



FINAL REPORT  
of  
METHODS & FINDINGS  
for

SITE ASSESSMENT METHODS AND FINDINGS:  
SOIL BORINGS AND SAMPLING,  
GROUNDWATER MONITORING WELL  
DRILLING, INSTALLATION, SAMPLING

at  
the vacant lot, former Shell Station,  
5293 Crow Canyon Rd.  
Castro Valley, Ca.



submitted by  
AQUA SCIENCE ENGINEERS, INC.  
Concord, CA 94518

September 16, 1991

*Final Report  
for Aqua  
letter 9 Oct 91*

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and  
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## INTRODUCTION

Aqua Science Engineers, Inc. (ASE) was contracted by the property owner to drill five soil borings, two of which were converted into groundwater monitoring wells (MW-4, MW-5). This scope of work represents a second phase of preliminary site assessment activities conducted at the vacant lot, former Shell Station, 5293 Crow Canyon Rd., Castro Valley ("the site") (Figure 1). Upon review of initial site assessment methods and findings, the Alameda County Health Care Services Agency requested the performance of the additional investigative activities documented herein.

The site history with regards to contaminated site assessment activities begins in 1989 with the removal of underground fuel storage and waste oil storage facilities, and soil sampling at the former gasoline filling/service station. All other gas station facilities have been removed except the dispenser islands. The details of the tank removals and associated soil sampling and analysis are contained in the Aqua Science Engineers, Inc., project report of March 10, 1989. Gasoline and waste oil constituents were detected in soil samples associated with the tank removals.

The ASE project report of Preliminary Site Assessment methods and findings dated July 23, 1990 contains soil and groundwater sampling data collected from 11 borings, including three groundwater monitoring wells (Appendix A). Soil sample analyses confirm the existence of gasoline contaminated soils at some of the data points furthest from the tank pit sources. Groundwater gradient and flow direction calculations indicated a southwesterly flow of groundwater. Initial groundwater samples were found to be free of gasoline and other petroleum hydrocarbon constituents.

The lateral extent of soil contamination was incompletely defined, hence the scope of work performed and documented herein.

## DRILLING AND WELL CONSTRUCTION PROCEDURES

A workplan was prepared and submitted to the Alameda County Health Care Services Agency, and approved by Mr. Scott Seery of that office prior to permitting. Permits for well construction were obtained from the Alameda County Flood Control and Water District Zone 7 prior to initiation of drilling activities (Appendix B).

Four of the five borings were located further away from the tank pits, on westerly and southerly bearings, than the previously performed 11 borings. The exception is MW-4, which was emplaced within 10 feet of the southwest corner of the gas tank pit. The configuration of latest boring locations (minus MW-4) forms an arc comprising the southwest quadrant of a circle with a radial point in the center of the gas tank pit. Figure 2 shows the locations of

borings advanced and documented within this report. All sample analytical data points utilized to date are shown on Figure 3.

In May, 1991, a Mobile Drill B-61 hydraulic rotary drill with 4.25" I.D. X 8" O.D. hollow stem augers was used to drill the five borings to between 24.5 feet and 40 feet depth below grade. The three borings which were not converted into monitoring wells were all drilled to 30-40 feet depth, and backfilled with cement pumped through a tremmie pipe to the bottom of the boring. Into each of the other two borings a 2 inch groundwater monitoring well was installed through the augers, to 24.5 feet total depth at MW-5 and 28 feet depth at MW-4. Well casing consisted of 2 inch inside diameter schedule 40 PVC, of which the bottom 10 feet was machine slotted (0.01") well screen. All casing joints were flush threaded. The wells were suspended at about 6 inches above total depth within the augers while #2/12 sand was emplaced up to about two feet above the top of the perforated casing interval. Approximately two feet of medium bentonite pellets were emplaced above the sand and hydrated with tap water, with the remainder of the borings filled to near original grade with cement/bentonite grout. Above grade "stovepipe" well covers and locking inner caps comprised the surface completions (Appendix C).

Soils excavated by the augers were placed onto plastic sheeting and left on and near existing soil stockpiles. The drill rig and augers were high pressure hot washed prior to arrival on site, and the augers were again washed on site after drilling. Steam cleaning and sampler cleaning rinsates were contained within a plastic lined pit and allowed to evaporate.

#### SITE GEOLOGY

The site rests upon northwest trending, folded and faulted Cretaceous marine sedimentary rocks of the Panoche Formation ( "Preliminary Geologic Map of the Hayward Quadrangle...", by Thomas Dibblee, USGS Open File Report 80-540, 1980) . The sandstone, siltstone, and claystone beds dip at 66 degrees west-southwest, striking at N 23 degrees west, (as measured in existing tank pit excavation). Jointing/fracture patterns were visible in three planes, two of which were well defined, the strikes and dips of which were measured at N 70E, 66 degrees NW and N29E, 60 degrees SE. The relatively flat site is situated midway up a steep, southward facing slope, with Crow Canyon Creek at the canyon bottom to the south.

The soils encountered as drilling progressed were logged by an ASE geologist using the Unified Soil Classification System (USCS) (Appendix C). From grade to about 1-3 feet depth the soils were silt and clay, dark brown, sandy, dry (ML). These soils represent sedimentary rocks which had weathered in place. Below 1 to 3 feet depth, the native materials were found to be sandstone, siltstone, and claystone, interbedded, distinctly bedded from a few millimeters to a few feet in individual thickness. Jointing patterns were prominent on sample cores obtained. Deeper encountered rocks showed mild to moderate secondary pyritization. There were no "marker" beds noted during drilling,

sampling which could contribute to definitive stratigraphic correlation. Cross section views of the subsurface materials are shown on Figures 4 and 5.

Free groundwater was encountered in the borings at between about 15 feet depth below grade at the northern portion of the site, and as deep as 52 feet in the southern portions of the site. Site groundwater is under some pressure as static water levels measured in each of the five wells are between about 8 feet and 16 feet depth below grade.

Fuel product odors were noted during drilling at B-10,11, MW-4, MW-5, between depths approximating 3-15 feet. Particularly heavy ground contamination was apparent at MW-4 between about 5 and 15 feet depth.

### SOIL SAMPLING PROCEDURES

Undisturbed soil samples were obtained, as possible, from each boring at 2.5-5 foot intervals with a California modified split spoon sampler and a 140 lb. drop hammer. The samples were collected into precleaned brass liners, and used for visual soils/rock classification, and for certified chemical analysis. The sample tubes were sealed with plastic caps and tape, permanently labeled, then placed into a cooler containing ice for transport to a State Certified Hazardous Waste Analytical Lab following chain of custody procedures. The samplers and liners were cleaned immediately prior to each use with a TSP solution and rinsed with tap water in plastic buckets. Cleaning rinsates were contained in a temporary, plastic lined pit.

The materials encountered during the drilling at all locations were found to be so well indurated that hammer driven sampling of these rocks proved to be difficult and even impossible at certain locations and horizons. \*

### WELL DEVELOPMENT AND SAMPLING

At least 24 hours after installation, the new wells were developed with an air lift pump system. pH, temperature, and conductivity of the groundwater were measured and recorded during development. The following day, the wells were purged and groundwater samples were obtained for certified chemical analysis from each of the five wells with the use of an air lift pump. The well developing, purging, and sampling documentation can be found in Appendix D. No petrochemical odors from the well or it's waters were noted during the development, purging, or sampling of groundwater.

### SOIL AND GROUNDWATER SAMPLE ANALYSES

Soil samples were analyzed twice, by two different State Certified Hazardous Waste Analytical Labs (Appendix E). The second laboratory was utilized to verify analyses performed by the first lab. The consolidated nature of the sampled materials probably has an effect on the quantitative results of sample

\* Field observation during drill suggested no higher HC levels than what was measured lab.

analyses. It is likely that much of the petroleum contamination present exists mainly on and along fracture/bedding planes.

Soil samples were analyzed for some combination of the following constituents using EPA methods approved by the Regional Water Quality Control Board: total petroleum hydrocarbons (TPH) as gasoline with aromatic volatile hydrocarbons, TPH as diesel, total oil and grease (TOG), chlorinated volatile hydrocarbons, base/neutral/acid extractable organics.

Groundwater samples were analyzed at the usual State Certified lab for TPH as gasoline with BTEX. MW-4 water was additionally analyzed for TPH as diesel. Groundwater sample analyses for MW-3 include 13 metals, TPH as diesel, total oil and grease, PCB's, and base/neutral/acid extractable organics.

At the first lab, 19 soil samples were analyzed for TPH-G with BTEX, three analyses for TPH-D, two analyses for chlorinated volatile hydrocarbons, and two tests for total oil and grease (Table1). Six samples contained detectable amounts of TPH-G, none exceeding 43.8 parts per million (ppm). Three of these same samples contained one or more BTEX constituents from 66 ppb benzene to 860 ppb xylenes in B-10,10'. All three TPH-D analyses failed to detect diesel in those three samples. Two samples from B-12, 10' and B-12, 15' showed 97 and 6410 parts per billion (ppb) dichloromethane, respectively, which is a chemical used at the lab in sample preparation. These same two samples indicated TOG at less than the detection limit.

The same 19 soil sample were analyzed at a second lab for TPH-G with BTEX, though the acceptable holding time for the soil samples had been exceeded. Two of the samples yielded detectable levels of TPH-G, at 0.6 ppm (B-10, 11.5') and 48 ppm (B-10,10'). Analysis for TPH-D was performed on the same three soil samples as at the first lab. Only MW-4, 10' showed a detectable diesel concentration of 20 ppm, with the notation that a heavier hydrocarbon product such as motor oil was probably present in this sample.

TABLE ONE:  
RESULTS OF  
SOIL SAMPLE ANALYSES  
(5-16-91)

Soil Sample #	TPH gasoline mg/kg	benzene ug/kg	toluene ug/kg	ethyl benzene ug/kg	total xylenes ug/kg
B-10,5'	N.D.	N.D.	N.D.	N.D.	N.D.
B-10,11.5'	10.6	N.D.	140	N.D.	190
B-10,15'	28.2	N.D.	160	N.D.	260
B-10,20'	3.5	N.D.	N.D.	N.D.	N.D.
B-11,5'	N.D.	N.D.	N.D.	N.D.	N.D.
B-11,20'	N.D.	N.D.	N.D.	N.D.	N.D.
B-12,5'	N.D.	N.D.	N.D.	N.D.	N.D.
B-12,10'	N.D.	N.D.	N.D.	N.D.	N.D.
B-12,15'	N.D.	N.D.	N.D.	N.D.	N.D.
B-12,20'	N.D.	N.D.	N.D.	N.D.	N.D.
B-12,25'	N.D.	N.D.	N.D.	N.D.	N.D.
MW-4,5'	N.D.	N.D.	N.D.	N.D.	N.D.
MW-4,10'	5.3	N.D.	N.D.	N.D.	N.D.
MW-4,15'	N.D.	N.D.	N.D.	N.D.	N.D.
MW-4,20'	N.D.	N.D.	N.D.	N.D.	N.D.
MW-5,5'	N.D.	N.D.	N.D.	N.D.	N.D.
MW-5,9.5'	N.D.	N.D.	N.D.	N.D.	N.D.
MW-5,15'	N.D.	N.D.	N.D.	N.D.	N.D.

Soil Sample #	TPH-diesel mg/kg	TOG mg/kg	chlorinated hydrocarbons ug/kg
B-12,10'	N.D.	N.D.	97 dichloromethane
B-12,15'	N.D.	N.D.	6,400 dichloromethane
MW-4,10'	N.D.	----	----

*total hydrocarbon  
methane dichloromethane*

*75-4-2*

*Acetylene methane - Acetylene (C<sub>2</sub>H<sub>2</sub>)*

TABLE TWO:  
RESULTS OF  
SOIL SAMPLE ANALYSES  
(6-13-91)

Soil Sample #	TPH gasoline mg/kg	benzene ug/kg	toluene ug/kg	ethyl benzene ug/kg	total xylenes ug/kg
B-10,5'	N.D.	N.D.	N.D.	N.D.	N.D.
B-10,10'	48	100	310	270	1,700
B-10,11.5'	0.6	N.D.	N.D.	7	29
B-10,15'	N.D.	N.D.	N.D.	N.D.	11
B-10,20'	N.D.	N.D.	N.D.	N.D.	8
B-11,5'	N.D.	N.D.	N.D.	N.D.	N.D.
B-11,20'	N.D.	N.D.	N.D.	N.D.	N.D.
B-12,5'	N.D.	N.D.	N.D.	N.D.	7
B-12,10'	N.D.	N.D.	N.D.	N.D.	N.D.
B-12,15'	N.D.	N.D.	N.D.	N.D.	6
B-12,20'	N.D.	N.D.	N.D.	N.D.	N.D.
B-12,25'	N.D.	N.D.	N.D.	N.D.	N.D.
MW-4,5'	N.D.	N.D.	N.D.	N.D.	N.D.
MW-4,10'	N.D.	N.D.	N.D.	N.D.	8
MW-4,15'	N.D.	N.D.	N.D.	N.D.	8
MW-4,20'	N.D.	N.D.	N.D.	N.D.	9
MW-5,5'	N.D.	N.D.	N.D.	N.D.	N.D.
MW-5, 9.5'	N.D.	N.D.	N.D.	N.D.	24
MW-5,15'	N.D.	N.D.	N.D.	N.D.	N.D.

Soil Sample #	TPH-diesel mg/kg	TOG mg/kg	chlorinated hydrocarbons ug/kg
B-12,10'	N.D.	N.D.	3.8 methylene chloride
B-12,15'	N.D.	N.D.	5.3 methylene chloride
MW-4,10'	20	----	----

*methane, ethyl benzene  
and toluene*



TABLE THREE:  
 HISTORICAL RESULTS OF  
 GROUNDWATER SAMPLE ANALYSES  
 THROUGH 6-7-91

Groundwater Sample #	TPH gasoline mg/l	benzene ug/l	toluene ug/l	ethyl benzene ug/l	total xylenes ug/l
MW-1 (6-1-90)	N.D.	N.D.	N.D.	N.D.	N.D.
MW-1 (2-28-91)	N.D.	N.D.	N.D.	N.D.	N.D.
MW-1 (5-22-91)	N.D.	N.D.	N.D.	N.D.	N.D.
MW-2 (6-1-90)	N.D.	N.D.	N.D.	N.D.	N.D.
MW-2 (2-28-91)	N.D.	N.D.	N.D.	N.D.	N.D.
MW-2 (5-22-91)	N.D.	N.D.	N.D.	N.D.	N.D.
MW-3 (6-1-90)	N.D.	N.D.	N.D.	N.D.	N.D.
MW-3 (2-28-91)	N.D.	N.D.	N.D.	N.D.	N.D.
MW-3 (5-22-91)	N.D.	N.D.	N.D.	N.D.	N.D.
MW-4 (5-22-91)	N.D.	N.D.	N.D.	N.D.	N.D.
MW-5 (5-22-91)	N.D.	N.D.	N.D.	N.D.	N.D.

Water Sample #	TPH-diesel mg/l	TOG mg/l	chlorinated hydrocarbons ug/l	P BNA (method 625) extractables ug/l	metals mg/l
MW-3* (6-1-90)	N.D.	N.D.	N.D.	N.D.	0.004 Cd 0.027 Zn
MW-3 (2-28-91)	N.D.	N.D.	N.D.	N.D.	N.D.
MW-3* (5-22-91)	N.D.	N.D.	1.1 chloroform 2.1 bromodichloromethane 6.1 dibromochloromethane 2.8 bromoform	N.D.	N.D.
MW-4 (5-22-91)	N.D.	----	----	----	----

PCB  
P.C.B.  
P.C.B.

\* = samples also analyzed N.D. for PCB's  
 mg/kg = parts per million  
 ug/kg = parts per billion  
 N.D. = Not Detected  
 ---- = not analyzed

### GROUNDWATER GRADIENT AND FLOW DIRECTION DETERMINATION

MW-4 and MW-5 were surveyed by a state licensed Land Surveyor to an established vertical datum. Top of casing at MW-4 and MW-5 was established at 303.71 and 300.78 feet above mean sea level (MSL), respectively. On August 21, 1991, the top of the column of water contained within the two new wells was located at 289.79 and 290.68 feet above MSL, respectively. Figure 6 represents groundwater elevation data with gradient and flow direction determinations for the August measurements, and derived from 3-3 point problems. The direction of groundwater flow was determined to be toward the south-southwest with an average gradient of 0.065 ft./ft. Groundwater at all well locations exists under some pressure representing a mild Artesian condition. The gradient and flow direction determinations depict conditions which are based on the assumption that all wells penetrate the same water bearing zone.

Well	Sample #	Contaminant
x	75-27-4	bromodichloromethane - suspected carcinogen
x	124-118-1	dibromochloromethane
x	75-28-2	bromoform - toxic (poison)
x	67-66-3	chloroform - toxic (poison); susp. human carcinogen

## CONCLUSIONS

Five soil borings were drilled and sampled, with two then converted into groundwater monitoring wells (MW-4, MW-5) at the vacant lot, former Shell Station, 5293 Crow Canyon Rd., Castro Valley, Ca. These five data collection points are in addition to 11 borings (including 3 monitoring wells) advanced in 1990 as part of a Preliminary Site Assessment. Underground fuel storage and waste oil facilities were removed from the site in 1989. Related soil sample analyses indicated gasoline and total oil and grease contamination of site grounds. This has led to the requirement by the Alameda County Health Care Services Agency for ongoing site investigation activities to define the lateral extent of soil contamination, and further investigate the possibility of residual groundwater contamination.

The borings were advanced with hollow stem auger equipment, and soil samples were taken for visual classification and certified chemical analysis. The two wells were installed by placing 2" schedule 40 PVC well casing through the augers to near total depth, followed by the emplacement of sand, bentonite, and cement, in that order, through the augers as well. The well specifications were based on field observations of subsurface soil and groundwater conditions.

The soils were sampled during drilling at 2.5-5 foot intervals. Fuel product odors were noted during the drilling of all borings but B-12. Soil sampling, and the drilling in general were very difficult as the subsurface materials proved to be well indurated sedimentary rocks. Interbedded claystone, siltstone, and sandstone of the Panoche Formation comprised the investigated site materials.

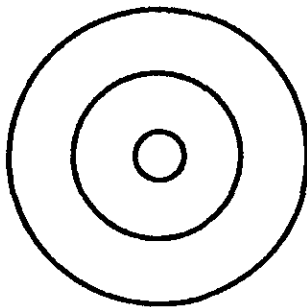
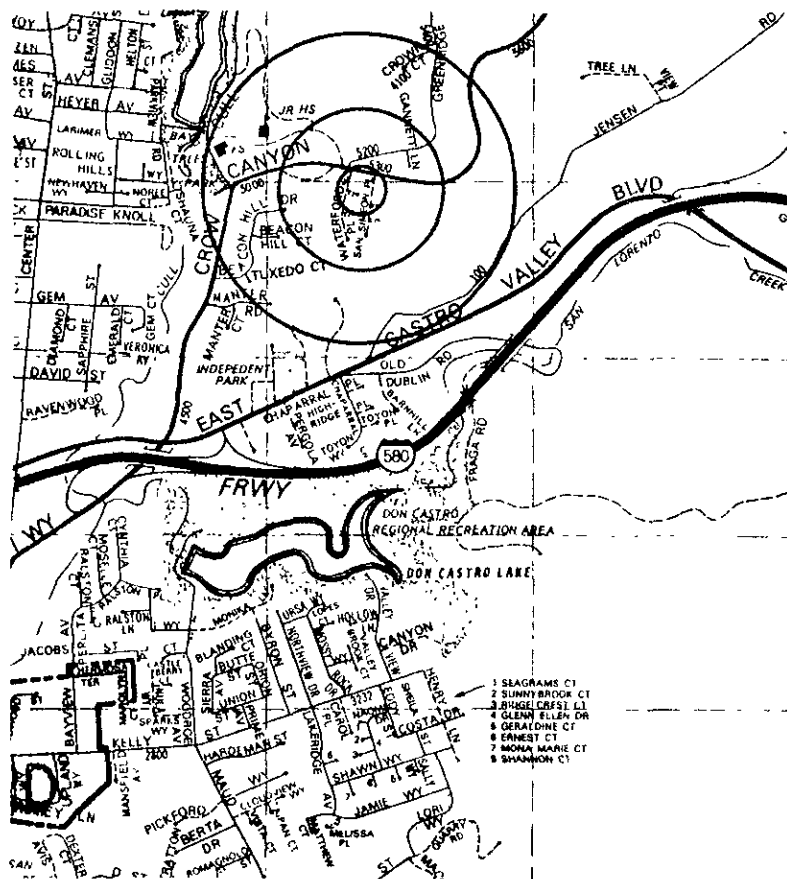
Development of the two new wells, and purging and sampling of all five wells were performed. The samples were obtained for chemical analysis at a State Certified Hazardous Waste Analytical Lab.

Certified chemical analysis of soil and groundwater samples indicated low levels of TPH as gasoline and BTEX in rock at two of the 5 boring locations. Groundwater samples were free of the constituents of interest except for MW-3, which contained some chlorinated volatile hydrocarbons in the few ppb range. This well had previously analyzed clean on two separate occasions.

Groundwater exists with a mild Artesian condition. The depth to free groundwater varies widely between the northern and southern portions of the site. The groundwater flow direction was determined to be south southwest with an average gradient of 0.065 ft./ft., using August 20, 1991 water level data. Low level gasoline contaminated soil and rock has been noted at about 100 feet westerly from the existing tank pit. This outermost arc of data points have defined the lateral limits of a soil contaminant plume in all directions except to the west, where dwindling contaminant levels are documented.

## RECOMMENDATIONS

As per current County requirements for this site, the wells should be monitored quarterly. MW-4 should be additionally analyzed for TPH diesel and for total oil and grease as per soil sample results from that point location. The hope is for clean wells to remain clean and for contaminated well constituents to decrease and disappear from future analyses. Further excavation of contaminated subsurface materials would prove difficult based on the consolidated nature of those materials. Site characterization within the property boundaries has been achieved and no further investigation is recommended at this time. A

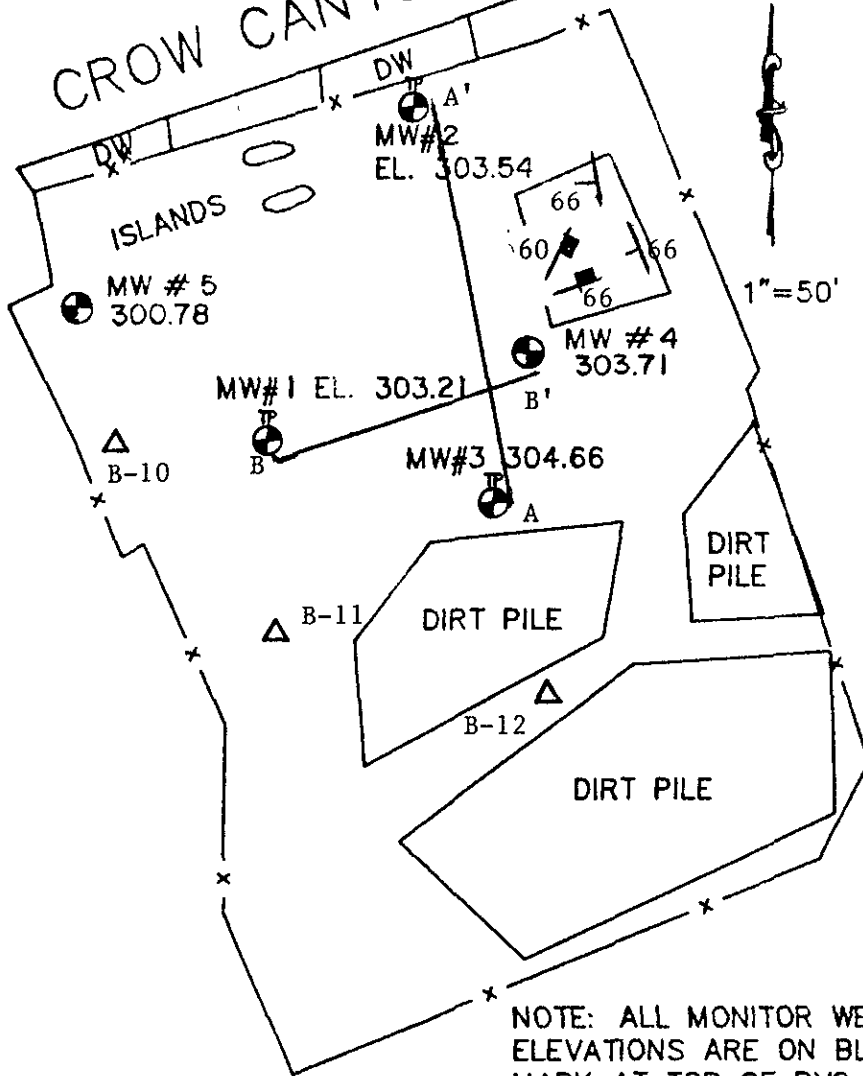


denotes site location



Figure 1  
 Site Location Map  
 5293 Crow Canyon Rd.,  
 Castro Valley, Ca.  
 Aqua Science Engineers, Inc.  
 After Thomas Bros., 1989  
 1 inch = approx. 2,200 feet

CROW CANYON RD



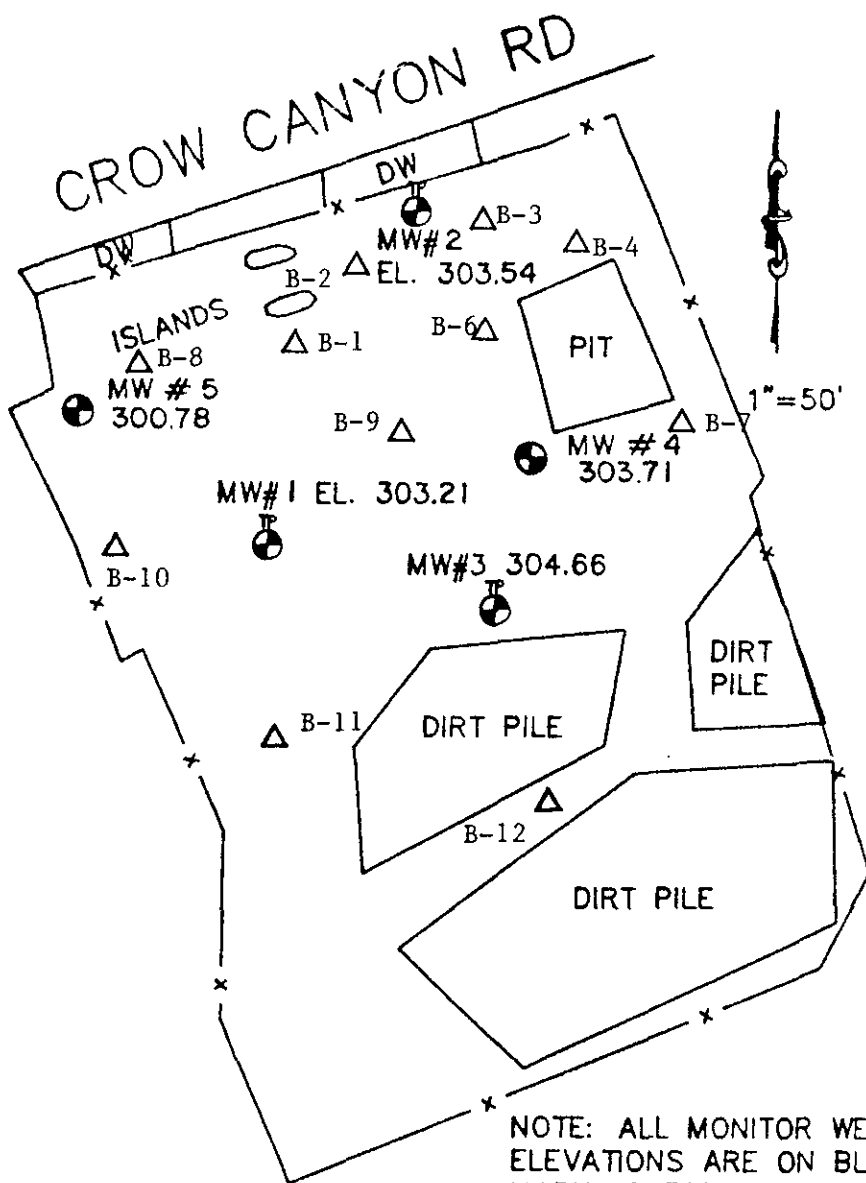
NOTE: ALL MONITOR WELL ELEVATIONS ARE ON BLACK MARK AT TOP OF PVC PIPE.

- ⊕ Monitoring Well Location
- △ Soil Boring Location

BM BRASS DISK IN TOP OF CURB AT THE MOST EASTERLY CURB RETURN AT CROW CANYON ROAD AND SAN SIMEON PLACE. ELEV. : 307.73 FEET



**Figure 2**  
**Site Plan**  
 5293 Crow Canyon Rd.,  
 Castro Valley, Ca.  
 Aqua Science Engineers, Inc.  
 1 inch = 50 feet



NOTE: ALL MONITOR WELL ELEVATIONS ARE ON BLACK MARK AT TOP OF PVC PIPE.

- Monitoring Well Location
- Soil Boring Location

BM BRASS DISK IN TOP OF CURB AT THE MOST EASTERLY CURB RETURN AT CROW CANYON ROAD AND SAN SIMEON PLACE. ELEV. : 307.73 FEET



**Figure 3**  
**Locations of Sample Points to Date**  
 5293 Crow Canyon Rd.,  
 Castro Valley, Ca.  
 Aqua Science Engineers, Inc.  
 1 inch = 50 feet

toward steep cliff, creek

MW-3

MW-4

SB-6

MW-2

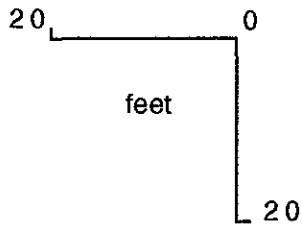
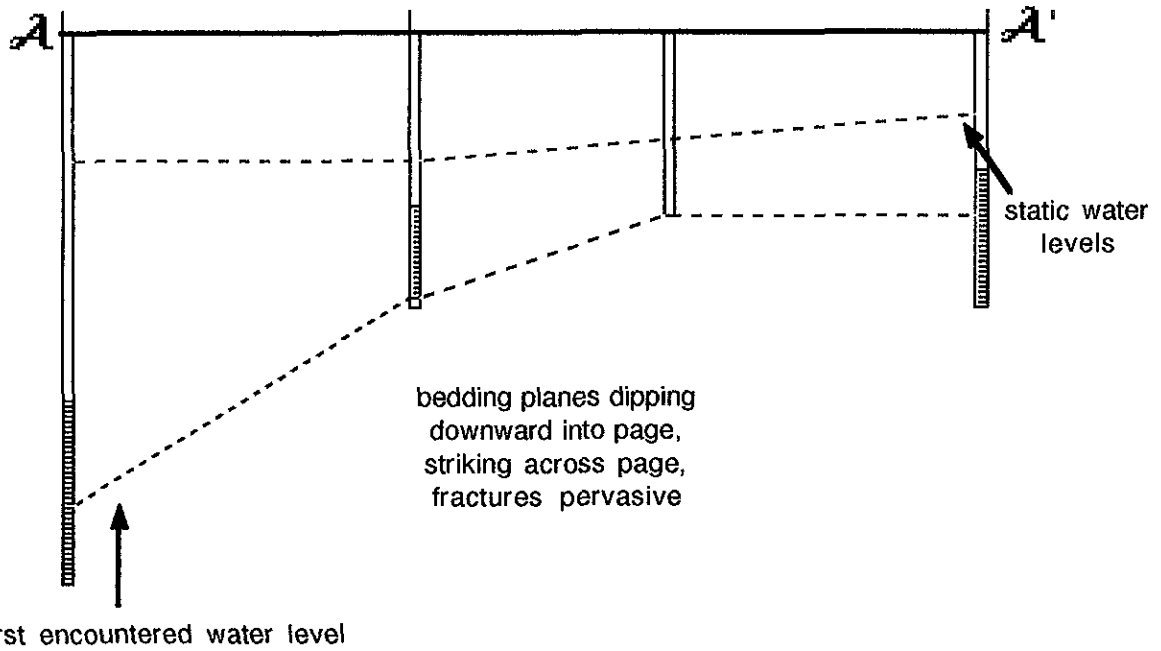


Figure 4  
Cross Section A-A'  
5293 Crow Canyon Rd.,  
Castro Valley, Ca.  
Aqua Science Engineers, Inc.



toward steep cliff, creek,  
out of page

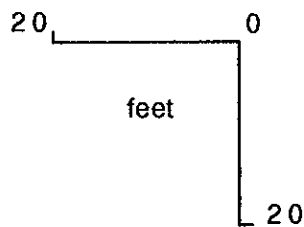
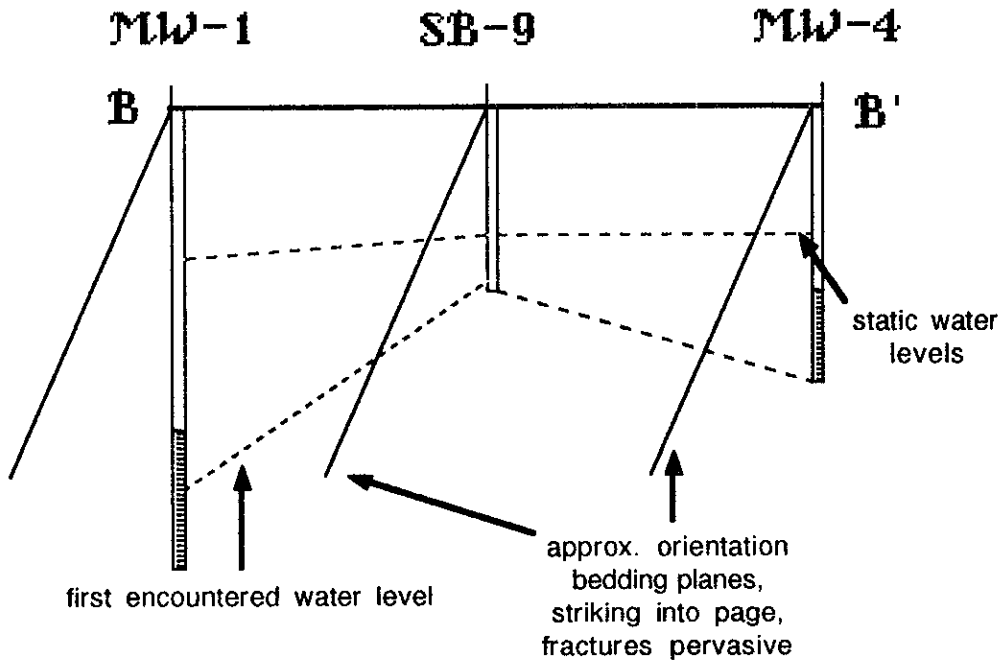
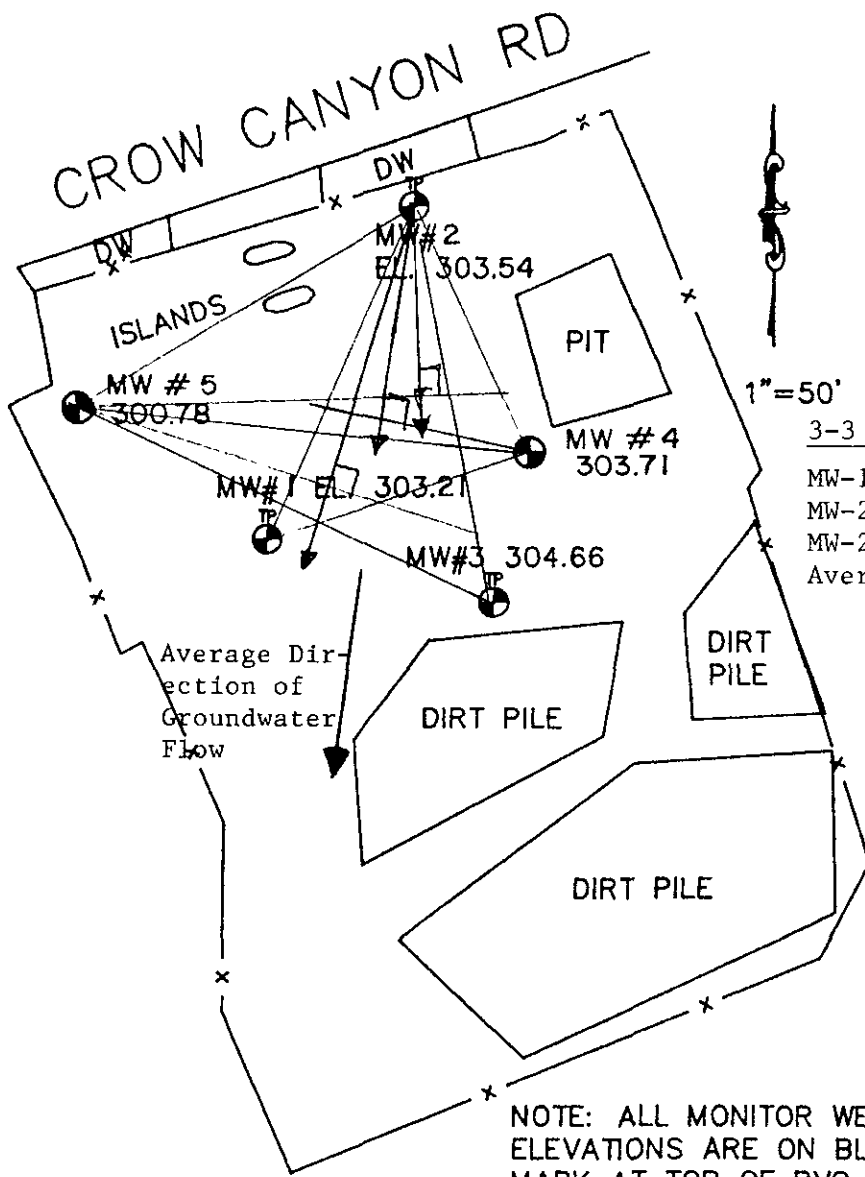


Figure 5  
Cross Section B-B'  
5293 Crow Canyon Rd.,  
Castro Valley, Ca.  
Aqua Science Engineers, Inc.



