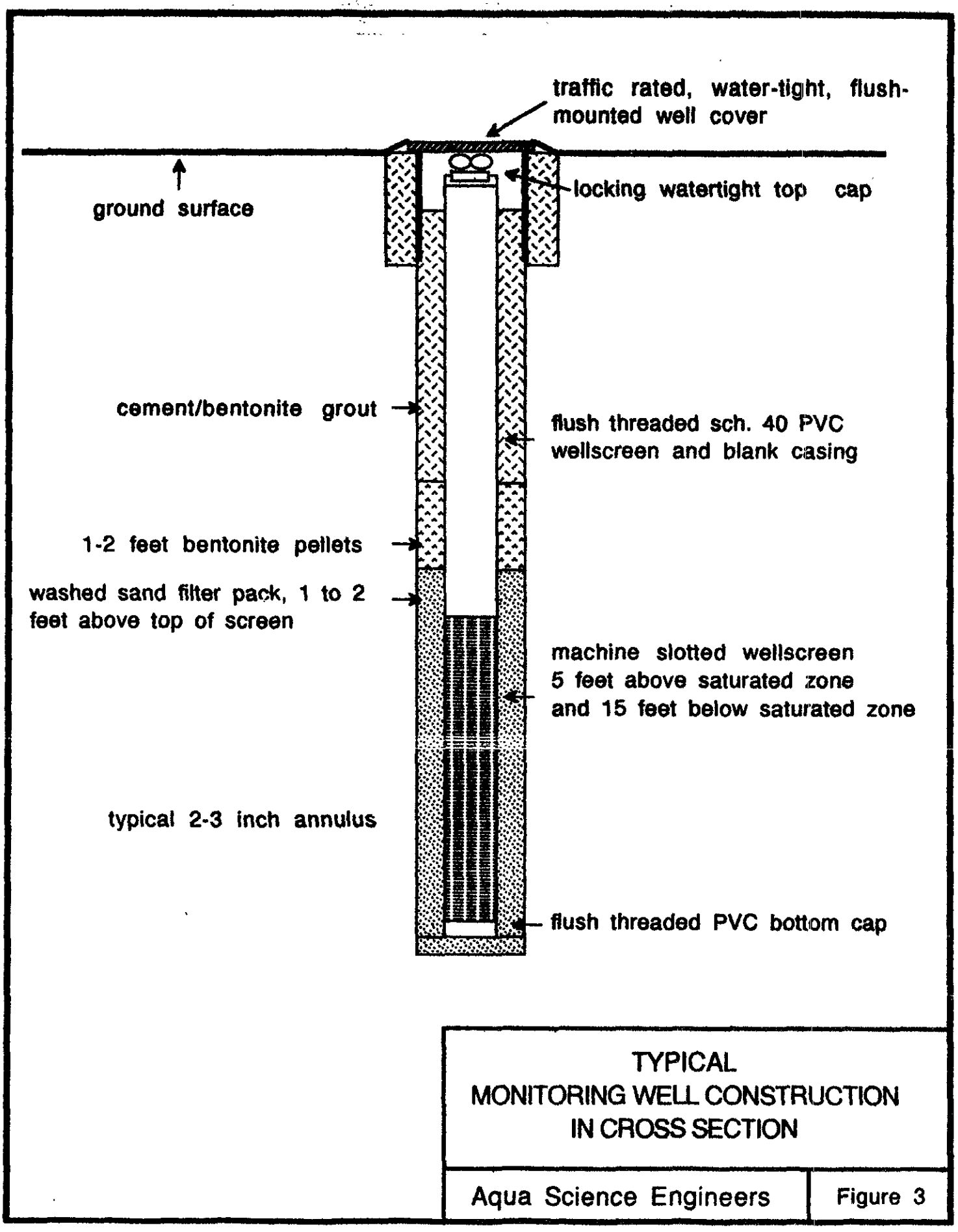
BASE USGS Oakland West 7.5 minute quadrangle topographic r
dated 1980 scale 1:24,000

