aqua science engineers inc.

January 10, 1990

Mr. Dan Dineen
Lakeshore Financial
21060 Redwood Rd., Suite 250
Castro Valley, Ca. 94546

Re: [redacted]

Dear Mr. Dineen,

The following is Aqua Science Engineer's workplan-proposal for 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 2896 Castro Valley Blvd. in Castro Valley, Ca., as a result of earlier investigative activities at the site. The site assessment has been mandated by May 8, 1989 correspondence from the Alameda County Dept. of Environmental Health, Hazardous Materials Program. The May 8 letter requires that the vertical and horizontal extent of gasoline and waste oil contamination in the soils and groundwater be determined.

B. Site Location:
The site is located on the northwest corner of Castro Valley Blvd. and Anita Ave. in Castro Valley, about 1/4 mile north of Interstate 580 (Figure 1). The site relief is low, and the surrounding area slopes gently toward the south.

C,D. Background and Site History:
[redacted] The details of the tank removal and associated sampling are summarized in the project report of June 30, 1987, by Geonomics Inc. (Appendix A).

[redacted]tails the methods and findings of a soil boring and sampling job which indicated TPH contamination of the soils around the perimeter of the tank cluster at between 1.3 and 267 ppm TPH, several months prior to the tank removals (Appendix A).

Another soil boring and sampling project conducted by [redacted] endix A).

An estimate of the amount of fuel products lost into the soils was not made. To date, no other investigative work is known to have been performed at the site.

II. SITE DESCRIPTION

A. Vicinity Description and Hydrogeologic Setting:
The site rests upon recent alluvial deposits in a valley with dimensions of several miles. The inferred location of the East Chabot Fault runs in a NW-SE direction within 1,000 feet west of the site. Groundwater has been encountered during previous investigative work at about 12-13 feet depth below grade.

B, C. Vicinity Map:
Though the tanks and pumps have been removed, the building and pump islands remain. Figure 2 gives the layout of those facilities and the locations of the proposed borings and monitoring wells.

D. Existing Soil Contamination and Excavation:
Soil samples obtained during the October, 1986 boring and sampling job were obtained from native soil at 10 feet depth from the borings which are proximal to the gas tanks, and from native soil at 6 feet depth near the waste oil tank. The samples were collected into tubes of some kind by methods unknown to this company. The soil samples showed from 1.3 to 267 ppm TPH as gasoline and 1.3 ppm TPH as diesel or oil in the sample near the waste oil tank (Table 1). The soils were logged as baserock from 0-4 feet depth and sandy clay from 3-4 feet down to 10 feet depth.

Soil samples associated with the tank removals of June, 1987 indicated no TPH as gasoline contamination of the native soils at each end of the 10,000 and 7,500 gallon tanks. The 5,000 gallon tank soil sample from opposite the fill end showed 100 ppm TPH as gas, 200 ppb toluene, and 2,200 ppb total xylenes. These samples were obtained from 11 feet below grade, at the soil/groundwater interface, about 1 foot above the bottoms of the gas tanks. A sheen was noted on the groundwater within the tankpit.

[redacted] A composite sample of soils excavated from the gas tankpit yeilded 15 ppm TPH as gas and 1,100 ppb total xylenes. The soil from the gas tankpit was called medium sand.

[redacted] he sampling methods used are unknown to this company. It is not known to this company where the excavated soil ended up. The tank removal permits have not been provided to ASE.

The complete Giles report has not been provided to ASE and it can be stated only that soil contamination was apparent at the fill ends of the gas tank cluster at about 10 feet depth. The soils encountered during drilling were logged as clayey silt, sandy silt, and gravelly silt from grade to as much as 20 feet depth.

From the information gathered thusfar, it appears that no utilities or problems were encountered during any of the previous investigative work, though USA will be notified as required before commencement of further underground work.

Monitoring well construction permits will be obtained before monitoring well drilling is initiated.

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, and analysis of soils and groundwater at the site.

A,B. Describe Method/Technique for Determining the Extent of Soil Contamination on site:

Boring Methods, Numbers, Locations, Abandonment

To determine the extent of soil and groundwater contamination present at the site, [redacted] The United Soil Classification System will be used by a geologist to make a continuous log of each boring. A Mobile B-61 or B-57 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 as much as 25 feet.

A monitoring well (MW-1) will be drilled and installed near the southwest corner of the building and the waste oil tankpit (Figure 2). MW-2 will be located within 20 feet northeast of the gas tankpit. MW-3 is to be drilled at a point south of the gas tankpit very near the south property line and Castro Valley Blvd.

All three wells will be constructed of 2 inch Schedule 40 PVC casing, with up to 10 feet of .010" slotted schedule 40 PVC, up to 2 feet above the first water level to allow for seasonal fluctuations (Figure 4). 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 water. The seal will be finished up to the surface with cement, and a locking cap and surface cover will be installed. The wells will be surveyed by a Registered Land Surveyor and water level measurements taken. The local groundwater gradient will be determined from the elevations of groundwater at the three well locations.

It has been established that the tankpit area soils and groundwater have been impacted by motorfuel contamination. Four soil borings (B-1 through B-4) will be drilled to 13 feet maximum and sampled at locations which, with the monitoring wells, will have made a perimeter around the entire site. B-1 will be drilled just south of the location of the formerly stockpiled soils. B-2 will be drilled in the vicinity of the pump islands. B-3 and B-4 will be located east of the tankpit and east of the building, respectively, near the western and eastern property lines.

The four 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.