1"=50' August 20, 1991  
 3-3 Point Problems:  
 MW-1,2,4  
 MW-2,3,5  
 MW-2,4,5  
 Average Gradient = 0.065ft./ft.

Average Direction of Groundwater Flow

BM BRASS DISK IN TOP OF CURB AT THE MOST EASTERLY CURB RETURN AT CROW CANYON ROAD AND SAN SIMEON PLACE. ELEV. : 307.73 FEET



**Figure 6**  
 Groundwater Gradient, Flow Direction  
 5293 Crow Canyon Rd.,  
 Castro Valley, Ca.  
 Aqua Science Engineers, Inc.  
 1 inch = 50 feet



**APPENDIX A**  
**Previous Investigative Data**

March 10, 1989

PROJECT REPORT

UNDERGROUND STORAGE TANK REMOVAL ASSESSMENT  
AT 5293 CROW CANYON ROAD, CASTRO VALLEY, CALIFORNIA

Prepared for:

Dan Dineen  
Lakeshore Financial  
2100 Lakeshore Avenue  
Oakland, Ca. 94606

Submitted by:

Aqua Science Engineers  
2500 Old Crow Canyon Rd. # 121  
San Ramon, CA 94583



## 1. INTRODUCTION

This report documents activities related to removal of the underground storage tanks located at 5293 Crow Canyon Road, Castro Valley, California.

Our scope of work consisted of the following:

1. Collecting soil samples at each end of the tanks to be removed and submit the samples to a state-certified laboratory for analysis of total petroleum hydrocarbons (TPH) and BTX using approved EPA Methods.
2. Submit a report to the client presenting results.

## 2. INVESTIGATIVE METHODS AND FIELD EXPLORATION

On February 10, 1989, Aqua Science Engineers obtained soil samples from under the storage tanks removed at 5293 Crow Canyon Road, Castro Valley, California. Soil samples were collect by driving a 4-inch by 2-inch brass tube into the soil using a wooden mallet. The samples were secured using aluminum foil, teflon caps, and sealed with duct tape.

The odor of petroleum products was present in the soil after removal of the tanks. Samples were collected at approximately thirteen (13) feet below grade at each end of the gasoline tanks and approximately seven (7) feet below grade for the waste oil tank. Also, four samples were collected from the excavated material.

The native soil was classified as a fractured sandstone and the backfill material as sand.

No groundwater was encountered during the excavation.

The samples were refrigerated and shipped to Pace Laboratories, Inc. in Novato, Ca. The gasoline samples were prepared and analyzed for TPH (light) and BTXE. The waste oil sample was analyzed for TPH (light & heavy), BTEX, and oil & grease.

The tanks were hauled as hazardous waste under manifest to Erickson, Inc. in Richmond for disposal. A copy of the manifest forms are in Appendix A.

### 3. DISCUSSION AND CONCLUSIONS

The results of laboratory analysis show contamination is present around the tank pit. TPH (Total Petroleum Hydrocarbons) concentrations at the end of the pit are 980 ppm as gasoline. A copy of the certified laboratory results is included as Appendix B.

An investigation into the vertical and lateral extent of contamination will be required. A workplan will need to be developed to define how the contaminated soil will be remediated; this plan must be submitted to Alameda County Health Hazardous Materials Division (Larry Seto) for approval.

Four samples were collected from the excavated material and a composite analysis completed to determine levels of contamination. This shows that high concentrations of oil & grease are present and that levels of gasoline are low. Additional samples should be collected and analyzed to develop the work plan for remediation, which is outside the scope of this report.

The results of this investigation represent conditions at the time and location at which samples were collected and for the parameters analyzed in the laboratory. It does not fully characterize the site for contamination resulting from other sources or parameters not analyzed.

**TABLE 1 - SOIL SAMPLE ANALYSIS - TANK REMOVAL**

Sample ID Chemical Compound	TA-1 (ppm)	TA-2 (ppm)	TB-1 (ppm)	TB-2 (ppm)	TC-1 (ppm)	TC-2 (ppm)	TD-1 (ppm)
TPH (light)	980.0	210.0	78.0	75.0	ND	19.0	ND
TPH (diesel)	NA	NA	NA	NA	NA	NA	ND
Benzene	4.0	<0.08	0.05	<0.04	ND	0.013	0.007
Ethylbenzene	17.0	0.34	0.29	0.13	0.015	0.022	0.005
Toluene	35.0	0.29	0.26	0.12	0.010	0.035	0.017
Xylenes	75.0	0.27	0.64	0.19	0.062	0.310	0.020
Oil & Grease	NA	NA	NA	NA	NA	NA	35.0

NA - Not Applicable

ND - Not Detected

**TABLE 2 - SOIL SAMPLE ANALYSIS - STOCKPILE**

Sample ID	Composite S1 to S4 Chemical Analysis (ppm)
TPH (light)	84.0
Oil & Grease	775.0

4. Site Plan at 5293 Crow Canyon Road, Castro Valley

CROWCANYON ROAD

DISPENSER ISLANDS

UNDERGROUND PIPING  
TO ISLANDS

TA-1 TA-2  
TB-1 TB-2  
TC-1 TC-2

(E) 8,000 GALLON  
GASOLINE TANKS  
TO BE REMOVED

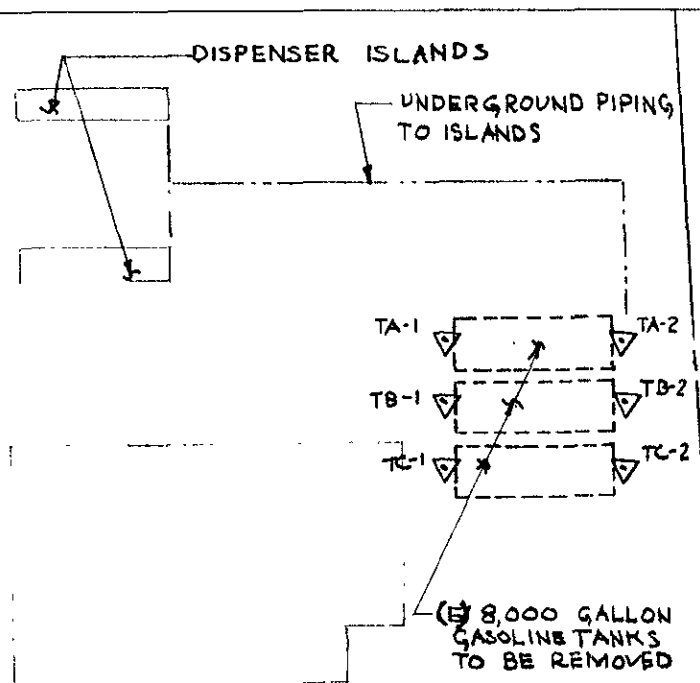
TD-1  
(E) 500 GALLON WASTE-OIL  
TANK TO BE REMOVED

LEGEND

▽ SOIL SAMPLE  
LOCATION  
(E) EXISTING



PROPERTY LINE



APPENDIX A  
HAZARDOUS WASTE MANIFEST FORM



<b>UNIFORM HAZARDOUS WASTE MANIFEST</b>		1. Generator's US EPA ID No. CA190101370105	Manifest Document No.	2. Page 1 of 1	Information in the shaded areas is not required by Federal law.	
3. Generator's Name and Mailing Address LAKE SHORE FINANCIAL 2100 LAKE SHORE AV OAK, CALIF. 94612				A. State Manifest Document Number 87005572		
4. Generator's Phone 415 444-6658				B. State Generator's ID		
5. Transporter 1 Company Name ROGERS TR. & EQUIP.		6. US EPA ID Number CA1D048624910		C. State Transporter's ID 9100513		
7. Transporter 2 Company Name		8. US EPA ID Number		D. Transporter's Phone 415-579-7015		
9. Designated Facility Name and Site Address 255 PARK BLVD RICHMOND CA ERICKSON INC.				E. State Facility's ID		
10. US EPA ID Number CA1D009466392				F. Facility's Phone 415-235-1593		
11. US DOT Description (Including Proper Shipping Name, Hazard Class, and ID Number)					12. Containers	13. Total Quantity
a. WASTE EMPTY STORAGE TANKS CAL. REGULATED WASTE ONLY					No.	Type
J. Additional Descriptions for Materials Listed Above EMPTY GASOLINE TANK # 1532 EMPTY GASOLINE TANK # 1533					K. Handling Codes for Wastes Listed Above	
					a.	b.
					c.	d.
15. Special Handling Instructions and Additional Information GLOVES & SAFETY GLASSES						
16. GENERATOR'S CERTIFICATION: I hereby declare that the contents of this consignment are fully and accurately described above by proper shipping name and are classified, packed, marked, and labeled, and are in all respects in proper condition for transport by highway according to applicable international and national government regulations. If I am a large quantity generator, I certify that I have a program in place to reduce the volume and toxicity of waste generated to the degree I have determined to be economically practicable and that I have selected the practicable method of treatment, storage, or disposal currently available to me which minimizes the present and future threat to human health and the environment; OR, if I am a small quantity generator, I have made a good faith effort to minimize my waste generation and select the best waste management method that is available to me and that I can afford.						
Printed/Typed Name MARTIN W. CLARK			Signature <i>Martin W. Clark</i>		Month Day Year 12/10/89	
17. Transporter 1 Acknowledgement of Receipt of Materials			Signature <i>Tom Homer</i>		Month Day Year 01/10/89	
Printed/Typed Name Tom Homer			Signature		Month Day Year	
18. Transporter 2 Acknowledgement of Receipt of Materials			Signature		Month Day Year	
Printed/Typed Name			Signature		Month Day Year	
19. Discrepancy Indication Space						
20. Facility Owner or Operator Certification of receipt of hazardous materials covered by this manifest except as noted in item 19.						
Printed/Typed Name			Signature		Month Day Year	

GENERATOR  
TRANSPORTER  
FACILITY

**UNIFORM HAZARDOUS WASTE MANIFEST**

1. Generator's US EPA ID No. **CAC000137005** Manifest Document No.

2. Page 1 of 1 Information in the shaded areas is not required by Federal law.

3. Generator's Name and Mailing Address  
**LAKE SHORE FINANCIAL SITE**  
**2100 LAKE SHORE AV ONK CASTRO VALLEY**

State Generator's ID  
**87005509**

4. Generator's Phone (415) 444-6658 / 5193 CREW CANYON RD

5. Transporter 1 Company Name  
**ROGERS TR. & EQUIPMENT** 6. US EPA ID Number  
**CAD048624910**

State Transporter's ID  
**15-367005**

7. Transporter 2 Company Name 8. US EPA ID Number

9. Designated Facility Name and Site Address  
**ERICKSON INC.** 10. US EPA ID Number  
**255 FARR BLVD RICHMOND**  
**CAD1009466392**

State Transporter's ID  
**415-235-1343**

11. US DOT Description (including Proper Shipping Name, Hazard Class, and ID Number)	12. Containers		13. Total Quantity	14. Unit WT/VOL	15. Waste No.
	No.	Type			
a. WASTE EMPTY STORAGE TANKS CAL. REGULATED WASTE ONLY	002	TIP	10550	P	State 512 EPA/Other NONE
b.					State EPA/Other
c.					State EPA/Other
d.					State EPA/Other

16. Additional Descriptions for Materials Listed Above  
**1 EMPTY GASOLINE TANK # 1534**  
**2 EMPTY OIL TANK # 1535**

17. Handling Codes for Wastes Listed Above  
 a. b.

18. Special Handling Instructions and Additional Information  
**GLOVES & SAFETY GLASSES**

19. GENERATOR'S CERTIFICATION: I hereby declare that the contents of this consignment are fully and accurately described above by proper shipping name and are classified, packed, marked, and labeled, and are in all respects in proper condition for transport by highway according to applicable international and national government regulations.  
 If I am a large quantity generator, I certify that I have a program in place to reduce the volume and toxicity of waste generated to the degree I have determined to be economically practicable and that I have selected the practicable method of treatment, storage, or disposal currently available to me which minimizes the present and future threat to human health and the environment; OR, if I am a small quantity generator, I have made a good faith effort to minimize my waste generation and select the best waste management method that is available to me and that I can afford.

Printed/Typed Name: **MARTIN W. CHARK** Signature: *Martin W. Chark* Month Day Year: **12/10/89**

17. Transporter 1 Acknowledgement of Receipt of Materials  
 Printed/Typed Name: **JOHN H ALLEN** Signature: *John H Allen* Month Day Year: **02/10/89**

18. Transporter 2 Acknowledgement of Receipt of Materials  
 Printed/Typed Name: Signature: Month Day Year:

19. Discrepancy Indication Space

20. Facility Owner or Operator Certification of receipt of hazardous materials covered by this manifest except as noted in item 18.  
 Printed/Typed Name: Signature: Month Day Year:

8711055509  
 IN CASE OF AN EMERGENCY OR SPILL, CALL THE NATIONAL RESPONSE CENTER 1-800-424-8802. WITHIN 60 DAYS OF RECEIVING THIS MANIFEST, CALL 1-800-424-8802.

APPENDIX B  
LABORATORY ANALYSIS AND CHAIN-OF-CUSTODY FORM

AquaScience Engineers, Inc.  
 2500 Old Crow Canyon Rd.  
 Suite 121  
 San Ramon, CA 94583

March 02, 1989  
 PACE Project Number: 490213.506

Attn: Mr. Terry Carter

Re: Lakeshore Financial

Date Sample(s) Collected: 02/10/89  
 Date Sample(s) Received: 02/13/89

PACE Sample Number:  
 Parameter

Units	MDL	70659 TA-1	70660 TA-2	70661 TB-1
-------	-----	---------------	---------------	---------------

ORGANIC ANALYSIS

INDIVIDUAL PARAMETERS

Petroleum Fuels, Purgeable, as Gasoline mg/kg  
 (EPA Method 8015, Modified)

3.0	980	210	78
-----	-----	-----	----

PURGEABLE AROMATIC COMPOUNDS, EPA 8020

Benzene mg/kg	0.004	4.0	LT 0.08	0.05
Ethylbenzene mg/kg	0.004	17	0.34	0.29
Toluene mg/kg	0.004	35	0.29	0.26
Xylenes, Total mg/kg	0.004	75	0.27	0.64

MDL Method Detection Limit, Estimated Value.  
 LT Compound not detected at or below LT value, dilution required.

RECEIVED  
 MAR 08 1989  
 AQUA SCIENCE ENG.

Mr. Terry Carter  
 Page 2

March 02, 1989  
 PACE Project Number: 490213.506

PACE Sample Number: Parameter	Units	MDL	70662 TB-2	70663 TC-1	70664 TC-2
<u>ORGANIC ANALYSIS</u>					
<u>INDIVIDUAL PARAMETERS</u>					
Petroleum Fuels, Purgeable, as Gasoline (EPA Method 8015, Modified)	mg/kg	3.0	75	ND	19
<u>PURGEABLE AROMATIC COMPOUNDS, EPA 8020</u>					
Benzene	mg/kg	0.004	LT 0.04	ND	0.013
Ethylbenzene	mg/kg	0.004	0.13	0.015	0.022
Toluene	mg/kg	0.004	0.12	0.010	0.035
Xylenes, Total	mg/kg	0.004	0.19	0.062	0.31

MDL Method Detection Limit, Estimated Value.  
 ND Not detected at or above the MDL.  
 LT Compound not detected at or below LT value, dilution required.

Mr. Terry Carter  
Page 3

March 02, 1989  
PACE Project Number: 490213.506

PACE Sample Number:

70665  
TD-1

<u>Parameter</u>	<u>Units</u>	<u>MDL</u>	<u>Waste Oil</u>
------------------	--------------	------------	------------------

ORGANIC ANALYSIS

INDIVIDUAL PARAMETERS

Petroleum Fuels, Purgeable, as Gasoline (EPA Method 8015, Modified)	mg/kg	3.0	ND
--	-------	-----	----

PURGEABLE AROMATIC COMPOUNDS, EPA 8020

Benzene	mg/kg	0.004	0.007
Ethylbenzene	mg/kg	0.004	0.005
Toluene	mg/kg	0.004	0.017
Xylenes, Total	mg/kg	0.004	0.020

EXTRACTABLE FUELS

Extractable Fuels, as Diesel Soxhlet Extraction Date Started	mg/kg	10	ND 02-15-89
---	-------	----	----------------

TOTAL OIL AND GREASE (GRAV. EPA 9071)

Total Oil and Grease (Freon Extractable) Date Extracted	mg/kg wet	10	35 2-14-89
--	-----------	----	---------------

MDL Method Detection Limit, Estimated Value.  
ND Not detected at or above the MDL.

Mr. Terry Carter  
Page 4

March 02, 1989  
PACE Project Number: 490213.506

PACE Sample Number:

70670  
COMPOSITE  
S1-1 to  
S1-4

Parameter

Units

MDL

ORGANIC ANALYSIS

INDIVIDUAL PARAMETERS

Petroleum Fuels, Purgeable, as Gasoline mg/kg 3.0 84  
(EPA Method 8015, Modified)

TOTAL OIL AND GREASE (GRAV. EPA 9071)

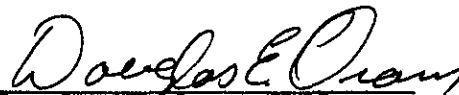
Total Oil and Grease (Freon Extractable) mg/kg wet 10 775  
Date Extracted 2-14-89

MDL Method Detection Limit, Estimated Value.

Approval:



Wasfi Y. Attalla, Ph.D  
Project Manager for  
PACE Laboratories



Douglas E. Oram, Ph.D  
Technical Reviewer for  
PACE Laboratories

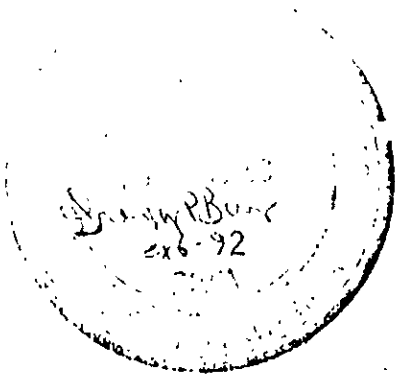
Final Report of  
Methods and Findings

for a

PRELIMINARY SITE INVESTIGATION  
including  
SOIL BORINGS AND SOIL SAMPLE ANALYSES,  
GROUNDWATER MONITORING WELL DRILLING, INSTALLATION, SAMPLING

at  
5293 Crow Canyon Rd.  
Castro Valley, Ca.

submitted by  
Aqua Science Engineers  
San Ramon, Ca.  
July 23, 1990





## INTRODUCTION

Aqua Science Engineers (ASE) was contracted by the property owner to drill and sample 11 soil borings, of which three were converted into groundwater monitoring wells at the vacant lot located at 5293 Crow Canyon Rd., Castro Valley, Ca. (Figure 1). The scope of work performed closely follows the ASE Workplan - Proposal for Soil and Groundwater Investigation Services at 5293 Crow Canyon Rd., dated February 11, 1990. Approval of the scope of the workplan was given by the Alameda County Health Care Services Agency on March 14, 1990, (Appendix A). The scope of work reflects the minimum amount of investigation required to define the vertical and lateral extent of soil and groundwater contamination.

The following report details the investigative methods used and the findings of the investigation. The investigation was mandated by earlier soil sampling and analysis related to underground fuel and waste oil storage tank removals. This sampling and analysis, conducted in February, 1989, showed that site soils had been impacted by petroleum hydrocarbon products.

Prior to February 1989, the site was utilized as a gasoline filling and auto service station. In February, 1989, ASE removed three 8,000 gallon gasoline tanks and one 500 gallon waste oil tank from 5293 Crow Canyon Rd., Castro Valley. Seven soil samples obtained from beneath the tank inverts yielded Total Petroleum Hydrocarbons (TPH) as gasoline concentrations within the gasoline tankpit from non-detectable (ND) to 980 parts per million (ppm). Levels of benzene, toluene, ethylbenzene, and total xylenes (BTEX) were measurable in all seven samples. A soil sample from beneath the waste oil tank (separate pit) showed 35 ppm total oil and grease (TOG) and detectable amounts of BTEX. An eighth soil sample from the stockpiled soils contained 84 ppm TPH as gas and 775 ppm TOG. The stockpiled soil remains onsite at this time, and the tankpit excavations remain open.

Currently, the site is vacant and enclosed by chain link fence. The pump island bases remain in place. The ground surface is not covered by pavement. Topographic relief at the site is fairly low, having been leveled by construction equipment in the distant past. Topographic relief in the area surrounding the site is steeply downhill toward the south, southeast, and Crow Canyon Creek. The site rests on Cretaceous marine sedimentary deposits of the Panoche Formation (Preliminary Geologic Map of the Hayward Quadrangle, Alameda and Contra Costa Counties, by Mr. Thomas Dibblee, Jr., 1980, U.S.G.S. open file report 80-540)

## DRILLING PROCEDURES

Prior to site investigation activities, a hazardous materials site safety plan was formulated (Appendix B). The plan was reviewed with all onsite personnel immediately preceding the implementation of investigation activity.

Between April and May, 1990, a Mobile Drill B-61 or B-57 hydraulic rotary drill with 8 inch hollow stem augers was used to drill 11 soil borings. Soil boring #1 (SB-1) through SB-9 (lacking SB-5), were drilled to 20 feet depth each from the pump islands, along the product piping, and around the gasoline tankpit (Figure 2). Three soil borings were drilled to between 30.5 feet and 60 feet depth, then converted into groundwater monitoring wells MW-1, MW-2 and MW-3. Into each boring a 2 inch I.D. schedule 40 PVC monitoring well was installed. A permit from the Alameda County Flood Control and Water Conservation District, Zone 7, was obtained prior to monitoring well drilling (Appendix C).

MW-1 was drilled and installed about 40 feet southwest of the dispenser islands in what was assumed to be the downgradient direction from the islands and possibly the gas tankpit. The boring was advanced down to 40 feet depth, then allowed to stand open overnight for a water check, which proved to be marginal. On the following day the well was drilled to 55 feet total depth and the casing installed.

MW-2 was placed north of the product piping in the northeast portion of the site near the northern property line, in what was considered an upgradient direction from the piping and the tankpits. Drilling proceeded to 30.5 feet total depth, then the well was installed.

The location of MW-3 was designed to monitor groundwater in the vicinity of and downgradient from the waste oil tankpit, so it is located about 25 feet south and west of the pit. The well was initially drilled to 45 feet depth, then left to stand open overnight for a water check, which was negative. The borehole was furthered to 60 feet depth and the well installed.

Prior to arrival onsite, as well as between borings, the drill rig and all downhole tools were high pressure hot washed. Decon rinseates were contained in a plastic lined pit and allowed to evaporate.

#### SITE GEOLOGY

The site rests on Cretaceous marine sedimentary rocks of the Panoche Formation. These clay shale, argillaceous to silty rocks, with thin sandstone beds dip steeply toward the west-southwest. The surrounding area is comprised of northwesterly trending folded and faulted rocks of the Panoche Formation. The northwest trending East Chabot Fault trace lies about 1.5 miles southwest of the site. The axis of the Niles Syncline lies about 2,000 feet southwest of the site.

The soils and rocks encountered as drilling progressed were logged by an ASE geologist using the United Soil Classification System (USCS) (Appendix D). From grade to just a few feet depth, the soils are Panoche rocks which have weathered in place. Below just a few feet depth are well indurated claystone, siltstone, and sandstone beds from a few inches to a few feet in thickness.

During drilling of SB-1 through SB-9 it was noted that at most locations free groundwater was encountered at about 15 to 18 feet depth, with the exception of SB-7, which was dry to 20 feet depth. Overnight, the water levels in the borings rose up to about 7 to 9 feet depth below grade, excepting SB-7. Gasoline odors described as slight to strong were noted during drilling of all of the borings at depths ranging from 5 feet to 15 feet.

At MW-1 groundwater was negligible down to about 40 feet depth. Free groundwater was encountered at about 43 feet depth.

In MW-2 free groundwater was found at about 18 feet depth and rose to about 9 feet depth.

MW-3 was found to be dry down to about 45 feet depth. Groundwater was encountered at about 50 feet depth and rose in the well up to about 16 feet depth.

#### WELL CONSTRUCTION PROCEDURES

Upon drilling to total depth, a 2" I.D. schedule 40 PVC well was installed through the augers from grade to total depth (Appendix D). The well casing was high pressure hot washed prior to installation. Machine slotted well screen (0.02") with a threaded bottom cap was followed by flush threaded blank casing, bringing the well up to grade. A locking top cap was screwed into the top of the well for security. The wells were sanded with washed #3 sand through the augers, from total depth up to 2 feet above the top of the perforated casing. Two feet of bentonite pellets were placed above the sand, followed with water for activation of the pellets. The remainder of the borings were filled to grade with cement, and steel stovepipe well covers were emplaced to protect the wells.

MW-1 was screened from 50 feet total depth up to 35 feet depth. The wellscreen in MW-2 was placed between 30 feet total depth and 15 feet depth. MW-3 has the wellscreen located between 60 feet and 40 feet depth.

#### SAMPLING PROCEDURES

Undisturbed soil samples were obtained at five foot intervals with a California modified split spoon sampler and a 140 lb. drop hammer into 2" X 6" precleaned brass tubes and sealed with plastic caps and tape. The sampler and sample tubes were cleaned with a TSP solution and rinsed with tap water between samplings. The samples were put into a cooler with ice and transported to a State Certified Hazardous Waste Analytical Laboratory for certified analysis following chain of custody procedures (Appendix E). An Organic Vapor Meter (OVM-PID) was used to screen the soil samples obtained during drilling of SB-1 through SB-9. The meter was used only to determine the presence of volatile hydrocarbons and not to quantify any contamination detected. The OVM readings proved to be much higher than confirming analyses values given by a State Certified Hazardous Waste Analytical Laboratory.

The completed wells were developed with an airlift pump, then sampled with dedicated disposable bailers by Sampling Specialists on June 1, 1990. The field log and sampling log detailing the procedures of the development/sampling are in Appendix D. No odors or petroleum sheen were detected during the development/sampling. The groundwater samples were obtained for analysis at a State Certified Hazardous Waste Analytical Lab.

SAMPLE ANALYSIS

All of the soil samples and groundwater samples were analyzed for TPH as gasoline using EPA method 8015 modified, and benzene, toluene, ethyl benzene, and total xylenes (BTEX) distinction using EPA method 8020/602. The groundwater sample from MW-3 was additionally analyzed for chlorinated hydrocarbons using EPA method 601, polynuclear aromatics using EPA method 625, chlorinated pesticides using EPA method 608, and priority pollutant metals using EPA method 6010.

Soil samples from five feet depth yielded gasoline concentrations ranging from nondetectable in SB-3, SB-6, SB-9, to 7.8 ppm in SB-2, to 110 ppm in SB-1, up to 390 ppm in SB-8. At the ten foot depth level, gasoline was N.D. in SB-1, SB-2, SB-3, SB-4, SB-7, SB-8, 66 ppm in SB-9, up to 79 ppm in SB-6 (Table 2). TPH as gas and BTEX were not detected in any soil sample obtained from below 15 feet depth. Several soil samples which were N.D. for TPH as gasoline did contain measurable levels of BTEX.

Benzene values for samples with detectable concentrations of TPH as gas ranged from 23 parts per billion (ppb) (SB-6,10') to 4,300 ppb (SB-8,5'). Toluene in these samples ranged from 5.1 ppb (SB-2,5') to 4,000 ppb (SB-8,5'). Ethylbenzene existed at from 97 ppb (SB-2,5') to 2,800 ppb (SB-8,5'). Total xylenes were detected at from 5.5 ppb (SB-2,5') to 5,300 ppb (SB-8,5'). Soil sample SB-8, 5' contained the highest levels of all constituents identified.

At 15 feet and 20 feet depth, no soil sample yielded detectable levels of TPH as gas, though SB-8, 15' showed 49 ppb benzene, 20 ppb toluene, 7.5 ppb ethylbenzene, 15 ppb xylenes.

Groundwater samples from all three wells were N.D. for the constituents sought.

### GROUNDWATER GRADIENT DETERMINATION

Markings at top of casing on each of the three wells were surveyed to a known benchmark by Major's Engineering on July 12, 1990. The wells were marked by Sampling Specialists at the time of water level measurement. Top of casing for each well was found to be between 303.21 feet above mean sea level (MSL) (MW-1) and 304.66 feet above MSL (MW-3). Corresponding water level elevations were between 287.74 feet above MSL (MW-1) and 294.56 feet above MSL (MW-2) at the time of measurement. The geometry of the water table between the three well locations indicates groundwater flow to the southwest at XX, which is approximately parallel to the down dip direction of the site rocks.

## CONCLUSIONS

A soil and groundwater contamination investigation was conducted at the site of a previously removed gasoline filling and auto service station located at 5293 Castro Valley Blvd. in Castro Valley, Ca. Soil samples obtained in February, 1989, from beneath the inverts of three removed 8,000 gallon gasoline tanks and one removed 500 gallon waste oil tank showed that site soils had been impacted by petroleum hydrocarbon products. These findings led to the requirement by the Alameda County Health Care Services Agency that a preliminary site investigation be conducted to determine the vertical and lateral extent of soil and groundwater contamination resulting from the previous operation of the underground tankage.

Eleven soil borings were advanced down to from 20 to 60 feet depth below grade at the relatively flat, vacant site. The site rests upon steeply dipping Cretaceous marine sedimentary rocks of the Panoche Formation which are distinctly bedded from a few inches to a few feet in thickness. Three of the borings were converted into groundwater monitoring wells ranging from 30.5 feet to 60 feet depth below grade.