SITE LOCATION MAP

Romak Iron Works
3250 Hollis Street
Oakland, California

Aqua Science Engineers | Figure 1


HAVEN STREET
34th STREET
PERALTA STREET
Yard
Former UST's
ROMAK IRON WORKS BUILDING
Storage & Office Spaces
Proposed Monitoring Well
HOLLIS STREET
= UST Location
= Fuel Dispenser
= Vent line
= Product line
N
SCALE
1" = 20 FEET
AQUA SCIENCE ENGINEERS, INC.
PROPOSED MONITORING WELL LOCATION
3250 Hollis Street
Romak Iron Works
Oakland, California 94608
figure two



TYPICAL
MONITORING WELL CONSTRUCTION
IN CROSS SECTION

Aqua Science Engineers | Figure 3

APPENDIX A

Alameda County Health Care Services Agency
"Direction" Letter

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

RAFAT A. SHAHID, ASST. AGENCY DIRECTOR

DEPARTMENT OF ENVIRONMENTAL HEALTH
State Water Resources Control Board
Division of Clean Water Programs
UST Local Oversight Program
80 Swan Way, Rm 200
Oakland, CA 94621
(510) 271-4530

April 29, 1993
STID# 379
Mr. Kevin Romak
Romak Iron Works
3250 Hollis Street
Oakland, California 94608

RE: Removal of Two Underground Storage Tanks at Romak Iron Works 3250 Hollis Street, Oakland, CA 94608

Dear Mr. Romak:

The Alameda County Department of Environmental Health, Hazardous Materials Division has reviewed the files concerning the removal of two underground gasoline tanks on January 15, 1992 at the referenced site. We are in receipt of the Underground Storage Tank Removal Project Report (January 27, 1992) and the Sampling and Tank Pit Closure Final Report (August 27, 1992) prepared by Aqua Science Engineers.

Soil samples collected beneath the tank areas showed elevated levels of Total Petroleum Hydrocarbon as gasoline (180 ppm) and benzene (510 ppb). In addition, free floating product was observed during the tank removal activities. Limited overexcavation was performed on January 16, 1992 and verification soil samples collected showed 11 ppm of TPH gasoline and 120 ppb of benzene. Because of the degree of contamination found at the site which exceeded regulatory threshold levels, further environmental assessment is required to determine the extent of the unauthorized release associated with the former tanks at the site.

This office will be the lead agency overseeing the environmental investigation and cleanup activities at the site. The RWQCB has delegated this authority to our office. However, you must keep the Water Board apprised of all actions taken to characterize and remediate contamination at the site, because the Board retains the ultimate responsibility for ensuring protection of the waters of the state.

A preliminary assessment should be conducted to determine the extent of soil and/or groundwater contamination that has resulted from the former leaking tank. The information gathered by this investigation will be used to assess the need for additional actions at the site. The preliminary assessment should be designed to provide all of the information in the format shown in the attachment at the end of this letter, which is based on the RWQCB's guidelines. You should be prepared to install at a minimum, three monitoring wells to establish gradient direction of the groundwater at the site. One of the wells should be installed within 10 feet downgradient of the former tank location. Monthly water elevation reading for the first six months and reduced to every quarter is necessary to determine groundwater flow direction. Quarterly

sampling for target compounds (TPH gasoline, benzene, ethyl benzene, toluene, & xylene) must occur to determine extent of the groundwater contamination.

Until cleanup is complete, you will need to submit reports to this office and to RWQCB every three months (or at a more frequent interval, if specified at any time by either agency). These reports must include information pertaining to further investigative results; the methods of cleanup actions implemented to date; and the method and disposal of any contaminated material. Copies of manifests for such disposal must be sent to this office.

Your work plan must be submitted to this office no later than **June 14, 1993.** All reports and proposals must be submitted under seal of a California Registered Geologist or Registered Civil Engineer with a statement of qualifications for each lead professionals involved with the project. Copies of the reports and proposals must also be submitted to:

Rich Hiett
RWQCB, San Francisco Bay Region
2101 Webster Street, Fourth Floor
Oakland, California 94612

Because we are overseeing this site under the designated authority of the Regional Water Quality Control Board, this letter constitutes a formal requests for technical reports pursuant to California Water Code Section 13267(b). Any extensions of stated deadlines or changes in the workplan must be confirmed in writing and approved by this agency or RWQCB.

