LIC. #478799

ZACCOR
CORPORATION

January 6, 1991

92 JAN 13 PM 3:01

Alameda County Department of Environmental Health
Hazardous Materials Unit
80 Swan Way, Room 200
Oakland, California 94612

Dear Mr. Bryan Oliva

Please find attached a copy of the Aqua Science Engineers Report documenting the installation of one two-inch groundwater monitoring well adjacent to the tank pit at Alameda Fire Station #2, 635 Pacifica Street, Alameda California.

In reviewing the file it appears the monitoring well was constructed in compliance with Assembly Bill 1362 and the Groundwater Monitoring Guidelines for Hazardous Material Storage drafted by the Alameda County Water District in May, 1984. The well was placed in the assumed groundwater gradient direction and within 1.5' of the tank pit cavity.

Although the guidelines for the installation of groundwater monitoring wells have been up-dated it appears this well is properly constructed for monitoring purposes.

The well should supply a representative groundwater sample subsequent to purging.
We would like to properly develop and sample the well to determine if further excavation is needed on site.

Thank you for your time and please contact us regarding your response.

Please refer to the attached tank removal report.

Sincerely,
ZACCOR CORPORATION

Gary Zaccor

Gary Zaccor

791 HAMILTON AVENUE MENLO PARK, CA. 94025 (415) 363-2181

aqua science engineers inc.

July 2, 1986

PROJECT REPORT

FUEL TANK MONITORING WELL INSTALLATION

For The

City of Alameda
Room 204
Santa Clara and Oak Streets
Alameda, California 94501

Submitted
By

Aqua Science Engineers
P.O. Box 535
San Ramon, California 94583

BACKGROUND

The passage of Assembly Bill 1362 has required that every owner/operator of underground tanks used for the storage of hazardous substances including fuels provide a means of monitoring their tanks against leaks or spills. The deadline for compliance was January 1, 1985. However, extensions have been granted. The bill stipulated that administration was to be conducted at the local level. Subsequently, The Alameda County Flood Control and Water Conservation District, Zone 7 with jurisdiction over Alameda City groundwater use jointly adopted hazardous materials ordinances and accepted the Groundwater Monitoring Guidelines for Hazardous Materials Storage (GMG) drafted by the Alameda County Water District (May 1984).

The City of Alameda maintains eleven underground tanks at seven different sites around the city. Nine tanks were selected for monitoring and two tanks selected for removal. The following is a summary of tank size, site location, and installations for the nine tanks selected for monitoring.

Location	Capacity	Contents	# of wells Installed
Alameda Police Department 1555 Oak Street	1,000 Gallons	Diesel	1
Alameda City Hall 2263 Santa Clara	1,000 Gallons 280 Gallons	Gasoline Gasoline	2
Firehouse #1 1300 Park Street	280 Gallons 280 Gallons	Gasoline Diesel	1
Firehouse #2 635 Pacific Street	280 Gallons	Diesel	1
Firehouse #3 1703 Grand Street	280 Gallons 280 Gallons	Gasoline Diesel	2
Alameda Mun. Golf Course	500 Gallons	Gasoline	1

In September 1985, Aqua Science Engineers was asked to submit a proposal on behalf of the City of Alameda which would fulfill city monitoring requirements for underground fuel tanks. Our proposal to install four monitoring wells was submitted on September 19. Four additional wells have since been approved, bringing the total number of installed wells

to eight. The proposal and subsequent additions have been approved by the Alameda County Flood Control and Water Conservation District, Zone 7 and well drilling permits issued. The monitoring wells were installed during the period begining June 2 and ending June 4, 1986.

We certify that all licensing, credential and permit requirements under Chapter 3 of the GMG covering owner responsibility with regard to responsibility of performance (3.1), compliance with existing statutes (3.2), and well construction permits (3.3) have been satisfied. The hazardous materials classification used with reference to the Alameda County Water District GMG was that for commercial motor fuel (4.1).

The elements of the following report include monitoring well construction, figures depicting the site, tank configuration and monitoring well placement, well logs, soil and water sampling, analysis for hydrocarbons and recommendations for continued monitoring.

MONITORING WELL CONSTRUCTION

A 2-inch diameter PVC monitoring well was installed adjacent to each of the underground fuel tanks or tank configurations during the period 6/2 thru 6/4/86 (Figures 1 thru 6). The wells are located in the assumed direction of groundwater flow and satisfy the criteria within section 5.1.3. (GMG) concerning adequacy of monitoring coverage with respect to tank dimensions and spacing.

A Geo Space mobile drill with an 8-inch hollow stem auger was used and 2-inch PVC casing was installed in the borings. Screw caps were attached to the 2-inch PVC and 12-inch steel street boxes were grouted in to prevent surface contamination from entering the well. Eye bolt anchors were set in the street boxes to allow the placement of locks which will preclude tampering with the monitoring wells. A description of the well construction and findings is provided in the boring logs (Appendix).

The well screen used was 2 inch I.D. PVC tubing with 0.010 inch slots. The annular space outside each well screen was packed with washed No. 3 aquarium sand. The top of each well was sanitary sealed with neat portland cement to prevent surface contamination from entering the borings.