Soil borings #1-9 (SB-1 to SB-9, lacking SB-5) were all drilled to 20 feet depth from the vicinity of the dispenser islands, along product piping, and around the gasoline tankpit. SB-8 and SB-9 were drilled at distances of about 50 feet in assumed downgradient directions from the dispenser islands, and the gasoline tankpit, respectively. Groundwater was encountered in these borings at from about 15 feet to 19 feet depth, with static levels at about 7 to 9 feet depth below grade. SB-7 was dry to 21 feet depth.

It was apparent from the soil borings that measureable petroleum hydrocarbon contamination existed at distances from the gas tankpit and product piping of at least 60 feet. The three monitoring wells were then drilled in locations approximating those outlined in the ASE Workplan - Proposal For Soil and Groundwater Investigation Services of Feb. 11, 1990. Monitoring Well #2 (MW-2) was drilled and installed as an assumed upgradient well instead of near the tankpit. The three wells have differing construction specifications resultant from varying hydrogeologic conditions which are apparent at the site. In MW-1, moistening was noted at about 17 feet depth but first free groundwater was encountered at about 42 feet depth. Free groundwater was encountered in MW-2 at about 18 feet depth. MW-3, near the waste oil tankpit, was dry to about 50 feet depth. These observations were verified by overnight water checks in open borehole.

The soils were sampled at 5 foot intervals and submitted to a State Certified Hazardous Waste Analytical Laboratory following chain of custody procedures. The samples were analyzed for TPH as gasoline with BTEX distinction (EPA methods 8015 modified, 8020). The samples yielded TPH as gasoline with BTEX concentrations ranging from N.D. in several samples to 390 ppm gasoline, 4,300 ppb benzene, 4,000 ppb toluene, 2,800 ppb ethylbenzene, and 5,300 ppb xylenes in sample SB-8, 5'.

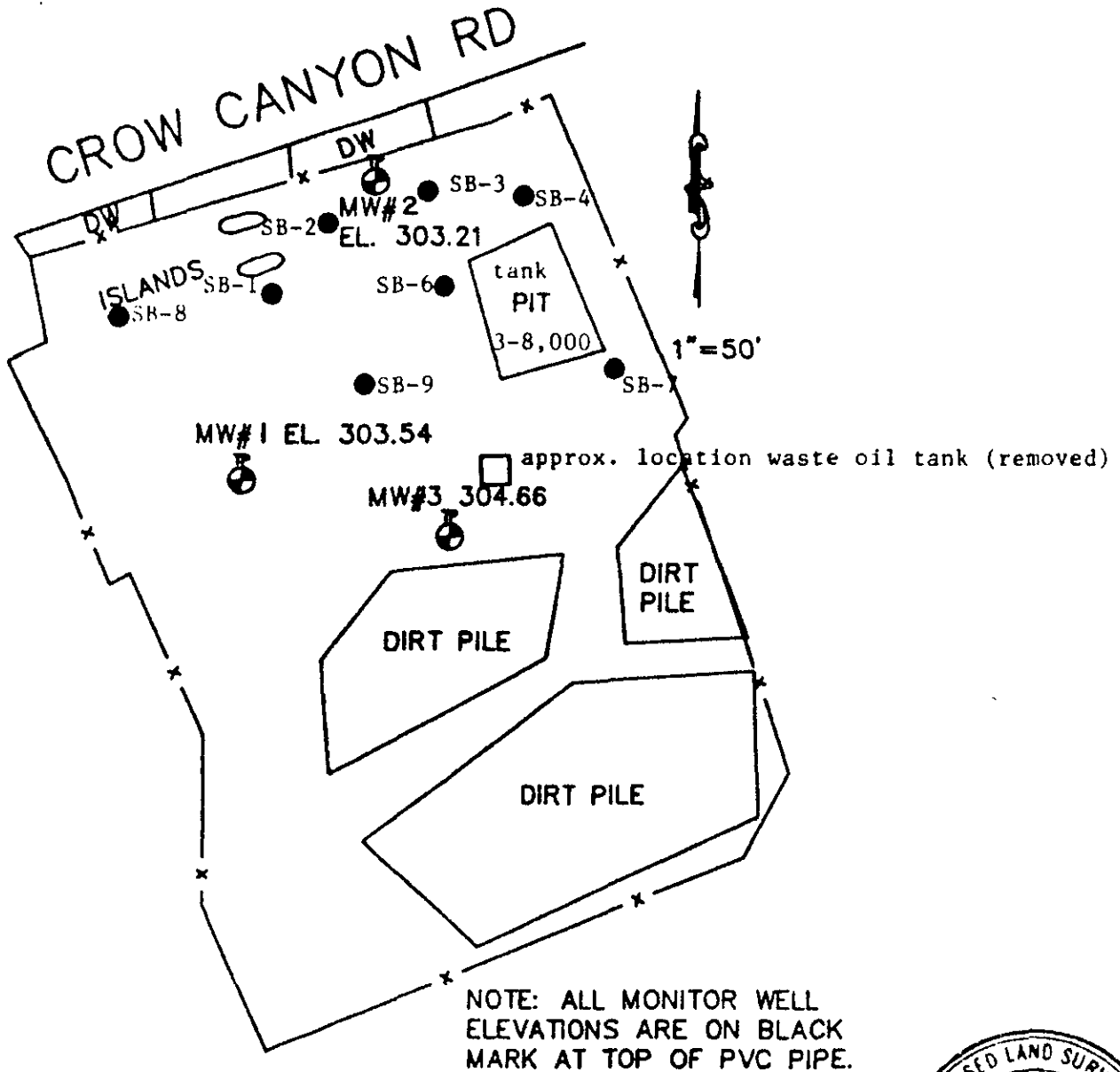
The wells were developed with an air lift pump and sampled with disposable dedicated ballers. Groundwater samples were submitted following chain of custody procedues to a State Certified Laboratory for TPH as gas with BTEX (EPA methods 8015, 602). Groundwater from MW-3 was additionally analyzed using EPA methods 601, 608, 625, 6010, 7470, due to the well's proximity to the waste oil tankpit. All groundwater samples analyzed N.D. for all hydrocarbon constituents of interest. MW-3 did contain 0.004 ppm cadmium and 0.027 ppm zinc.

#### RECOMMENDATIONS

The groundwater monitoring wells should be sampled quarterly for a period of one year. If chemical constituents continue to be absent from groundwater samples throughout the year, sampling can probably be discontinued and the wells properly abandoned.



Figure 1  
Site Plan



● denotes soil boring/sampling location

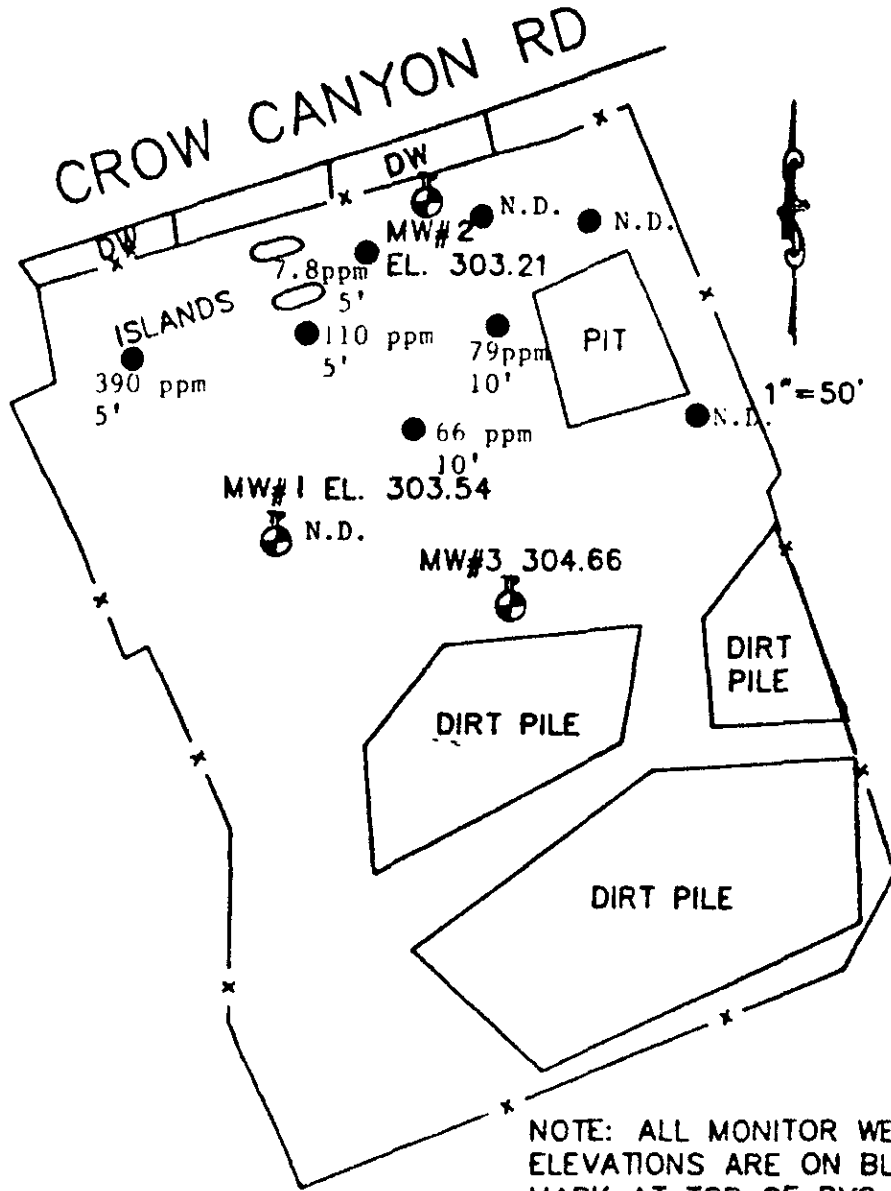
BM BRASS DISK IN TOP OF CURB AT THE MOST EASTERLY CURB RETURN AT CROW CANYON ROAD AND SAN SIMEON PLACE. ELEV. : 307.73 FEET



Drawn DE Job 4307-01 Checked DE  
 Scale 1" = 50' Date 7-16-90 Parcel \_\_\_\_\_



Figure 2  
Highest TPH as  
Gasoline Values,  
Soil Samples



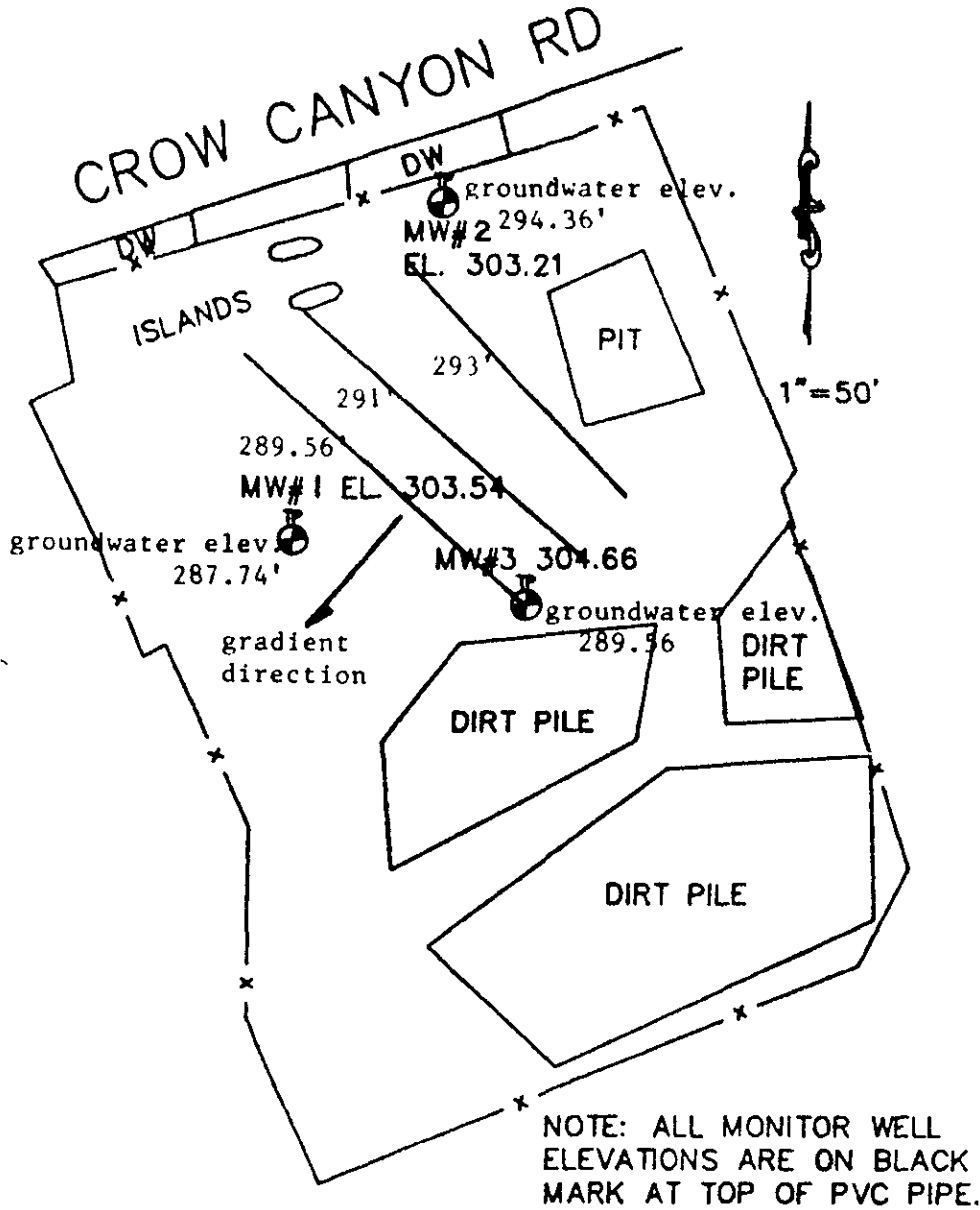
NOTE: ALL MONITOR WELL ELEVATIONS ARE ON BLACK MARK AT TOP OF PVC PIPE.

BM BRASS DISK IN TOP OF CURB AT THE MOST EASTERLY CURB RETURN AT CROW CANYON ROAD AND SAN SIMEON PLACE. ELEV. : 307.73 FEET



Drawn DE Job 4307-01 Checked DE  
 Scale 1" = 50' Date 7-16-90 Parcel \_\_\_\_\_

Figure 3  
Groundwater Gradient  
May 30, 1990



NOTE: ALL MONITOR WELL ELEVATIONS ARE ON BLACK MARK AT TOP OF PVC PIPE.

BM BRASS DISK IN TOP OF CURB AT THE MOST EASTERLY CURB RETURN AT CROW CANYON ROAD AND SAN SIMEON PLACE. ELEV. : 307.73 FEET



Drawn DE Job 4307-01 Checked DE  
Scale 1" = 50' Date 7-16-90 Parcel \_\_\_\_\_

April 1, 1991

Mr. Frank Ramos  
c/o Mr. Richard P. Flynn  
1630 N. Main St., Suite 134  
Walnut Creek, Ca. 94596-4609

Re: Workplan-Proposal for Soil and Groundwater Investigation Services at  
5293 Crow Canyon Rd., Castro Valley

Dear Mr. Ramos,

The following is Aqua Science Engineer's workplan-proposal for a second phase of a preliminary site assessment to be conducted at the site referenced above. The scope of work was developed from the Regional Board Staff Recommendations for Initial Evaluation and Investigation of Underground Tanks of June 2, 1988, revised April, 1989. The format for the proposal is from the Workplan for Initial Subsurface Investigation, Proposal Format attachment that accompanied recent correspondence from the Alameda County Dept. of Environmental Health, Hazardous Materials Program offices.

## I. INTRODUCTION

### A. Statement of Work Scope:

A soil and groundwater investigation is to be conducted at 5293 Crow Canyon Rd. in Castro Valley, Ca., as a result of earlier investigative activities at the site. The furtherance of site assessment activities has been mandated by October 4, 1990 correspondence from the Alameda County Dept. of Environmental Health, Hazardous Materials Program. The Oct. 4 letter requires that the vertical and horizontal extent of gasoline contamination in the soils and groundwater be determined (Appendix A). Prior to commencement of monitoring well drilling, well construction permits will be obtained from Alameda County Water District, Zone 7.

### B. Site Location:

The site is located on the southern side of Crow Canyon Rd., east of Castro Valley (Figure 1). From the southern property line the topography slopes steeply downhill toward the southeast and Crow Canyon Creek which flows to the southwest at the bottom of Crow Canyon.

### C,D. Background and Site History:

A Shell gasoline station operated at the subject site prior to February, 1989, when three 8,000 gallon gasoline tanks and one 500 gallon waste oil were removed by Aqua Science Engineers. The details of the tank removals and associated sampling are summarized in the project report of March 10, 1989 (Appendix B). An estimate of the amount of fuel products lost into the soils was not made.

Aqua Science Engineers Final Report for a Preliminary site investigation dated July 23, 1990 includes soil and groundwater sampling data obtained from drilling operations which indicated the existence of soil contamination in the area of the pump islands and as much as 50 feet west-southwest from the fuel tankpit. Three groundwater monitoring wells were permitted and are currently operated.

## II. SITE DESCRIPTION

### A. Vicinity Description and Hydrogeologic Setting:

The site rests upon Cretaceous marine sedimentary deposits of the Panoche Formation. The sandstone and claystone beds dip steeply to the southwest and the axis of the Niles Syncline less than 1/2 mile away. Surrounding the valley are Cretaceous marine deposits of the Panoche and Knoxville Formations. The surrounding area is comprised of northwest trending folds and faults, including the East Chabot Fault which lies about one mile to the southwest of the site.

### B, C. Vicinity Map:

Though the gas station has been removed, Figure 2 gives the approximate layout of those facilities, as well as the locations of proposed borings and monitoring wells.

### D. Existing Soil Contamination and Excavation

Initial soil samples were obtained from the backhoe bucket by driving 2" X 6" brass tubes into the soil until they were full. The tubes were sealed with aluminum foil, teflon caps, and tape, then placed into a cooler with ice. They were transported following chain of custody procedures to a State Certified laboratory with the documentation and results contained in Appendix B.

Groundwater was not encountered in the tankpit excavation, which was excavated to about 13 feet depth. Near surface soils are of the same composition as the sedimentary rocks described above, and were hard.

The soil samples were obtained from beneath the gasoline tank inverts at 13 feet depth and from beneath the wasted oil tank at 7 feet depth.

Six samples of the soils/rock beneath the tanks yielded concentrations of Total Petroleum Hydrocarbons (TPH) as gasoline ranging from non-detectable to 980 parts per million (ppm) and 35 ppm total oil and grease in the tankpit soil sample (Table 1). Benzene concentrations ranged from nondetectable to 4,000 parts per billion (ppb), ethylbenzene from 5 ppb to 17,000 ppb. Toluene was detected at between 100 ppb to 35,000 ppb, with total xylenes between 20 ppb and 75,000 ppb.

No underground utilities were encountered during the tank removal, though Underground Service Alert will be notified before commencement of further investigative work.

Soil excavated from the tankpits was piled onsite where it exists today. A stockpile soil sample was analyzed and the results included in Table 1.

A preliminary site investigation was performed by ASE and documented in the July 23, 1990 final report of methods and findings. Undisturbed soil samples yielded TPH as gasoline concentrations ranging up to 390 ppm, with associated BTEX concentrations. No soil sample obtained from below about 15 feet depth contained detectable amounts of the constituents of interest. The soil samples were obtained with split spoon samplers inserted through hollow stem augers to the hole bottom, where they were driven into the native soils by successive blows from a 140 lb. drop hammer. The drill cuttings were placed onto the southern existing stockpile.

Table 1  
Soil Sample Analyses

**TABLE 1 - SOIL SAMPLE ANALYSIS - TANK REMOVAL**

Sample ID (figure 2) Chemical Compound	TA-1 (ppm)	TA-2 (ppm)	TB-1 (ppm)	TB-2 (ppm)	TC-1 (ppm)	TC-2 (ppm)	TD-1 (ppm)
TPH (light)	980.0	210.0	78.0	75.0	ND	19.0	ND
TPH (diesel)	NA	NA	NA	NA	NA	NA	ND
Benzene	4.0	<0.08	0.05	<0.04	ND	0.013	0.007
Ethylbenzene	17.0	0.34	0.29	0.13	0.015	0.022	0.005
Toluene	35.0	0.29	0.26	0.12	0.010	0.035	0.017
Xylenes	75.0	0.27	0.64	0.19	0.062	0.310	0.020
Oil & Grease	NA	NA	NA	NA	NA	NA	35.0

NA - Not Applicable  
ND - Not Detected

**SOIL SAMPLE ANALYSIS - STOCKPILE**

Sample ID	Composite S1 to S4
Chemical Analysis	(ppm)
TPH (light)	84.0
Oil & Grease	775.0

TABLE 1  
SAMPLE ANALYTICAL RESULTS

SAMPLE #	GASOLINE	BENZENE	TOLUENE	ETHYL BENZENE	TOTAL XYLENES
	mg/kg	ug/kg	ug/kg	ug/kg	ug/kg
SB-1, 5'	110	2,500	1,200	690	1,300
SB-1, 10'	N.D.	780	44	19	18
SB-1, 15'	N.D.	N.D.	N.D.	N.D.	N.D.
SB-1, 20'	N.D.	N.D.	N.D.	N.D.	N.D.
SB-2, 5'	7.8	240	5.1	97	5.5
SB-2, 10'	N.D.	N.D.	N.D.	N.D.	N.D.
SB-2, 20'	N.D.	N.D.	N.D.	N.D.	N.D.
SB-3, 5'	N.D.	90	N.D.	16	10
SB-3, 10'	N.D.	N.D.	N.D.	N.D.	N.D.
SB-3, 15'	N.D.	N.D.	N.D.	N.D.	N.D.
SB-4, 10'	N.D.	N.D.	N.D.	N.D.	N.D.
SB-4, 15'	N.D.	N.D.	N.D.	N.D.	N.D.
SB-4, 20'	N.D.	6.3	N.D.	N.D.	N.D.
SB-6, 5'	N.D.	N.D.	N.D.	N.D.	N.D.
SB-6, 10'	79	23	10	330	310
SB-6, 15'	N.D.	N.D.	N.D.	N.D.	N.D.
SB-7, 10'	N.D.	N.D.	N.D.	N.D.	N.D.
SB-7, 15'	N.D.	N.D.	N.D.	N.D.	N.D.
SB-7, 20'	N.D.	N.D.	N.D.	N.D.	N.D.
SB-8, 5'	390	4,300	4,000	2,800	5,300
SB-8, 10'	N.D.	37	11	N.D.	5.4
SB-8, 15'	N.D.	49	20	7.5	15
SB-8, 20'	N.D.	N.D.	N.D.	N.D.	N.D.
SB-9, 5'	N.D.	N.D.	N.D.	N.D.	N.D.
SB-9, 10'	66	190	85	170	320
SB-9, 15'	N.D.	N.D.	N.D.	N.D.	N.D.
MW-1, 5'	N.D.	N.D.	N.D.	N.D.	N.D.
MW-1, 10'	N.D.	N.D.	N.D.	N.D.	N.D.
MW-1, 15'	N.D.	N.D.	N.D.	N.D.	N.D.
MW-1, 20'	N.D.	N.D.	N.D.	N.D.	N.D.
MW-1, 40'	N.D.	N.D.	N.D.	N.D.	N.D.

	GASOLINE	EPA 601	EPA 602	EPA 608	EPA 625
	mg/l	ug/l	ug/l	ug/l	ug/l
MW-1	N.D.	N.D.	N.D.	N.D.	N.D.
MW-2	N.D.	N.D.	N.D.	N.D.	N.D.
MW-3	N.D.	N.D.	N.D.	N.D.	N.D.

N.D. - not detected

### III. Plan For Determining the Extent of Soil Contamination On Site

The plan for determining the extent of soil and groundwater contamination includes drilling, sampling, monitoring well construction, and analysis of soils and groundwater from the site.

#### A. Describe Method/Technique For Determining Extent of Contamination Within the Excavation:

##### Boring Methods, Numbers, Locations, Abandonment

To facilitate a determination of the extent of soil and groundwater contamination present near the excavation and around the site, 4 borings are proposed, two of which will be converted to monitoring wells. A Mobile B-61 or B-57 hydraulic rotary drilling rig with 8 inch hollow stem augers will be used to drill all borings. At all proposed monitoring well locations, drilling will proceed to groundwater plus 5 to 10 feet.

Upon encountering groundwater a monitoring well (MW-4) will be drilled to a maximum of 65 feet and installed within ten feet of and in the confirmed downgradient direction from the former fuel tank pit. MW-5 will be placed near the northwest corner of the property and previously drilled SB-8.

Two soil borings (SB-10 and SB-11) will be drilled to 20 feet maximum depth at locations presently void of investigative data. Figure 2 shows the location of all proposed borings.

The two soil borings will be backfilled with Portland cement which will be pumped through a tremmie hose from the bottom of each boring up to original grade. MW-4 and MW-5 will be installed entirely through the augers up to original grade.

##### Soil Classification and Sampling Methods

Each boring will be continuously logged on site by a geologist using the Unified Soil Classification System. Undisturbed soil samples will be taken at 5 foot intervals with a hammer driven California Split Spoon sampler as drilling progresses. The samples will be collected in precleaned 2" X 6" brass tubes and sealed with plastic caps and tape. All sampling equipment will be cleaned with a brush in a bucket of TSP solution and rinsed twice between samplings. The drilling rig and augers will be high pressure hot washed before arriving on site and between borings.

#### C. Describe Methods/Criteria for Screening Soil and Storing Soil

The existing soil stockpile and in place site soils are known to contain detectable levels of petroleum hydrocarbons. Soil samples obtained during drilling will be screened with an organic vapor analyzer in the field and all samples yielding a positive reading of any kind will be submitted for analysis.

Soil cuttings generated during drilling will be stored on site, near existing stockpiles, on plastic sheeting and covered with plastic sheeting pending lab analyses for later disposal. On site treatment or off site disposal of contaminated soils is not a part of the workplan. Once the soil has been chemically characterized, proper disposal at a Class I, II, or Class III waste facility can be arranged at additional cost, to be determined after the characterization of the cuttings. It may be necessary to contract a hazardous waste hauler, manifest the soils properly, and dispose of the soils as hazardous waste.

#### D. Security Measures

The site is currently fenced across Crow Canyon Rd. A working area will be established with barricades and warning tape around the drill rig. Within the working area only authorized personnel will be allowed.

### IV. Plan For Determining Groundwater Contamination

#### A. Placement and Rationale For Monitoring Well Placement

MW-4 and MW-5 will be installed in areas downgradient from points with known contamination. MW-4 will be emplaced very near the fuel tankpit, off of the southwest corner, with MW-5 very near SB-8. The two wells are located to provide groundwater sample data from areas with known soil contamination, to allow good triangulation of survey points in a groundwater gradient determination, as well as to obtain sample points from specific areas of concern, as noted above.

#### B. Monitoring Well Drilling and Installation Specs.

Monitoring wells MW-4, 5 will be drilled as described above. Both wells will be constructed of 2 inch Schedule 40 PVC casing, with up to 15 feet of .010" slotted schedule 40 PVC, with the top of the screened interval extending about 5 feet above encountered water level to account for seasonal groundwater level fluctuations (Figure 3). The well casing will be inserted through the augers, followed by #3 washed sand through the augers in 1 to 2 foot lifts up to at least 2 feet above the perforated casing. One foot of bentonite pellets will be placed above the sand and activated with some tap water. The seal will be finished up to the surface with cement, and a locking cap and surface cover will be installed.

Soil samples will be collected at 5 foot intervals, starting at 5 feet depth, obtained as described above.

#### C. Groundwater Sampling Plans

The wells will be developed by swabbing, bailing, and air lift pumping of water into drums until the water appears to be reasonably clear, or until pH, conductivity, and temperature readings obtained from the groundwater stabilize. The water's clearness will be determined subjectively as development proceeds. The wells will be sampled as per Pratt Consulting Company's Monitoring Well Protocol of April, 1989 (Appendix B). All soil and groundwater samples to be submitted for analysis will be immediately placed into a cooler with ice and submitted to a State Certified Analytical Laboratory following chain of custody procedures for TPH as gasoline with BTXE distinction using EPA methods



Laboratory analysis reports will have QA/QC data on the report itself, and groundwater samples will be analyzed with a duplicate and a blank. Purged water will be stored on site in drums until laboratory analyses are available.

The tops of well casings will be surveyed to an established benchmark by a State Registered Land Surveyor to within 0.01 foot. Free product and sheen will be measured either with an interface probe which will measure the thickness of floating product, or with an acrylic bailer which will be lowered slowly to the water surface and filled about half full for direct observation of sheen and odor. Water level measurements will be taken as per Pratt Consulting Co. protocol noted above.

Chain of custody documentation shall accompany every soil and groundwater sample from the site to the laboratory.

#### V. Site Safety

Prior to commencement of investigative activities each day, a site safety meeting will be held at the designated command post which will be a vehicle which is proximal to the working area. Emergency procedures to follow in case of fire or severe injury or explosion will be outlined at site safety meetings. The hazards of the known or suspected chemicals on site will be explained at these meetings. Level D protection is the anticipated maximum amount of protection needed. A site safety plan which conforms to Part 1910.120 (i) (2) of 29 CFR will be on site at all times.

A working area will be established with barricades and warning tape to delineate the zone where hardhats, steel toed shoes must be worn, and where unauthorized personnel will not be allowed.

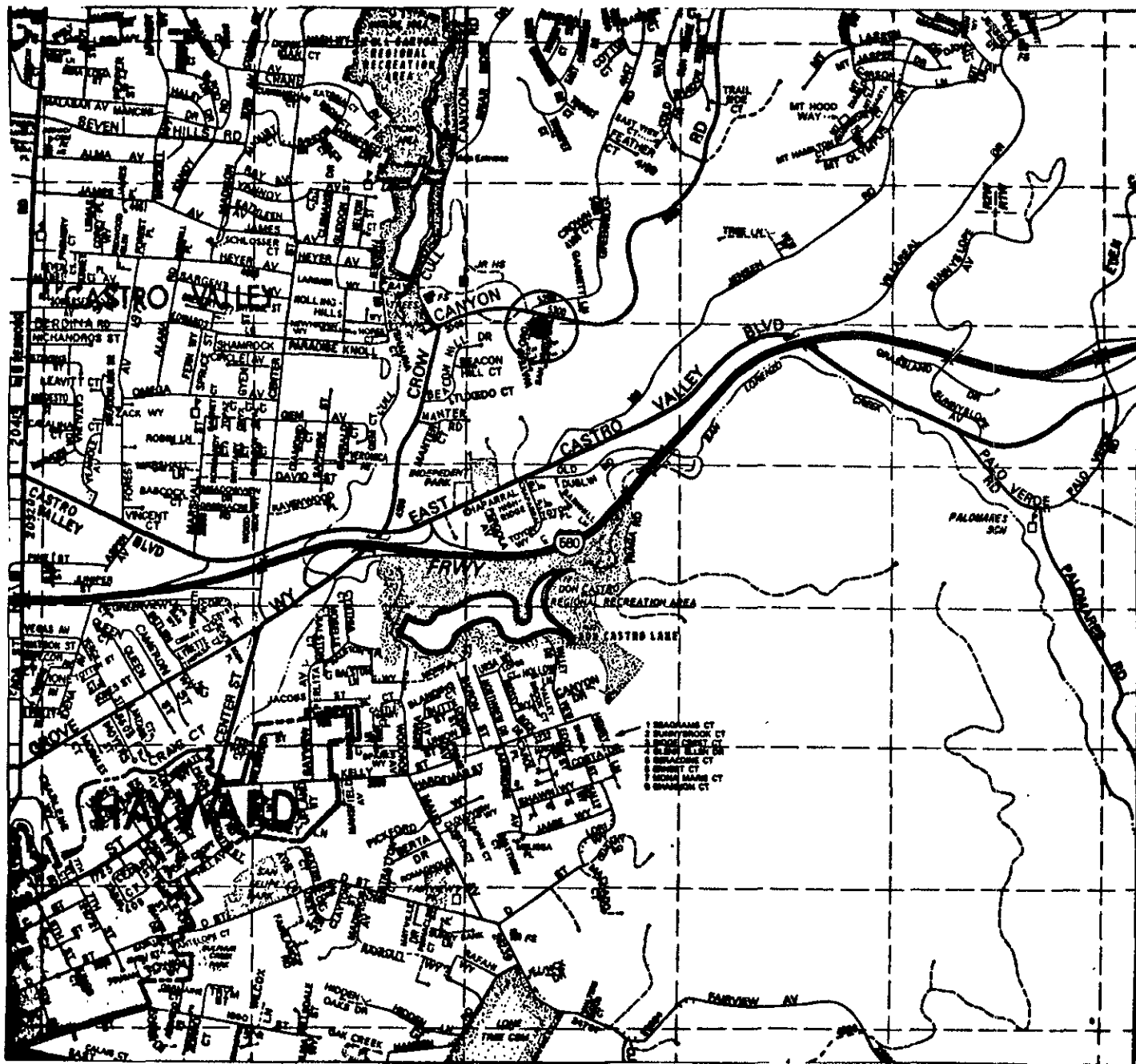
Drilling will not be conducted during lightning storms. If, during drilling, product odors emanating from the hole or cuttings are deemed substantial, on site personnel will wear Tyvek suits, rubber gloves, and possibly don respirators.

The closest hospital is Laurel Hospital which is reached by traveling south on Crow Canyon Rd. to Castro Valley Blvd. where you turn to the west, then north on Lake Chabot Rd. and continuing about two blocks to the hospital on the left. Another nearby hospital is John Muir Emergicenter, reached by traveling northeast on Crow Canyon Rd. to the intersection with Porter Dr. The hospital is there on the northwest corner of the intersection.