Enclosed is a copy of Appendix A (Workplan for Initial Subsurface Investigation (August 20, 1991) for your reference.

Should you have any questions regarding this letter, please contact me at (510) 271-4530.

Sincerely,

Susan L. Hugo

Susan L. Hugo
Senior Hazardous Materials Specialist

Enclosure
cc: Rafat A. Shahid, Asst. Agency Director, Environmental Health
Rich Hiett, San Francisco Bay RWQCB
Gil Jensen, Alameda County District Attorney's Office
Edgar B. Howell, Chief, Hazardous Materials Division /file
David Allen, Aqua Science Engineers, Inc.
P.O. Box 535 San Ramon, CA 94583

APPENDIX B

Health and Safety Plan

HEALTH & SAFETY PLAN

for the

Romak Iron Works Jobsite
3250 Hollis Street
Oakland, CA 94662

prepared by

Aqua Science Engineers, Inc.
2411 Old Crow Canyon Road, #4
San Ramon, California 94583
(510) 820-9391

AQUA SCIENCE ENGINEERS, INC.
HEALTH & SAFETY PLAN
for the
ROMAK IRON WORKS JOBSITE

A. GENERAL DESCRIPTION

Site: 3250 HOLLIS STREET, OAKLAND, CALIFORNIA

Work Scope: AQUA SCIENCE ENGINEERS WILL INSTALL ONE GROUNDWATER MONITORING WELL AT THE ABOVE REFERENCED SITE.

SAFETY POLICY:

This Health and Safety Plan is written specifically for the Romak Iron Works jobsite. All persons on site will follow OSHA safe operating practices as outlined in 29 CFR 1910 and 1926, as well as established guidelines from their respective companies or organizations.

Plan Prepared by: Robert Kitay Date: 7/9/93

Plan Approved by: David Schultz Date: 7/9/93

Background Review Done? Complete: 7/2/93
Preliminary:

Overall Hazard Level: Serious: Low: XXX
Moderate: Unknown:

Project Organization:
Site Manager for A.S.E.: David Allen
A.S.E. Safety Officer: Robert Kitay
Other A.S.E. Personnel: Diane Sobrero

B. SITE/WASTE CHARACTERISTICS

Waste Type(s): Solid: XXX Sludge: Liquid: XXX Gas:

Characteristics: HYDROCARBON RESIDUALS, TOXIC

Site Parameter:
THE MONITORING WELL LOCATION IS IDENTIFIED AS AN EXCLUSION ZONE. A MINIMUM BOUNDARY OF THREE FEET IS TO BE MAINTAINED AS MUCH AS IS POSSIBLE.

C. HAZARD EVALUATION

CHEMICAL HAZARDS

Potential chemical hazards include skin and eye contact or inhalation exposure to potentially toxic concentrations of hydrocarbon vapors. The potential toxic compounds that may exist at the site are listed below, with descriptions of specific health effects of each. The list includes the primary potential toxic constituents of gasoline and waste oil known to be on site. Exposure levels and symptoms are taken from the NIOSH Pocket Guide to Chemical Hazards.

1. BENZENE

a. Colorless, clear, highly flammable liquid with characteristic odor.
b. High exposure levels may cause acute restlessness, convulsions, depression, respiratory failure. BENZENE IS A SUSPECTED CARCINOGEN.
c. Permissible exposure level (PEL) for a time weighted average (TWA) over an eight hour period is 1.0 ppm.

2. TOLUENE

a. Colorless liquid with a benzene-like odor.
b. High exposure levels may cause fatigue, euphoria, confusion, dizziness. TOLUENE IS LESS TOXIC THEN BENZENE.
c. PEL for a ten hour TWA is 100 ppm.

3. XYLENE

a. Colorless, flammable liquid with aromatic odors.
b. high exposure levels may case dizziness, drowsiness, narcosis.
c. PEL for a ten hour TWA is 100 ppm.