The well logs (see appendix) indicate layers of sand, and sandy clays of variable thickness were encountered at each of the borings with the exception of the golf course where the soils were mainly clays. Drilling was terminated after having penetrated at least five feet of saturated aquifer, the full depth of the primary aquifer to aquiclude, or at least five feet of aquiclude in the region of the water table. The engineer on site was careful to conduct the boring to a depth at which conclusive hydrogeolgic results were obtained without penetrating the bay muds of the region which protect underlying aquifers.

Saturated conditions were first encountered at depths between four and seven feet. Since, in all cases, groundwater was encountered at a depth of less than 20 feet, no vadose monitoring well was required within the tank backfill. Details of well construction in each case, including

final depth to water, are shown on the accompanying well logs.

Motor fuels are essentially non-miscible with water and are lighter than water; therefore, when present, they will be found floating on top. The important interval to monitor is at the motor fuel-water interface (GMG 5.2). For this reason well screen was installed in the appropriate region about this interface to allow for fluctuations in groundwater level. The boring from the bottom of the well screen to the bottom of boring was backfilled with bentonite to protect deeper aquifers against possible introduction of contaminants via the monitoring wells.

SOIL AND WATER SAMPLING

Alameda County Groundwater Monitoring Guidelines state that soils shall be sampled, starting at the bottom of the tank, every 5 feet to the water table (6.1). A modified California split spoon sampler, holding 4, 2-in x 4-in brass tubes was used to take undisturbed samples. The samples thus obtained were used for soil classification but, in all cases, were excluded from chemical analysis since groundwater levels were above the level of the tank bottoms. Water samples were taken from the newly installed and developed monitoring wells, sealed, refrigerated, and transported to the lab for analysis.

Chemical analysis of the samples was performed by Wesco Laboratories, Novato, CA. using Gas Chromatography/Flame Ionization Detection. The hydrocarbon concentration in the samples obtained adjacent to the Fire House #3 diesel tank and the Police Station diesel tank indicate low to moderate levels of contamination at these sites. Hydrocarbon concentrations of 5.4 ppm and 1.6 ppm respectively were recorded (see appendix). The RWQCB is to be notified directly concerning these findings. At the Golf Course, odors of old, decomposing fuel were detected but high levels of fuels were not detected in the chemical analysis.

At all of the other sites sampled and tested, the hydrocarbon concentration recorded in the test results indicate levels below which either the Department of Health Services or the Regional Water Quality Control Board would require further action. Additionally, these sites have no prior history of contamination. Drilling spoils were frequently checked for fuel odors throughout the drilling. None were found.

SCHEDULE FOR CONTINUED MONITORING

To assure early detection in the event of a fuel leak or spill, monthly monitoring is required (GMG 6.3.2). Groundwater monitoring wells for motor fuels are generally sampled using a clear plastic ball-valve bailer. The visual indication is the presence of sheen at the water surface which reflects rainbow colors when exposed to sunlight. Should positive results be found, you must notify hazardous materials officials at the California Regional Water Quality Control Board and the Alameda County Flood Control and Water Conservation District, Zone 7 as soon as possible.

Monitoring is also required of vadose wells, on a quarterly basis (GMG

6.3.2). The procedure recommended by ACWD is to pump vapor from the monitoring well through a portable field analyzer (GMG 6.4). Should you find positive results, you must notify the hazardous materials administrators as soon as possible.

If you wish we can set up a groundwater and/or vapor monitoring program and maintain a monthly log of the results. The fee for a water monitoring well is $45.00 per month for water monitoring wells and $50.00 per quarter for vapor monitoring wells.

William F. Rusk, PhD.
Director

Approved:

David M. Schultz, P.E.
C 38738

APPENDIX

CREDENTIALS

Engineer of Record

For Aqua Science Engineers:
David M. Schultz, Civil Engineer
Calif. State License P.E. C 38738
1280 C, Suite 144
Walnut Creek, CA 94596

Driller

ASE Drilling
P.O. Box 535
San Ramon, CA 94583
License #487000

Laboratory

Wesco Laboratories
State Certified Water Quality Lab
14 Galli Drive, Suite A
Novato, CA 94947

PRIMARY AUTHORITY FOR MONITORING WELL REQUIREMENTS

Alameda County Flood Control and Water Conservation District, Zone 7 as put forth in:

(GMG) Groundwater Monitoring Guidelines
for Hazardous Materials Storage. May 1984.
Alameda County Water District
38050 Fremont Boulevard
Fremont, CA 94537

WESCO LABORATORIES

RECEIVED
JUN 18 1986
AQUA SCIENCE ENG.