#### Reporting

A complete and final report of methods, findings, and conclusions will be submitted to the client for forwarding to all appropriate agencies within 30 days of the completion of field activities and data collection. The report will be submitted under the seal of a State Registered Civil Engineer, Mr. David Schultz (#38738). Mr. Schultz has implemented and managed hundreds of tank removal, site investigation, and remediation projects for ASE since our inception as a company in 1982.

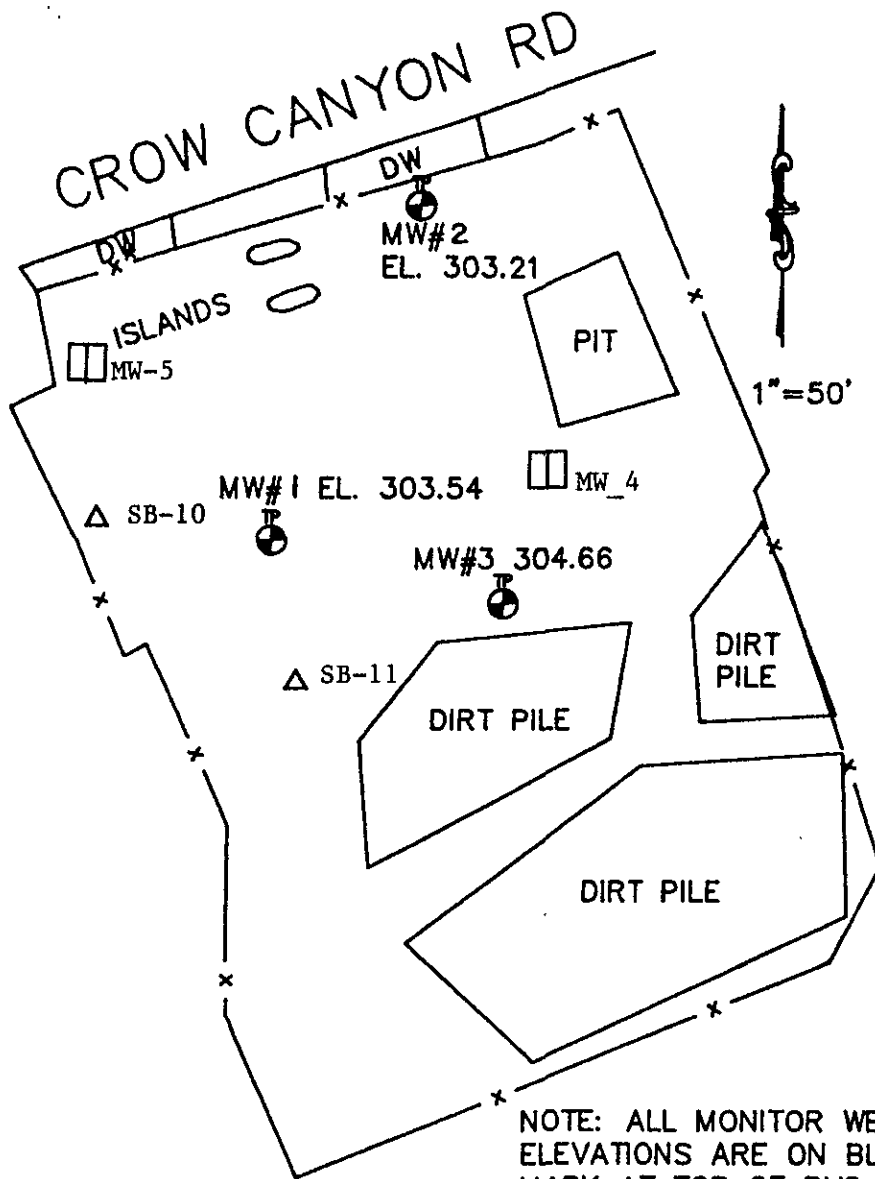
Figure 1  
Site Location Map



Site Location

1 inch = 2,200 feet  
from Thomas Bros.

Figure 2  
Site Plan Showing Proposed  
Boring Locations



△ proposed soil boring  
□ proposed mon. well

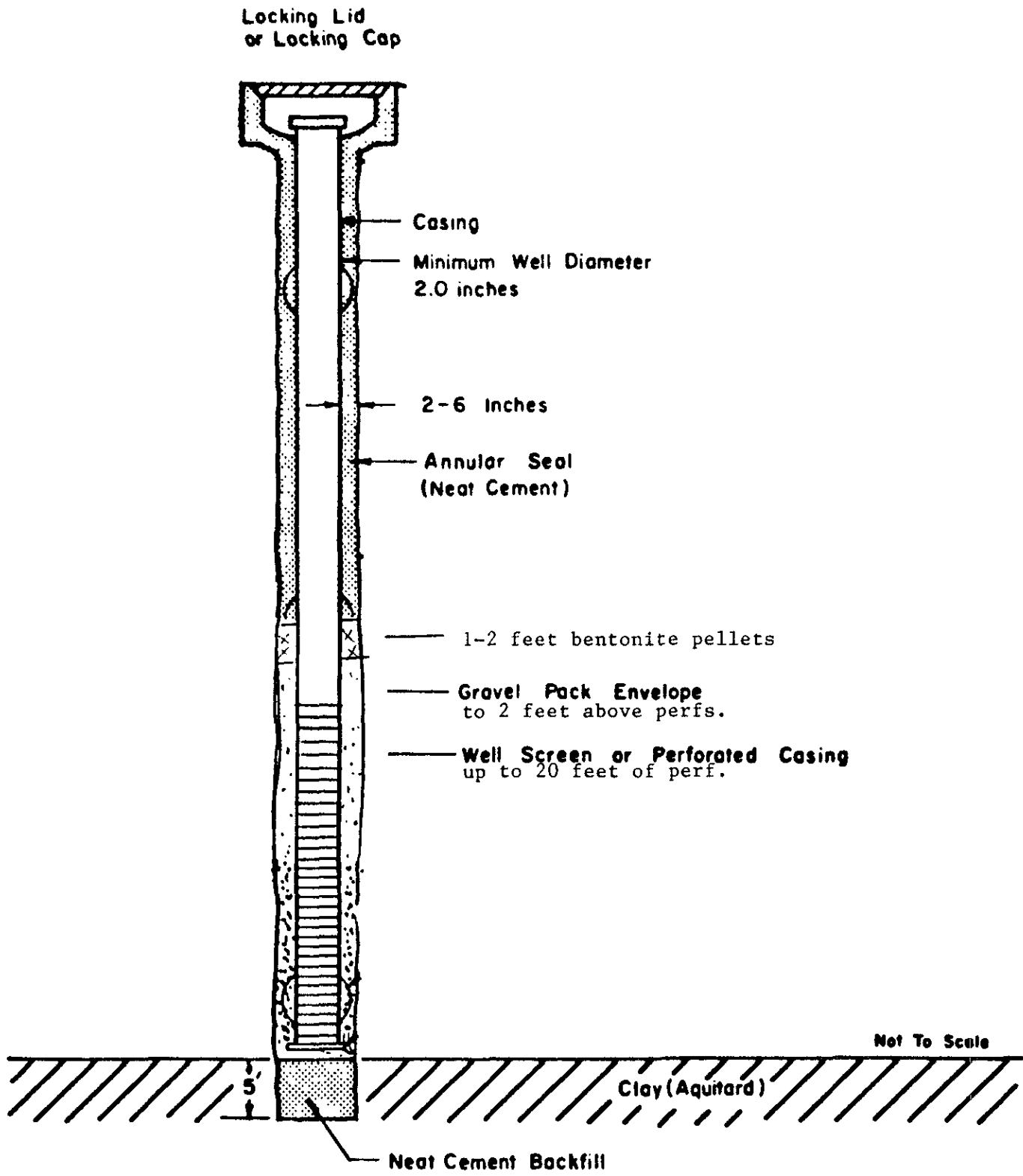
NOTE: ALL MONITOR WELL  
ELEVATIONS ARE ON BLACK  
MARK AT TOP OF PVC PIPE.

BM BRASS DISK IN TOP OF CURB AT THE MOST  
EASTERLY CURB RETURN AT CROW CANYON ROAD  
AND SAN SIMEON PLACE. ELEV. : 307.73 FEET



Drawn DE Job 4307-01 Checked DE  
Scale 1" = 50' Date 7-16-90 Parcel \_\_\_\_\_

Figure 3  
Typical Monitoring Well



TYPICAL MONITORING FACILITY

APPENDIX A  
DOCUMENTATION OF EVENTS  
LEADING TO INVESTIGATION

APPENDIX C  
MONITORING WELL PERMIT



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

FOR OFFICE USE

1) LOCATION OF PROJECT vacant lot
5293 Crow Canyon Rd.
Castro Valley

PERMIT NUMBER 90249
LOCATION NUMBER

2) CLIENT
Name Mr. Frank Ramos
Address 2381 Grove Way Phone 591-4286
City Castro Valley Zip 94546

PERMIT CONDITIONS

Circled Permit Requirements Apply

3) APPLICANT
Name Aqua Science Eng.
Address 2500 Old Crow Canyon Rd. #121
City Castro Valley Zip 94546

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. Submit to Zone 7 within 60 days after completion of permitted work the original Department of Water Resources Water Well Drillers Report or equivalent for well projects, or drilling logs and location sketch for geotechnical projects.
3. Permit is void if project not begun within 90 days of approval date.

4) DESCRIPTION OF PROJECT
Water Well Construction Geotechnical Investigation
Cathodic Protection General
Well Destruction Contamination X

B. WATER WELLS, INCLUDING PIEZOMETERS

- 1. Minimum surface seal thickness is two inches of cement grout placed by tremie.
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.

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

C. GEOTECHNICAL. Backfill bore hole with compacted cuttings or heavy bentonite and upper two feet with compacted material. In areas of known or suspected contamination, tremied cement grout shall be used in place of compacted cuttings.

6) PROPOSED CONSTRUCTION
Drilling Methods:
Mud Rotary Air Rotary Auger X
Cable Other

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

DRILLER'S LICENSE NO. 487000

E. WELL DESTRUCTION. See attached.

WELL PROJECTS
Drill Hole Diameter 8 in. Maximum Depth 50 ft.
Casing Diameter 2 in. Number 3
Surface Seal Depth 0-20 ft.

GEOTECHNICAL PROJECTS
Number of Borings 8 Maximum Depth 20 ft.
Hole Diameter 8 in.

ESTIMATED STARTING DATE 4-16-90
ESTIMATED COMPLETION DATE 4-19-90

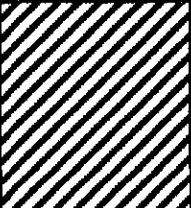
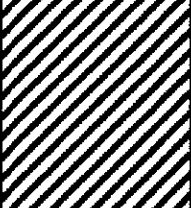
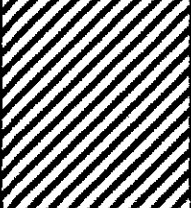
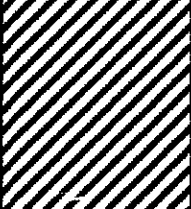
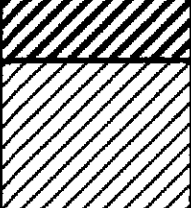
I hereby agree to comply with all requirements of this permit and Alameda County Ordinance No. 73-68.

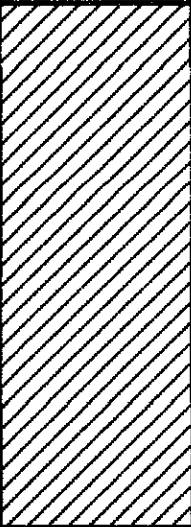
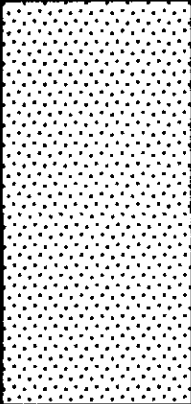
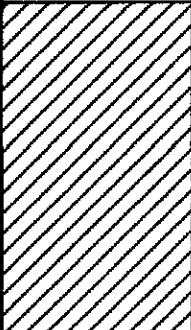
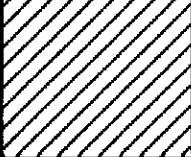

Approved Wyman Hong Date 17 APR 90

APPLICANT'S SIGNATURE [Signature] Date 4-13-90

APPENDIX D  
BORING / WELL COMPLETION LOGS

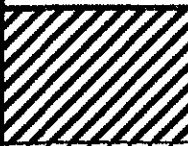



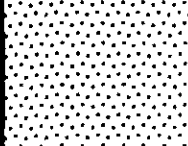
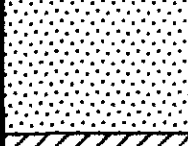





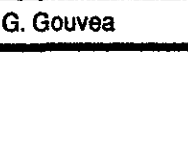



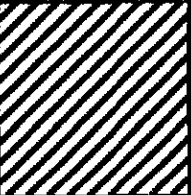
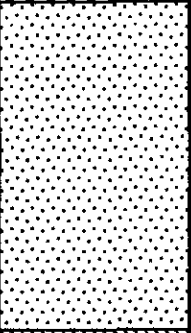
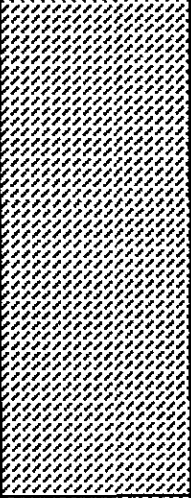
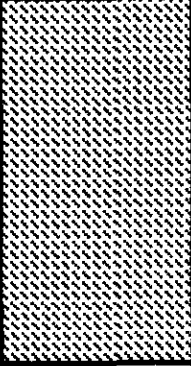
PROJECT: 5293 Crow Canyon Rd., Castro Valley		LOG OF SOIL BORING # SB-1				
depth ft.	SOILS DESCRIPTION	GRAPHIC SYMBOL	BACKFILL DETAILS	OVM	REMARKS	
0	clay, tan-orange brown, silty 20%, v. fine sand <10%, dry, (CL)		neat cement bentonite grout 0-20.5 feet	0		
1						
2	clay, rusty brown, Fe oxides, silty 20%, mildly indurated, dry, (CL)			5	2,780	strong gasoline odor soil sample 5-6.5'
3						
4						
5						
6	claystone, dk. olive green-gray, silty v. fine sandy laminae, bedded 0.5-2cm, hard, dry			10	39	soil sample 10-10.5' sl. odor
7						
8						
9						
10						
11						
12	siltstone, dk. gray, clayey 20%, hard, friable, bedded 0.5-3cm., dry			15	29	sample 15-15.5' no odor
13						
14						
15	siltstone, dk. gray and lt. gray, beds 1-10mm, sand v. fine <10%, wet			20	<1	▽ approx. 20' sample 20-20.5' no odor
16						
17						
18						
19	-----Bottom of hole-----					
20						
21						
22						

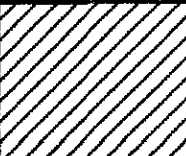
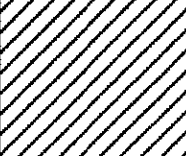
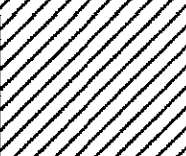

depth ft.	SOILS DESCRIPTION	GRAPHIC SYMBOL	BACKFILL DETAILS	OVM	REMARKS	
0				0		
1	siltstone, olive tan brown, v. fine sandy 20-30%, hard, dry		neat cement bentonite grout 0-20.5 feet			
2						
3						
4						
5	siltstone, dk. olive gray, clayey 20%, very fine sand 10%, bedded 5-20 cm., hard, dry			700	mod. gasoline odor soil sample 5-6.5'	
6						
7						
8	sandstone, olive tan rusty, fine to med. gr., silty 10-20%, clay <10%, bedded 0.5-2cm. hard, dry					
9						
10						
11						
12	siltstone, dk. gray, clayey 20%, v. fine sandy 10-20%, bedded 0.5-2 cm., hard, dry					
13						
14						
15						
16	as above					
17						
18						
19						
20				20	<1	sample 20-20.5' no odor
21						
22						

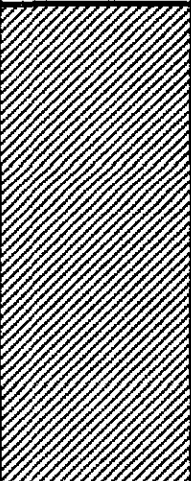
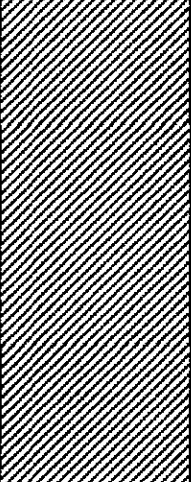
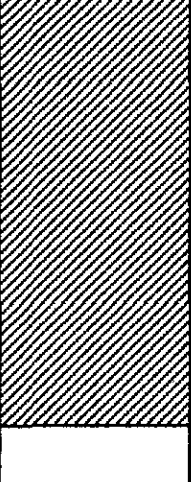
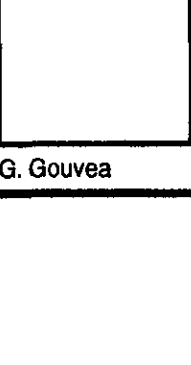
Bottom of hole

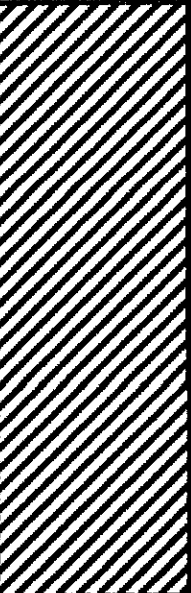
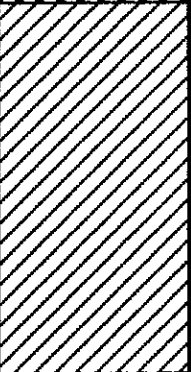
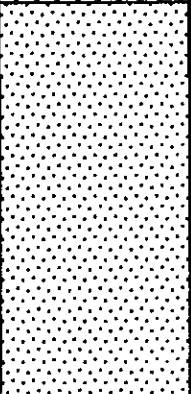

▽ approx. 19'

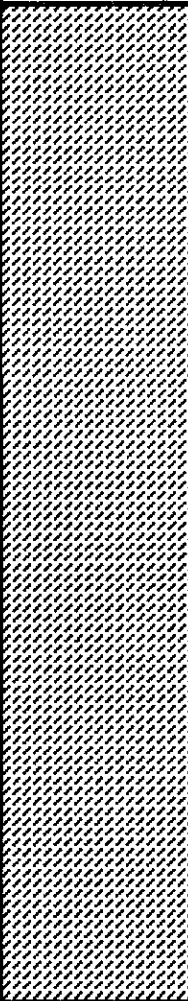
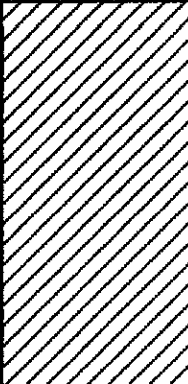
depth ft.	SOILS DESCRIPTION	GRAPHIC SYMBOL	BACKFILL DETAILS	OVM	REMARKS
0				0	
1	clay and silt, dk. brown gray, sandy v. fine 10-20%, dry, (CL)				
2					
3	siltstone, dk. gray, olive brown laminae, v. fine sandy 10%, hard, dry		neat cement bentonite grout 0-15 feet		3' mod. gas odor
4					
5				5 20	sl. gasoline odor soil sample 5-5.5'
6					
7					
8					
9					
10	sandstone, olive tan gray, fine to med. gr., silty 10-20%, clay 10%, hard, dry			10 19	soil sample 10-10.5' sl. odor
11					
12					
13	siltstone, dk. olive gray, sandy v. fine 10-20%, hard, damp				
14					
15	moist — Bottom of hole			15 <1	sample 14.5-15' ▽ approx. 15'
16					
17					
18					
19					
20				20	
21					
22					

depth ft.	SOILS DESCRIPTION	GRAPHIC SYMBOL	BACKFILL DETAILS	OVM	REMARKS
0				0	
1	clay, silt, sand, olive tan brown, dry				
2					
3			neat cement bentonite grout 0-20 feet		
4					
5	sandstone, orange tan brown, fine to med gr. silty 10-20%, hard, dry			<1	no odor soil sample 5'
6					
7					
8					
9	siltstone and sandstone, interbedded, dk. olive gray to orange tan brown, sandstone fine to med. gr. fractured, mod. friable, dry				
10				<1	soil sample 10'
11					
12					
13					
14					
15				<1	sample 15' no odor
16	sandstone and siltstone, interbedded 1 mm to 3 cm, lt. gray and v. dk. gray, sandstone v. fine to fine gr., silty 10-20%, siltstone beds 1 mm. to 1cm., hard, friable, fractures with pyrite mineralization, slickensides				
17					
18					
19					▽ approx. 19'
20	Bottom of hole			<1	sample 20' no odor
21					
22					

depth ft.	SOILS DESCRIPTION	GRAPHIC SYMBOL	BACKFILL DETAILS	OVM	REMARKS
0				0	
1	siltstone, olive tan gray to dk. olive gray, sandy v. fine 10-20%, clayey 10%, hard, friable, dry			<1	
2					
3			neat cement bentonite grout 0-20 feet		
4					
5				30	soil sample 5'
6					
7					
8					strong gas odor
9	siltstone, green gray to olive tan brown, sandy v. fine 20%, faintly bedded, hard, dry				
10				over-range	sample 10'
11					
12					
13					
14	siltstone, dk. gray, as above				
15				9	sample 15'
16					
17	siltstone, lt. gray and v. dk. gray, sandy v. fine 10% in bedding planes, bedded 1-10mm pyrite mineralization in fractures, hard, dry				
18					
19					▽ approx. 19'
20	Bottom of hole			<1	
21					
22					



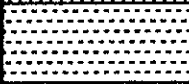
PROJECT: 5293 Crow Canyon Rd., Castro Valley		LOG OF SOIL BORING # SB-7				
depth ft.	SOILS DESCRIPTION	GRAPHIC SYMBOL	BACKFILL DETAILS	OVM	REMARKS	
0				0		
1	clay, rusty olive tan brown, silty 30-40%, sand v. fine 10%, damp, soft		neat cement bentonite grout 0-20 feet			
2						
3						
4						
5						
6						
7	claystone and siltstone, interbedded, olive tan gray-rusty, bedded few mm. to 3 cm., dry to damp, hard			5	<1	no odor soil sample 5'
8						
9						
10						
11	claystone and siltstone, interbedded, sandy v. fine 10%, hard, dry			10	<1	sample 10' no odor
12						
13						
14						
15	claystone and siltstone, interbedded, olive tan brown, bedded few mm. to 5 cm., sandy v. fine 10%, hard, dry			15	<1	sample 15' no odor
16						
17						
18						
19	Bottom of hole			20	<1	sample 20' no odor
20						
21						
22						

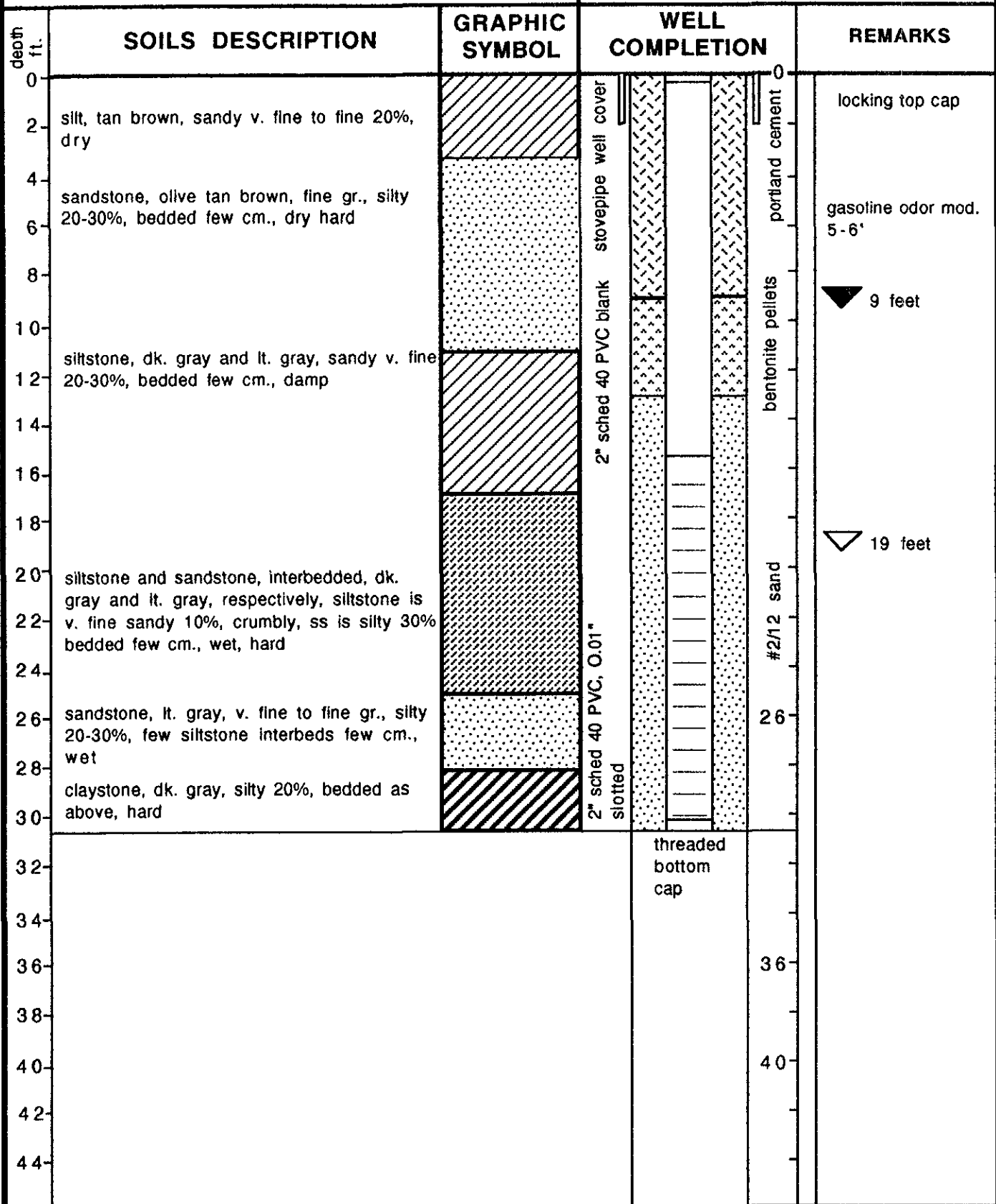
depth ft.	SOILS DESCRIPTION	GRAPHIC SYMBOL	BACKFILL DETAILS	OVM	REMARKS
0				0	
1	clay, dk. olive gray green, silty 20-30%, v. fine sandy, 10%, hard, dry		neat cement bentonite grout 0-20 feet		
2					
3					
4					
5	clay, olive tan brown -rusty, silty 20-30%, v. fine sandy 10%, hard, dry				5 over-range soil sample 5' gasoline odor
6					
7					
8					
9	siltstone, dk. olive gray green w/rusty v. fine sandy laminae, 1-2mm., sand fine gr. 20-30%, clay 10-20%, hard, dry				
10					
11					
12					
13	sandstone, dk. olive tan gray, black silty laminae 1-2 mm. hard				
14					
15					
16					
17					15 <1 sample 15' sl. odor
18					
19					
20					
20	Bottom of hole				20 26 sample 20' no odor
21					
22					


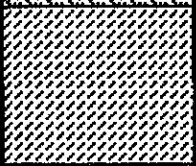

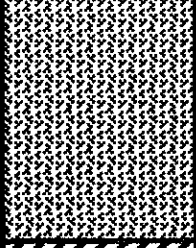
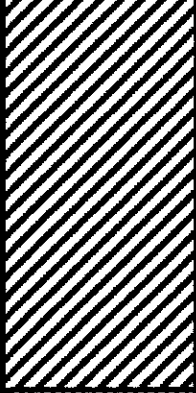
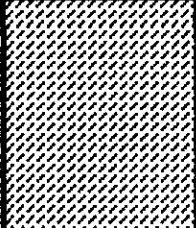
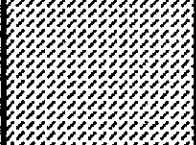
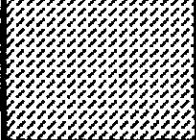
depth ft.	SOILS DESCRIPTION	GRAPHIC SYMBOL	BACKFILL DETAILS	OVM	REMARKS		
0				0			
1	clay and silt, mixed, olive brown, sandy <10%, damp, soft		neat cement bentonite grout 0-20 feet				
2							
3	claystone and siltstone, interbedded, dk. olive gray brown, bedded few cm., fractured with FeOx in fractures						
4							
5						5	<1 soil sample 5'
6							
7							
8							
9							strong gas odor
10						10	3,120 sample 10'
11							
12							
13							
14							
15	siltstone, lt. gray and v. dk. gray, bedded 1-10mm, sandy v. fine <10%, slickensides, fracture zone 17.5-20 feet, moist			15	<1 sample 15'		
16							
17							
18							
19							
20	Bottom of hole					20	<1 ▽ approx. 19' no odor
21							
22							



depth ft.	SOILS DESCRIPTION	GRAPHIC SYMBOL	WELL COMPLETION	REMARKS
0				locking top cap
2	silt, sand, gravel, tan red brown, sand fine to med. gr., 20-30%, clayey 20%, dry, loose		stovepipe well cover	
4	sandstone and siltstone, interbedded, tan orange brown, ss fine to med. gr., bedded 1-3 cm., siltstone ls sandy, v. fine 20-30%, clayey 10%, dry, hard			
8	siltstone and claystone, interbedded, dk. gray, sandy v. fine 10%, hard, dry		2" sched 40 PVC blank	
10				
14	siltstone, claystone, sandstone, interbedded, claystone is dk. gray, silt- and sandstone are lt. gray, mixed as bioturbated, ss 20-30%, bedded 1-5 cm., hard, dry		portland cement	sample 4.5-5', gasoline odor mod. 7'
16				
18			portland cement	sample 9.5-11', no odor
20	claystone, dk. gray, sandy v. fine 10% mostly in bedding planes, bedded 1-3 cm, dry			
22			portland cement	sample 14.5-15.5', no odor
24				
26	claystone, dk. gray, silty 10-20%, sandy v. fine <10%, dry, hard, bedded 1-3 cm.		portland cement	▼ approx 15'
28				
30	siltstone and sandstone, interbedded, dk. gray and lt. gray, respectively, ss fine to med. gr., v. hard, bedded 1-3 cm.		bentonite pellets	19'- 30 min. water check negative
32				
34			bentonite pellets	sample 19.5-21', no odor
36				
38	siltstone and sandstone, as above,		bentonite pellets	sample 24.5-26', no odor
40				
42	siltstone and sandstone, interbedded, dk. gray and lt. gray, sandstone fine to med. gr., siltstone sandy v. fine 10%, clayey 20%, hard, moist		#2/12 sand	sample 29.5-30', no odor
44				
			2" sched 40 PVC, 0.01" slotted	sample 35'-36' 30 min. water check negative
				sample 39.5-40', no odor, moistening
				▽ approx 42'

PROJECT: 5293 Crow Canyon Rd., Castro Valley		MONITORING WELL # MW-1		
depth ft.	SOILS DESCRIPTION	GRAPHIC SYMBOL	WELL COMPLETION	REMARKS
4.6	as above			well completion details preceding
4.8	siltstone and claystone, interbedded, dk. gray and lt. gray, siltstone is sandy v. fine 10%, claystone silty 20%, v. hard			
5.0	Bottom of hole		threaded bottom cap	
5.2				
5.4				
5.6				
5.8				
6.0				



depth ft.	SOILS DESCRIPTION	GRAPHIC SYMBOL	WELL COMPLETION	REMARKS
0				locking top cap
2	silt, clay, sand, gravel, tan brown, sand fine to med. gr., 20%, clay 20%, gravel "pea" 10%, dry		stovepipe well cover	gasoline odor mod. to strong 5-12'
4	sandstone and siltstone, interbedded, tan orange brown, ss fine to med. gr., bedded 1-3 cm., siltstone is sandy, v. fine 20-30%, clayey 10%, dry, hard			
6			2" sched 40 PVC blank	approx 15'
8	claystone, dk. gray, silty 30%, sandy v. fine 10%, hard, dry			
10			2" sched 40 PVC, 0.01" slotted	overnight water check negative
12	siltstone, claystone, sandstone, interbedded, claystone is dk. gray, silt- and sandstone are lt. gray, mixed as bioturbated, ss 20-30%, bedded 1-5 cm., hard, dry			
14			#2/12 sand	
16	claystone, dk. gray, v. fine sandy laminae 1-few mm., bedded 1-3 cm, dry			
18			bentonite pellets	
20	siltstone and sandstone, interbedded, dk. gray and lt. gray, respectively, ss fine to med. gr., v. hard, bedded few cm., siltstone clayey 20%			
22				
24	claystone, dk. gray, v. fine sandy laminae 1-few mm., bedded 1-3 cm, dry			
26				
28	siltstone and sandstone, interbedded, dk. gray and lt. gray, sandstone fine to med. gr., siltstone clayey 10%, sandy v. fine 10%, hard, dry			
30				
32				
34				
36				
38				
40				
42				
44				

PROJECT: 5293 Crow Canyon Rd., Castro Valley		MONITORING WELL # MW-3				
depth ft.	SOILS DESCRIPTION	GRAPHIC SYMBOL	WELL COMPLETION	REMARKS		
46	siltstone and claystone, interbedded, dk. gray and lt. gray, siltstone sandy v. fine 10%, claystone has v. fine sand laminae 1-2mm., wet, mod. hard		<p>2" sched. 40 PVC, .01" slotted</p> <p>#2/12 sand</p> <p>threaded bottom cap</p>	<p>▽ approx. 52'</p>		
48						
50						
52						
54						
56						
58						
60					Bottom of hole	60

APPENDIX E  
SAMPLE ANALYSES,  
CHAIN OF CUSTODY DOCUMENTATION,  
MONITORING WELL SAMPLING PROTOCOL

# CHROMALAB, INC.

Analytical Laboratory  
Specializing in GC-GC/MS

- Environmental Analysis
- Hazardous Waste (#238)
- Drinking Water (#955)
- Waste Water
- Consultation

April 10, 1990

ChromaLab File No.: 0490016

AQUA SCIENCE ENGINEERS, INC.