4. ETHYLBENZENE

a. Clear, colorless, highly flammable liquid with characteristic odor.
b. High exposure levels may cause irritation to skin, nose and throat, dizziness, constriction in chest, loss of consciousness, respiratory failure.
c. PEL for an eight hour TWA is 100 ppm.

5. LEAD

(Lead Arsenate)

a. Odorless, colorless solid with properties that vary depending upon specific compounds.
b. High exposure levels may cause nausea, diarrhea, inflamed mucous membranes, abdominal pains, weakness. LEAD IS A SUSPECTED CARCINOGEN.
c. PEL for an eight hour TWA is .05 milligrams per cubic meter (airborne).

ALL SUBSTANCES AS THEY EXIST ON SITE ARE EXPECTED TO BE STABLE.

PHYSICAL HAZARDS

Personnel shall maintain the maximum distance possible from the borings while performing their activities. Other on-site hazards include physical injuries due to the proximity of workers to engine-driven heavy equipment and tools. Heavy equipment used during drilling includes a drill rig. Only trained personnel will operate machines, tools and equipment; all will be kept clean and in good repair. Minimum safety apparel required around heavy equipment will include a hardhat, steel-toed boots and hearing conservation devices. ALL WORK WILL BE PERFORMED IN ACCORDANCE WITH OSHA GUIDELINES.

Inspections of well location, the adjacent areas, and protective systems are to be made by a qualified person while personnel are on site.

1. USE SAFETY EQUIPMENT, MASK RESPIRATORS WITH NIOSH APPROVED C-21 CARTRIDGES FOR ORGANIC VAPORS, AS NECESSARY.

2. HAVE AT LEAST ONE DRY CHEMICAL MODEL PA-200 A-B-C FIRE EXTINGUISHER PRESENT.

LEVEL OF PROTECTION

A contamination Reduction Zone (CRZ) will be maintained and adjusted as work proceeds and moves around the site. The workers on-site will wear level 'D' protective clothing. (This protection level may be upgraded after on-site conclusions of data are completed). THE LEVEL OF PROTECTION FOR PERSONNEL WORKING IN THE AREA WILL BE UPGRADED IF: THE ORGANIC VAPOR LEVELS IN THE OPERATOR'S BREATHING ZONE EXCEEDS 5 PPM ABOVE BACKGROUND LEVELS CONTINUOUSLY FOR MORE THAN FIVE MINUTES (to be monitored by a hand-held OVM). In this event, personnel protective equipment will include full face respirators with double-cartridge filters for organic vapors and particulates, in addition to hardhat, steel-toed boots and coveralls. If work proceeds in an environment where vapor concentrations exceed 200 ppm, a self contained breathing apparatus or airline respirator will be utilized by the personnel.

Levels of Protective Clothing are defined on the following pages as described in the "EPA Standard Operating Safety Guidelines":

LEVEL A PROTECTION

Components:

1.) Pressure-demand, supplied air respirator that is MSHA and NIOSH approved. Respirators may be pressure demand, self contained breathing apparatus (SCBA), or pressure demand, airline respirator with an escape bottle for atmospheres with an extreme IDLH.

2.) Fully encapsulating chemical resistant suit.

3.) Inner, chemical resistant gloves.

4.) Disposable gloves and boot covers, worn over the fully encapsulating suit.

5.) 2-way radio communications is highly recommended.

LEVEL B PROTECTION

Components:

1.) Pressure-demand, supplied air respirator that is MSHA and NIOSH approved. Respirators may be pressure demand, self contained breathing apparatus (SCBA), or pressure demand, airline respirator with an escape bottle for atmospheres with an extreme IDLH.

2.) Chemical resistant clothing which includes overalls and long sleeved jacket or, hooded one or two piece chemical splash suit or disposable chemical resistant one piece suit..

3.) Outer chemical resistant gloves.

4.) Inner chemical resistant gloves.

5.) Chemical resistant, steel toed and shank boots.

6.) Disposable chemical resistant boot covers.

7.) Hardhat.

8.) 2-way radio communications is highly recommended.

LEVEL C PROTECTION

Components:

1.) Air purifying respirator, full face, with twin cartridge or cannister equipped filters, that are MSHA and NIOSH approved.