Date: June 17, 1986
Client: Aqua Science
Submitted by: E. Bratlien
Report to: Aqua Science
WESCO Job #: AQS 8648

Client Job/P.O. #: Alameda City
Date collected: 6-9-86
Date submitted: 6-10-86
& type of sample(s): 8 Water

Lab No.	Client ID	Motor Fuel (mg/l)	Benzene (mg/l)	Toluene (mg/l)	Xylene (mg/l)	Fuel Type	
4629	Fire House #2 635 Pacific Street	< 0.2	———	———	———	Diesel	
4630	Fire House #3 1703 Grand Street	5.4	———	———	———	Diesel	
4631	Police Dept. 1555 Oak Street	1.6	———	———	———	Diesel	
4632	Fire House #1 1300 Park Street	< 0.2	———	———	———	Diesel	
4633	City Hall #1 2263 Santa Clara	< 0.05	< 0.001	< 0.001	< 0.001	Gasoline	
4634	City Hall #2 2263 Santa Clara	< 0.05	< 0.001	< 0.001	< 0.001	Gasoline	
4635	Fire House #3 1703 Grand Street	< 0.05	< 0.001	< 0.001	< 0.001	Gasoline	
4636	Alameda Municipal Golf Course	< 0.05	< 0.001	< 0.001	< 0.001	Gasoline	
	METHOD: Note 1						

NOTES:
Note 1 - EPA method 5020/8015/8020.

Analytical Supervisor

ZONE 7 WATER RESOURCES

ALAMEDA COUNTY FLOOD CONTROL AND WATER CONSERVATION DISTRICT

5997 PARKSIDE DRIVE, PLEASANTON, CALIFORNIA 94566 415-484-2600

GROUNDWATER PROTECTION ORDINANCE PERMIT APPLICATION

FOR APPLICANT TO COMPLETE

(1) LOCATION OF PROJECT Firehouse #2
635 Pacific Street
Alameda, CA 94501

(2) CLIENT
Name City of Alameda
Address 2263 Santa Clara Phone (415) 522-4100
City Alameda, CA Zip 94501

(3) APPLICANT
Name Aqua Science Engineers *
1 Crow Canyon Ct. Suite 100
Address San Ramon, CA Phone (415) 820-9391
City Zip 94583

(4) DESCRIPTION OF PROJECT
Water Well Construction X Geotechnical ___
Cathodic Protection ___ Well Destruction ___

(5) PROPOSED WATER WELL USE
Domestic ___ Industrial ___ Irrigation ___
Municipal ___ Monitoring X Other ___

(6) PROPOSED CONSTRUCTION
Drilling Method:
Mud Rotary ___ Air Rotary ___ Auger X
Cable ___ Other ___

WELL PROJECTS
Drill Hole Diameter 8 in. Depth 15 ft.
Casing Diameter 2 in. Number 1
Surface Seal Depth 5 ft.
Driller's License No. 483678

GEOTECHNICAL PROJECTS
Number ___
Diameter ___ in. Maximum Depth ___ ft.

(7) ESTIMATED STARTING DATE 6-2-86
ESTIMATED COMPLETION DATE 6-4-86

(8) I hereby agree to comply with all requirements of this permit and Alameda County Ordinance No. 73-68.

APPLICANT'S SIGNATURE David Schultz 5-27-86

FOR OFFICE USE

PERMIT NUMBER 86137
LOCATION NUMBER ___

Approved Craig A. Mayfield Date 3 Jun 8
Craig A. Mayfield

PERMIT CONDITIONS

•Circled Permit Requirements Apply

(A.) GENERAL
1. A permit application should be submitted so as to arrive at the Zone 7 office five days prior to proposed starting date.
2. Notify this office (443-9300) at least one day ~~prior to starting work on permitted work~~ and before placing well seals.
3. Submit to Zone 7 within 30 days after completion of permitted work the original Department of Water Resources Water Well Drillers Report or equivalent for well projects, or bore hole logs and location sketch for geotechnical projects. Permitted work is completed when the last surface seal is placed or the last boring is completed.
4. Permit is void if project not begun within 90 days of approval date.

(B.) WATER WELLS, INCLUDING PIEZOMETERS
1. Minimum surface seal thickness is two inches of cement grout placed by tremie, or equivalent.
2. Minimum seal depth is 50 feet for municipal and industrial wells or 20 feet for domestic, irrigation, and monitoring wells unless a lesser depth is specially approved.

C. GEOTECHNICAL. Backfill bore hole with compacted cuttings or heavy bentonite and upper two feet with compacted material.

D. CATHODIC. Fill hole above anode zone with concrete placed by tremie, or equivalent.

E. WELL DESTRUCTION. See attached.

* Aqua Science Engineers Representative:
Mr David Schultz

AQUA SCIENCE ENGINEERS WELL LOG

Casing: 2" PVC
Well Depth: 18.0 ft.
Logged By: D. Schultz, P.E.
Water Depth: 5.0 ft.
Driller: ASE

Alameda Firehouse #2
635 Pacific Street
Alameda, CA
Boring # 1
Date: 6-3-86

DEPTH (ft.)	SOIL DESCRIPTION	WELL CONSTRUCTION DETAILS
0-	Brown Sand	
2-		
4-		
6-		
8-		
10-		
12-		
14-		
16-		
18-		
20-		
22-		
24-	Bottom of Boring 23.0 ft.	