Soil Classification and Sampling Methods

Each boring will be continuously logged on site by a geologist using the United Soil Classification System. Undisturbed soil samples will be taken at 5 foot intervals with a hammer driven California Split Spoon sampler as drilling progresses, starting at 5 feet depth. 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

Soil samples obtained during drilling will be screened with an organic vapor analyzer in the field and all samples yeilding a positive reading of any kind will be submitted for analysis.

Soil cuttings generated during drilling will be stored with plastic sheeting beneath and over the soil, pending lab analyses for later disposal. On site treatment of contaminated soils is not a part of the workplan.

D. Security Measures

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

The three monitoring wells essentially surround the tankpit at distances from points with known contamination to show that whatever groundwater contamination may exist has not migrated offsite. The three wells are located 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-1, 2, 3 will be drilled as described above. All three wells will be constructed of 2 inch Schedule 40 PVC casing, with 10 feet of .010" slotted schedule 40 PVC (Figure 4). 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 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 the bailing of water into drums until the water appears to be reasonably clear. The water's clearness will be determined subjectively as bailing proceeds. The wells will be sampled as per Pratt Consulting Company's Monitoring Well Protocol of April, 1989 (Appendix B).

[redacted]

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 wells will be surveyed by a Registered Land Surveyor to an established benchmark to .01 feet accuracy. Water level measurements will be taken as per Pratt Consulting Co. protocol.

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 will be on site at all times, along with a map which will show the location of nearby medical facilities.

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.

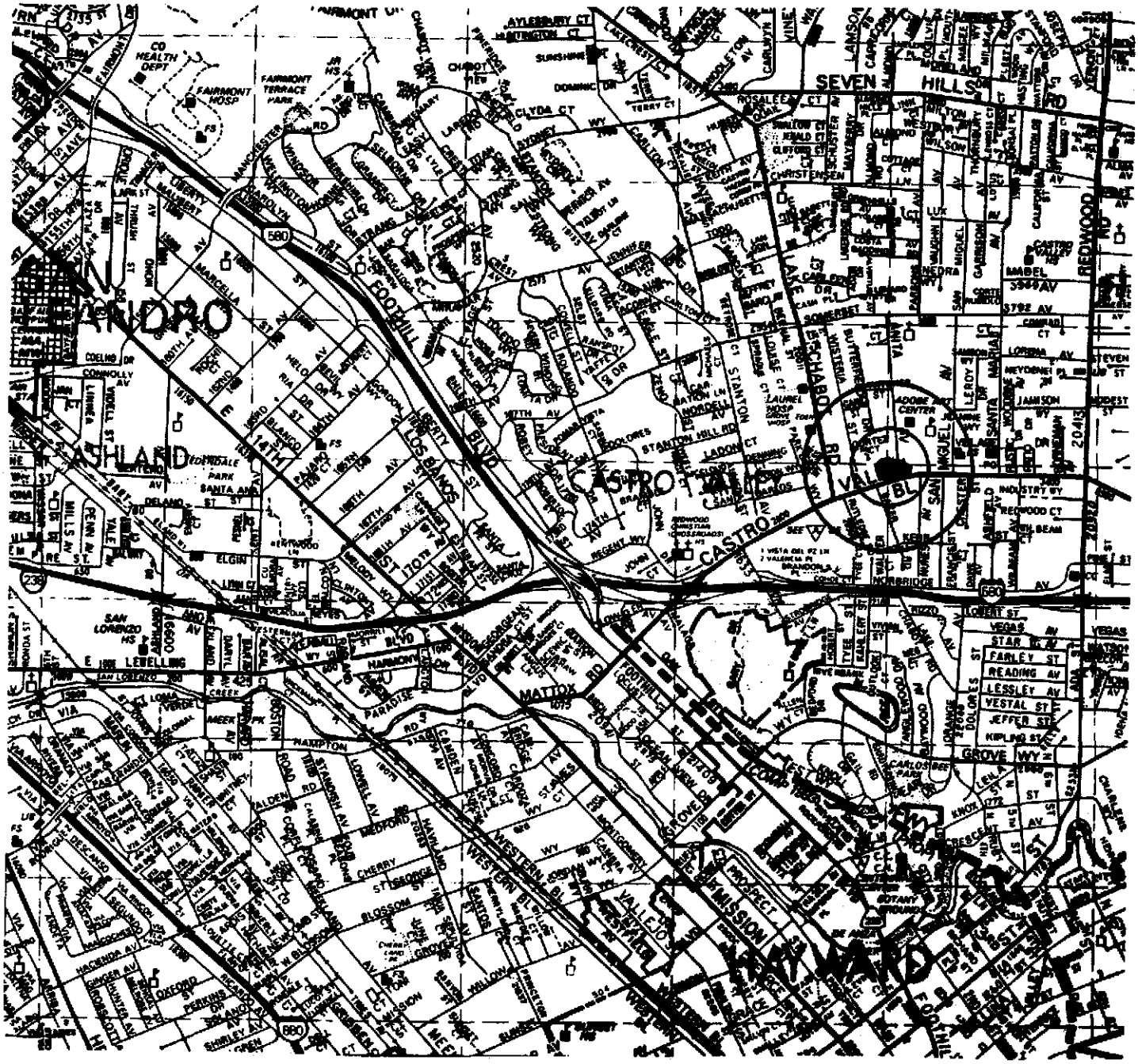
Drilling will not be conducted during lightning storms. If, during drilling, product odors emanating from the hole are deemed to be substantial, drilling personnel will wear Tyvek suits and rubber gloves. Respirators equipped with organic vapor cartridges may be worn as well under these drilling conditions.