2.) Chemical resistant clothing which includes coveralls or, hooded one-piece or two-piece chemical splash suit or chemical resistant hood and apron; disposable chemical resistant coveralls.

3.) Outer chemical resistant gloves.

4.) Inner chemical resistant gloves.

5.) Chemical resistant, steel toed and shank boots.

6.) Disposable chemical resistant boot covers.

7.) Hardhat.

8.) 2-way radio communications is recommended.

LEVEL D PROTECTION

Components:

1.) Coveralls.

2.) Gloves.

3.) Leather boots, shoes or chemical resistant, with steel toe and shank.

4.) Safety glasses or chemical splash goggles.

5.) Hardhat or face shield.

SITE ENTRY PROCEDURES

Any personnel entering the site will observe all conditions set forth by the owners/operators of the property, including vehicle travel speeds, restricted areas and conduct. Eating, drinking, smoking and other practices which increase the probability of hand-to-mouth transfer of contamination is prohibited in the work zone. All field personnel will be instructed to thoroughly wash their hands and face upon leaving the work area for breaks or cessation of day's activities.

DECONTAMINATION PROCEDURES

If required, equipment and personnel decontamination areas will be designated by the Project Manager at the start of the project. To prevent the transfer of contamination from the work site into clean areas, all tools will be cleaned adequately prior to final removal from the work zone. Disposable protective clothing such as Tyvek coveralls, latex gloves, boot covers, etc. will be changed on a daily basis or at the discretion of the Project Manager on site. All disposable protective clothing will be put into plastic bags and disposed of in a proper manner. All respirator cartridges will be discarded and replaced with fresh units on a daily basis, disposal will be in the same manner as the protective clothing. Excavated material and drill cuttings will be stockpiled in an area designated by the Project Manager, to be handled as agreed upon in the scope of work contract with the client.

In the event of a medical emergency, the injured party will be taken through decontamination procedures, if possible. However, the procedures may be omitted when it may aggravate or cause further harm to the injured party. member of the work team will accompany the injured party to the medical facility to advise on matters concerning chemical exposure. <u>The injured person will not transport themselves to the medical facility!</u>

Personnel Protection Level will be Level 'D'. Protective clothing levels may be upgraded in the event that on site conclusions determine a greater then anticipated danger to personnel.

Site Entry: BARRICADES, CONES, OR BANNER GUARD MAY BE ERECTED TO CONTROL FOOT TRAFFIC AWAY FROM THE WORK ACTIVITY.

Decontamination-

Personnel and Equipment: IF REQUIRED, PERSONNEL AND EQUIPMENT WILL BE DECONTAMINATED AS PER USEPA STANDARD OPERATING SAFETY GUIDELINES. A SMALLER MODIFIED DECONTAMINATION LINE MAY BE USED DUE TO SPACE RESTRICTIONS.

Work Limitations (time, weather):

NONE ARE ANTICIPATED; HOWEVER, PERSONNEL WORKING ON SITE MAY EXPERIENCE ELEVATED TEMPERATURES DURING THE WORK DAY. IN THE EVENT THAT AMBIENT TEMPERATURES REACH OR EXCEED 80 DEGREES FAHRENHEIT, THE FOLLOWING GUIDELINES ARE RECOMMENDED.

1. Periods of work should be reduced to no less then one hour time frames and separated by breaks intended to reduce personnel stress due to reduced natural ventilation from wearing protective clothing.

2. All personnel wearing level C protective clothing or greater, will be subject to medical monitoring of body temperature after work periods, by the following guidelines;

a. Heart Rate (HR) should be measured by counting the radial pulse rate for 30 seconds and doubling count for the correct pulse rate. This should be done as early as possible in the resting period. The HR at the beginning of the rest period should not exceed 110 beats per minute. If the HR is higher, the next work period should be shortened by 10 minutes, while the length of the rest period remains the same. If the HR is 100 beats per minute at the beginning of the next rest period, the following work period should be shortened by an additional 10 minutes.

b. Body temperatures should be measured orally with a clinical thermometer as soon as possible in each resting period. Oral Temperatures (OT) should not exceed 99 degrees Fahrenheit. If it does, the next work period should be reduced by 10 minutes while the length of the resting period remains the same. If the OT exceeds 99 degrees Fahrenheit at the beginning of the next work period, the following work period should be reduced by an additional 10 minutes. OT should be measured at the end of each rest period to ensure that the body's temperature has dropped below 99 degrees Fahrenheit.