Attn: Greg Gouvea

RE: Nine soil samples for Gasoline/BTEX analysis

Project Name: F. RAMOS

Duration of Analysis: April 4-10, 1990

## RESULTS:

Sample No.	Gasoline (mg/Kg)	Benzene (ug/Kg)	Toluene (ug/Kg)	Ethyl Benzene (ug/Kg)	Total Xylenes (ug/Kg)
SB-1, 5'	110	2500	1200	690	1300
SB-1, 10'	N.D.	780	44	19	18
SB-1, 15'	N.D.	N.D.	N.D.	N.D.	N.D.
SB-1, 20'	N.D.	N.D.	N.D.	N.D.	N.D.
SB-2, 5'	7.8	240	5.1	97	5.5
SB-2, 10'	N.D.	N.D.	N.D.	N.D.	N.D.
SB-2, 20'	N.D.	N.D.	N.D.	N.D.	N.D.
SB-3, 5'	N.D.	90	N.D.	16	10
SB-3, 10'	N.D.	N.D.	N.D.	N.D.	N.D.
BLANK	N.D.	N.D.	N.D.	N.D.	N.D.
SPIKE RECOVERY	102.5%	92.8%	98.3%	99.6%	95.2%
DETECTION LIMIT	2.5	5.0	5.0	5.0	5.0
METHOD OF ANALYSIS	MOD.8015	8020	8020	8020	8020

CHROMALAB, INC.



David Duong  
Senior Chemist



Eric Tam  
Laboratory Director

# CHROMALAB, INC.

Analytical Laboratory  
Specializing in GC-GC/MS

- Environmental Analysis
- Hazardous Waste (#238)
- Drinking Water (#955)
- Waste Water
- Consultation

April 10, 1990

ChromaLab File No.: 0490017

AQUA SCIENCE ENGINEERS, INC.

Attn: Greg Gouvea

RE: Nine soil samples for Gasoline/BTEX analysis

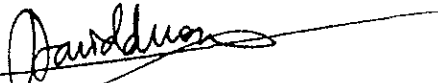
Project Name: F. RAMOS

Duration of Analysis: April 4-9, 1990

## RESULTS:

Sample No.	Gasoline (mg/Kg)	Benzene (ug/Kg)	Toluene (ug/Kg)	Ethyl Benzene (ug/Kg)	Total Xylenes (ug/Kg)
SB-12(3), 15'	N.D.	N.D.	N.D.	N.D.	N.D.
SB-4, 10'	N.D.	N.D.	N.D.	N.D.	N.D.
SB-4, 15'	N.D.	N.D.	N.D.	N.D.	N.D.
SB-4, 20'	N.D.	6.3	N.D.	N.D.	N.D.
SB-6, 5'	N.D.	N.D.	N.D.	N.D.	N.D.
SB-6, 14(10)'	79	23	10	330	310
SB-6, 15'	N.D.	N.D.	N.D.	N.D.	N.D.
SB-7, 10'	N.D.	N.D.	N.D.	N.D.	N.D.
SB-7, 15'	N.D.	N.D.	N.D.	N.D.	N.D.
BLANK	N.D.	N.D.	N.D.	N.D.	N.D.
SPIKE RECOVERY	102.5%	92.8%	98.3%	99.6%	95.2%
DETECTION LIMIT	2.5	5.0	5.0	5.0	5.0
METHOD OF ANALYSIS	MOD.8015	8020	8020	8020	8020

CHROMALAB, INC.

  
David Duong  
Senior Chemist

  
Eric Tam  
Laboratory Director



# CHROMALAB, INC.

Analytical Laboratory  
Specializing in GC-GC/MS

- Environmental Analysis
- Hazardous Waste (#238)
- Drinking Water (#955)
- Waste Water
- Consultation

April 10, 1990

ChromaLab File No.: 0490018

AQUA SCIENCE ENGINEERS, INC.

Attn: Greg Gouvea

RE: Eight soil samples for Gasoline/BTEX analysis

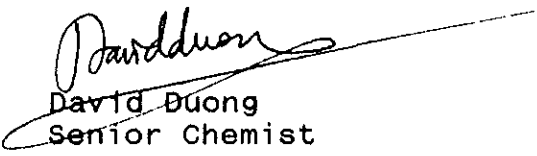
Project Name: F. RAMOS

Duration of Analysis: April 4-9, 1990

## RESULTS:

Sample No.	Gasoline (mg/Kg)	Benzene (µg/Kg)	Toluene (µg/Kg)	Ethyl Benzene (µg/Kg)	Total Xylenes (µg/Kg)
SB-7, 20'	N.D.	N.D.	N.D.	N.D.	N.D.
SB-8, 5'	390	4300	4000	2800	5300
SB-8, 10'	N.D.	37	11	N.D.	5.4
SB-8, 15'	N.D.	49	20	7.5	15
SB-8, 20'	N.D.	N.D.	N.D.	N.D.	N.D.
SB-9, 5'	N.D.	N.D.	N.D.	N.D.	N.D.
SB-9, 10'	66	190	85	170	320
SB-9, 15'	N.D.	N.D.	N.D.	N.D.	N.D.
BLANK	N.D.	N.D.	N.D.	N.D.	N.D.
SPIKE RECOVERY	102.5%	92.8%	98.3%	99.6%	95.2%
DETECTION LIMIT	2.5	5.0	5.0	5.0	5.0
METHOD OF ANALYSIS	MOD.8015	8020	8020	8020	8020

CHROMALAB, INC.

  
David Duong  
Senior Chemist

  
Eric Tam  
Laboratory Director

# CHROMALAB, INC.

Analytical Laboratory  
Specializing in GC-GC/MS

- Environmental Analysis
- Hazardous Waste (#238)
- Drinking Water (#955)
- Waste Water
- Consultation

April 24, 1990

ChromaLab File No.: 0490063

AQUA SCIENCE ENGINEERS, INC.

Attn: Greg Gouvea

RE: Five soil samples for Gasoline/BTEX analysis

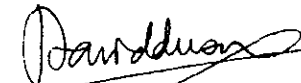
Project Name: F. RAMOS


Duration of Analysis: April 22-24, 1990

RESULTS:

Sample No.	Gasoline (mg/Kg)	Benzene (ug/Kg)	Toluene (ug/Kg)	Ethyl Benzene (ug/Kg)	Total Xylenes (ug/Kg)
MW-1, 5'	N.D.	N.D.	N.D.	N.D.	N.D.
MW-1, 10'	N.D.	N.D.	N.D.	N.D.	N.D.
MW-1, 15'	N.D.	N.D.	N.D.	N.D.	N.D.
MW-1, 20'	N.D.	N.D.	N.D.	N.D.	N.D.
MW-1, 40'	N.D.	N.D.	N.D.	N.D.	N.D.
BLANK	N.D.	N.D.	N.D.	N.D.	N.D.
SPIKE RECOVERY	102.5%	92.8%	98.3%	99.6%	95.2%
DETECTION LIMIT	2.5	5.0	5.0	5.0	5.0
METHOD OF ANALYSIS	MOD.8015	8020	8020	8020	8020

ChromaLab, Inc.

  
David Duong  
Senior Chemist

  
Eric Tam  
Laboratory Director

APR 28 1990

PROJ. F. Ramos Greg Gouvea  
COMPANY Aqua Science  
ADDRESS San Ramon

**ANALYSIS REQUEST**

SAMPLERS (SIGNATURE) Greg Gouvea (PHONE NO.) 415 920 9399

SAMPLE ID.	DATE	TIME	MATRIX	LAB ID.	TPH - Gasoline (EPA 5030)	TPH - Gasoline (5030) w/BTEX (EPA 602, 8020)	TPH - Diesel (EPA 3510, 3550)	PURGEABLE AROMATICS BTEX (EPA 602, 8020)	PURGEABLE HALOCARBONS (EPA 601, 8010)	VOLATILE ORGANICS (EPA 624, 8240)	BASE/NEUTRALS, ACIDS (EPA 624/627, 8270)	TOTAL OIL & GREASE (EPA 5030/4E)	PESTICIDES/PCB (EPA 606, 8060)	PHENOLS (EPA 604, 8040)	METALS: Cd, Cr, Pb, Zn	CAN METALS (18) w/Cr VI	PRIORITY POLLUTANT METALS (13)	NUMBER OF CONTAINERS
SB-1, 5'	4-29-88	8-3	Soil		X	X	X	X	X	X	X	X	X	X				1
SB-1, 10'	"	"	"		X	X	X	X	X	X	X	X	X	X				1
SB-1, 15'	"	"	"		X	X	X	X	X	X	X	X	X	X				1
SB-1, 20'	"	"	"		X	X	X	X	X	X	X	X	X	X				1
SB-2, 5'	"	"	"		X	X	X	X	X	X	X	X	X	X				1
SB-2, 10'	"	"	"		X	X	X	X	X	X	X	X	X	X				1
SB-2, 20'	"	"	"		X	X	X	X	X	X	X	X	X	X				1
SB-3, 5'	"	"	"		X	X	X	X	X	X	X	X	X	X				1
SB-3, 10'	"	"	"		X	X	X	X	X	X	X	X	X	X				1

PROJECT INFORMATION	SAMPLE RECEIPT
PROJECT <u>F. Ramos</u>	TOTAL NO. OF CONTAINERS <u>9</u>
PO NO.	CHAIN OF CUSTODY SEALS <u>1</u>
SHIPPING ID NO.	REC'D GOOD CONDITION/COLD <u>1</u>
VIA.	CONFORMS TO RECORD <u>1</u>
	LAB NO.

RELINQUISHED BY	1.	RELINQUISHED BY	2.	RELINQUISHED BY	3.
(Signature)	<u>Greg Gouvea 4-3-90</u>	(Signature)		(Signature)	
(Printed Name)	<u>Greg Gouvea</u>	(Printed Name)		(Printed Name)	
(Company)	<u>Aqua Science</u>	(Company)		(Company)	
RECEIVED BY	1.	RECEIVED BY	2.	RECEIVED BY (LABORATORY)	3.
(Signature)		(Signature)		<u>[Signature]</u>	
(Printed Name)		(Printed Name)		<u>4-3-90 16:35</u>	
(Company)		(Company)			

SPECIAL INSTRUCTIONS/COMMENTS:  
standard turnaround

PROJ. <u>F. Ramos Greer Souver</u>					ANALYSIS REQUEST													NUMBER OF CONTAINERS	
COMPANY <u>Aqua Science</u>					TPH - Gasoline (EPA 5030)	TPH - Gasoline (5030) w/BTEX (EPA 602, 8020)	TPH - Diesel (EPA 3510, 3550)	PURGEABLE AROMATICS BTEX (EPA 602, 8020)	PURGEABLE HALOCARBONS (EPA 601, 8010)	VOLATILE ORGANICS (EPA 624, 8240)	BASE/NEUTRALS, ACIDS (EPA 624/627, 8270)	TOTAL OIL & GREASE (EPA 5030A-E)	PESTICIDES/PCB (EPA 608, 8080)	PHENOLS (EPA 604, 8040)	METALS: Cd, Cr, Pb, Zn	CAN METALS (18) w/CP VI	PRIORITY POLLUTANT METALS (13)		
ADDRESS <u>San Ramon</u>																			
SAMPLERS (SIGNATURE) <u>[Signature]</u> (PHONE NO.) <u>415 820 9391</u>																			
SAMPLE ID	DATE	TIME	MATRIX	LAB ID.															
SB-12(3) 15'	4-29-90	15:00	SOIL																
SB-4, 10'	4-3-90	8-5	u																
SB-4, 15'	u	u	u																
SB-4, 20'	u	u	u																
SB-6, 5'	u	u	u																
SB-6, 14(10)'	u	u	u																
SB-6, 15'	u	u	u																
SB-7, 10'	u	u	u																
SB-7, 15'	u	u	u																

PROJECT INFORMATION		SAMPLE RECEIPT		RELINQUISHED BY 1.		RELINQUISHED BY 2.		RELINQUISHED BY 3.	
PROJECT <u>F. Ramos</u>	TOTAL NO. OF CONTAINERS <u>9</u>			<u>[Signature]</u> 16:35 (Signature) (Time)		(Signature) (Time)		(Signature) (Time)	
PO NO	CHAIN OF CUSTODY SEALS			<u>[Signature]</u> 4-3-90 (Signature) (Date)		(Signature) (Date)		(Signature) (Date)	
SHIPPING ID NO.	REC'D GOOD CONDITION/COLD			<u>Aqua Science</u> (Printed Name) (Date)		(Printed Name) (Date)		(Printed Name) (Date)	
VIA:	CONFORMS TO RECORD	(Company)		(Company)		(Company)		(Company)	
SPECIAL INSTRUCTIONS/COMMENTS:  <u>5-day turn</u>		LAB NO.		RECEIVED BY 1.		RECEIVED BY 2.		RECEIVED BY (LABORATORY) 3.	
				(Signature) (Time)		(Signature) (Time)		(Signature) (Time)	
				(Printed Name) (Date)		(Printed Name) (Date)		(Printed Name) (Date)	
				(Company)		(Company)		(LAB)	

# CHROMALAB, INC.

2239 Omega Rd  
415/831- CHROMALAB FILE # 490018

Chain of Custody

DATE 4-3-90 PAGE 3 OF 3

COJ. MGR. Greg Bowler  
COMPANY Aqua Science  
ADDRESS San Ramon

### ANALYSIS REQUEST

ANALYSTS (SIGNATURE) [Signature] (PHONE NO.) 415 820 9399

SAMPLE ID.	DATE	TIME	MATRIX	LAB ID.	TPH - Gasoline (EPA 5030)	TPH - Gasoline (5030) w/BTEX (EPA 602, 8020)	TPH - Diesel (EPA 3510, 3550)	PURGEABLE AROMATICS BTEX (EPA 602, 8020)	PURGEABLE HALOCARBONS (EPA 601, 8010)	VOLATILE ORGANICS (EPA 624, 8240)	BASE/NEUTRALS, ACIDS (EPA 624/627, 8270)	TOTAL OIL & GREASE (EPA 50304E)	PESTICIDES/PCB (EPA 608, 8080)	PHENOLS (EPA 604, 8040)	METALS: Cd, Cr, Pb, Zn	CAN METALS (18) w/Cr VI	PRIORITY POLLUTANT METALS (13)	NUMBER OF CONTAINERS
3-7, 20'	4-3-90	8-5	Soil		<del>X</del>	<del>X</del>	<del>X</del>	<del>X</del>	<del>X</del>	<del>X</del>	<del>X</del>	<del>X</del>	<del>X</del>	<del>X</del>				
3-8, 5'	"	"	"		<del>X</del>	<del>X</del>	<del>X</del>	<del>X</del>	<del>X</del>	<del>X</del>	<del>X</del>	<del>X</del>	<del>X</del>	<del>X</del>				
3-8, 10'	"	"	"		<del>X</del>	<del>X</del>	<del>X</del>	<del>X</del>	<del>X</del>	<del>X</del>	<del>X</del>	<del>X</del>	<del>X</del>	<del>X</del>				
3-8, 15'	"	"	"		<del>X</del>	<del>X</del>	<del>X</del>	<del>X</del>	<del>X</del>	<del>X</del>	<del>X</del>	<del>X</del>	<del>X</del>	<del>X</del>				
3-8, 20'	"	"	"		<del>X</del>	<del>X</del>	<del>X</del>	<del>X</del>	<del>X</del>	<del>X</del>	<del>X</del>	<del>X</del>	<del>X</del>	<del>X</del>				
3-9, 5'	"	"	"		<del>X</del>	<del>X</del>	<del>X</del>	<del>X</del>	<del>X</del>	<del>X</del>	<del>X</del>	<del>X</del>	<del>X</del>	<del>X</del>				
3-9, 10'	"	"	"		<del>X</del>	<del>X</del>	<del>X</del>	<del>X</del>	<del>X</del>	<del>X</del>	<del>X</del>	<del>X</del>	<del>X</del>	<del>X</del>				
3-9, 15'	"	"	"		<del>X</del>	<del>X</del>	<del>X</del>	<del>X</del>	<del>X</del>	<del>X</del>	<del>X</del>	<del>X</del>	<del>X</del>	<del>X</del>				

PROJECT INFORMATION  
PROJECT: F. Ramos  
SINO.  
IPPING ID. NO.  
A:

SAMPLE RECEIPT  
TOTAL NO. OF CONTAINERS 8  
CHAIN OF CUSTODY SEALS  
REC'D GOOD CONDITION/COLD  
CONFORMS TO RECORD  
LAB NO.

RELINQUISHED BY 1.  
[Signature] 16:35  
Greg Bowler 4-3-90  
Aqua Science  
(Signature) (Time)  
(Printed Name) (Date)  
(Company)

RELINQUISHED BY 2.  
  
(Signature) (Time)  
(Printed Name) (Date)  
(Company)

RELINQUISHED BY 3.  
  
(Signature) (Time)  
(Printed Name) (Date)  
(Company)

SPECIAL INSTRUCTIONS/COMMENTS:  
5-day turn

RECEIVED BY 1.  
  
(Signature) (Time)  
(Printed Name) (Date)  
(Company)

RECEIVED BY 2.  
  
(Signature) (Time)  
(Printed Name) (Date)  
(Company)

RECEIVED BY (LABORATORY) 3.  
[Signature] 16:35  
Vin Kenny Tam 4-3-90  
CHROMALAB  
(Signature) (Time)  
(Printed Name) (Date)  
(LAB)

PROJ. F. Ramos Castro Valley  
 COMPANY Aqua Science  
 ADDRESS San Ramon

ANALYSIS REQUEST

SAMPLERS (SIGNATURE) [Signature] (PHONE NO.) 4158209391

SAMPLE ID.	DATE	TIME	MATRIX	LAB ID.	TPH - Gasol (mw) (EPA 5030)	TPH - Gasoline (5030) W/STEX (EPA 602, 8020)	TPH - Diesel (EPA 3510, 3550)	PURGEABLE AROMATICS BTEX (EPA 602, 8020)	PURGEABLE HALOCARBONS (EPA 601, 8010)	VOLATILE ORGANICS (EPA 624, 8240)	BASE/NEUTRALS, ACIDS (EPA 624/627, 8270)	TOTAL OIL & GREASE (EPA 5030E)	PESTICIDES/PCB (EPA 606, 8060)	PHENOLS (EPA 604, 8040)	METALS: Cd, Cr, Pb, Zn	CAN METALS (18) w/CP VI	PRIORITY POLLUTANT METALS (13)	NUMBER OF CONTAINERS	
MW-1, 5'	4-17	13:00	soil		X	X													1
MW-1, 10'	4-17	13:30	u		X	X													1
MW-1, 15'	u u	14:00	u		X	X													1
MW-1, 20'	u u	14:35	u		X	X													1
MW-1, 40'	u u	15:30	u		X	X													1

PROJECT INFORMATION		SAMPLE RECEIPT		RELINQUISHED BY 1.		RELINQUISHED BY 2.		RELINQUISHED BY 3.	
PROJECT <u>F. Ramos</u>	TOTAL NO. OF CONTAINERS <u>5</u>	<u>[Signature]</u> 16:30		<u>[Signature]</u> (Time)		(Signature) (Time)		(Signature) (Time)	
PG NO.	CHAIN OF CUSTODY SEALS <u>[Signature]</u>	<u>[Signature]</u> 4:17:30		<u>[Signature]</u> (Time)		(Signature) (Time)		(Signature) (Time)	
SHIPPING ID NO.	REC'D GOOD CONDITION/COLD <u>[Signature]</u>	<u>[Signature]</u> (Date)		<u>[Signature]</u> (Date)		(Signature) (Date)		(Signature) (Date)	
VIA.	CONFORMS TO RECORD <u>[Signature]</u>	<u>[Signature]</u> (Date)		<u>[Signature]</u> (Date)		(Signature) (Date)		(Signature) (Date)	
LAB NO.		(Company) <u>Aqua Science</u>		(Company)		(Company)		(Company)	
SPECIAL INSTRUCTIONS/COMMENTS: <u>5-day turn</u>		RECEIVED BY 1.		RECEIVED BY 2.		RECEIVED BY (LABORATORY) 3.			
		<u>[Signature]</u> (Time)		<u>[Signature]</u> (Time)		<u>[Signature]</u> (Time)			
		<u>[Signature]</u> (Date)		<u>[Signature]</u> (Date)		<u>[Signature]</u> (Date)			
		(Company)		(Company)		(Company)		(LAB) <u>CHROMALAB, INC.</u>	

# CHROMALAB, INC.

Analytical Laboratory  
Specializing in GC-GC/MS

- Environmental Analysis
- Hazardous Waste (#238)
- Drinking Water (#955)
- Waste Water
- Consultation

June 13, 1990

ChromaLab File No.: 0690001

AQUA SCIENCE ENGINEERS, INC.

Attn: Greg Gouvea

RE: Three water samples for Gasoline/BTEX, Diesel and Oil & Grease analyses

Project Name: CASTRO VALLEY

Project Number: 1017-038-018

Date Sampled: June 1, 1990

Date Submitted: June 1, 1990

Date Extracted: June 1-9, 1990

Date Analyzed: June 1-9, 1990

## RESULTS:

Sample No.	Gasoline (mg/L)	Diesel (mg/L)	Benzene (µg/L)	Toluene (µg/L)	Ethyl Benzene (µg/L)	Total Xylenes (µg/L)	Oil & Grease (mg/L)
MW-1-C	N.D.	----	N.D.	N.D.	N.D.	N.D.	----
MW-2-A	N.D.	----	N.D.	N.D.	N.D.	N.D.	----
MW-3-B	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.
BLANK SPIKED	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.
RECOVERY	94.1%	92.3%	98.3%	101.0%	97.0%	98.9%	----
DUP. SPIKED							
RECOVERY	95.2%	114.0%	91.4%	90.1%	93.6%	109.5%	----
DETECTION LIMIT	0.5	0.5	1.0	1.0	1.0	1.0	10
METHOD OF ANALYSIS	5030/ 8015	3510/ 8015	602	602	602	602	503 A&E

ChromaLab, Inc.

  
David Duong  
Senior Chemist

  
Eric Tam  
Laboratory Director

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JUN 20 1990

AQUA SCIENCE ENG.

# CHROMALAB, INC.

Analytical Laboratory  
Specializing in GC-GC/MS

- Environmental Analysis
- Hazardous Waste (#E694)
- Drinking Water (#955)
- Waste Water
- Consultation

June 14, 1990  
AQUA SCIENCE ENGINEERS, INC.  
Project Name: AQUA-CASTRO VALLEY  
Date Sampled: May 30, 1990  
Detection Limit: 1 µg/L

ChromaLab File No.: 0690001C  
Attn: Greg Gouvea  
Sample No.: MW-3-B  
Date Submitted: June 1, 1990  
Date of Analysis: June 8, 1990

<u>601/8010</u>	
Dichlorodifluoromethane	<u>N.D.</u>
Chloromethane	<u>N.D.</u>
Vinyl Chloride	<u>N.D.</u>
Bromomethane	<u>N.D.</u>
Chlorethane	<u>N.D.</u>
Trichlorofluoromethane	<u>N.D.</u>
1,1-Dichloroethene	<u>N.D.</u>
Methylene Chloride	<u>N.D.</u>
t-1,2-Dichloroethene	<u>N.D.</u>
c-1,2-Dichloroethene	<u>N.D.</u>
1,1-Dichloroethane	<u>N.D.</u>
Chloroform	<u>N.D.</u>
1,1,1-Trichloroethane	<u>N.D.</u>
Carbon Tetrachloride	<u>N.D.</u>
1,2-Dichloroethane	<u>N.D.</u>
Trichloroethene	<u>N.D.</u>
1,2-Dichloropropane	<u>N.D.</u>
Bromodichloromethane	<u>N.D.</u>
2-Chloroethylvinyl ether	<u>N.D.</u>
t-1,3-Dichloropropene	<u>N.D.</u>
Cis-1,3-Dichloropropene	<u>N.D.</u>
1,1,2-Trichloroethane	<u>N.D.</u>
1,1,2-Trichlorotrifluorethane	<u>N.D.</u>
Tetrachloroethene	<u>N.D.</u>
Dibromochloromethane	<u>N.D.</u>
Chlorobenzene	<u>N.D.</u>
Bromoform	<u>N.D.</u>
1,1,2,2-Tetrachloroethane	<u>N.D.</u>
1,3-Dichlorobenzene	<u>N.D.</u>
1,4-Dichlorobenzene	<u>N.D.</u>
1,2-Dichlorobenzene	<u>N.D.</u>

### QA/QC:

\*Sample blank concentration is none detected.

\*Spiked recovery for Chloroethane is 99.9%, Trichloroethene is 89.7% Bromoform is 100.1% and 1,2-Dichlorobenzene is 101.7%

CHROMALAB, INC.

*David Duong*  
David Duong, Sr. Chemist

*Eric Tam*  
Eric Tam, Lab Director

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JUN 20 1990



# CHROMALAB, INC.

Analytical Laboratory  
Specializing in GC-GC/MS

- Environmental Analysis
- Hazardous Waste (#E694)
- Drinking Water (#955)
- Waste Water
- Consultation

Page 2

ChromaLab File # 0690001

Project No.: 1017-038-018

Sample I.D.: MW 3-B

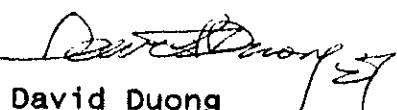
Method of Analysis: EPA 625

Matrix: water

COMPOUND NAME	Sample mg/L	MDL mg/L	Spike Recovery
2,4-DINITROTOLUENE	N.D.	0.01	-----
2,6-DINITROTOLUENE	N.D.	0.01	109.0%, 108.5%
DIETHYL PHTHALATE	N.D.	0.01	-----
4-CHLORO-PHENYL PHENYL ETHER	N.D.	0.01	-----
FLUORENE	N.D.	0.01	-----
4-NITROANILINE	N.D.	0.05	-----
4,6-DINITRO-2-METHYL PHENOL	N.D.	0.05	-----
N-NITROSODIPHENYLAMINE	N.D.	0.01	-----
4-BROMOPHENYL PHENYL ETHER	N.D.	0.01	-----
HEXACHLOROBENZENE	N.D.	0.01	-----
PENTACHLOROPHENOL	N.D.	0.05	-----
PHENANTHRENE	N.D.	0.01	-----
ANTHRACENE	N.D.	0.01	-----
DI-N-BUTYL PHTHALATE	N.D.	0.01	-----
FLUORANTHENE	N.D.	0.01	-----
PYRENE	N.D.	0.01	-----
BUTYLBENZYLPHTHALATE	N.D.	0.01	103.8%, 99.7%
3,3'-DICHLOROBENZIDINE	N.D.	0.02	-----
BENZO(A)ANTHRACENE	N.D.	0.01	-----
BIS(2-ETHYLHEXYL)PHTHALATE	N.D.	0.01	-----
CHRYSENE	N.D.	0.01	105.8%, 102.0%
DI-N-OCTYLPHTHALATE	N.D.	0.01	-----
BENZO(B)FLUORANTHENE	N.D.	0.01	-----
BENZO(K)FLUORANTHENE	N.D.	0.01	-----
BENZO(A)PYRENE	N.D.	0.01	-----
INDENO(1,2,3 C,D)PYRENE	N.D.	0.01	-----
DIBENZO(A,H)ANTHRACENE	N.D.	0.01	-----
BENZO(G,H,I)PERYLENE	N.D.	0.01	-----

\*No Creosote or PCB detected. Detection Limit = 0.1 mg/L

ChromaLab, Inc.

  
David Duong  
Senior Chemist

  
Eric Tam  
Lab Director

**RECEIVED**

JUN 20 1990

# CHROMALAB, INC.

Analytical Laboratory  
Specializing in GC-GC/MS

- Environmental Analysis
- Hazardous Waste (#E694)
- Drinking Water (#955)
- Waste Water
- Consultation

June 14, 1990

ChromaLab File # 0690001

Client: Aqua Science Engineers  
Date Sampled: 5/30/90  
Date Extracted: 6/13/90

Attn: Greg Gouvea  
Date Submitted: 6/01/90  
Date Analyzed: 6/14/90

Project No.: 1017-038-018

Sample I.D.: MW 3-B

Method of Analysis: EPA 625

Matrix: water

COMPOUND NAME	Sample mg/L	MDL mg/L	Spike Recovery
PHENOL	N.D.	0.01	103.2%, 97.9%
BIS(2-CHLOROETHYL) ETHER	N.D.	0.01	-----
2-CHLOROPHENOL	N.D.	0.01	-----
1,3-DICHLOROBENZENE	N.D.	0.01	-----
1,4-DICHLOROBENZENE	N.D.	0.01	-----
BENZYL ALCOHOL	N.D.	0.02	-----
1,2-DICHLOROBENZENE	N.D.	0.01	-----
2-METHYLPHENOL	N.D.	0.01	-----
BIS(2-CHLOROISOPROPYL) ETHER	N.D.	0.01	-----
4-METHYLPHENOL	N.D.	0.01	114.2%, 105.3%
N-NITROSO-DI-N-PROPYLAMINE	N.D.	0.01	-----
HEXACHLOROETHANE	N.D.	0.01	-----
NITROBENZENE	N.D.	0.01	-----
ISOPHORONE	N.D.	0.01	-----
2-NITROPHENOL	N.D.	0.01	-----
2,4-DIMETHYLPHENOL	N.D.	0.01	-----
BENZOIC ACID	N.D.	0.05	-----
BIS(2-CHLOROETHOXY)METHANE	N.D.	0.01	94.6%, 90.3%
2,4-DICHLOROPHENOL	N.D.	0.01	-----
1,2,4-TRICHLOROBENZENE	N.D.	0.01	-----
NAPHTHALENE	N.D.	0.01	-----
4-CHLOROANILINE	N.D.	0.02	-----
HEXACHLOROBUTADIENE	N.D.	0.01	-----
4-CHLORO-3-METHYLPHENOL	N.D.	0.02	-----
2-METHYLNAPHTHALENE	N.D.	0.01	-----
HEXACHLOROCYCLOPENTADIENE	N.D.	0.01	-----
2,4,6-TRICHLOROPHENOL	N.D.	0.01	-----
2,4,5-TRICHLOROPHENOL	N.D.	0.01	-----
2-CHLORONAPHTHALENE	N.D.	0.01	-----
2-NITROANILINE	N.D.	0.05	-----
DIMETHYL PHTHALATE	N.D.	0.01	-----
ACENAPHTHYLENE	N.D.	0.01	-----
3-NITROANILINE	N.D.	0.05	-----
ACENAPHTHENE	N.D.	0.01	113.2%, 108.3%
2,4-DINITROPHENOL	N.D.	0.05	-----
4-NITROPHENOL	N.D.	0.05	-----
DIBENZOFURAN	N.D.	0.01	-----

(continued on next page)

**RECEIVED**

JUN 20 1990

# CHROMALAB, INC.

Analytical Laboratory  
Specializing in GC-GC/MS

June 13, 1990

AQUA SCIENCE ENGINEERS, INC.  
Project Name: CASTRO VALLEY  
Sample No.: MW-3-B

- Environmental Analysis
- Hazardous Waste (#238)
- Drinking Water (#955)
- Waste Water
- Consultation

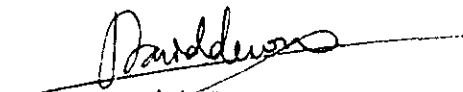
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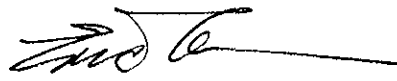
Attn: Greg Gouvea  
Project No.: 1017-038-018  
Analysis Duration: 6/6-8/90

## CHLORINATED PESTICIDE ANALYSIS

<u>Compounds</u>	<u>Concentration (<math>\mu\text{g/L}</math>)</u>	<u>Detection Limit (<math>\mu\text{g/L}</math>)</u>	<u>Spike Recovery</u>
ALDRIN	N.D.	0.1	----
DIELDRIN	N.D.	0.1	93.2%
ENDRIN ALDEHYDE	N.D.	0.5	----
ENDRIN	N.D.	0.1	----
HEPTACHLOR	N.D.	0.1	----
HEPTACHLOR EPOXIDE	N.D.	0.1	----
p,p' - DDT	N.D.	0.5	92.0%
p,p' - DDE	N.D.	0.1	98.7%
p,p' - DDD	N.D.	0.5	----
ENDOSULFAN I	N.D.	0.5	----
ENDOSULFAN II	N.D.	0.5	----
$\alpha$ - BHC	N.D.	0.1	----
$\beta$ - BHC	N.D.	0.1	----
$\gamma$ - BHC (LINDANE)	N.D.	0.1	89.4%
$\delta$ - BHC	N.D.	0.1	----
ENDOSULFAN SULFATE	N.D.	1.0	----
p,p' - METHOXYCHLOR	N.D.	1.0	----
TOXAPHENE	N.D.	1.0	----
PCB's	N.D.	1.0	----
CHLORDANE	N.D.	1.0	----

CHROMALAB, INC.

  
David Duong  
Senior Chemist

  
Eric Tam  
Laboratory Director

**RECEIVED**

JUN 20 1990

AQUA SCIENCE ENG.