REPORTING

A complete 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 the investigation. The report will be submitted under the seal of a qualified, California-Registered Civil Engineer.

Figure 1

Site Location Map



Site Location

from Thomas Bros., 1988

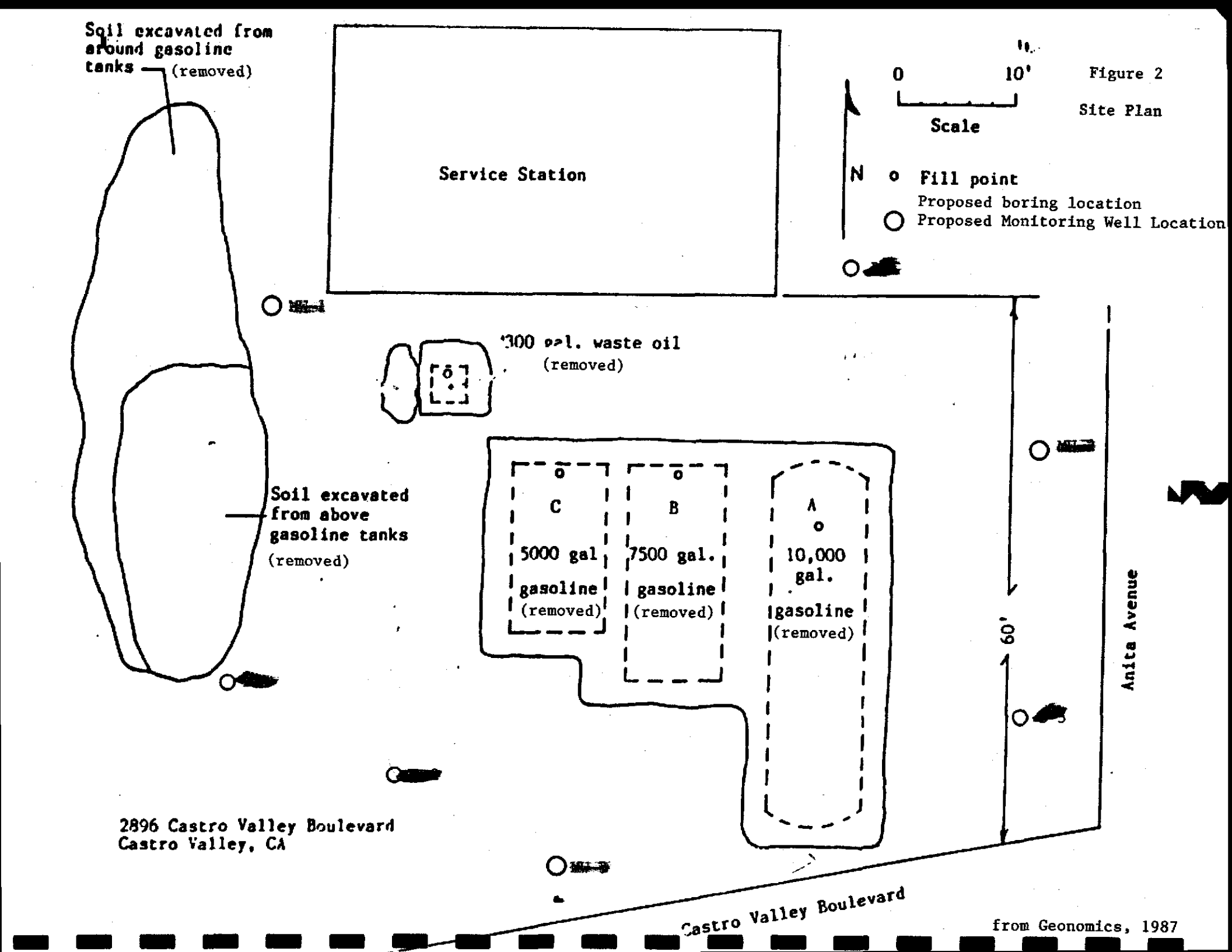
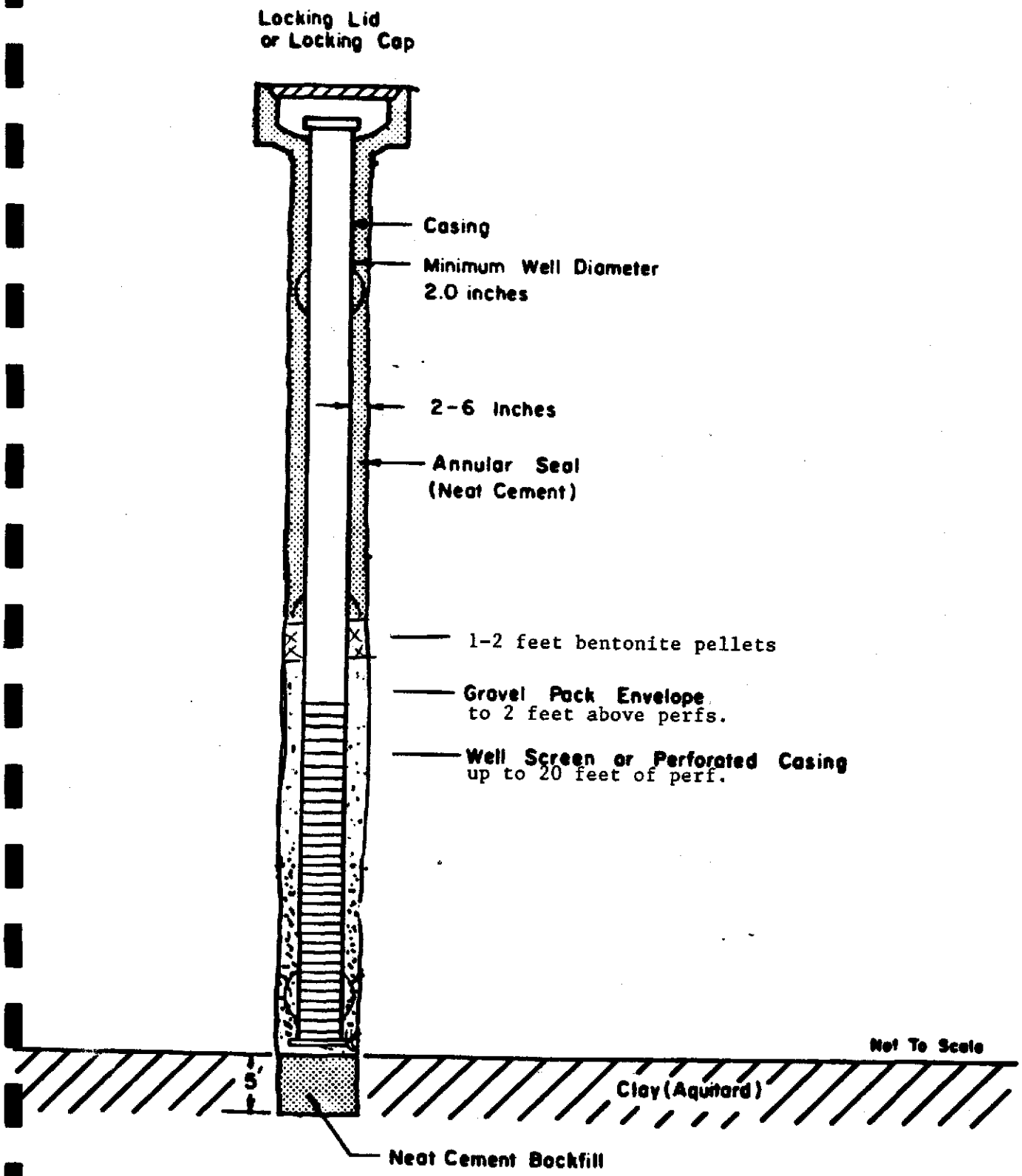