Body Water Loss (BWL) from sweating, could result in dehydration and further complications and stress on personnel working in protective clothing under adverse weather conditions. It is strongly recommended that plenty of stress relief beverages be available on site to replace body fluids. Commercial drink mixes that provide electrolyte balancing solutions or water are adequate for replacing body fluids.
Alternate methods of heat stress reduction can be made available such as,

Portable showers or hose-down facilities,
Shelter cover to protect against direct sunlight,
Rotating teams of personnel wearing protective clothing,
Performing extremely arduous tasks early in the workday.

EMERGENCY INFORMATION

In the event of an injury or suspected chemical exposure, the first responsibility of the project Manager will be to prevent any further injury. This objective will normally require an immediate stop to work until the situation is remedied. The Project Manager may order the evacuation of the work party. Other primary responsibilities in the event of an accident will be the first aid and decontamination of the injured team member(s). The injured party will be moved to a designated safe area and initial first aid will be rendered.

Employees are asked to make every effort and take personnel responsibility to prevent accidents involving machinery or any other aspect of the job, either by individual action or by notifying the Project Manager immediately of any unsafe condition that may exist.

In the event of an unexpected hazardous material discovery on site, the following actions will be taken by any employee involved;

1. The person having uncovered the unexpected material will notify the Project Manager and other workers of the danger. The site will be cleared of personnel if deemed necessary by the Project Manager. If site evacuation is required, appropriate local agencies such as the Fire Department or Health Department will be notified as well.

2. Immediate action will be taken to contain the hazardous material, provided the workers involved are properly attired with adequate protective clothing to avoid exposure.

3. Proper containment procedures will be determined for the hazardous material encountered prior to cleanup commencing. All personnel involved in the containment effort will be properly protected to prevent exposure. Backup personnel will be similarly protected while monitoring the work being done for any additional dangers.

4. The container(s) will be staged on-site, away from the major activity areas and in such a way that if loss of containment occurs, the material will be withheld from further spread by a secondary containment berm or vessel.

5. The owner or agent controller of the property will be notified promptly of the incident and will be apprised as to the options available for proper disposal.

EXPOSURE SYMPTOMS AND FIRST AID

EXPOSURE ROUTE	SYMPTOMS	FIRST AID
Skin	Dermatitis, itching redness, swelling	Wash immediately with soap and water contact ambulance if evacuation is needed.
Eyes	Irritation, watering	Flush with water, transport directly to emergency room, if necessary.
Inhalation	Vertigo, tremors	Move person to fresh air, cover source of exposure.
Ingestion	Nausea, vomiting	Call Poison Control Center, DO NOT INDUCE VOMITING, transport to medical facility.

Local Resources:
HEALTH AND SAFETY CONTACT FOR ASE:

David Allen
Office: (510) 820-9391

Police : 911
Fire

POISON CONTROL: SF (415) 476-6600

ROUTE TO NEAREST HOSPITAL

Exit site, Travel south on Hollis Street
LEFT onto Peralta Street
RIGHT onto 34th Street
LEFT into emergency entrance just after
Andover Street and before Webster Street