# SAMPLING SPECIALISTS

CHROMALAB FILE # 690001

A DIVISION OF PRATT CONSULTING COMPANY  
 COMPLETE WELL DEVELOPMENT SERVICES

COMPLETE BAILING, PURGING AND SAMPLING SERVICE FOR  
 MONITORING, RECOVERY AND VADOSE WELLS IN THE FOLLOWING STATES:  
 CALIFORNIA, NEVADA, OREGON, WASHINGTON, ARIZONA, IDAHO AND UTAH

Office Locations  
 3146 Manor Avenue  
 Walnut Creek, California 94596

12003 49th Street North  
 Building 307  
 Clearwater, Florida 34622

1-(415)-932-4356 Office  
 1-(415)-932-4256 Fax

## CHAIN OF CUSTODY DOCUMENT

PROJECT NUMBER: 1017-038-018								
PROJECT NAME: AQUA-CASTRO VALLEY								
SAMPLERS SIGNATURE: MS & JP								
CHECK FOR FIVE (5) DAY VERBAL/FAX SERVICE:						*	100%	
CHECK FOR EMERGENCY 24 HOUR VERBAL/FAX SERVICE:							200%	
DATES	TIME	SAMPLE ID	NUMBER OF SAMPLE	TPH GAS BTEX	TPH DIESEL	TOTAL OIL GREASE		
5-20-96		MW-1-C	6	*				
5-20-96		MW-2-A	6	*				
5-30-96		MW-3-B	6	*	*	*	*NOTE*	
CUSTOMER		FORM MW-3-B ONLY ALSO WANTS		1) CHLORINATED HYDROCARBONS (?601)				
				2) PNA & CREOSOTE				
				3) PRIORITY METALS				
				4) PCB & PCP (625-627?)				
RELINQUISHED BY:			DATE	TIME	RECEIVED BY:			
<i>Mike Sprow</i>			06/01/96	8:40 AM	<i>David...</i>			
RELINQUISHED BY:			DATE	TIME	RECEIVED BY:			

FAX RESULTS ASAP TO JOHN PRATT AT 1-415-932-4256

BILL AQUASCIENCE ENGINEERS

FOR ANALYSIS

**RECEIVED**

JUN 20 1996

AQUA SCIENCE ENG.

ENVIRONMENTAL & OCCUPATIONAL HEALTH SERVICES

3440 Vincent Road Pleasant Hill, CA 94523 • (415) 930-9090 • FAX# (415) 930-0256

LABORATORY ANALYSIS REPORT

CHROMALAB, INC.  
2239 OMEGA ROAD, #1  
SAN RAMON, CA 94583

REPORT DATE: 06/20/90

DATE SAMPLED: 06/01/90

ATTN: ERIC TAM

DATE RECEIVED: 06/01/90

CLIENT PROJ. NO: 0690001

MED-TOX JOB NO: 9006002

ANALYSIS OF: WATER SAMPLE FOR PRIORITY POLLUTANT METALS

See attached for results

  
Jack Sheets, Manager  
Inorganic Laboratory

Results FAXed to Eric Tam 06/15/90

CHROMALAB, INC.

CLIENT ID: MW-B  
CLIENT JOB NO: 0690001  
DATE RECEIVED: 06/01/90

MED-TOX LAB NO: 9006002-01A  
MED-TOX JOB NO: 9006002  
REPORT DATE: 06/20/90

PRIORITY POLLUTANT METALS IN WATER BY ICP

CODE	METAL	CONCENTRATION (mg/L)	DETECTION LIMIT (mg/L)	METHOD REFERENCE	INST.*
Ag	Silver	ND	0.01	6010	ICP
As	Arsenic	ND	0.03	6010	ICP
Be	Beryllium	ND	0.001	6010	ICP
Cd	Cadmium	0.004	0.002	6010	ICP
Cr	Chromium	ND	0.02	6010	ICP
Cu	Copper	ND	0.02	6010	ICP
Hg	Mercury	ND	0.0003	7470	Hg
Ni	Nickel	ND	0.01	6010	ICP
Pb	Lead	ND	0.02	6010	ICP
Sb	Antimony	ND	0.02	6010	ICP
Se	Selenium	ND	0.03	6010	ICP
Tl	Thallium	ND	0.03	6010	ICP
Zn	Zinc	0.027	0.005	6010	ICP

ND = Not Detected

\* INST. = Instrument Number

# CHROMALAB, INC.

2239 Omega Road, #1 • San Ramon, California 94583  
415/831-1788 • Facsimile 415/831-8798

Chain of Custody

DATE 06/01 PAGE \_\_\_\_\_ OF \_\_\_\_\_

J. MGR. \_\_\_\_\_  
COMPANY \_\_\_\_\_  
ADDRESS \_\_\_\_\_

CLIENTS SIGNATURE: David Duong (PHONE NO.) 831-1788

### ANALYSIS REQUEST

SAMPLE ID.	DATE	TIME	MATRIX	LAB ID.	TPH - Gasoline (EPA 5030)	TPH - Gasoline (5030) w/BTEX (EPA 602, 8020)	TPH - Diesel (EPA 3510, 3550)	PURCEABLE AROMATICS BTEX (EPA 602, 8020)	PURCEABLE HALOCARBONS (EPA 601, 8010)	VOLATILE ORGANICS (EPA 624, 8240)	BASE/NEUTRALS, ACIDS (EPA 624/627, 8270)	TOTAL OIL & GREASE (EPA 5030LE)	PESTICIDES/PCB (EPA 608, 8080)	PHENOLS (EPA 604, 8040)	METALS: Cd, Cr, Pb, Zn	CAN METALS (18) w/CF VI	PRIORITY POLLUTANT METALS (13)
MW-B	06/01/90	10:35A	Water	OIA													✓

PROJECT INFORMATION	SAMPLE RECEIPT
PROJECT: 0690001	TOTAL NO. OF CONTAINERS: 01
2.	CHAIN OF CUSTODY SEALS
3.	REC'D GOOD CONDITION/COLD
4.	CONFORMS TO RECORD
5.	LAB NO. 9006002

ADDITIONAL INSTRUCTIONS/COMMENTS:  
Normal TAT

RELINQUISHED BY <u>David Duong</u> (Signature) DAVID DUONG (Printed Name) CHROMALAB, INC. (Company)	1. 10:35am (Time) 06/01/90 (Date)	RELINQUISHED BY <u>D. St John</u> (Signature) D. St John (Printed Name) Med-Tox (Company)	2. 11:00 (Time) 0-7-90 (Date)	RELINQUISHED BY <u>Denise Harrington</u> (Signature) DENISE HARRINGTON (Printed Name) MED-TOX (LAB)	2. 6/1/90 (Date) 110 (ID#)
RECEIVED BY <u>Salon St John</u> (Signature) Salon St John (Printed Name) Med-Tox (Company)	1. 10:40 (Time) 6/1/90 (Date)	RECEIVED BY	2.	RECEIVED BY (LABORATORY) <u>Denise Harrington</u> (Signature) DENISE HARRINGTON (Printed Name) MED-TOX (LAB)	2. 6/1/90 (Date) 110 (ID#)

# SAMPLING SPECIALISTS

A DIVISION OF PRATT CONSULTING COMPANY

COMPLETE WELL DEVELOPMENT SERVICES

ENVIRONMENTAL SAMPLE  
COLLECTION SPECIALISTS

COMPLETE BAILING, PURGING AND SAMPLING SERVICE FOR  
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July 12, 1990

Aqua Science Engineers, Inc.  
Mr. Greg Gouvea  
P.O.Box 535  
San Ramon, California 94583-0535

Re: Quarterly Sampling Report - Castro Valley Facility - Castro Valley, California.

Dear Mr. Greg Gouvea,  
This report presents the results of the quarterly groundwater monitoring of the existing wells by Sampling Specialists Company on May 30, 1990.

## Sampling Specialists Company Well Monitoring Procedure

The well manway and top of casing seals are first inspected for possible leaks into the well of surrounding standing water. Next using a liquid level indicator the depth to groundwater and casing bottom are recorded. Using a NEW BAILER CORD and a DISPOSABLE BAILER we collect the first draw of product from the well being careful to only let the bailer enter the groundwater halfway. After extracting the bailer we check for the amount of free-floating hydrocarbons if any or note the sheen. Then using our previous measurements to groundwater and casing bottom we calculate how much well column is in the water. We then multiply this number by .17 gallons per foot for 2" column, .66 gallons per foot for 4" column etc. Finally we multiply by 3 to calculate the number of gallons we bail before sample collection. After allowing the well to recover to at least 90% of it's pre-bailed groundwater level we again take a measurement to groundwater level prior to sampling. VOA's vials are filled first from the first draw from well and from the same sampler. Liters are then filled. Duplicates are always collected when VOA's vials are used. Samples are kept on ice and delivered to the state certified laboratory within 24 hours of collection.

### \* NOTE \*

The practice of using new bailer cord and disposable bailers/samplers for each well eliminates the possibility of cross contamination.

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Special Services Include: 5-Day Standard Turnaround Time On Laboratory Analysis At No Additional Charge, Fax Results Upon Completion Of Analysis (If Requested), Full QA / QC Reports Included At No Additional Charge, Specialized Underground Tank And Associated Pipe Testing For Leaks And Repairs. Check For Other Services

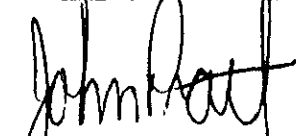


## Analysis Requested

The samples were delivered to the state certified laboratory of CHROMALAB, INC. in San Ramon, California. The analysis were for Total Petroleum Hydrocarbons as Gasoline with BTEX for all wells and additional analysis for MW-3. The analysis results and chain of custody are attached.

If you have any further questions or concerns please feel free to call our office.

Sincerely,  
SAMPLING SPECIALISTS COMPANY



Mr. John T. Pratt  
General Manager

1017-038-018

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---

July 12, 1990

Aqua Science Engineers, Inc.  
Mr. Greg Gouvea  
P.O.Box 535  
San Ramon, California 94583-0535

Re: Well Development - Castro Valley Facility / Castro Valley,  
California.

Dear Mr. Greg Gouvea,

This report presents the results and findings of the well development activities that have been performed on the existing wells by Sampling Specialists Company on May 25-27, 1990.

Sampling Specialists Company  
Well Developing Procedure

The well manway and top of casing seals are first inspected for possible leaks into the well of surrounding standing water. Next using a liquid level indicator the depth to groundwater and casing bottom are recorded. Using a NEW BAILER CORD and a DISPOSABLE BAILER we collect the first draw of product from the well being careful to only let the bailer enter the groundwater halfway. After extracting the bailer we check for the amount of free-floating hydrocarbons if any or note the sheen.

\* NOTE \*

The practice of using new bailer cord and disposable bailers / samplers for each well eliminates the possibility of cross contamination.

WELL DEVELOPMENT

All monitoring wells were developed to clean the well and to stabilize the sand, gravel, and aquifer materials around the screens or perforations. Well development is accomplished by bailing, mechanical or air lift pumping, surging, or swabbing. For this facility well development was achieved by surging the well


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with a vented surge block and bringing sand and silt to surface with each stroke. We continue to development the well until the well is thoroughly developed and free of sand, silt, and turbidity. Care was taken not to damage the well screen or casing while swabbing or surging. Well developing was then followed by pumping. This procedure was repeated as required to establish full development.

If you have any questions or would like to discuss a specific site or well please call our office.

Sincerely,  
PRATT CONSULTING COMPANY/  
SAMPLING SPECIALISTS



Mr. John T. Pratt  
General Manager

**SAMPLING SPECIALISTS**  
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**MONITORING WELL FIELD NOTES**

AQUA-CASTRO VALLEY, CA	PROJECT NAME
1017-038-018	PROJECT NUMBER
05/30/90	DATE OF ACTIVITIES (SAMPLING OR DEVELOPMENT)
JP / MS	BY (SAMPLING TECHNICIANS)
MW-1	CLIENT'S MONITORING/RECOVERY/ VADOSE WELL NUMBER
CLIENT TO PROVIDE	TOP OF CASING ELEVATION (Provided By Client)
15.80'	DEPTH TO WATER FROM WELL CASING BEFORE BAILING
50'	TOTAL DEPTH OF USABLE COLUMN (TO NEAREST FOOT MARKING)
17.90'	DEPTH TO WATER FROM WELL CASING BEFORE SAMPLING
2"	DIAMETER OF MONITORING/RECOVERY/ VADOSE WELL
34.20'	AMOUNT OF WELL COLUMN IN WATER (INCLUDING OIL INTERFACE)
29.07 GALLONS	REQUIRED AMOUNT OF GROUNDWATER TO PURGE FROM WELL IS
35 GALLONS	APPROXIMATE AMOUNT GROUNDWATER REMOVED FROM WELL
STOVE PIPE	TYPE OF SEAL AT GRADE (VANDAL PROOF MANWAY LID/ELEVATED STOVEPIPE)
YES	IS SEAL AT GRADE WATER TIGHT
2" WING NUT PLUG	TYPE OF CAP
YES	IS CAP WATER TIGHT
5	NUMBER OF SAMPLES COLLECTED (40mil VOA FOR GAS/BTEX AND Liters For Diesel)
NO	DID 40 mil VOA CONTAINERS HAVE HEADSPACE BEFORE DELIVERY TO LABORATORY
YES	WERE CONTAINERS KEPT ON ICE PRIOR TO BEING DELIVERED TO LABORATORY
YES	WAS THERE A QA / QC SAMPLER BLANK SAMPLE COLLECTED

(All Groundwater Samples Collected Are Kept On ice And Delivered To The Laboratory For Analysis In Less Than 24 Hours After being Collected)

NR	SAMPLE TEMPERATURE (F) (Special Request)
NR	SAMPLE PH LEVEL (Special Request)
NR	SPECIFIC GRAVITY OF SAMPLE (Special Request)
NA	CONDITION OF WATER DURING DEVELOPMENT (IF APPLIES)
SANDY	CONDITION OF WATER DURING INITIAL BAILING PERIOD
SANDY	CONDITION OF WATER FOR SAMPLE
NO	DID BAILED PRODUCT HAVE ANY TYPE OF PETROLEUM ODOR
	DOES WELL NEED REDEVELOPED
TPH/GAS/BTEX	TYPE OF ANALYSIS REQUESTED
NORMAL	TURNAROUND TIME REQUESTED
DISPOSABLE	TYPE OF BAILER USED
NO	WAS BAILER CLEANED IN FIELD

This monitoring well field guide is provided to give you the necessary answers to questions you might have concerning the condition of the well. Any recommendations that we make are solely based on knowledge gained from a visual inspection of the well during bailing and sampling. On request we would furnish a cost estimate to complete any recommendations that we made. If you have any further questions concerning this well please call our office for assistance.

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**MONITORING WELL FIELD NOTES**

AQUA-CASTRO VALLEY, CA	PROJECT NAME
1017-038-018	PROJECT NUMBER
05/30/90	DATE OF ACTIVITIES (SAMPLING OR DEVELOPMENT)
JP / MS	BY (SAMPLING TECHNICIANS)
MW-2	CLIENT'S MONITORING/RECOVERY/ VADOSE WELL NUMBER
CLIENT TO PROVIDE	TOP OF CASING ELEVATION (Provided By Client)
8.85'	DEPTH TO WATER FROM WELL CASING BEFORE BAILING
30'	TOTAL DEPTH OF USABLE COLUMN (TO NEAREST FOOT MARKING)
10.50'	DEPTH TO WATER FROM WELL CASING BEFORE SAMPLING
2"	DIAMETER OF MONITORING/RECOVERY/ VADOSE WELL
21.15'	AMOUNT OF WELL COLUMN IN WATER (INCLUDING OIL INTERFACE)
17.98 GALLONS	REQUIRED AMOUNT OF GROUNDWATER TO PURGE FROM WELL IS
25 GALLONS	APPROXIMATE AMOUNT GROUNDWATER REMOVED FROM WELL
STOVE PIPE	TYPE OF SEAL AT GRADE (VANDAL PROOF MANWAY LID/ELEVATED STOVEPIPE)
YES	IS SEAL AT GRADE WATER TIGHT
2" WING NUT PLUG	TYPE OF CAP
YES	IS CAP WATER TIGHT
5	NUMBER OF SAMPLES COLLECTED (40mil VOA FOR GAS/BTEX AND Liters For Diesel)
NO	DID 40 mil VOA CONTAINERS HAVE HEADSPACE BEFORE DELIVERY TO LABORATORY
YES	WERE CONTAINERS KEPT ON ICE PRIOR TO BEING DELIVERED TO LABORATORY
YES	WAS THERE A QA / QC SAMPLER BLANK SAMPLE COLLECTED

(All Groundwater Samples Collected Are Kept On ice And Delivered To The Laboratory For Analysis In Less Than 24 Hours After being Collected)

NR	SAMPLE TEMPERATURE (F) (Special Request)
NR	SAMPLE PH LEVEL (Special Request)
NR	SPECIFIC GRAVITY OF SAMPLE (Special Request)
NA	CONDITION OF WATER DURING DEVELOPMENT (IF APPLIES)
SANDY	CONDITION OF WATER DURING INITIAL BAILING PERIOD
SANDY	CONDITION OF WATER FOR SAMPLE
NO	DID BAILED PRODUCT HAVE ANY TYPE OF PETROLEUM ODOR
	DOES WELL NEED REDEVELOPED
TPH/GAS/BTEX	TYPE OF ANALYSIS REQUESTED
NORMAL	TURNAROUND TIME REQUESTED
DISPOSABLE	TYPE OF BAILER USED
NO	WAS BAILER CLEANED IN FIELD

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## MONITORING WELL FIELD NOTES

AQUA-CASTRO VALLEY, CA	PROJECT NAME
1017-038-018	PROJECT NUMBER
05/30/90	DATE OF ACTIVITIES (SAMPLING OR DEVELOPMENT)
JP / MS	BY (SAMPLING TECHNICIANS)
MW-3	CLIENT'S MONITORING/RECOVERY/ VADOSE WELL NUMBER
CLIENT TO PROVIDE	TOP OF CASING ELEVATION (Provided By Client)
15.10'	DEPTH TO WATER FROM WELL CASING BEFORE BAILING
59'	TOTAL DEPTH OF USABLE COLUMN (TO NEAREST FOOT MARKING)
17.50'	DEPTH TO WATER FROM WELL CASING BEFORE SAMPLING
2"	DIAMETER OF MONITORING/RECOVERY/ VADOSE WELL
41.50'	AMOUNT OF WELL COLUMN IN WATER (INCLUDING OIL INTERFACE)
35.26 GALLONS	REQUIRED AMOUNT OF GROUNDWATER TO PURGE FROM WELL IS
40 GALLONS	APPROXIMATE AMOUNT GROUNDWATER REMOVED FROM WELL
STOVE PIPE	TYPE OF SEAL AT GRADE (VANDAL PROOF MANWAY LID/ELEVATED STOVEPIPE)
YES	IS SEAL AT GRADE WATER TIGHT
2" WING NUT PLUG	TYPE OF CAP
YES	IS CAP WATER TIGHT
5	NUMBER OF SAMPLES COLLECTED (40mil VOA FOR GAS/BTEX AND Liters For Diesel)
NO	DID 40 mil VOA CONTAINERS HAVE HEADSPACE BEFORE DELIVERY TO LABORATORY
YES	WERE CONTAINERS KEPT ON ICE PRIOR TO BEING DELIVERED TO LABORATORY
YES	WAS THERE A QA / QC SAMPLER BLANK SAMPLE COLLECTED

(All Groundwater Samples Collected Are Kept On ice And Delivered To The Laboratory For Analysis In Less Than 24 Hours After being Collected)

NR	SAMPLE TEMPERATURE (F) (Special Request)
NR	SAMPLE PH LEVEL (Special Request)
NR	SPECIFIC GRAVITY OF SAMPLE (Special Request)
NA	CONDITION OF WATER DURING DEVELOPMENT (IF APPLIES)
SANDY	CONDITION OF WATER DURING INITIAL BAILING PERIOD
SANDY	CONDITION OF WATER FOR SAMPLE
NO	DID BAILED PRODUCT HAVE ANY TYPE OF PETROLEUM ODOR
	DOES WELL NEED REDEVELOPED
TPH/GAS/BTEX/DIESEL	TYPE OF ANALYSIS REQUESTED
TOG / PRIORITY METALS / 625 / 627	
NORMAL	TURNAROUND TIME REQUESTED
DISPOSABLE	TYPE OF BAILER USED
NO	WAS BAILER CLEANED IN FIELD

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CHROMALAB FILE # 690001

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## CHAIN OF CUSTODY DOCUMENT

PROJECT NUMBER: 1017-038-018								
PROJECT NAME: AQUA-CASTRO VALLEY								
SAMPLERS SIGNATURE: MS & JP								
CHECK FOR FIVE (5) DAY VERBAL/FAX SERVICE:						*	100%	
CHECK FOR EMERGENCY 24 HOUR VERBAL/FAX SERVICE:							200%	
DATES	TIME	SAMPLE ID	NUMBER OF SAMPLE	TPH GAS BTEX	TPH DIESEL	TOTAL OIL GREASE		
5-30-90		MW-1-C	6	*				
5-30-90		MW-2-A	6	*				
5-30-90		MW-3-B	6	*	*	*	*NOTE*	
CUSTOMER		FORM MW-3-B ONLY ALSO WANTS	1) CHLORINATED HYDROCARBONS (7001)					
			2) PNA & CREOSOTE					
			3) PRIORITY METALS					
			4) PCB & PCP (625-627?)					
RELINQUISHED BY:			DATE	TIME	RECEIVED BY:			
Mike Spurgeon			06/01/90	8:40 AM	Darddua			
RELINQUISHED BY:			DATE	TIME	RECEIVED BY:			

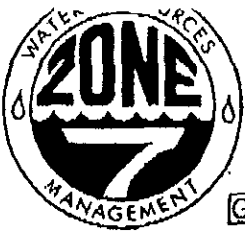
FAX RESULTS ASAP TO JOHN PRATT AT 1-415-932-4256

BILL AQUASCIENCE ENGINEERS

FOR ANALYSIS

**APPENDIX B**  
**Permits**





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

FOR OFFICE USE

LOCATION OF PROJECT vacant lot
5293 Crow Canyon Rd.
Castro Valley

PERMIT NUMBER 91234
LOCATION NUMBER

CLIENT Name Mr. Frank Ramos
Address 2381 Grove Way Phone 881-8286
City Castro Valley Zip 94546

PERMIT CONDITIONS

Circled Permit Requirements Apply

APPLICANT Name Aqua Science Eng.
Address P.O. Box 535 Phone 820-9391
City San Ramon Zip 94583

TYPE OF PROJECT
Well Construction Geotechnical Investigation
Cathodic Protection General
Water Supply Contamination X
Monitoring Well Destruction

PROPOSED WATER SUPPLY WELL USE
Domestic Industrial Other monitoring
Municipal Irrigation

DRILLING METHOD:
Mud Rotary Air Rotary Auger X
Cable Other

DRILLER'S LICENSE NO. 487000

WELL PROJECTS
Drill Hole Diameter 8 in. Maximum
Casing Diameter 2 in. Depth 70 ft.
Surface Seal Depth 20 ft. Number 2

GEOTECHNICAL PROJECTS
Number of Borings 2 Maximum
Hole Diameter 8 in. Depth 30 ft.

ESTIMATED STARTING DATE 5-2-91
ESTIMATED COMPLETION DATE 5-9-91

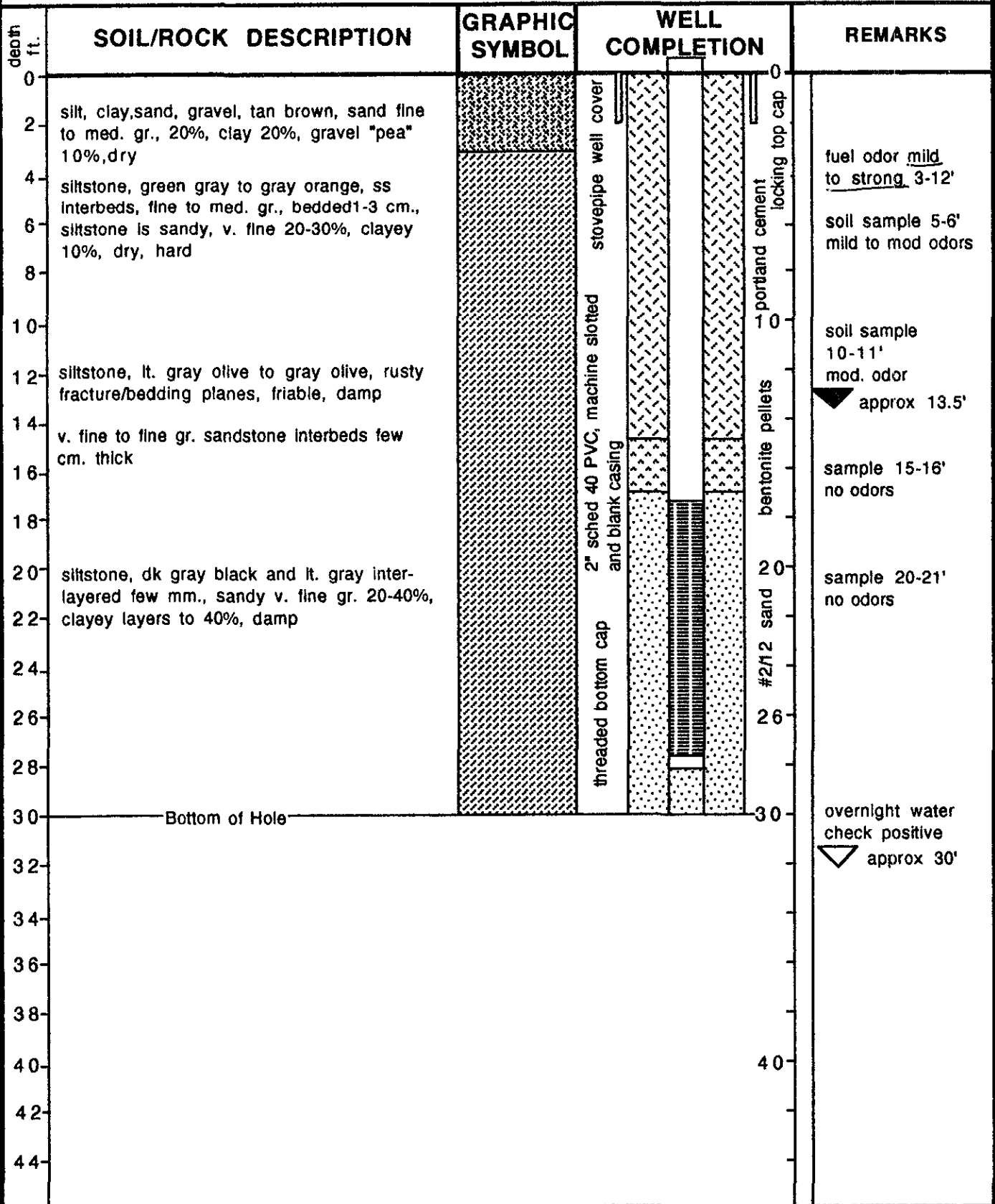
I hereby agree to comply with all requirements of this permit and Alameda County Ordinance No. 73-68.

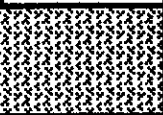
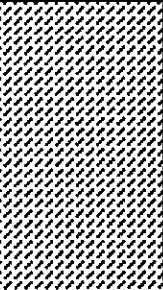
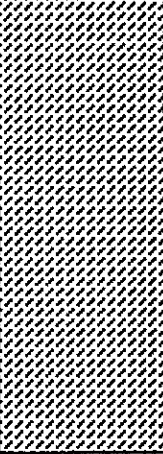

APPLICANT'S SIGNATURE [Signature] Date 4-29-91

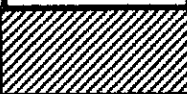
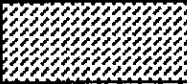
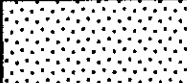
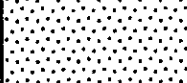
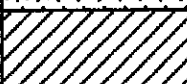

- A. GENERAL
1. A permit application should be submitted so as to arrive at the Zone 7 office five days prior to proposed starting date.
2. Submit to Zone 7 within 60 days after completion of permitted work the original Department of Water Resources Water Well Drillers Report or equivalent for well projects, or drilling logs and location sketch for geotechnical projects.
3. 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.
2. Minimum seal depth is 50 feet for municipal and industrial wells or 20 feet for domestic and irrigation wells unless a lesser depth is specially approved. Minimum seal depth for monitoring wells is the maximum depth practicable or 20 feet.
C. GEOTECHNICAL. Backfill bore hole with compacted cuttings or heavy bentonite and upper two feet with compacted material. In areas of known or suspected contamination, tremied cement grout shall be used in place of compacted cuttings.
D. CATHODIC. Fill hole above anode zone with concrete placed by tremie.
E. WELL DESTRUCTION. See attached.

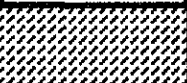
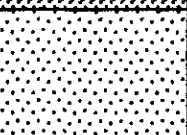
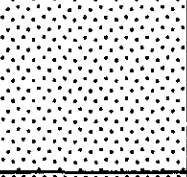
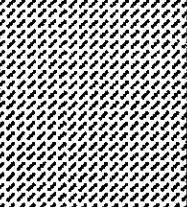
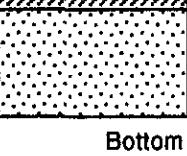
Approved [Signature] Date 29 Apr 91
Wyman Hong

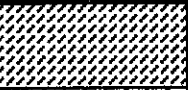
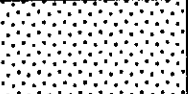
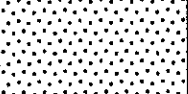
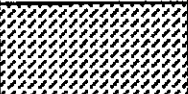


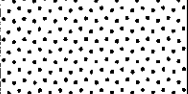
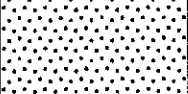
**APPENDIX C**  
**Boring/Well Completion Logs**



depth ft.	SOIL/ROCK DESCRIPTION	GRAPHIC SYMBOL	WELL COMPLETION			REMARKS
0						
2	silt, dk. yellow brown, clayey 20%, sandy v. fine 10%, loose, dry					no odors
4						soil sample 5-6' no odors
6	sandstone, dk. yellow orange, fine to med. gr., silty 10%, crumbly, dry					gasoline odors mild to mod. 7-10'
8						very hard drilling mod. odor
10						
12	sandstone, dk. yellow brown and green gray mottled, bedded approx. 1" distinct, silty as interbeds					▼ approx 13.5'
14						softer drilling 17'
16						
18						
20	siltstone, dk gray black and lt. gray inter-layered few mm., sandy v. fine gr. 20-40%, clayey layers to 40%, damp					▽ approx 20'
22						
24	auger refusal, 24.5' Bottom of Hole					
26						
28						
30						
32						
34						
36						
38						
40						
42						
44						

depth ft.	SOIL/ROCK DESCRIPTION	GRAPHIC SYMBOL	BACKFILL DETAILS	REMARKS	
0					
2	silt and clay, dk. yellow brown, sandy fine gr. 10-20%, damp, (ML)		cement/bentonite grout	no odor	
4	siltstone			sample 5-6' no odors	
6	sandstone, dusky yellow, interlayered with siltstone yellow gray to 1 cm., iron oxides (FeOx) on bedding, fracture planes, hard, dry			gas odors mod. 7'	
8					
10	siltstone and claystone, lt. olive gray with green gray mottling, damp, hard			sample 10-11' mod. to strong gas odors	
12				sample 11-12 ' mod. odors	
14					
16					
18	sandstone, dusky yellow, fine to med. gr., bedded to 2 cm. with lt. gray SS, sl. damp			sample 15-16' v.sl.odors	
20				sample 20-21' no odors	
22	siltstone and claystone, lt. gray and dk. gray interbedded, dry, hard				
24					
26					
28					
30	Bottom of hole			overnight water check negative	
32					
34					
36					
38					
40					
42					
44					

depth ft.	SOIL/ROCK DESCRIPTION	GRAPHIC SYMBOL	BACKFILL DETAILS	REMARKS
0 2	silt and sand, dk. brown, sandy fine to med. gr. 50%, dry, (ML)		cement/bentonite grout	no odor
4 6	sandstone, dusky yellow, fine to med.gr., silty 10%, rusty bedding, fracture planes, mod. to weakly bedded, mod. hard, dry			sample 5-6' no odors
10 12	sandstone, as above color change 11' to siltstone, lt. blue gray, sandy v. fine 10-20%, bedded 2 cms., hard, dry			sample 10-10.5' no odors
14 16	sandstone and siltstone, lt. blue gray and black, interbedded 1 mm. to 2 cm., hard, dry			sample 15' refusal, no odors
18 20	sandstone, dusky yellow, fine to med. gr., bedded to 2 cm. with lt. gray SS, sl. damp siltstone, greenish black, sandy v. fine 10%, clayey 20%, mild sulfur odor, fine pyrite crystals (secondary) dry, hard			sample 20-20.5' no odors
22 24 26 28 30 32 34 36 38 40 42 44		Bottom of hole, 20.5'		

depth ft.	SOIL/ROCK DESCRIPTION	GRAPHIC SYMBOL	BACKFILL DETAILS	REMARKS
0				
0-2	silt and clay, dk. brown, sandy fine gr. 10%, dry, (CL)		cement/bentonite grout	no odors
2-4	siltstone, dk. yellow brown, clayey 20%, bedded approx. 1 cm., dry			sample 5-5.5'
4-6	claystone, lt. olive gray, silty 20-30%, bedded 1 mm. to 1 cm., FeOx and perhaps Mn Ox on bedding/fracture planes, hard, dry			no odors
6-8				
8-10				
10-12	siltstone, dk. yellow brown, sandy fine gr. 10-30%, clayey 10%, bedded to 1 cm.			sample 11-11.5'
12-14				no odors
14-16	as above, 3 fracture planes apparent by FeOx lineations			sample 15-16'
16-18				no odors
18-20	claystone, green black, silty 10-20%, sandy v. fine <10%, v. hard, sl. damp			sample 20-21'
20-22			no odors	
22-24				
24-26	siltstone and claystone, interbedded, green black, bedded few mm. to few cm.			
26-28				
28-30				
30-32			sampler refusal	
32-34			no odors	
34-36				
36-38			sampler refusal	
38-40	siltstone and claystone, interbedded as above pyritic, damp		no odors	
40	Bottom of hole		sample 40-40.25'	
40-42			no odors, overnight water check neg.	
42-44				

**APPENDIX D**  
**Well Development and Sampling Documentation**



**Sampling Specialists Company**  
**Independent Third Party Sampling**  
**Complete Well Development Services**

**Environmental Sample**  
**Collection Specialists**  
**Liquid & Solid Sampling**

Office Location  
5393 Pacheco Boulevard #B  
Pacheco, California 94553

Complete Bailing, Purging And Sampling Services For  
Monitoring And Recovery Wells In The Following States:  
California, Nevada, Oregon, Washington, Arizona, Idaho and Utah

Telephone Numbers  
1-415-798-6882 Office  
1-415-798-6908 Fax

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May 24, 1991

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

Re: Crow Canyon Road Site  
5017-018

Dear Greg Gouvea,

This report presents the results of the well developing performed by Sampling Specialists Company on May 22, 1991 on monitoring well numbers 4,5.