Soil excavated from around gasoline tanks (removed)
Service Station
0
10'
Scale
Figure 2
Site Plan
N
Fill point
Proposed boring location
Proposed Monitoring Well Location
300 gal. waste oil (removed)
Soil excavated from above gasoline tanks (removed)
C
5000 gal gasoline (removed)
B
7500 gal. gasoline (removed)
A
10,000 gal. gasoline (removed)
60'
Anita Avenue
2896 Castro Valley Boulevard
Castro Valley, CA
Castro Valley Boulevard
from Geonomics, 1987

Figure 3

Typical Monitoring Well



TYPICAL MONITORING FACILITY

APPENDIX A

PREVIOUS INVESTIGATIVE WORK

Suite 212
100 West Rincon Avenue
Campbell, CA 95008

Geonomics Inc.
ENVIRONMENTAL SERVICES DIVISION

(408) 374-9116

[redacted]

Mr. Dennis Wade
Battalion Chief
Castro Valley Fire Protection District
20336 San Miguel Avenue
Castro Valley, CA 94546

Dear Chief Wade:

[redacted] at 2896 Castro Valley Blvd., Castro Valley, CA. The tank removal work was performed on June 16, 1987.

If you have any questions after reading the report, please feel free to call our office.

Sincerely,

Frank W. Smith
Geologist

Enclosure

Suite 212
100 West Rincon Avenue
Campbell, CA 95008

Geonomics Inc.
ENVIRONMENTAL SERVICES DIVISION

(408) 374-9116

June 30, 1987

Soil Sampling Report - Underground Storage Tanks

Site address: 2896 Castro Valley Blvd., Castro Valley, CA

Type of work performed: Soil samples taken for laboratory testing during removal of underground storage tanks.

Date sampled: 6/16/87

Number of tanks removed: 4

Tank - capacity (approx.), contents, type, depth to bottom:

A: 10,000 gal., gasoline, fiberglass, 12'
B: 7,500 gal., gasoline, unwrapped steel, 12'
C: 5,000 gal., gasoline, unwrapped steel, 12'
D: 300 gal., waste oil, unwrapped steel, 5'

Soil samples:

Note: [redacted] approximately 1 foot above the bott[redacted] The two composite samples were collected at the request of Castro Valley Fire Department Battalion Chief, Dennis Wade.

Sample #	Depth(ft)	Location description (See attached Site Map)
TP147A-1	11.0	Native soil adjacent to fill end of tank [redacted] 10,000 gas
TP147A-2	11.0	Native soil adjacent to end opposite fill end of tank [redacted] " "
TP147B-1	11.0	Native soil adjacent to fill end of tank [redacted] 7500 gas
TP147B-2	11.0	Native soil adjacent to end opposite fill end of tank [redacted] "
TP147C-1	11.0	Native soil adjacent to fill end of tank [redacted] 5000 gas
TP147C-2	11.0	Native soil adjacent to end opposite fill end of tank [redacted] "

Soil samples (Continued):

TP147D	[redacted]	Native soil below center of tank [redacted]
TP147E	N/A	Composite sample of backfill soil excavated from around gasoline tanks.
TP147F	N/A	Composite sample of backfill soil excavated from around waste oil tank.