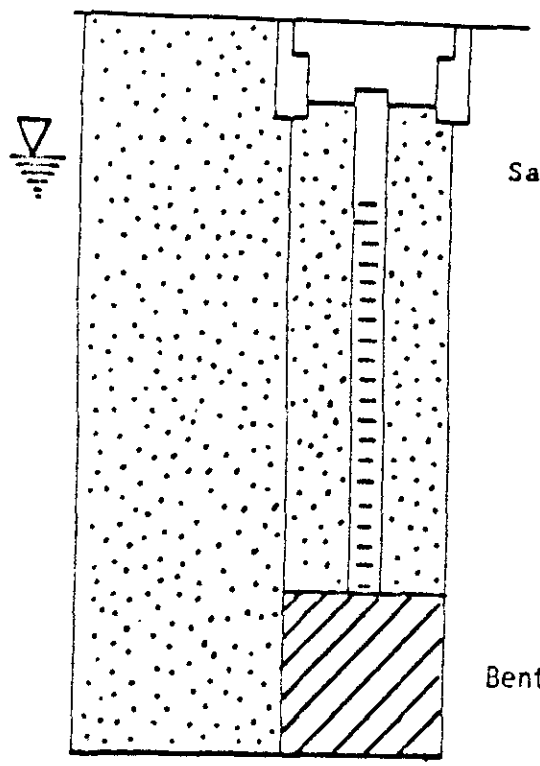


Figure 3

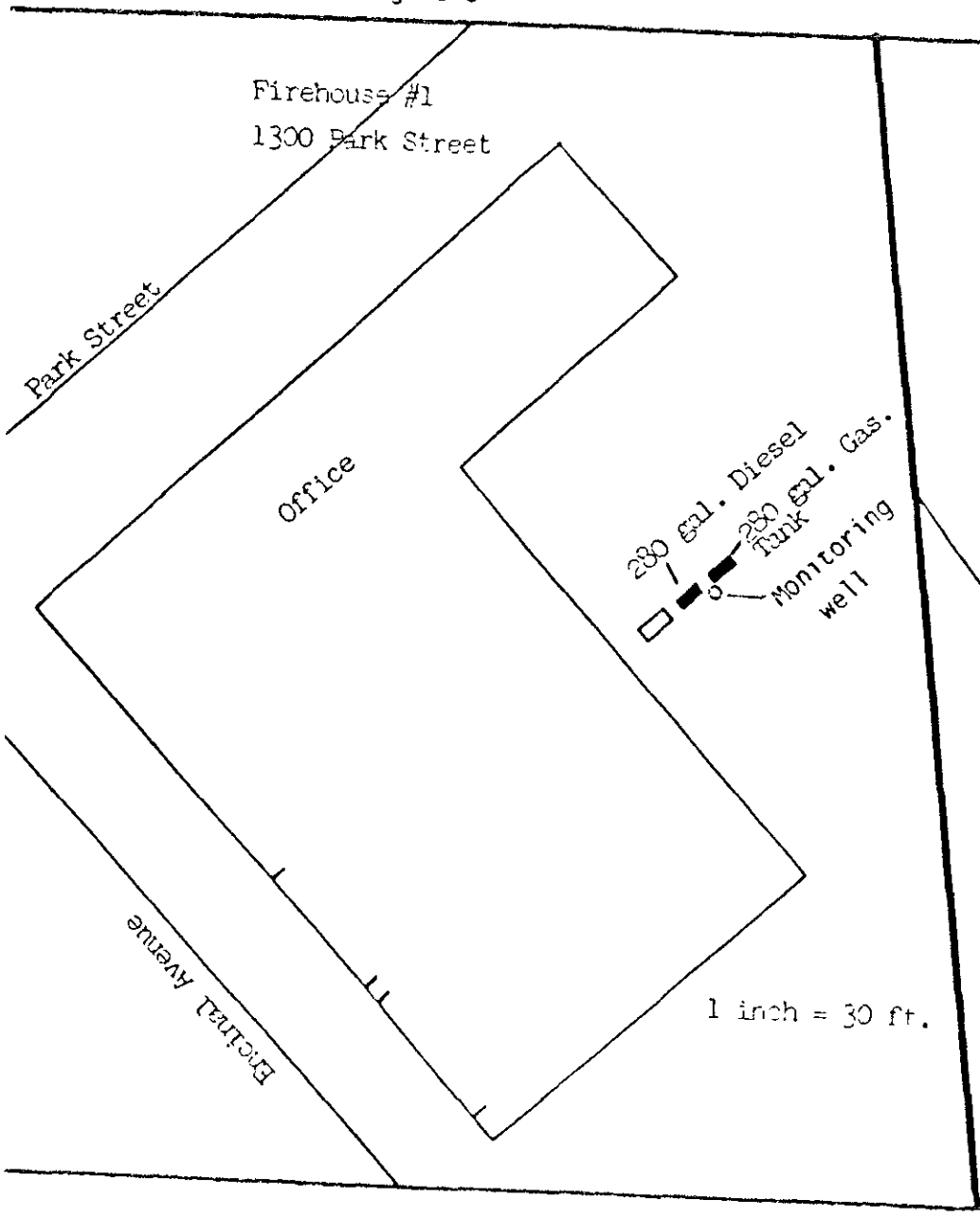
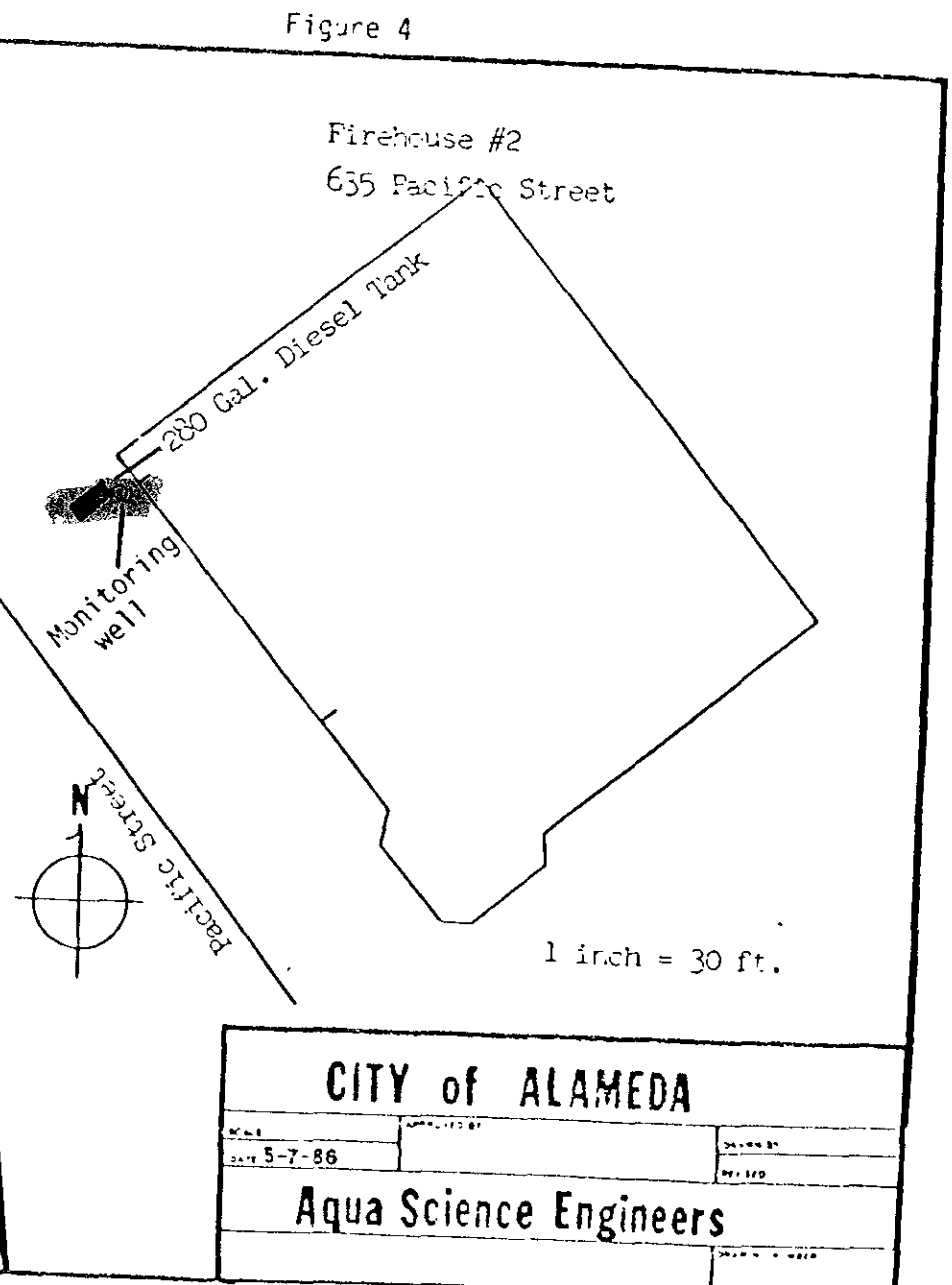