First we inspected the well manway and top of casing seals for possible leaks into the well of surrounding standing water. Next using a liquid level indicator or interface probe we measured the depth to groundwater, free product (if any) and casing bottom. Then using a bailer we collected the first draw of product from the well being careful to only let the bailer enter the groundwater halfway. After extracting the bailer we checked for the amount of free-floating hydrocarbons if any (compared to interface reading) and noted any sheen.

All monitoring wells were developed to clean the well and to stabilize the sand, gravel, and aquifer materials around the screens or perforations. We accomplished the well development by bailing, mechanical or air lift pumping, surging and swabbing. For this facility well development was achieved by surging the well with a 4" vented surge block by bringing sand and silt to surface with each stroke. We continued to development the well until it was free of sand, silt, and turbidity. Care was taken not to damage the well screen or casing while swabbing and surging. Well developing was then followed by pumping and evacuating the well. This procedure was repeated as required to establish full development.

Comments:

MW-4      Heavy turbidity then well would go dry. Small yield.

MW-5      Cleared up after continuous bailing.

Recommendations:

If you have any questions or would like to discuss a specific site or well please call our office. All of us at Sampling Specialists Company appreciate the opportunity to be of service to you.

Sincerely,

Sampling Specialists Co. Inc.

A handwritten signature in black ink, appearing to read "John T. Pratt". The signature is written in a cursive, somewhat stylized font.

John T. Pratt  
Project Manager

# Sampling Specialists Company

## Independent Third Party Sampling

### Monitoring Well Services

# Environmental Sampling

## Water Quality Surveys

### Recovery Well Services

Office Location  
5393 Pacheco Boulevard  
Suite B  
Pacheco, California 94553

Complete Bailing, Purging, Developing And Sampling Services For  
Monitoring And Recovery Wells In The Following States:  
California, Oregon, Washington, Idaho, Nevada, Utah, Arizona and Florida  
Comprehensive Drinking Water Quality Survey's

Telephone Numbers  
415/798-6882 off  
415/798-6887 off  
415/798-6908 fax

Client Name:	Aqua Science Engineers, Inc.
Contact:	Greg Gouvea
Address For Billing:	P.O. Box 535
City, State, Zip:	San Ramon, California 94583
Client Project Name:	Crow Canyon Road Site
Client Project Number:	
Project Address:	5293 Crow Canyon Road
City, State, Zip:	Castro Valley, California
Project Contact:	Greg Gouvea
Services Provided:	Development / Bailing / Sampling
Date Of Services:	5-22-91
Date Of Report:	5-24-91
Our Project Number:	5017-018

5-22-91

MW-1

Monitoring Well Number:	MW-1	
Depth To Groundwater (feet):		15.80
Product Thickness (feet):		0.00
Total Depth Of Well (feet):		50.00
Diameter Of Well (inches):		2.00
Well Column In Groundwater (feet):		34.20
Groundwater In Well Column (gallons):		5.81
Product In Well Column (gallons):		0.00
GW/Product Removed From Well (gallons):		25.00
Manway Or Stove Pipe:	Stovepipe	
Water Tight Or Not:	Not Water Tight	
Type Of Well Column Seal:	Wing Nut Plug	
Water Tight Or Not:	Water Tight	
First PH Reading:		9.98
First Temperature Reading:		79.90
First Specific Conductance Reading:		1,704.00
First Condition Of Water Reading:	Sand/Light Tan	
Second PH Reading:		9.15
Second Temperature Reading:		79.80
Second Specific Conductance Reading:		1,619.00
Second Condition Of Water Reading:	Same	
Third PH Reading:		9.34
Third Temperature Reading:		73.30
Third Specific Conductance Reading:		1,543.00
Third Condition Of Water Reading:	Same	
Fourth PH Reading:		9.54
Fourth Temperature Reading:		72.30
Fourth Specific Conductance Reading:		1,500.00
Fourth Condition Of Water Reading:	Same	
Fifth PH Reading:		9.77
Fifth Temperature Reading:		72.20
Fifth Specific Conductance Reading:		1,528.00

Fifth Condition Of Water Reading:	Same	
Sixth PH Reading:		9.31
Sixth Temperature Reading:		72.40
Sixth Specific Conductance Reading:		1,528.00
Sixth Condition Of Water Reading:	Same	
Seventh PH Reading:		9.24
Seventh Temperature Reading:		75.10
Seventh Specific Conductance Reading:		1,560.00
Seventh Condition Of Water Reading:	Same	
Eighth PH Reading:		9.33
Eighth Temperature Reading:		74.20
Eighth Specific Conductance Reading:		1,478.00
Eighth Condition Of Water Reading:	Clear	
Petroleum Odor Present:	No	
Type Of Bailer/Pump Used:	2" Air Lift Pump	
Type Of Sampler Used:	Teflon / Disposable	

Monitoring Well Number:	MW-2	
Depth To Groundwater (feet):		8.60
Product Thickness (feet):		0.00
Total Depth Of Well (feet):		30.00
Diameter Of Well (inches):		2.00
Well Column In Groundwater (feet):		21.40
Groundwater In Well Column (gallons):		3.64
Product In Well Column (gallons):		0.00
GW/Product Removed From Well (gallons):		20.00
Manway Or Stove Pipe:	Stovepipe	
Water Tight Or Not:	Not Water Tight	
Type Of Well Column Seal:	Wing Nut Plug	
Water Tight Or Not:	Water Tight	
First PH Reading:		9.42
First Temperature Reading:		76.00
First Specific Conductance Reading:		1,463.00
First Condition Of Water Reading:	Sand/Light Tan	
Second PH Reading:		9.40
Second Temperature Reading:		73.60
Second Specific Conductance Reading:		1,404.00
Second Condition Of Water Reading:	Same	
Third PH Reading:		9.22
Third Temperature Reading:		70.40
Third Specific Conductance Reading:		1,387.00
Third Condition Of Water Reading:	Same	
Fourth PH Reading:		9.48
Fourth Temperature Reading:		74.70
Fourth Specific Conductance Reading:		1,398.00
Fourth Condition Of Water Reading:	Same	
Fifth PH Reading:		9.11
Fifth Temperature Reading:		72.00
Fifth Specific Conductance Reading:		1,376.00
Fifth Condition Of Water Reading:	Same	
Sixth PH Reading:		9.27
Sixth Temperature Reading:		71.50
Sixth Specific Conductance Reading:		1,370.00
Sixth Condition Of Water Reading:	Same	
Seventh PH Reading:		9.22
Seventh Temperature Reading:		71.60
Seventh Specific Conductance Reading:		1,393.00
Seventh Condition Of Water Reading:	Clear	
Petroleum Odor Present:	No	
Type Of Bailer/Pump Used:	2" Air Lift Pump	
Type Of Sampler Used:	Teflon / Disposable	

Monitoring Well Number:	MW-3	
Depth To Groundwater (feet):		13.44
Product Thickness (feet):		0.00
Total Depth Of Well (feet):		59.00
Diameter Of Well (inches):		2.00
Well Column In Groundwater (feet):		45.56
Groundwater In Well Column (gallons):		7.75
Product In Well Column (gallons):		0.00
GW/Product Removed From Well (gallons):		40.00
Manway Or Stove Pipe:	Stovepipe	
Water Tight Or Not:	Not Water Tight	
Type Of Well Column Seal:	Wing Nut Plug	
Water Tight Or Not:	Water Tight	
First PH Reading:		9.66
First Temperature Reading:		73.30
First Specific Conductance Reading:		1,200.00
First Condition Of Water Reading:	Sand/Light Tan	
Second PH Reading:		9.54
Second Temperature Reading:		72.10
Second Specific Conductance Reading:		10.92
Second Condition Of Water Reading:	Same	
Third PH Reading:		8.47
Third Temperature Reading:		74.10
Third Specific Conductance Reading:		1,119.00
Third Condition Of Water Reading:	Same	
Fourth PH Reading:		8.67
Fourth Temperature Reading:		73.30
Fourth Specific Conductance Reading:		1,109.00
Fourth Condition Of Water Reading:	Same	
Fifth PH Reading:		8.83
Fifth Temperature Reading:		72.60
Fifth Specific Conductance Reading:		1,136.00
Fifth Condition Of Water Reading:	Clear	
Petroleum Odor Present:	No	
Type Of Bailer/Pump Used:	2" Air Lift Pump	
Type Of Sampler Used:	Teflon / Disposable	

Monitoring Well Number:	MW-4	
Depth To Groundwater (feet):		12.79
Product Thickness (feet):		0.00
Total Depth Of Well (feet):		28.10
Diameter Of Well (inches):		2.00
Well Column In Groundwater (feet):		15.31
Groundwater In Well Column (gallons):		2.45
Product In Well Column (gallons):		0.00
GW/Product Removed From Well (gallons):		40.00
Manway Or Stove Pipe:	Stovepipe	
Water Tight Or Not:	Not Water Tight	
Type Of Well Column Seal:	Wing Nut Plug	
Water Tight Or Not:	Water Tight	
First PH Reading:		9.25
First Temperature Reading:		82.60
First Specific Conductance Reading:		1,438.00
First Condition Of Water Reading:	Sand/Light Tan	
Second PH Reading:		8.87
Second Temperature Reading:		76.50
Second Specific Conductance Reading:		1,305.00
Second Condition Of Water Reading:	Same	
Third PH Reading:		8.90

Third Temperature Reading:		75.90
Third Specific Conductance Reading:		1,290.00
Third Condition Of Water Reading:	Same	
Fourth PH Reading:		8.92
Fourth Temperature Reading:		76.10
Fourth Specific Conductance Reading:		1,300.00
Fourth Condition Of Water Reading:	Clear	
Petroleum Odor Present:	No	
Type Of Bailer/Pump Used:	2" Air Lift Pump	
Type Of Sampler Used:	Teflon / Disposable	

Monitoring Well Number:	MW-5	
Depth To Groundwater (feet):		9.63
Product Thickness (feet):		0.00
Total Depth Of Well (feet):		25.46
Diameter Of Well (inches):		2.00
Well Column In Groundwater (feet):		15.83
Groundwater In Well Column (gallons):		2.54
Product In Well Column (gallons):		0.00
GW/Product Removed From Well (gallons):		20.00
Manway Or Stove Pipe:	Stovepipe	
Water Tight Or Not:	Not Water Tight	
Type Of Well Column Seal:	Wing Nut Plug	
Water Tight Or Not:	Water Tight	
First PH Reading:		9.13
First Temperature Reading:		71.30
First Specific Conductance Reading:		1,657.00
First Condition Of Water Reading:	Sand/Light Tan	
Second PH Reading:		9.33
Second Temperature Reading:		68.50
Second Specific Conductance Reading:		1,932.00
Second Condition Of Water Reading:	Same	
Third PH Reading:		9.12
Third Temperature Reading:		71.40
Third Specific Conductance Reading:		1,974.00
Third Condition Of Water Reading:	Same	
Fourth PH Reading:		9.18
Fourth Temperature Reading:		68.00
Fourth Specific Conductance Reading:		1,931.00
Fourth Condition Of Water Reading:	Same	
Fifth PH Reading:		9.38
Fifth Temperature Reading:		69.40
Fifth Specific Conductance Reading:		1,725.00
Fifth Condition Of Water Reading:	Clear	
Petroleum Odor Present:	No	
Type Of Bailer/Pump Used:	2" Air Lift Pump	
Type Of Sampler Used:	Teflon / Disposable	

**Appendix E**  
**Soil and Groundwater Sample Analyses**

ENVIRONMENTAL ANALYSIS REPORT

**RECEIVED**

JUN 10 1991

CARTER ANALYTICAL LABORATORY, INC.

AQUA SCIENCE ENG.

---

590 DIVISION STREET • CAMPBELL, CA 95008 • (408) 364-3030 • FAX (408) 866-0319



ANALYSIS REPORT  
FOR

Mr. Greg Gouvea  
Aqua Science Engineers  
2411 Old Crow Canyon Road Unit Q  
San Ramon, CA 94583

CONTACT: Mr. Greg Gouvea

DATE: 06-06-91

CHAIN OF CUSTODY ID NO: not provided

ORDER NO: 10988

P.O. NO: 8883

SITE DESCRIPTION:  
Aqua Science  
5293 Crow Canyon Rd.  
San Ramon, CA 94583

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SAMPLE DESCRIPTION:

Soil  
Sampled: 5/06/91 to 5/09/91  
Received: 5/10/91  
Analyzed: 5/15/91 to 5/16/91  
Number of Samples: 19

REQUESTED ANALYSIS:

Methods: Total Petroleum Hydrocarbons as Gasoline (TPH-G)  
and Diesel (TPH-D), with Benzene, Toluene, Ethyl Benzene,  
and Xylenes (BTEX), EPA 8010 and EPA 9071.

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The analyses reported are considered accurate. Should you wish further support for the reported data, submit your requirements in writing within 10 days. It is Carter Analytical Labs intent to give you complete satisfaction. Please reference the order number when communicating with us. The invoice is due and payable within 30 days from invoice date.

Hazardous Materials Certification No: 304 • Drinking Water Certification No: 953  
from the  
State of California • Department of Health Services

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CARTER ANALYTICAL LABORATORY, INC.

590 DIVISION STREET • CAMPBELL, CA 95008 • (408) 364-3030 • FAX (408) 866-0319

Sample Number	Sample Description	TPH-G (mg/Kg)	TPH-D (mg/Kg)	Benzene (mg/Kg)	Toluene (mg/Kg)	Ethyl Benzene (mg/Kg)	Xylenes (mg/Kg)
L1	MW-5,5	LDL	NT	LDL	LDL	LDL	LDL
L2	MW-5,9.5	LDL	NT	LDL	LDL	LDL	LDL
L3	MW-5,15	10.6	NT	LDL	LDL	LDL	LDL
L4	B-10,5	LDL	NT	LDL	LDL	LDL	LDL
L5	B-10,11.5	10.6	NT	LDL	0.14	LDL	0.19
L6	B-10,15	28.2	NT	LDL	0.16	LDL	0.26
L7	B-11,5	LDL	NT	LDL	LDL	LDL	LDL
L8	B-10,20	3.5	NT	LDL	LDL	LDL	LDL
L9	B-11,20	LDL	NT	LDL	LDL	LDL	LDL
L10	B-12,5	LDL	NT	LDL	LDL	LDL	LDL
L11	B-12,10	LDL	LDL	LDL	LDL	LDL	LDL
L12	B-12,15	LDL	LDL	LDL	LDL	LDL	LDL
L13	B-12,25	LDL	NT	LDL	LDL	LDL	LDL
L14	MW-4,5	LDL	NT	LDL	LDL	LDL	LDL
L15	MW-4,10	5.3	LDL	LDL	LDL	LDL	LDL
L16	MW-4,15	LDL	NT	LDL	LDL	LDL	LDL
L17	MW-4,20	LDL	NT	LDL	LDL	LDL	LDL
L18	B-12,20	LDL	NT	LDL	LDL	LDL	LDL
L19	B-10,10	43.8	NT	0.066	0.40	LDL	0.86

**Detection Limits:**                                  1.0                  1.0                  0.005                  0.005                  0.005                  0.005  
 LDL means less than detection limit.  
 NT means not tested.

EPA Method 8010 Analysis

Samples, L11 and L12 were analyzed for volatile halogenated organic compounds according to EPA method 8010 using an HP model 5890 gas chromatograph (GC) and purge and trap method 5030. A 500 microliter (ul) portion of each sample extract was purged for 11 minutes at a rate of 25 ml per minute in a Tekmar liquid sample concentrator. The purged gases were trapped, concentrated, and automatically desorbed into the GC. Separation of the various sample components was accomplished on a packed column with a bonded phase of 1% SP-1000 on 60/80 Carboxpack B. The eluted components were detected by a Hall electrolytic conductivity detector (ElCD) and the output recorded on an HP digital plotter/recorder. The results and detection limits, reported in micrograms per kilogram (ug/Kg), are as follows.

<u>Compound</u>	<u>L11</u>	<u>L12</u>	<u>Detection Limit</u>
Benzyl chloride	LDL	LDL	1.
Bis(2-chloroethoxy)methane	LDL	LDL	1.
Bromobenzene	LDL	LDL	1.
Bromodichloromethane	LDL	LDL	0.10
Bromoform	LDL	LDL	0.20
Bromomethane	LDL	LDL	1.0
Carbon tetrachloride	LDL	LDL	0.12
Chlorobenzene	LDL	LDL	0.25
Chloroethane	LDL	LDL	0.52
2-Chloroethylvinyl ether	LDL	LDL	0.13
Chloroform	LDL	LDL	0.05
1-Chlorohexane	LDL	LDL	1.
Chloromethane	LDL	LDL	0.08
Chloromethyl methyl ether	LDL	LDL	1.
Chlorotoluene	LDL	LDL	1.
Dibromochloroethane	LDL	LDL	0.09
Dibromomethane	LDL	LDL	1.
1,2-Dichlorobenzene	LDL	LDL	0.15
1,3-Dichlorobenzene	LDL	LDL	0.32
1,4-Dichlorobenzene	LDL	LDL	0.24
Dichlorodifluoromethane	LDL	LDL	1.
1,1-Dichloroethane	LDL	LDL	0.07
1,2-Dichloroethane	LDL	LDL	0.03
1,1-Dichloroethylene	LDL	LDL	0.10
trans-1,2-Dichloroethylene	LDL	LDL	0.10
Dichloromethane	97	6410	1.
1,2-Dichloropropane	LDL	LDL	0.04
trans-1,3-Dichloropropylene	LDL	LDL	0.34
1,1,1,2-Tetrachloroethane	LDL	LDL	1.
1,1,2,2-Tetrachloroethane	LDL	LDL	0.03

EPA Method 8010 Analysis - cont

<u>Compound</u>	<u>L11</u>	<u>L12</u>	<u>Detection Limit</u>
Tetrachloroethylene	LDL	LDL	0.03
1,1,1-Trichloroethane	LDL	LDL	0.03
1,1,2-Trichloroethane	LDL	LDL	0.02
Trichloroethylene	LDL	LDL	0.12
Trichlorofluoromethane	LDL	LDL	1.
Trichloropropane	LDL	LDL	1.
Vinyl chloride	LDL	LDL	0.18

LDL means less than detection limit.

EPA Method 9071 Analysis


Samples, L11 and L12 were analyzed for total oil and grease. The results and detection limits, reported percent (%), are as follows.

<u>Sample</u>	<u>TOG</u>
L11	LDL
L12	LDL

Detection Limit                      0.001

LDL means less than detection limit.

=====

  
Warren Belisle  
Lab Supervisor

  
Dan Turgeon  
Sales Manager

**ANAMETRIX INC**

Environmental & Analytical Chemistry  
 12511 S. Encinitas Drive, Suite F, San Diego, CA 92131  
 (408) 333-3192 • Fax: (408) 333-8428

**REPORT**

MR. GREG GOUVEA  
 AQUA SCIENCE ENGINEERS INC.  
 PO BOX 535  
 SAN RAMON, CA 94583

Workorder # : 9106063  
 Date Received : 06/05/91  
 Project ID : 5293 CROW CANYON  
 Purchase Order: N/A

The following samples were received at Anamatrix, Inc. for analysis :

ANAMETRIX ID	CLIENT SAMPLE ID
9106063- 1	MW-5, 9.5'
9106063- 2	MW-4, 10'
9106063- 3	B-10, 11.5'
9106063- 4	B-12, 10'
9106063- 5	MW-4, 15'
9106063- 6	MW-5, 5'
9106063- 7	MW-5, 15'
9106063- 8	B-10, 5'
9106063- 9	B-10, 15'
9106063-10	B-11, 5'
9106063-11	B-10, 20'
9106063-12	B-11, 20'
9106063-13	B-12, 5'
9106063-14	B-12, 15'
9106063-15	B-12, 25'
9106063-16	MW-4, 5'
9106063-17	MW-4, 20'
9106063-18	B-12, 20'
9106063-19	B-10, 10'

**RECEIVED**

JUN 26 1991

AQUA SCIENCE ENG.

This report consists of 17 pages not including the cover letter, and is organized in sections according to the specific Anamatrix laboratory group or section which performed the analysis(es) and generated the data. The Report Summary that precedes each section will help you determine which Anamatrix group is responsible for those test results, and will bear the signatures of the department supervisor and the chemist who have reviewed the analytical data. Please refer all questions to the department supervisor who signed the form.

Anamatrix is certified by the California Department of Health Services (DHS) to perform environmental testing under Certificate Number 1234. A detailed list of the approved fields of testing can be obtained by calling our office, or the DHS Environmental Laboratory Accreditation Program at (415)540-2800.

If you have any further questions or comments on this report, please give us a call as soon as possible. Thank you for using Anamatrix.

Sarah Schoen, Ph.D.  
 Laboratory Manager

6-25-91

Date

REPORT SUMMARY  
ANAMETRIX, INC. (408)432-8192

MR. GREG GOUVEA  
AQUA SCIENCE ENGINEERS INC.  
PO BOX 535  
SAN RAMON, CA 94583

Workorder # : 9106063  
Date Received : 06/05/91  
Project ID : 5293 CROW CANYON R  
Purchase Order: N/A  
Department : GC  
Sub-Department: TPH

SAMPLE INFORMATION:

ANAMETRIX SAMPLE ID	CLIENT SAMPLE ID	MATRIX	DATE SAMPLED	METHOD
9106063- 2	MW-4, 10'	SOIL	05/09/91	TPHd
9106063- 4	B-12, 10'	SOIL	05/08/91	TPHd
9106063-14	B-12, 15'	SOIL	05/08/91	TPHd
9106063- 1	MW-5, 9.5'	SOIL	05/06/91	TPHg/BTEX
9106063- 2	MW-4, 10'	SOIL	05/09/91	TPHg/BTEX
9106063- 3	B-10, 11.5'	SOIL	05/09/91	TPHg/BTEX
9106063- 4	B-12, 10'	SOIL	05/08/91	TPHg/BTEX
9106063- 5	MW-4, 15'	SOIL	05/09/91	TPHg/BTEX
9106063- 6	MW-5, 5'	SOIL	05/06/91	TPHg/BTEX
9106063- 7	MW-5, 15'	SOIL	05/06/91	TPHg/BTEX
9106063- 8	B-10, 5'	SOIL	05/09/91	TPHg/BTEX
9106063- 9	B-10, 15'	SOIL	05/09/91	TPHg/BTEX
9106063-10	B-11, 5'	SOIL	05/07/91	TPHg/BTEX
9106063-11	B-10, 20'	SOIL	05/09/91	TPHg/BTEX
9106063-12	B-11, 20'	SOIL	05/07/91	TPHg/BTEX
9106063-13	B-12, 5'	SOIL	05/08/91	TPHg/BTEX
9106063-14	B-12, 15'	SOIL	05/08/91	TPHg/BTEX
9106063-15	B-12, 25'	SOIL	05/08/91	TPHg/BTEX
9106063-16	MW-4, 5'	SOIL	05/09/91	TPHg/BTEX
9106063-17	MW-4, 20'	SOIL	05/09/91	TPHg/BTEX
9106063-18	B-12, 20'	SOIL	05/08/91	TPHg/BTEX
9106063-19	B-10, 10'	SOIL	05/09/91	TPHg/BTEX

REPORT SUMMARY  
ANAMETRIX, INC. (408)432-8192

MR. GREG GOUVEA  
AQUA SCIENCE ENGINEERS INC.  
PO BOX 535  
SAN RAMON, CA 94583

Workorder # : 9106063  
Date Received : 06/05/91  
Project ID : 5293 CROW CANYON R  
Purchase Order: N/A  
Department : GC  
Sub-Department: TPH

QA/QC SUMMARY :

- No QA/QC problems encountered for these samples.

Cheyl Bulmer      6/19/91  
Department Supervisor      Date

C. Fern      6.25.91  
Chemist      Date

ANALYSIS DATA SHEET - TOTAL PETROLEUM HYDROCARBONS  
(GASOLINE WITH BTEX)  
ANAMETRIX, INC. - (408) 432-8192

Anamatrix W.O.: 9106063  
Matrix : SOIL  
Date Sampled : 05/06 - 09/91

Project Number : 5293 CROW CANYON  
Date Released : 06/19/91

Reporting Limit	Sample I.D.# MW-5,9.5'	Sample I.D.# MW-4,10'	Sample I.D.# B-10,11.5'	Sample I.D.# B-12,10'	Sample I.D.# MW-4,15'
COMPOUNDS (mg/Kg)	-01	-02	-03	-04	-05
Benzene	0.005	ND	ND	ND	ND
Toluene	0.005	ND	ND	ND	ND
Ethylbenzene	0.005	ND	ND	0.007	ND
Total Xylenes	0.005	0.024	0.008	0.029	ND
TPH as Gasoline	0.5	ND	ND	0.6	ND
% Surrogate Recovery	81%	104%	113%	99%	81%
Instrument I.D.	HP21	HP21	HP21	HP21	HP21
Date Analyzed	06/10/91	06/10/91	06/10/91	06/10/91	06/10/91
RLMF	1	1	1	1	1

ND - Not detected at or above the practical quantitation limit for the method.  
TPHg - Total Petroleum Hydrocarbons as gasoline is determined by GCFID using EPA Method 5030.  
BTEX - Benzene, Toluene, Ethylbenzene, and Total Xylenes are determined by modified EPA Method 8020.  
RLMF - Reporting Limit Multiplication Factor.  
Anamatrix control limits for surrogate p-Bromofluorobenzene recovery are 53-147%.

All testing procedures follow California Department of Health Services (Cal-DHS) approved methods.

Steve Juvical      06-19-91  
Analyst                                  Date

Cheryl Balmer      6/19/91  
Supervisor                                  Date



ANALYSIS DATA SHEET - TOTAL PETROLEUM HYDROCARBONS  
(GASOLINE WITH BTEX)  
ANAMETRIX, INC. - (408) 432-8192

Anamatrix W.O.: 9106063  
Matrix : SOIL  
Date Sampled : 05/06 - 09/91

Project Number : 5293 CROW CANYON  
Date Released : 06/19/91

Reporting Limit	Sample I.D.# MW-5,5'	Sample I.D.# MW-5,15'	Sample I.D.# B-10,5'	Sample I.D.# B-10,15'	Sample I.D.# B-11,5'
COMPOUNDS (mg/Kg)	-06	-07	-08	-09	-10
Benzene	0.005	ND	ND	ND	ND
Toluene	0.005	ND	ND	ND	ND
Ethylbenzene	0.005	ND	ND	ND	ND
Total Xylenes	0.005	ND	ND	0.011	ND
TPH as Gasoline	0.5	ND	ND	ND	ND
% Surrogate Recovery	69%	76%	56%	63%	75%
Instrument I.D.	HP8	HP8	HP8	HP8	HP8
Date Analyzed	06/11/91	06/13/91	06/11/91	06/11/91	06/11/91
RLMF	1	1	1	1	1

- ND - Not detected at or above the practical quantitation limit for the method.
- TPHg - Total Petroleum Hydrocarbons as gasoline is determined by GC/FID using EPA Method 5030.
- BTEX - Benzene, Toluene, Ethylbenzene, and Total Xylenes are determined by modified EPA Method 8020.
- RLMF - Reporting Limit Multiplication Factor.  
Anamatrix control limits for surrogate p-Bromofluorobenzene recovery are 53-147%.

All testing procedures follow California Department of Health Services (Cal-DHS) approved methods.

Irma Juarez 06-19-91  
Analyst Date

Cheryl Balmer 6/19/91  
Supervisor Date

ANALYSIS DATA SHEET - TOTAL PETROLEUM HYDROCARBONS  
(GASOLINE WITH BTEX)  
ANAMETRIX, INC. - (408) 432-8192

Anamatrix W.O.: 9106063  
Matrix : SOIL  
Date Sampled : 05/07 - 09/91

Project Number : 5293 CROW CANYON  
Date Released : 06/19/91

Reporting Limit	Sample I.D.# B-10,20'	Sample I.D.# B-11,20'	Sample I.D.# B-12,5'	Sample I.D.# B-12,15'	Sample I.D.# B-12,25'
COMPOUNDS (mg/Kg)	-11	-12	-13	-14	-15
Benzene	0.005	ND	ND	ND	ND
Toluene	0.005	ND	ND	ND	ND
Ethylbenzene	0.005	ND	ND	ND	ND
Total Xylenes	0.005	0.008	ND	0.007	0.006
TPH as Gasoline	0.5	ND	ND	ND	ND
% Surrogate Recovery	77%	59%	72%	66%	67%
Instrument I.D.	HP4	HP4	HP8	HP8	HP4
Date Analyzed	06/14/91	06/14/91	06/13/91	06/13/91	06/14/91
RLMF	1	1	1	1	1

- ND - Not detected at or above the practical quantitation limit for the method.
- TPHg - Total Petroleum Hydrocarbons as gasoline is determined by GCFID using EPA Method 5030.
- BTEX - Benzene, Toluene, Ethylbenzene, and Total Xylenes are determined by modified EPA Method 8020.
- RLMF - Reporting Limit Multiplication Factor.  
Anamatrix control limits for surrogate p-Bromofluorobenzene recovery are 53-147%.

All testing procedures follow California Department of Health Services (Cal-DHS) approved methods.

Steve Lusk 06-19-91  
Analyst Date

Cheryl Balmer 6/19/91  
Supervisor Date

ANALYSIS DATA SHEET - TOTAL PETROLEUM HYDROCARBONS  
 (GASOLINE WITH BTEX)  
 ANAMETRIX, INC. - (408) 432-8192

Anamatrix W.O.: 9106063  
 Matrix : SOIL  
 Date Sampled : 05/07 - 09/91

Project Number : 5293 CROW CANYON  
 Date Released : 06/19/91

Reporting Limit	Sample I.D.# MW-4,5'	Sample I.D.# MW-4,20'	Sample I.D.# B-12,20'	Sample I.D.# B-10,10'	Sample I.D.# 21B0610A
COMPOUNDS (mg/Kg)	-16	-17	-18	-19	BLANK
Benzene	0.005	ND	ND	ND	0.10
Toluene	0.005	ND	ND	ND	0.31
Ethylbenzene	0.005	ND	ND	ND	0.27
Total Xylenes	0.005	ND	0.009	0.011	1.7
TPH as Gasoline	0.5	ND	ND	ND	48
% Surrogate Recovery	75%	53%	80%	56%	122%
Instrument I.D.	HP8	HP4	HP4	HP8	HP21
Date Analyzed	06/13/91	06/14/91	06/14/91	06/13/91	06/10/91
RLMF	1	1	1	10	1

ND - Not detected at or above the practical quantitation limit for the method.  
 TPHg - Total Petroleum Hydrocarbons as gasoline is determined by GCFID using EPA Method 5030.  
 BTEX - Benzene, Toluene, Ethylbenzene, and Total Xylenes are determined by modified EPA Method 8020.  
 RLMF - Reporting Limit Multiplication Factor.  
 Anamatrix control limits for surrogate p-Bromofluorobenzene recovery are 53-147%.

All testing procedures follow California Department of Health Services (Cal-DHS) approved methods.

Steve Swain 06-19-91  
 Analyst Date

Cheryl Balmer 6/17/91  
 Supervisor Date

ANALYSIS DATA SHEET - TOTAL PETROLEUM HYDROCARBONS  
(GASOLINE WITH BTEX)  
ANAMETRIX, INC. - (408) 432-8192

Anamatrix W.O.: 9106063  
Matrix : SOIL  
Date Sampled : N/A

Project Number : 5293 CROW CANYON  
Date Released : 06/19/91

	Reporting Limit	Sample I.D.# 08B0611A	Sample I.D.# 08B0613A	Sample I.D.# 04B0614A
COMPOUNDS	(mg/Kg)	BLANK	BLANK	BLANK
Benzene	0.005	ND	ND	ND
Toluene	0.005	ND	ND	ND
Ethylbenzene	0.005	ND	ND	ND
Total Xylenes	0.005	ND	ND	ND
TPH as Gasoline	0.5	ND	ND	ND
% Surrogate Recovery		107%	114%	95%
Instrument I.D.		HP8	HP8	HP4
Date Analyzed		06/11/91	06/13/91	06/14/91
RLMF		1	1	1

- ND - Not detected at or above the practical quantitation limit for the method.
- TPHg - Total Petroleum Hydrocarbons as gasoline is determined by GCFID using EPA Method 5030.
- BTEX - Benzene, Toluene, Ethylbenzene, and Total Xylenes are determined by modified EPA Method 8020.
- RLMF - Reporting Limit Multiplication Factor.  
Anamatrix control limits for surrogate p-Bromofluorobenzene recovery are 53-147%.