Condition of tanks:

A: Good condition, no holes observed.

[redacted] ich was connected to the fill riser.

C: Some rust noted at waterline, approx. one foot above bottom, otherwise good condition.

[redacted]

Condition of soil taken for samples from excavation pit:

[redacted] All native soil samples were silty clay. Samples TP147A-1, A-2, and B-2 had no noticeable petroleum odor. Samples TP147B-1, C-1, and C-2 contained a slight petroleum odor.

[redacted]

Laboratory results: (lab report attached)

Sample Number	Tested for:	Test results (ug/g = ppm) (ug/kg = ppb)
Tank A 10000 gal gas [redacted]	Total hydrocarbons (gasoline)	U*
	Benzene	U
	Toluene	U
	Total xylenes	U
[redacted]	Total hydrocarbons (gasoline)	U
	Benzene	U
	Toluene	U
	Total xylenes	U
Tank B 7500 gal gas [redacted]	Total hydrocarbons (gasoline)	U
	Benzene	U
	Toluene	U
	Total xylenes	U
[redacted]	Total hydrocarbons (gasoline)	U
	Benzene	U
	Toluene	U
	Total xylenes	U

Laboratory results (Continued):

Tank C
5000 gal
gas

[redacted]

Total hydrocarbons (gasoline)	U
Benzene	U
Toluene	U
Total xylenes	U

[redacted]

Total hydrocarbons (gasoline)	[redacted]
Benzene	U
Toluene	0.2 ppm
Total xylenes	2.2 ppm

Tank D
300 gal
waste oil

[redacted]

Diesel/waste oil	[redacted]
Total oil & grease	

EPA 8240 Volatile hydrocarbons (Priority pollutants).
Those detected were:

Benzene	[redacted]
Toluene	
Ethylbenzene	
Total xylenes	

TP147E

Total hydrocarbons (gasoline)	[redacted]
Benzene	U
Toluene	U
Total xylenes	1.1 ppm

TP147F

Diesel/waste oil	2,900 ppm
Total oil & grease	7,100 ppm

EPA 8240 Volatile hydrocarbons (Priority pollutants).
None detected

* U = The compound was analyzed for but was not detected.

(Rev. 5/20/87)

ANAMETRIX, INC.
GC/MS SPECIALISTS
ENVIRONMENTAL • ANALYTICAL SERVICES
2754 AIELLO DRIVE • SAN JOSE, CA 95111 • (408) 629-1131

June 26, 1987
Work Order Number 8706061
Date Received 6/17/87
PO No. NA

Frank Smith
Geonomics Inc.
100 W. Rincon Ave. #212
Campbell, CA 95008

Nine soil samples were received for analysis, seven for total volatile hydrocarbons and BTX by GC and two for volatile hydrocarbons, total extractable hydrocarbons and waste oil by GC and GC/MS using the following EPA method(s):

ANAMETRIX I.D.	SAMPLE I.D.	METHOD(S)
8706061-01	TP147-A1	5020
-02	A2	"
-03	B1	"
-04	B2	"
-05	C1	"
-06	C2	"
-07	D	8240/3550/503A
-08	E	5020
-09	F	8240/3550/503A

RESULTS

See enclosed data sheets, Forms 1-1 thru 2-12.

EXTRA COMPOUNDS

See enclosed data sheet, Form 4-1.

QUALITY ASSURANCE REPORTS

See enclosed data sheet, Form 5-2.

If there is any more that we can do, please give us a call. Thank you for using ANAMETRIX, INC.

Sincerely,

Paul Gowan

Paul Gowan
GC/MS Supervisor

PBG/qp

Date sampled : 6-16-87
Date extracted : NA
Date analyzed : 6-19-87
Weight extracted : NA

Analyst :
Supervisor : [illegible]
Date released : 6-26-87

CAS #	Compound Name	Det. Limit (ug/g)	(ug/g)	Q
71-43-2	Benzene	0.2		U
108-88-3	Toluene	0.2		U
	Total Xylenes	0.2		U
	Gasoline	10		U
	Diesel / Waste Oil	10		NR
	Total Oil & Grease	30		NR

For reporting purposes, the following qualifiers (Q) are used:
+ : A value greater than or equal to the method detection limit.
U : The compound was analyzed for but was not detected.
NR: Not requested.

Form 2-1.

ORGANIC ANALYSIS DATA SHEET - HYDROCARBON COMPOUNDS

Sample I.D. : TP147-A1 SPIKE % RECOVERY
Matrix : SOIL
Date sampled : 6-16-87
Date extracted : NA
Date analyzed : 6-22-87
Weight extracted : NA

Anametrix I.D. : 8706061 01
Analyst :
Supervisor : [illegible]
Date released : 6-26-87

CAS #	Compound Name	Det. Limit (ug/g)	(ug/g)	Q
71-43-2	Benzene	0.2		NR
108-88-3	Toluene	0.2		NR
	Total Xylenes	0.2		NR
	Gasoline	10	97%	+
	Diesel / Waste Oil	10		NR
	Total Oil & Grease	30		NR

For reporting purposes, the following qualifiers (Q) are used:
+ : A value greater than or equal to the method detection limit.
U : The compound was analyzed for but was not detected.
NR: Not requested.

Form 2-2.