Figure 4



November 20, 1991

City Hall of Alameda
Engineering Department
2263 Santa Clara at Oak Street
Room 207
Alameda, CA 94621
ATTN: Hank Wong

The following documentation concerns the initial tank removal and subsequent confirmatory sample collection, at:

ALAMEDA FIRE STATION #2
635 PACIFIC AVENUE
ALAMEDA, CALIFORNIA

On November 15, 1991, one 285 gallon underground storage tank was removed from the above referenced site. The tank recently contained diesel but had stored gasoline in past years.

Field Sampling was performed in accordance with state and local agency approved methodology, in the presence of Mr. Brian P. Oliva, Hazardous Materials Specialist for the Alameda County Department of Environmental Health.

See accompanying site diagram for the tank location, field sampling designations, and sampling depths.

UNDERGROUND STORAGE TANK INSPECTION

The tank condition was inspected upon removal. Rust and some pitting were noted. No holes were apparent. A slight hydrocarbon odor was present within the tank cavity backfill and native soil.

TANK PIT SAMPLING

A soil sample was collected from beneath the tank center. This was accomplished by the clearing of fill material and slough from the designated sample area. A backhoe bucket then obtained a sample from 12" to 18" into the native soil. The surface three inches of soil was removed from the backhoe bucket and a clean brass sleeve driven into the remaining soil.