All testing procedures follow California Department of Health Services (Cal-DHS) approved methods.

Gene Terrian                      06-19-91  
Analyst    Date

Cheryl Balmer                      6/19/91  
Supervisor    Date

ANALYSIS DATA SHEET - TOTAL PETROLEUM HYDROCARBONS AS DIESEL  
ANAMETRIX, INC. (408) 432-8192

Anamatrix W.O.: 9106063  
Matrix : SOIL  
Date Sampled : 05/08/91  
Date Extracted: 06/10/91

Project Number : 5293 CROW CANYON RD  
Date Released : 06/19/91  
Instrument I.D.: HP23

Anamatrix I.D.	Client I.D.	Date Analyzed	Reporting Limit (mg/Kg)	Amount Found (mg/Kg)
9106063-02	MW-4, 10'	06/13/91	10	20
9106063-04	B-12, 10'	06/13/91	10	ND
9106063-14	B-12, 15'	06/13/91	10	ND
DSBL061091	METHOD BLANK	06/12/91	10	ND

Note : Reporting limit is obtained by multiplying the dilution factor times 10mg/Kg.

ND - Not detected at or above the practical quantitation limit for the method.

TPHd - Total Petroleum Hydrocarbons as diesel is determined by GCFID following sample extraction by EPA Method 3550.

All testing procedures follow California Department of Health Services (Cal-DHS) approved methods.

Lina Skov 6/20/91  
Analyst Date

Cheryl Balmer 6/20/91  
Supervisor Date

REPORT SUMMARY  
ANAMETRIX, INC. (408)432-8192

MR. GREG GOUVEA  
AQUA SCIENCE ENGINEERS INC.  
PO BOX 535  
SAN RAMON, CA 94583

Workorder # : 9106063  
Date Received : 06/05/91  
Project ID : 5293 CROW CANYON R  
Purchase Order: N/A  
Department : GC  
Sub-Department: VOA

SAMPLE INFORMATION:

ANAMETRIX SAMPLE ID	CLIENT SAMPLE ID	MATRIX	DATE SAMPLED	METHOD
9106063- 4	B-12,10'	SOIL	05/08/91	8010
9106063-14	B-12,15'	SOIL	05/08/91	8010

REPORT SUMMARY  
ANAMETRIX, INC. (408)432-8192

MR. GREG GOUVEA  
AQUA SCIENCE ENGINEERS INC.  
PO BOX 535  
SAN RAMON, CA 94583

Workorder # : 9106063  
Date Received : 06/05/91  
Project ID : 5293 CROW CANYON R  
Purchase Order: N/A  
Department : GC  
Sub-Department: VOA

QA/QC SUMMARY :

- The amount of methylene chloride reported in samples is above normal laboratory background level of 2.5 ppb.

*Grinne Chan*      06/25/91  
Department Supervisor      Date

*Heather Vogt* 6/25/91  
Chemist      Date

ORGANIC ANALYSIS DATA SHEET - EPA METHOD 601/8010  
 ANAMETRIX, INC. (408) 432-8192

Sample I.D. : 5293 CROW CANYON RD. B-12, 10'  
 Matrix : SOIL  
 Date sampled : 05/08/91  
 Date analyzed: 06/14/91  
 Dilution : NONE

Anametrix I.D. : 9106063-04  
 Analyst :  
 Supervisor :  
 Date released : 06/24/91  
 Instrument ID : HP10

CAS #	Compound Name	Reporting Limit (ug/Kg)	Amount Found (ug/Kg)
74-87-3	* Chloromethane	1	ND
74-83-9	* Bromomethane	0.5	ND
75-71-8	* Dichlorodifluoromethane	1	ND
75-01-4	* Vinyl Chloride	0.5	ND
75-00-3	* Chloroethane	0.5	ND
75-09-2	* Methylene Chloride	0.5	3.8
79-69-4	* Trichlorofluoromethane	0.5	ND
75-35-4	* 1,1-Dichloroethene	0.5	ND
75-34-3	* 1,1-Dichloroethane	0.5	ND
156-59-2	# Cis-1,2-Dichloroethene	0.5	ND
156-60-5	* Trans-1,2-Dichloroethene	0.5	ND
67-66-3	* Chloroform	0.5	ND
76-13-1	# Trichlorotrifluoroethane	0.5	ND
107-06-2	* 1,2-Dichloroethane	0.5	ND
71-55-6	* 1,1,1-Trichloroethane	0.5	ND
56-23-5	* Carbon Tetrachloride	0.5	ND
75-27-4	* Bromodichloromethane	0.5	ND
78-87-5	* 1,2-Dichloropropane	0.5	ND
10061-02-6	* Trans-1,3-Dichloropropene	0.5	ND
79-01-6	* Trichloroethene	0.5	ND
124-48-1	* Dibromochloromethane	0.5	ND
79-00-5	* 1,1,2-Trichloroethane	0.5	ND
10061-01-5	* cis-1,3-Dichloropropene	0.5	ND
110-75-8	* 2-Chloroethylvinylether	1	ND
75-25-2	* Bromoform	0.5	ND
127-18-4	* Tetrachloroethene	0.5	ND
79-34-5	* 1,1,2,2-Tetrachloroethane	0.5	ND
108-90-7	* Chlorobenzene	0.5	ND
541-73-1	* 1,3-Dichlorobenzene	1	ND
95-50-1	* 1,2-Dichlorobenzene	1	ND
106-46-7	* 1,4-Dichlorobenzene	1	ND
% Surrogate Recovery		33-134%	46%

ND : Not detected at or above the practical quantitation limit for the method.

\* A 601/8010 approved compound (Federal Register, 10/26/84).  
 # A compound added by Anametrix, Inc.



ORGANIC ANALYSIS DATA SHEET - EPA METHOD 601/8010  
ANAMETRIX, INC. (408) 432-8192

Sample I.D. : 5293 CROW CANYON RD. B-12, 15'  
Matrix : SOIL  
Date sampled : 05/08/91  
Date analyzed: 06/14/91  
Dilution : NONE

Anamatrix I.D. : 9106063-14  
Analyst : *EV.*  
Supervisor : *Q*  
Date released : 06/24/91  
Instrument ID : HP10

CAS #	Compound Name	Reporting Limit (ug/Kg)	Amount Found (ug/Kg)
74-87-3	* Chloromethane	1	ND
74-83-9	* Bromomethane	0.5	ND
75-71-8	* Dichlorodifluoromethane	1	ND
75-01-4	* Vinyl Chloride	0.5	ND
75-00-3	* Chloroethane	0.5	ND
75-09-2	* Methylene Chloride	0.5	5.3
79-69-4	* Trichlorofluoromethane	0.5	ND
75-35-4	* 1,1-Dichloroethene	0.5	ND
75-34-3	* 1,1-Dichloroethane	0.5	ND
156-59-2	# Cis-1,2-Dichloroethene	0.5	ND
156-60-5	* Trans-1,2-Dichloroethene	0.5	ND
67-66-3	* Chloroform	0.5	ND
76-13-1	# Trichlorotrifluoroethane	0.5	ND
107-06-2	* 1,2-Dichloroethane	0.5	ND
71-55-6	* 1,1,1-Trichloroethane	0.5	ND
56-23-5	* Carbon Tetrachloride	0.5	ND
75-27-4	* Bromodichloromethane	0.5	ND
78-87-5	* 1,2-Dichloropropane	0.5	ND
10061-02-6	* Trans-1,3-Dichloropropene	0.5	ND
79-01-6	* Trichloroethene	0.5	ND
124-48-1	* Dibromochloromethane	0.5	ND
79-00-5	* 1,1,2-Trichloroethane	0.5	ND
10061-01-5	* cis-1,3-Dichloropropene	0.5	ND
110-75-8	* 2-Chloroethylvinylether	1	ND
75-25-2	* Bromoform	0.5	ND
127-18-4	* Tetrachloroethene	0.5	ND
79-34-5	* 1,1,2,2-Tetrachloroethane	0.5	ND
108-90-7	* Chlorobenzene	0.5	ND
541-73-1	* 1,3-Dichlorobenzene	1	ND
95-50-1	* 1,2-Dichlorobenzene	1	ND
106-46-7	* 1,4-Dichlorobenzene	1	ND
% Surrogate Recovery		33-134%	47%

ND : Not detected at or above the practical quantitation limit for the method.

\* A 601/8010 approved compound (Federal Register, 10/26/84).

# A compound added by Anamatrix, Inc.

ORGANIC ANALYSIS DATA SHEET - EPA METHOD 601/8010  
 ANAMETRIX, INC. (408) 432-8192

Sample I.D. : METHOD BLANK  
 Matrix : SOIL  
 Date sampled : N/A  
 Date analyzed: 06/14/91  
 Dilution : NONE

Anamatrix I.D. : 10B0614H02  
 Analyst : *CV*  
 Supervisor : *U*  
 Date released : 06/24/91  
 Instrument ID : HP10

CAS #	Compound Name	Reporting Limit (ug/Kg)	Amount Found (ug/Kg)
74-87-3	* Chloromethane	1	ND
74-83-9	* Bromomethane	0.5	ND
75-71-8	* Dichlorodifluoromethane	1	ND
75-01-4	* Vinyl Chloride	0.5	ND
75-00-3	* Chloroethane	0.5	ND
75-09-2	* Methylene Chloride	0.5	ND
79-69-4	* Trichlorofluoromethane	0.5	ND
75-35-4	* 1,1-Dichloroethene	0.5	ND
75-34-3	* 1,1-Dichloroethane	0.5	ND
156-59-2	# Cis-1,2-Dichloroethene	0.5	ND
156-60-5	* Trans-1,2-Dichloroethene	0.5	ND
67-66-3	* Chloroform	0.5	ND
76-13-1	# Trichlorotrifluoroethane	0.5	ND
107-06-2	* 1,2-Dichloroethane	0.5	ND
71-55-6	* 1,1,1-Trichloroethane	0.5	ND
56-23-5	* Carbon Tetrachloride	0.5	ND
75-27-4	* Bromodichloromethane	0.5	ND
78-87-5	* 1,2-Dichloropropane	0.5	ND
10061-02-6	* Trans-1,3-Dichloropropene	0.5	ND
79-01-6	* Trichloroethene	0.5	ND
124-48-1	* Dibromochloromethane	0.5	ND
79-00-5	* 1,1,2-Trichloroethane	0.5	ND
10061-01-5	* cis-1,3-Dichloropropene	0.5	ND
110-75-8	* 2-Chloroethylvinylether	1	ND
75-25-2	* Bromoform	0.5	ND
127-18-4	* Tetrachloroethene	0.5	ND
79-34-5	* 1,1,2,2-Tetrachloroethane	0.5	ND
108-90-7	* Chlorobenzene	0.5	ND
541-73-1	* 1,3-Dichlorobenzene	1	ND
95-50-1	* 1,2-Dichlorobenzene	1	ND
106-46-7	* 1,4-Dichlorobenzene	1	ND
	% Surrogate Recovery	33-134%	61%

ND : Not detected at or above the practical quantitation limit for the method.  
 \* A 601/8010 approved compound (Federal Register, 10/26/84).  
 # A compound added by Anamatrix, Inc.

REPORT SUMMARY  
ANAMETRIX, INC. (408)432-8192

MR. GREG GOUVEA  
AQUA SCIENCE ENGINEERS INC.  
PO BOX 535  
SAN RAMON, CA 94583

Workorder # : 9106063  
Date Received : 06/05/91  
Project ID : 5293 CROW CANYON R  
Purchase Order: N/A  
Department : PREP  
Sub-Department: PREP

SAMPLE INFORMATION:

ANAMETRIX SAMPLE ID	CLIENT SAMPLE ID	MATRIX	DATE SAMPLED	METHOD
9106063- 4	B-12,10'	SOIL	05/08/91	5520EF
9106063-14	B-12,15'	SOIL	05/08/91	5520EF

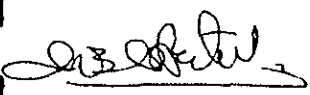
REPORT SUMMARY  
ANAMETRIX, INC. (408)432-8192

MR. GREG GOUEVA  
AQUA SCIENCE ENGINEERS INC.  
PO BOX 535  
SAN RAMON, CA 94583

Workorder # : 9106063  
Date Received : 06/05/91  
Project ID : 5293 CROW CANYON R  
Purchase Order: N/A  
Department : PREP  
Sub-Department: PREP


QA/QC SUMMARY :

- No QA/QC problems encountered for samples.

  
\_\_\_\_\_  
Department Supervisor

JUNE, 12<sup>TH</sup> 1991.

\_\_\_\_\_  
Date

  
\_\_\_\_\_  
Chemist

06.12.91

\_\_\_\_\_  
Date

ANALYSIS DATA SHEET - TOTAL OIL AND GREASE  
 ANAMETRIX, INC. (408) 432-8192

Project # : 5293 CROW CANYON RD. Anamatrix I.D. : 9106063  
 Matrix : SOIL Analyst : *ARR*  
 Date sampled : 05/08/91 Supervisor : *(91)*  
 Date ext. TOG: 06/06/91 Date released : 06/07/91  
 Date anl. TOG: 06/06/91

Workorder #	Sample I.D.	Reporting Limit (mg/Kg)	Amount Found (mg/Kg)
9106063-04	B-12, 10'	30	ND
GSBL060691	METHOD BLANK	30	ND

ND - Not detected at or above the practical quantitation limit for the method.

TOG - Total Oil & Grease is determined by Standard Method 5520E&F.

All testing procedures follow California Department of Health Services (Cal-DHS) approved methods.

ANALYSIS DATA SHEET - TOTAL OIL AND GREASE  
 ANAMETRIX, INC. (408) 432-8192

Project # : 5293 CROW CANYON RD. Anamatrix I.D. : 9106063  
 Matrix : SOIL Analyst : *AKP*  
 Date sampled : 05/08/91 Supervisor : *EP*  
 Date ext. TOG: 06/10/91 Date released : 06/12/91  
 Date anl. TOG: 06/10/91

Workorder #	Sample I.D.	Reporting Limit (mg/Kg)	Amount Found (mg/Kg)
9106063-14	B-12, 15'	30	ND
GSBL061091	METHOD BLANK	30	ND

ND - Not detected at or above the practical quantitation limit for the method.

TOG - Total Oil & Grease is determined by Standard Method 5520E&F.

All testing procedures follow California Department of Health Services (Cal-DHS) approved methods.

PROJ. 5293 Crow Canyon Rd.  
COMPANY Aqua Science  
ADDRESS PO. 535  
San Ramon 94583

ANALYSIS REQUEST

SAMPLER(S) SIGNATURE: [Signature] (PHONE NO.) 415 820 9391

SAMPLE ID	DATE	TIME	MATRIX	LAB ID.	TPH - Gasol (EPA 5030)	TPH - Gasol (EPA 5030)	W/TEX (EPA 602, 8020)	TPH - Diesel (EPA 3510, 3550)	PURGEABLE AROMATICS (EPA 602, 8020)	PURGEABLE HALOCARBONS (EPA 601, 8010)	VOLATILE ORGANICS (EPA 624, 8240)	BASE/NEUTRALS, ACIDS (EPA 624/627, 8270)	TOTAL OIL & GREASE (EPA 5030A)	PESTICIDES/PCB (EPA 608, 8080)	PHEOLS (EPA 604, 8040)	METALS: Cd, Cr, Pb, Zn	CAR METALS (18) w/CF VI	PRIORITY POLLUTANT METALS (13)
B-12, 5'	5-8-91	9:00	soil		X													
B-12, 10'	5-8-91	9:30	soil		X								X					
B-12, 15'	5-8-91	10:00	soil		X								X					
B-12, 25'	5-8-91	11:30	soil		X													
MW-4, 5'	5-9-91	1:00	soil		X													
MW-4, 10'	5-9-91	1:20	soil		X	X												
MW-4, 15'	5-9-91	2:00	soil		X													
MW-4, 20'	5-9-91	2:30	soil		X													

PROJECT INFORMATION	SAMPLE RECEIPT
PROJECT:	TOTAL NO. OF CONTAINERS <u>8</u>
PG NO	CHAIN OF CUSTODY SEALS <u>/</u>
SHIPPING ID NO	REC'D GOOD CONDITION/COLD <u>/</u>
VIA	CONFORMS TO RECORD <u>/</u>
	LAB NO.

RELINQUISHED BY	1.	RELINQUISHED BY	2.	RELINQUISHED BY
(Signature)	(Time)	(Signature)	(Time)	(Signature)
(Printed Name)	(Date)	(Printed Name)	(Date)	(Printed Name)
(Company)		(Company)		(Company)
RECEIVED BY	1.	RECEIVED BY	2.	RECEIVED BY (LABORATORY)
(Signature)	(Time)	(Signature)	(Time)	(Signature)
(Printed Name)	(Date)	(Printed Name)	(Date)	(Printed Name)
(Company)		(Company)		(LAB)

SPECIAL INSTRUCTIONS/COMMENTS:  
5,000 turn FAX to 415 837 4853

PROJ. 5093 Crow Canyon Rd.  
 COMPANY Aqua Science Engineers  
 ADDRESS San Ramon  
Greg Govea (AS)  
 ANALYST SIGNATURE (PHONE NO.)  
Greg Govea 415 820-9391

PROJECT INFORMATION					ANALYSIS REQUEST													NUMBER OF CONTAINERS
SAMPLE ID.	DATE	TIME	MATRIX	LAB ID.	TPH - Gasoline (EPA 5030)	TPH - Gasoline (5030) w/BTEX (EPA 602, 8020)	TPH - Diesel (EPA 3510, 3550)	PURGEABLE AROMATICS BTEX (EPA 602, 8020)	PURGEABLE HALOCARBONIS (EPA 601, 8010)	VOLATILE ORGANICS (EPA 624, 8240)	BASE/NEUTRALS, ACIDS (EPA 624/627, 8270)	TOTAL OIL & GREASE (EPA 5030&E)	PESTICIDES/PCB (EPA 608, 8080)	PHENOLS (EPA 604, 8040)	METALS: Cd, Cr, Pb, Zn	CAN METALS (18) w/CR VI	PRIORITY POLLUTANT METALS (13)	
W-5, 9.5'	5-6-91	11:00	soil		X													
W-4, 10'	5-9-91	13:20	soil		X	X												head space
-10, 11.5'	5-9-91	9:30	soil		X	X												↓
-12, 10'	5-8-91	9:30	soil		X	X						X						head space
N-11, 15'	5-9-91	14:00	soil		X	X												↓
W-5, 5'	5-6-91	10:00	soil		X	X												↓
																		Did not receive M
																		ice chest

PROJECT INFORMATION		SAMPLE RECEIPT		RELINQUISHED BY 1.		RELINQUISHED BY 2.		RELINQUISHED BY 3.	
PROJECT NO	293 Crow Canyon	TOTAL NO. OF CONTAINERS	6	Deborah Richmond	19 1	Benny S. Carrizosa			
SHIPPING ID NO		CHAIN OF CUSTODY SEALS		Deborah Richmond	6/5/91	BENNY S. CARRIZOSA	6/5/91 1555		
A		REC'D GOOD CONDITION/COLD		Carter Lab 6/5/91	2:55	ANAMETRIX			
		CONFORMS TO RECORD							
		LAB NO.		RECEIVED BY 1.		RECEIVED BY 2.		RECEIVED BY (LABORATORY) 3.	
SPECIAL INSTRUCTIONS/COMMENTS:				Benny S. Carrizosa	6-5-91 1455			TRAM TRAN	6/5/91 1455
Samples analyzed held at Carter Labs. since sampling date, 5 day turn all samples are consolidated rock matls. FAX to 415 837-4853				BENNY S. CARRIZOSA					
				ANAMETRIX					



# CHROMALAB, INC.

5 DAYS TURNAROUND

Analytical Laboratory (E694)

June 7, 1991

ChromaLab File No.: 0591174

AQUA SCIENCE ENGINEERS, INC.

Attn: Greg Gouvea

RE: Five water samples for Gasoline/BTEX, Diesel and PCB's analyses

Project Number: 5017-038-050

Date Sampled: May 22, 1991

Date Submitted: May 24, 1991

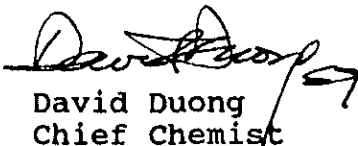
Date Extracted: June 4-7, 1991


Date Analyzed: June 4-7, 1991

## RESULTS:

Sample No.	Gasoline ( $\mu\text{g/l}$ )	Diesel ( $\mu\text{g/l}$ )	Benzene ( $\mu\text{g/l}$ )	Toluene ( $\mu\text{g/l}$ )	Ethyl Benzene ( $\mu\text{g/l}$ )	Total Xylenes ( $\mu\text{g/l}$ )	PCB'S (mg/l)
MW-1	N.D.	----	N.D.	N.D.	N.D.	N.D.	----
MW-2	N.D.	----	N.D.	N.D.	N.D.	N.D.	----
MW-3	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.
MW-4	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	----
MW-5	N.D.	----	N.D.	N.D.	N.D.	N.D.	----
BLANK	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.
SPIKE REC.	92.9%	99.2%	103.8%	105.6%	98.2%	95.4%	93.2%
DUP SPIKE REC.	95.0%	83.0%	89.3%	93.6%	91.4%	90.1%	----
DET. LIMIT	50	50	0.5	0.5	0.5	0.5	0.1
METHOD OF ANALYSIS	5030/ 8015	3510/ 8015	602	602	602	602	608

ChromaLab, Inc.

  
David Duong  
Chief Chemist

  
Eric Tam  
Laboratory Director

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JUN 13 1991

# CHROMALAB, INC.

5 DAYS TURNAROUND

Analytical Laboratory (E694)

June 7, 1991

ChromaLab File # 0591174 C

Client: Aqua Science Engineers

Attn: Greg Gouvea

Date Sampled: May 22, 1991

Date Submitted: May 24, 1991

Date of Analysis: June 05, 1991

Project No.: 5017-038-050

Project Name: Crow Canyon Rd.

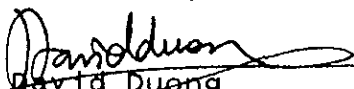
Sample I.D.: MW 3

Method of Analysis: EPA 601

Detection Limit: 0.5 µg/L

COMPOUND NAME	µg/L	Spike Recovery
CHLOROMETHANE	N.D.	---
VINYL CHLORIDE	N.D.	---
BROMOMETHANE	N.D.	---
CHLOROETHANE	N.D.	---
TRICHLOROFLUOROMETHANE	N.D.	---
1,1-DICHLOROETHENE	N.D.	89.5% 90.1%
METHYLENE CHLORIDE	N.D.	---
1,2-DICHLOROETHENE (TOTAL)	N.D.	---
1,1-DICHLOROETHANE	N.D.	---
CHLOROFORM	1.1	---
1,1,1-TRICHLOROETHANE	N.D.	---
CARBON TETRACHLORIDE	N.D.	---
1,2-DICHLOROETHANE	N.D.	---
TRICHLOROETHENE	N.D.	90.4% 89.2%
1,2-DICHLOROPROPANE	N.D.	---
BROMODICHLOROMETHANE	2.1	---
2-CHLOROETHYL VINYLETHER	N.D.	---
TRANS-1,3-DICHLOROPROPENE	N.D.	---
CIS-1,3-DICHLOROPROPENE	N.D.	---
1,1,2-TRICHLOROETHANE	N.D.	---
TETRACHLOROETHENE	N.D.	88.7% 85.7%
DIBROMOCHLOROMETHANE	6.1	---
CHLOROBENZENE	N.D.	---
BROMOFORM	2.8	---
1,1,2,2-TETRACHLOROETHANE	N.D.	87.2% 86.8%
1,3-DICHLOROBENZENE	N.D.	---
1,4-DICHLOROBENZENE	N.D.	---
1,2-DICHLOROBENZENE	N.D.	---

ChromaLab, Inc.

  
David Duong  
Senior Chemist

  
Eric Tam  
Lab Director

**RECEIVED**

JUN 13 1991

# CHROMALAB, INC.

Analytical Laboratory (E694)

5 DAYS TURNAROUND

June 7, 1991

ChromaLab File No.: 0591174

AQUA SCIENCE ENGINEERS, INC.

Attn: Greg Gouvea

RE: One water sample for TTLC CAM 13 metals analysis

Project Number: 5017-038-050

Date Sampled: May 22, 1991

Date Submitted: May 24, 1991

Date Analyzed: June 5, 1991


RESULTS: Sample ID: MW-3

<u>Metals</u>	<u>Concentration (mg/l)</u>	<u>Detection Limit (mg/l)</u>	<u>% Spiked Recovery</u>
*Ag	N.D.	0.004	87.5%
As	N.D.	0.088	92.4%
Be	N.D.	0.001	82.4%
Cd	N.D.	0.012	89.1%
Cr	N.D.	0.006	83.1%
Cu	N.D.	0.004	104.3%
Hg	N.D.	0.200	91.2%
Ni	N.D.	0.026	89.8%
Pb	N.D.	0.044	80.0%
*Sb	N.D.	0.040	80.9%
Se	N.D.	0.200	82.5%
Tl	N.D.	0.088	94.6%
Zn	N.D.	0.006	86.1%

Method of Analysis: 3050/6010

\*Method of Analysis: 3005/6010

ChromaLab, Inc.

  
David Duong  
Chief Chemist

  
Eric Tam  
Laboratory Director

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JUN 13 1991

2239 Omega Road, #1 • San Ramon, California 94583

415/831-1788 • Facsimile 415/831-8798

Federal ID #68-0140157

AQUA SCIENCE ENG.

# CHROMALAB, INC.

5 DAYS TURNAROUND

Analytical Laboratory (E694)

June 7, 1991

ChromaLab File # 0591174 C

Client: Aqua Science Engineers  
Date Sampled: May 22, 1991  
Date Extracted: June 3, 1991Attn: Greg Gouvea  
Date Submitted: May 24, 1991  
Date Analyzed: June 7, 1991Project No.: 5017-038-050  
Sample I.D.: MW 3Project Name: Crow Canyon Rd.Method of Analysis: EPA 625Matrix: water

COMPOUND NAME	Sample mg/L	MDL mg/L	Spike Recovery
PHENOL	N.D.	0.01	-----
BIS(2-CHLOROETHYL) ETHER	N.D.	0.01	96.0%
2-CHLOROPHENOL	N.D.	0.01	-----
1,3-DICHLOROBENZENE	N.D.	0.01	-----
1,4-DICHLOROBENZENE	N.D.	0.01	-----
BENZYL ALCOHOL	N.D.	0.02	-----
1,2-DICHLOROBENZENE	N.D.	0.01	-----
2-METHYLPHENOL	N.D.	0.01	96.2%
BIS(2-CHLOROISOPROPYL) ETHER	N.D.	0.01	-----
4-METHYLPHENOL	N.D.	0.01	-----
N-NITROSO-DI-N-PROPYLAMINE	N.D.	0.01	-----
HEXACHLOROETHANE	N.D.	0.01	-----
NITROBENZENE	N.D.	0.01	-----
ISOPHORONE	N.D.	0.01	-----
2-NITROPHENOL	N.D.	0.01	-----
2,4-DIMETHYLPHENOL	N.D.	0.01	93.7%
BENZOIC ACID	N.D.	0.05	-----
BIS(2-CHLOROETHOXY)METHANE	N.D.	0.01	92.4%
2,4-DICHLOROPHENOL	N.D.	0.01	-----
1,2,4-TRICHLOROBENZENE	N.D.	0.01	-----
NAPHTHALENE	N.D.	0.01	-----
4-CHLOROANILINE	N.D.	0.02	-----
HEXACHLOROBUTADIENE	N.D.	0.01	-----
4-CHLORO-3-METHYLPHENOL	N.D.	0.02	-----
2-METHYLNAPHTHALENE	N.D.	0.01	107.9%
HEXACHLOROCYCLOPENTADIENE	N.D.	0.01	-----
2,4,6-TRICHLOROPHENOL	N.D.	0.01	-----
2,4,5-TRICHLOROPHENOL	N.D.	0.01	-----
2-CHLORONAPHTHALENE	N.D.	0.01	-----
2-NITROANILINE	N.D.	0.05	-----
DIMETHYL PHTHALATE	N.D.	0.01	-----
ACENAPHTHYLENE	N.D.	0.01	-----
3-NITROANILINE	N.D.	0.05	-----
ACENAPHTHENE	N.D.	0.01	101.7%
2,4-DINITROPHENOL	N.D.	0.05	-----
4-NITROPHENOL	N.D.	0.05	-----
DIBENZOFURAN	N.D.	0.01	-----

(continued on next page)

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JUN 13 1991

AQUA SCIENCE ENG.

# CHROMALAB, INC.

Analytical Laboratory (E694)

5 DAYS TURNAROUND


Page 2

ChromaLab File # 0591174 C

Project No.: 5017-038-050 Project Name: Crow Canyon Rd.  
Sample I.D.: MW 3  
Method of Analysis: EPA 625 Matrix: water

COMPOUND NAME	Sample mg/L	MDL mg/L	Spike Recovery
2,4-DINITROTOLUENE	N.D.	0.01	-----
2,6-DINITROTOLUENE	N.D.	0.01	104.8%
DIETHYL PHTHALATE	N.D.	0.01	-----
4-CHLORO-PHENYL PHENYL ETHER	N.D.	0.01	-----
FLUORENE	N.D.	0.01	-----
4-NITROANILINE	N.D.	0.05	-----
4,6-DINITRO-2-METHYL PHENOL	N.D.	0.05	-----
N-NITROSODIPHENYLAMINE	N.D.	0.01	-----
4-BROMOPHENYL PHENYL ETHER	N.D.	0.01	-----
HEXACHLOROBENZENE	N.D.	0.01	-----
PENTACHLOROPHENOL	N.D.	0.05	111.6%
PHENANTHRENE	N.D.	0.01	-----
ANTHRACENE	N.D.	0.01	-----
DI-N-BUTYL PHTHALATE	N.D.	0.01	-----
FLUORANTHENE	N.D.	0.01	-----
PYRENE	N.D.	0.01	-----
BUTYLBENZYL PHTHALATE	N.D.	0.01	-----
3,3'-DICHLOROBENZIDINE	N.D.	0.02	-----
BENZO(A)ANTHRACENE	N.D.	0.01	-----
BIS(2-ETHYLHEXYL)PHTHALATE	N.D.	0.01	-----
CHRYSENE	N.D.	0.01	100.5%
DI-N-OCTYL PHTHALATE	N.D.	0.01	-----
BENZO(B)FLUORANTHENE	N.D.	0.01	-----
BENZO(K)FLUORANTHENE	N.D.	0.01	-----
BENZO(A)PYRENE	N.D.	0.01	-----
INDENO(1,2,3 C,D)PYRENE	N.D.	0.01	-----
DIBENZO(A,H)ANTHRACENE	N.D.	0.01	-----
BENZO(G,H,I)PERYLENE	N.D.	0.01	89.5%

ChromaLab, Inc.

  
David Duong  
Senior Chemist

  
Eric Tam  
Lab Director

**RECEIVED**

JUN 13 1991

AQUA SCIENCE ENG.

# Sampling Specialists Company

Independent Third Party Sampling  
Complete Well Development Services

# Environmental Sample Collection Specialists

Liquid & Solid Sampling

Office Location  
5393 Pacheco Boulevard #B  
Pacheco, California 94553

Complete Bailing, Purging And Sampling Services For  
Monitoring And Recovery Wells In The Following States:  
California, Nevada, Oregon, Washington, Arizona, Idaho and Utah

Telephone Numbers  
1-415-798-6882 Office  
1-415-798-6908 Fax

## CHAIN OF CUSTODY RECORD CHROMALAB FILE # 591174

Client Name: Aqua Science Engineers, Inc  
Address: P.O. Box 535  
City, State, Zip: San Ramon, California 94583  
Project Or P.O.: Crow Canyon Road / 5017-038-050  
Phone: 1-415-820-9391  
Report Attention: Greg Gouvea

2401

### TYPE OF ANALYSIS

- 1 TPH/Gasoline w/BTEX
- 2 TPH/Diesel
- 3 601/8010 Chlorinated Hydrocarbons
- 4 PNA & Creosote
- 5 Priority Metals
- 6 PCB & PCP

Sample Number	Date Sampled	Time Sampled	Number Of Containers	Sample Type	1	2	3	4	5	6
MW-1	052291	AM	5	GW	X					
MW-2	052291	AM	5	GW	X					
MW-3	052291	AM	5	GW	X	X	X	X	X	X
MW-4	052291	PM	5	GW	X	X				
MW-5	052291	PM	5	GW	X					

Turnaround Time 24Hr( ) 48Hr( ) 5Day( ) 10Day(X)  
 Fax Results To: 1-415-798-6908  
 Relinquished By: *Cindy Pratt* 5/24/91  
 Received By: *T. Jankovic* 5-24-91 12:00

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JUN 13 1991

AQUA SCIENCE ENG.

*Frank Ramos, Inc.*

REAL ESTATE - APPRAISING - LOANS

2381 GROVE WAY, CASTRO VALLEY, CALIFORNIA 94546-7042

TELEPHONE 415/881-8286

October 17, 1991

Scott O. Seery  
Department of Environmental Health  
Hazardous Materials Program  
80 Swan Way, Room 200  
Oakland, CA 94621

Re: 5293 Crow Canyon Road, Castro Valley, CA.

Dear Mr. Seery:

Enclosed is an updated report from Mr. Greg Gouvea of Aqua Science Engineers Inc. regarding the above property.

After your review, if conditions permit, would it be possible to fill in the large hole and level off the lot.

The report is dated September 16, 1991, however Greg had to make a few changes and that is why the delay.

Cordially,

  
Frank Ramos

Enc

cc: Richard Flynn, Esq.  
William McDonald  
Betty Henson