Sample I.D. : TP147-A2
Matrix : SOIL
Date sampled : 6-16-87
Date extracted : NA
Date analyzed : 6-19-87
Weight extracted : NA

Anametrix I.D. : 8706061-02
Analyst : [illegible]
Supervisor : [illegible]
Date released : 6-26-87

CAS #	Compound Name	Det. Limit (ug/g)	(ug/g)	Q
71-43-2	Benzene	0.2		U
108-88-3	Toluene	0.2		U
	Total Xylenes	0.2		U
	Gasoline	10		U
	Diesel / Waste Oil	10		NR
	Total Oil & Grease	30		NR

For reporting purposes, the following qualifiers (Q) are used:
+ : A value greater than or equal to the method detection limit.
U : The compound was analyzed for but was not detected.
NR: Not requested.

Form 2-3.

ORGANIC ANALYSIS DATA SHEET - HYDROCARBON COMPOUNDS

Sample I.D. : TP147-B1
Matrix : SOIL
Date sampled : 6-16-87
Date extracted : NA
Date analyzed : 6-19-87
Weight extracted : NA

Anametrix I.D. : 8706061-03
Analyst : [illegible]
Supervisor : [illegible]
Date released : 6-26-87

CAS #	Compound Name	Det. Limit (ug/g)	(ug/g)	Q
71-43-2	Benzene	0.2		U
108-88-3	Toluene	0.2		U
	Total Xylenes	0.2		U
	Gasoline	10		U
	Diesel / Waste Oil	10		NR
	Total Oil & Grease	30		NR

For reporting purposes, the following qualifiers (Q) are used:
+ : A value greater than or equal to the method detection limit.
U : The compound was analyzed for but was not detected.
NR: Not requested.

Form 2-4.

Date extracted : NA
Date analyzed : 6-22-87
Weight extracted : NA

Analyst : 8706061-04
Supervisor :
Date released : 6-26-87

CAS #	Compound Name	Det. Limit (ug/g)	(ug/g)	Q
71-43-2	Benzene	0.2		U
108-88-3	Toluene	0.2		U
	Total Xylenes	0.2		U
	Gasoline	10		U
	Diesel / Waste Oil	10		U
	Total Oil & Grease	30		NR
				NR

For reporting purposes, the following qualifiers (Q) are used:
+ : A value greater than or equal to the method detection limit.
U : The compound was analyzed for but was not detected.
NR: Not requested.

Form 2-5.

ORGANIC ANALYSIS DATA SHEET - HYDROCARBON COMPOUNDS

Sample I.D. : TP147-C1
Matrix : SOIL
Date sampled : 6-16-87
Date extracted : NA
Date analyzed : 6-22-87
Weight extracted : NA

Anametrix I.D. : 8706061-05
Analyst :
Supervisor :
Date released : 6-26-87

CAS #	Compound Name	Det. Limit (ug/g)	(ug/g)	Q
71-43-2	Benzene	0.2		U
108-88-3	Toluene	0.2		U
	Total Xylenes	0.2		U
	Gasoline	10		U
	Diesel / Waste Oil	10		U
	Total Oil & Grease	30		NR
				NR

For reporting purposes, the following qualifiers (Q) are used:
+ : A value greater than or equal to the method detection limit.
U : The compound was analyzed for but was not detected.
NR: Not requested.

Form 2-6.

Matrix : SOIL
Date sampled : 6-16-87
Date extracted : NA
Date analyzed : 6-22-87
Weight extracted : NA

Analyst :
Supervisor :
Date released : 6-26-87

CAS #	Compound Name	Det. Limit (ug/g)	(ug/g)	Q
71-43-2	Benzene	0.2		U
108-88-3	Toluene	0.2	0.2	+
	Total Xylenes	0.2	2.2	+
	Gasoline	10	100	+
	Diesel / Waste Oil	10		NR
	Total Oil & Grease	30		NR

For reporting purposes, the following qualifiers (Q) are used:
+ : A value greater than or equal to the method detection limit.
U : The compound was analyzed for but was not detected.
NR: Not requested.

Form 2-7.

ORGANIC ANALYSIS DATA SHEET - HYDROCARBON COMPOUNDS

Sample I.D. : TP147-C2 DUPLICATE
Matrix : SOIL
Date sampled : 6-16-87
Date extracted : NA
Date analyzed : 6-22-87
Weight extracted : NA

Anametrix I.D. : 8706061-06
Analyst :
Supervisor :
Date released : 6-26-87

CAS #	Compound Name	Det. Limit (ug/g)	(ug/g)	Q
71-43-2	Benzene	0.2		U
108-88-3	Toluene	0.2	0.2	+
	Total Xylenes	0.2	5.9	+
	Gasoline	10	135	+
	Diesel / Waste Oil	10		NR
	Total Oil & Grease	30		NR

For reporting purposes, the following qualifiers (Q) are used:
+ : A value greater than or equal to the method detection limit.
U : The compound was analyzed for but was not detected.
NR: Not requested.

Form 2-8.

Matrix : SOIL
Date sampled : 6-16-87
Date extracted : 6-18-87
Date analyzed : 6-19-87
Weight extracted : 30 g

Analyst :
Supervisor :
Date released : 6-26-87

CAS #	Compound Name	Det. Limit (ug/g	(ug/g)	Q
71-43-2	Benzene	0.1		NR
108-88-3	Toluene	0.		NR
	Total Xylenes	0.		NR
	Gasoline	10		NR
	Diesel / Waste Oil	10	5300	+
	Total Oil & Grease	30	16000	+

For reporting purposes, the following qualifiers (Q) are used:
+ : A value greater than or equal to the methoetection limit.
U : The compound was analyzed for but was not ected.
NR: Not requested.