TANK PIT SAMPLING-continued

The soil was packed into the brass sleeve to eliminate head space. Each sleeve end was immediately covered with a teflon sheet, fitted with plastic caps, sealed with duct tape, labeled, and placed under chain of custody, on blue ice for transport to a Certified Hazardous Waste Analytical Laboratory by laboratory personnel.

STOCKPILE SAMPLE COLLECTION

Approximately six cubic yards of soil was excavated from the tank pit cavity at the time of the tank removal. The excavated soil was stockpiled on asphalt and covered with Visqueen.

A composite soil sample was collected by dividing the stockpile into three sections. A brass sleeve was filled within each section by removing the surface two feet (2') of soil. A clean brass sleeve was driven into the remaining soil. The three soil samples were composited at a certified laboratory to be analyzed as one sample.

SAMPLE DATA

Matrix	Sample #	Location	Depth
Soil	TP-1	Beneath Tank Center	9'
Soil	SP1A-C	Stockpile	2'

SOIL SAMPLE ANALYSIS

#TP-1 and #SP1A-1C were analyzed for Total Petroleum Hydrocarbons as diesel (TPH-D, using EPA Method 3550), benzene, toluene, ethylbenzene and total xylenes (BTEX, using EPA Method 8020).

SOIL ANALYTICAL RESULTS

Sample#	TPH-D (ppm)	B (ppb)	T (ppb)	E (ppb)	X (ppb)
TP #1	ND	ND	6.5	ND	44
SP1A-C	220	ND	ND	ND	52

Not Detected at the lower detection limit.

RECOMMENDATIONS & CONCLUSIONS

The State Water Resources Control Board Document, Leaking Underground Fuel Tank Field Manual (LUFT), supported by the San Francisco Regional Water Quality Control Board (SFRWQCB), defines acceptable limits and appropriate actions for addressing UST contamination.

Stockpile composite sample, SP1A-C, contained a detectable amount of Total Petroleum Hydrocarbons as diesel at 220 ppm and total xylenes at 52 ppb.

Sample #TP-1 contained a detectable amount of toluene at 6.5 ppb and total xylenes at 44 ppb.

REPORT

Copies of the sampling report, chain of custody, and certified analytical report should be submitted to both the SFRWQCB and the Alameda County Department of Environmental Health.

The following addresses have been listed for your convenience:

Water Quality Control Board
San Francisco Bay Region
2101 Webster St. Rm. 500
Oakland Ca. 94612
ATTN: Fuel Leaks Division

Alameda County
Department of Environmental Health
Hazardous Materials Division.
80 Swan Way, Room 200
Oakland, California 94621

It has been a pleasure working with you. If I can be of further service please call me at (415) 363-2181.