HOSPITAL IS NEAR THE CORNER OF 34th STREET AND WEBSTER STREET

Hospital: MERRITT HOSPITAL
350 HAWTHORNE AVENUE, OAKLAND

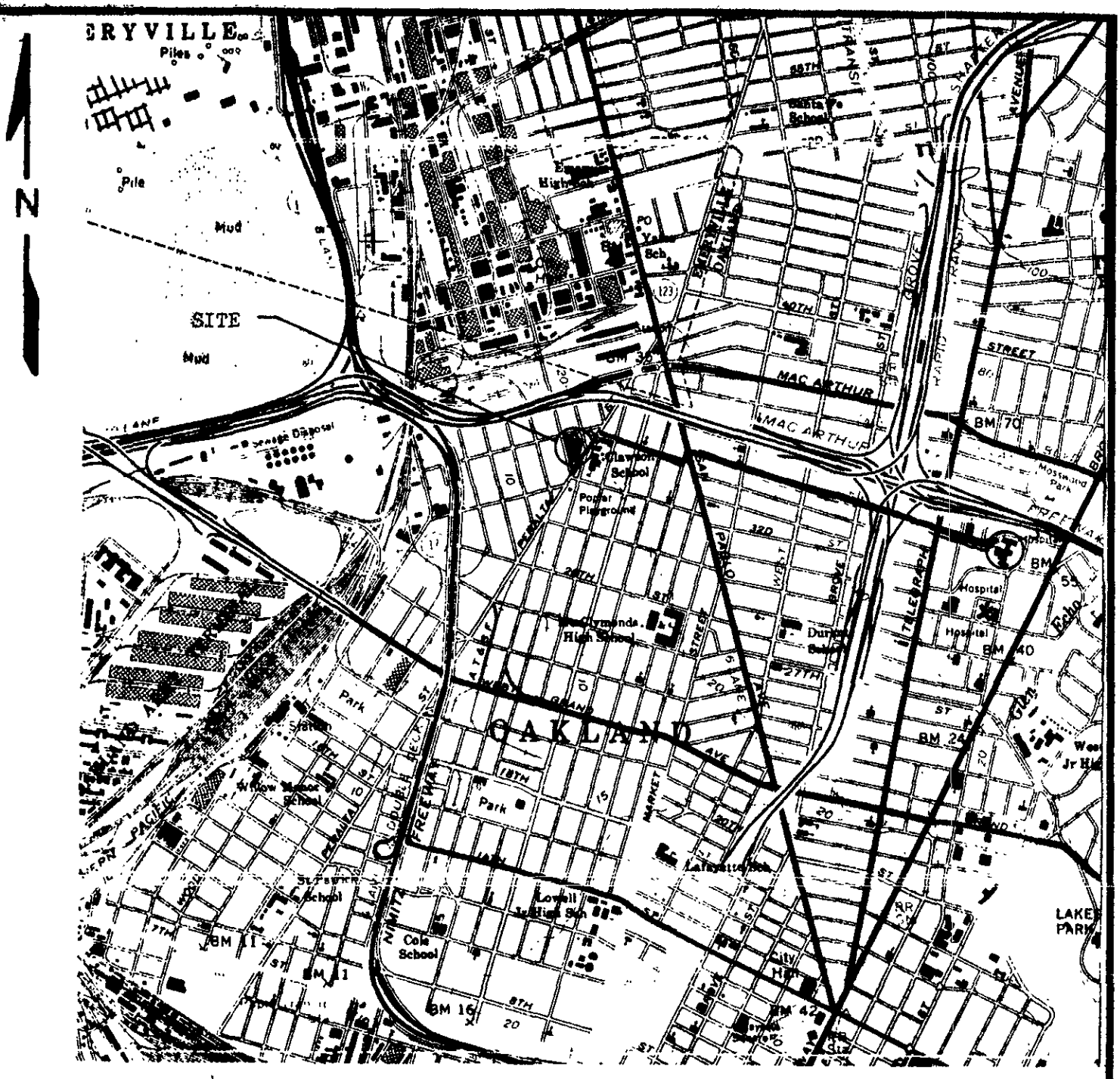
420-6080

AQUA SCIENCE ENGINEERS INC.

HAZARDOUS MATERIALS SITE SAFETY PLAN

The below signed personnel have read this plan, understand it's contents and agree to follow the guidelines set forth;

EMPLOYEE NAME (print)	SIGNATURE	DATE



HOSPITAL LOCATION MAP

Romak Iron Works
3250 Hollis Street
Oakland, California

Aqua Science Engineers

BASE: USGS Oakland West 7.5 minute quadrangle topographic map, dated 1980, scale 1:24,000.