Form 2-9.

ORGANIC ANALYSIS DATA SHEET - HYDROCARBON POUNDS

Sample I.D. : TP147-D DUPLICATE
Matrix : SOIL
Date sampled : 6-16-87
Date extracted : 6-18-87
Date analyzed : 6-19-87
Weight extracted : 30 g

Anam I.D. : 8706061-07
Anal :
Supe r : JMS
Date ased : 6-26-87

CAS #	Compound Name	Det Lim (ug ug/g)	Q
71-43-2	Benzene	0	NR
108-88-3	Toluene	0	NR
	Total Xylenes	0	NR
	Gasoline	1	NR
	Diesel / Waste Oil	16900	+
	Total Oil & Grease	318000	+

For reporting purposes, the following qualifiers (Q) ed:
+ : A value greater than or equal to the metho tion limit.
U : The compound was analyzed for but was not d.
NR: Not requested.

Form 2-10.

Matrix : SOIL
Date sampled : 6-16-87
Date analyzed : 6-25-87
Dilution : 1:10

Analyst : kM
Supervisor : [illegible]
Date released : 6-26-87

CAS #	Compound Name	Det. Limit (ug/kg)	(ug/kg)	Q
74-87-3	* Chloromethane	70		U
74-83-9	* Bromomethane	70		U
75-01-4	* Vinyl Chloride	70		U
75-00-3	* Chloroethane	70		U
75-09-2	* Methylene Chloride	20		U
67-64-1	**Acetone	100		U
79-69-4	* Trichlorofluoromethane	20		U
75-15-0	**Carbondisulfide	20		U
75-35-4	* 1,1-Dichloroethene	20		U
75-34-3	* 1,1-Dichloroethane	20		U
156-60-5	* Trans-1,2-Dichloroethene	20		U
156-59-2	* Cis-1,2-Dichloroethene	20		U
67-66-3	* Chloroform	20		U
76-13-1	# Trichlorotrifluoroethane	20		U
107-06-2	* 1,2-Dichloroethane	20		U
78-93-3	**2-Butanone	100		U
71-55-6	* 1,1,1-Trichloroethane	20		U
56-23-5	* Carbon Tetrachloride	20		U
108-05-4	**Vinyl Acetate	100		U
75-27-4	* Bromodichloromethane	20		U
78-87-5	* 1,2-Dichloropropane	20		U
10061-02-6	* Trans-1,3-Dichloropropene	20		U
79-01-6	* Trichloroethene	20		U
124-48-1	* Dibromochloromethane	20		U
79-00-5	* 1,1,2-Trichloroethane	20		U
71-43-2	* Benzene	20	220	+
10061-01-5	* cis-1,3-Dichloropropene	20		U
110-75-8	* 2-Chloroethylvinylether	20		U
75-25-2	* Bromoform	20		U
591-78-6	**2-Hexanone	100		U
108-10-1	**4-Methyl-2-Pentanone	100		U
127-18-4	* Tetrachloroethene	20		U
79-34-5	* 1,1,2,2-Tetrachloroethane	20		U
108-88-3	* Toluene	20	90	+
108-90-7	* Chlorobenzene	20		U
100-41-4	* Ethylbenzene	20	300	+
100-42-5	**Styrene	20		U
	**Total Xylenes	20	1500	+
541-73-1	* 1,3-Dichlorobenzene	20		U
95-50-1	* 1,2-Dichlorobenzene	20		U
106-46-7	* 1,4-Dichlorobenzene	20		U

* A 624/8240 approved compound (Federal Register, 10/26/84)
** A compound on the U.S. EPA CLP Hazardous Substance List (HSL)
\# A compound added by Anametrix, Inc.

For reporting purposes, the following qualifiers (Q) are used:
+ : A value greater than or equal to the method detection limit.
U : The compound was analyzed for but was not detected.

Form 1-1.

Sample I.D.	: TP147-D 1:10 DILUTION		Anametrix I.D.	:	8706061-07
Matrix	: SOIL		Analyst	:	WH
Date Sampled	: 6-16-87		Supervisor	:	PG
Analyzed VOA	: 6-25-87		Date Released	:	6-26-87
Analyzed SV	: NA				

	CAS #	Scan#	Volatile Fraction Compound Name	Det. Limit ppb	ppb
1	107-83-5	181	2-methylpentane	50	600
2	594-82-1	319	2,2,3,3-tetramethylbutane	50	440
3	111-84-2	825	nonane	50	630
4	124-18-5	1090	decane	50	1400
5	526-73-8	1204	1,2,3-trimethylbenzene	50	1100
6	1120-21-4	1338	undecane	50	710
7				50	
				50	
9				50	
10				50	

	CAS #	Scan#	Semivolatile Fraction Compound Name	Det. Limit ppb	ppb
1				10	
2				10	
3				10	
4				10	
5				10	
6				10	
7				10	
8				10	
9				10	
10				10	
11				10	
12				10	
13				10	
14				10	
15				10	
16				10	
17				10	
18				10	
19				10	
20				10	

Tentatively identified compounds are significant chromatographic peaks (TICs) other than priority pollutants. TIC spectra are compared with entries in the National Bureau of Standards mass spectral library. Identification is made by following US EPA guidelines and acceptance criteria. TICs are quantitated by using the area of the nearest interna standard and assuming a response factor of one (1). Values calculated ar ESTIMATES ONLY.