Sincerely,
ZACCOR CORPORATION

Gary Zaccor

ALAMEDA FIRE DEPARTMENT #2, 635 Pacific Ave, Alameda, California

11/15/91

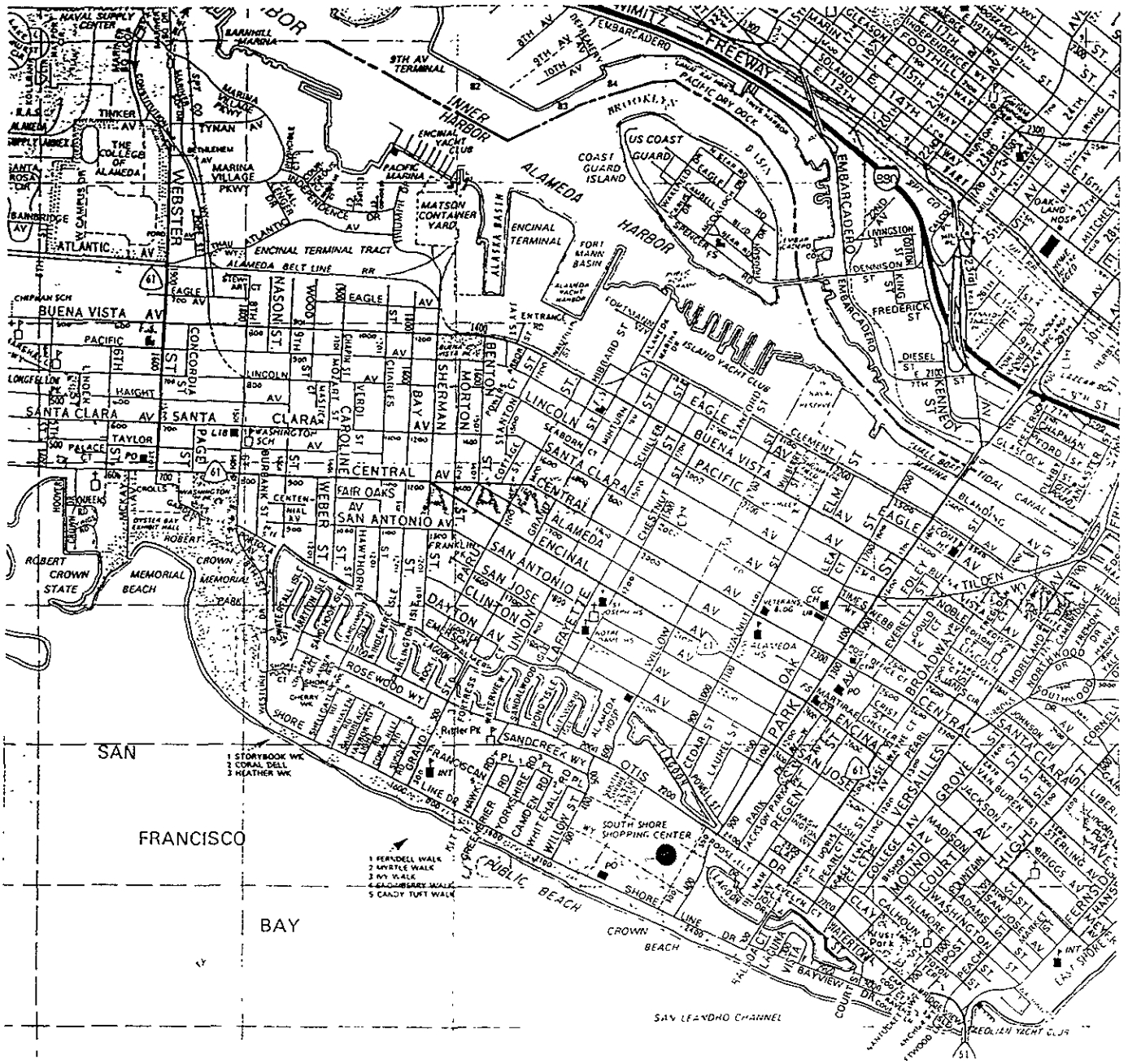
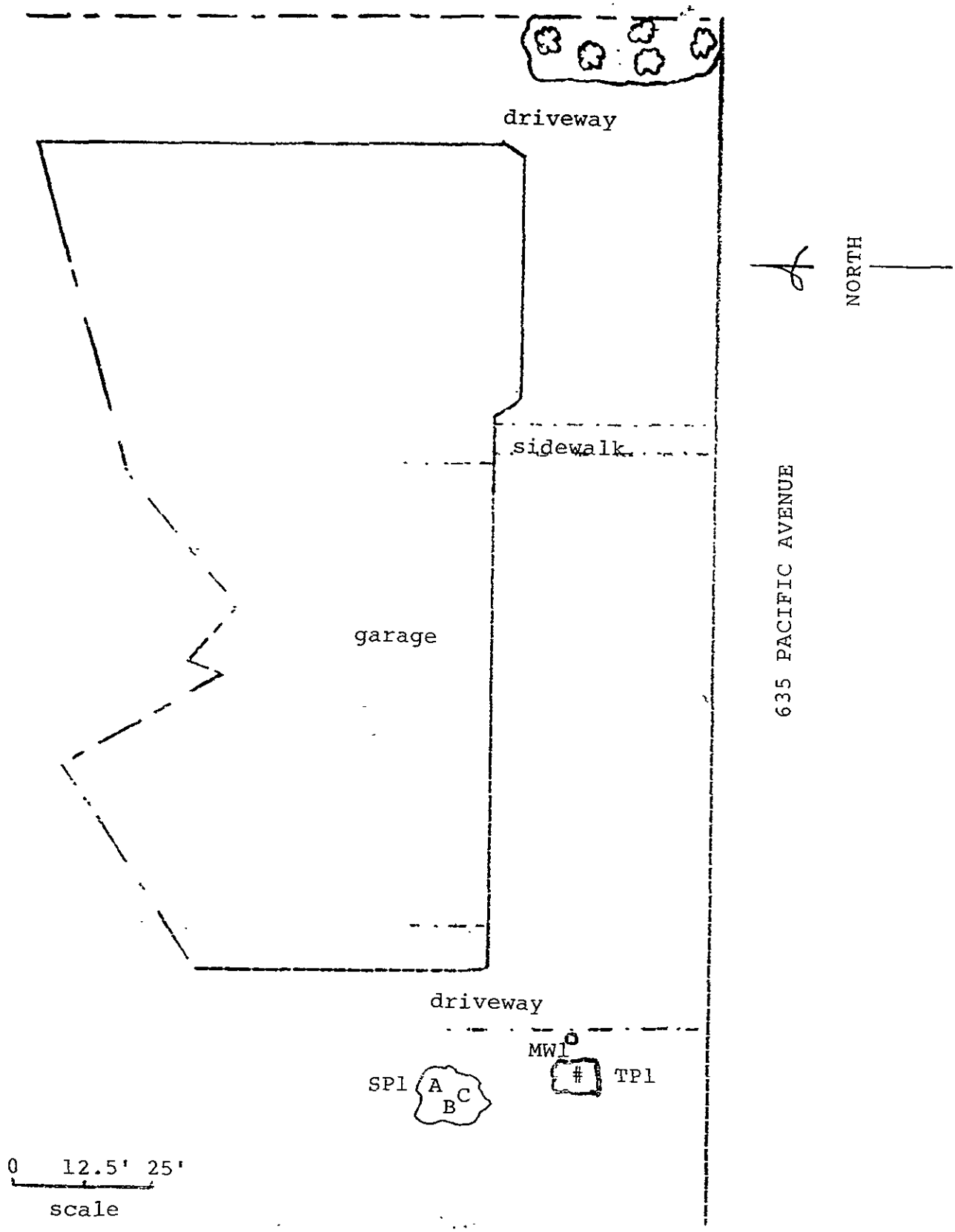


Fig.1 Site Location Map.

ENVIRONMENTAL
TECHNICAL
SERVICES

at: ALAMEDA FIRE STN. #2.

11/15/91



CHROMALAB, INC.

Analytical Laboratory (E694)

5 DAYS TURNAROUND

November 15, 1991

ChromaLab File No.: 1191152

ZACCOR CORPORATION

Attn: Gary Zaccor

RE: Two rush soil sample for BTEX and Diesel analysis

Project Name: ALAMEDA FIRE DEPT.
Project Number: ALM.FIRE
Date Sampled: Nov. 15, 1991 Date Submitted: Nov. 15, 1991
Date Extracted: Nov. 15, 1991 Date Analyzed: Nov. 15, 1991

RESULTS:

Sample I.D.	Diesel (mg/kg)	Benzene (µg/kg)	Toluene (µg/kg)	Ethyl Benzene (µg/kg)	Total Xylenes (µg/kg)
TP-1	N.D.	N.D.	6.5	N.D.	44
SP1A-1C	220	N.D.	N.D.	N.D.	52
LANK	N.D.	N.D.	N.D.	N.D.	N.D.
BLANK	N.D.	N.D.	N.D.	N.D.	N.D.
SPIKE RECOVERY	89.2%	85.7%	93.9%	100.8%	106.6%
DETECTION LIMIT	1.0	5.0	5.0	5.0	5.0
METHOD OF ANALYSIS	3550/ 8015	8020	8020	8020	8020

ChromaLab, Inc.

David Duong
Chief Chemist

Eric Tam
Laboratory Director

2239 Omega Road, #1 • San Ramon, California 94583
510/831-1788 • Facsimile 510/831-8798
Federal ID #68-0140157

ZACCOR COMPANIES, INCORPORATED Sampling by Environmental Technical Services

CLIENT CHAIN-OF-CUSTODY RECORD

PROJECT NUMBER: ALM.FIRE

PROJECT NAME: Alameda Fire Dept 635 Pacifica, Alameda

Send Report Attention of: Menlo Park Ca
GARY ZACCOR
791 Hamilton Ave,

Report Due: / /

Verbal Due: / /

CHROMALAB FILE # 1191152

4194

Sample Number	Date	Time	Comp	Grab	Station Location	Number of Cntnrs	Type of Containers	Type of Analysis: TPH 65 Diesel	Type of Analysis: BTEX	Samples	Initial
TP-1	11/15/91	9:05 AM		✓	Beneath 9' Tank Center	1	BRASS SLEEVE	✓	X		
SPIA-IC	11/15/91	9:10 AM	X		Stock pile 2'	3	BRASS SLEEVES	✓	✓		

Relinquished by: (Signature)	Date/Time	Received by: (Signature)	Date/Time
Helen Mendonsa	11-15-91		
Relinquished by: (Signature)	Date/Time	Received by: (Signature)	Date/Time
Relinquished by: (Signature)	Date/Time	Received by: (Signature)	Date/Time

Remarks: SAME DAY ANALYSIS

SAMPLE DISPOSAL:
Return to Client [ ]
Soil Disposal by Anametrix ($5.00 per container) [ ]

COMPANY: ZACCOR (0121)
ADDRESS: 791 Hamilton Ave Menlo Park, Ca
PHONE : 363-2181 FAX :

5025

CHROMALAB, INC.

Analytical Laboratory (E694)

5 DAYS TURNAROUND

November 15, 1991 ChromaLab File No.: 1191152

ZACCOR CORPORATION

Attn: Gary Zaccor

RE: Two rush soil sample for BTEX and Diesel analysis

Project Name: ALAMEDA FIRE DEPT.
Project Number: ALM.FIRE
Date Sampled: Nov. 15, 1991 Date Submitted: Nov. 15, 1991
Date Extracted: Nov. 15, 1991 Date Analyzed: Nov. 15, 1991

RESULTS:

Sample I.D.	Diesel (mg/kg)	Benzene (ug/kg)	Toluene (ug/kg)	Ethyl Benzene (ug/kg)	Total Xylenes (ug/kg)
TP-1	N.D.	N.D.	6.5	N.D.	44
SP1A-1C	220	N.D.	N.D.	N.D.	52
LANK	N.D.	N.D.	N.D.	N.D.	N.D.
BLANK	N.D.	N.D.	N.D.	N.D.	N.D.
SPIKE RECOVERY	89.2%	85.7%	93.9%	100.8%	106.6%
DETECTION LIMIT	1.0	5.0	5.0	5.0	5.0
METHOD OF ANALYSIS	3550/ 8015	8020	8020	8020	8020

ChromaLab, Inc.

David Duong
Chief Chemist

Eric Tam
Laboratory Director

2239 Omega Road, #1 • San Ramon, California 94583
510/831-1788 • Facsimile 510/831-8798
Federal ID #68-0140157