Form 4-1.

Matrix : SOIL
Date sampled : 6-16-87
Date extracted : NA
Date analyzed : 6-22-87
Weight extracted : NA

Analyst : [illegible]
Supervisor : [illegible]
Date released : 6-26-87

CAS #	Compound Name	Det. Limit (ug/g)	(ug/g)	Q
71-43-2	Benzene	0.2		U
108-88-3	Toluene	0.2		U
	Total Xylenes	0.2	1.1	+
	Gasoline	10	15	+
	Diesel / Waste Oil	10		NR
	Total Oil & Grease	30		NR

For reporting purposes, the following qualifiers (Q) are used:
+ : A value greater than or equal to the method detection limit.
U : The compound was analyzed for but was not detected.
NR: Not requested.

Form 2-11.

ORGANIC ANALYSIS DATA SHEET - HYDROCARBON COMPOUNDS

Sample I.D. : TP147-F
Matrix : SOIL
Date sampled : 6-16-87
Date extracted : 6-18-87
Date analyzed : 6-22-87
Weight extracted : 30 g

Anametrix I.D. : 8706061-09
Analyst : [illegible]
Supervisor : [illegible]
Date released : 6-26-87

CAS #	Compound Name	Det. Limit (ug/g)	(ug/g)	Q
71-43-2	Benzene	0.2		NR
108-88-3	Toluene	0.2		NR
	Total Xylenes	0.2		NR
	Gasoline	10		NR
	Diesel / Waste Oil	10	2900	+
	Total Oil & Grease	30	7100	+

For reporting purposes, the following qualifiers (Q) are used:
+ : A value greater than or equal to the method detection limit.
U : The compound was analyzed for but was not detected.
NR: Not requested.

Form 2-12.

Sample I.D. : TP147-F
Matrix : SOIL
Date sampled : 6-16-87
Date analyzed : 6-25-87
Dilution : NONE

Anametrix I.D. : 8706061-09
Analyst : MM
Supervisor : RG
Date released : 6-26-87

CAS #	Compound Name	Det. Limit (ug/kg)	(ug/kg)	Q
74-87-3	* Chloromethane	7		U
74-83-9	* Bromomethane	7		U
75-01-4	* Vinyl Chloride	7		U
75-00-3	* Chloroethane	7		U
75-09-2	* Methylene Chloride	2		U
67-64-1	**Acetone	10		U
79-69-4	* Trichlorofluoromethane	2		U
75-15-0	**Carbondisulfide	2		U
75-35-4	* 1,1-Dichloroethene	2		U
75-34-3	* 1,1-Dichloroethane	2		U
156-60-5	* Trans-1,2-Dichloroethene	2		U
156-59-2	* Cis-1,2-Dichloroethene	2		U
67-66-3	* Chloroform	2		U
76-13-1	# Trichlorotrifluoroethane	2		U
107-06-2	* 1,2-Dichloroethane	2		U
78-93-3	**2-Butanone	10		U
71-55-6	* 1,1,1-Trichloroethane	2		U
56-23-5	* Carbon Tetrachloride	2		U
108-05-4	**Vinyl Acetate	10		U
75-27-4	* Bromodichloromethane	2		U
78-87-5	* 1,2-Dichloropropane	2		U
10061-02-6	* Trans-1,3-Dichloropropene	2		U
79-01-6	* Trichloroethene	2		U
124-48-1	* Dibromochloromethane	2		U
79-00-5	* 1,1,2-Trichloroethane	2		U
71-43-2	* Benzene	2		U
10061-01-5	* cis-1,3-Dichloropropene	2		U
110-75-8	* 2-Chloroethylvinylether	2		U
75-25-2	* Bromoform	2		U
591-78-6	**2-Hexanone	10		U
108-10-1	**4-Methyl-2-Pentanone	10		U
127-18-4	* Tetrachloroethene	2		U
79-34-5	* 1,1,2,2-Tetrachloroethane	2		U
108-88-3	* Toluene	2		U
108-90-7	* Chlorobenzene	2		U
100-41-4	* Ethylbenzene	2		U
100-42-5	**Styrene	2		U
	**Total Xylenes	2		U
541-73-1	* 1,3-Dichlorobenzene	2		U
95-50-1	* 1,2-Dichlorobenzene	2		U
106-46-7	* 1,4-Dichlorobenzene	2		U

* A 624/8240 approved compound (Federal Register, 10/26/84)
** A compound on the U.S. EPA CLP Hazardous Substance List (HSL)
\# A compound added by Anametrix, Inc.

For reporting purposes, the following qualifiers (Q) are used:
+ : A value greater than or equal to the method detection limit.
U : The compound was analyzed for but was not detected.

Form 1-2.

SOIL VOLATILE/SEMIVOLATILE SURROGATE RECOVERY SUMMARY

ANAMETRIX WORKORDER# : 8706061
CLIENT PROJECT# : 308-TP147

SUPERVISOR : PG
ANALYST : KM

#	SAMPLE ID	VO1 (DCE)	VO2 (TOL)	VO3 (BFB)	A1 (2FP)	A2 (PHL)	A3 (TBP)	BN1 (NBZ)	BN2 (FBH)	BN3 (TPH)	TOTAL OUT
01	TP-147-D	103	109	113							
02	TP-147-F	97	96	79							0
03											0
04											
05											
06											
07											
08											
09											
10											
11											
12											
13											
14											
15											
16											
17											
18											
19											
20											
21											
22											
23											
24											
25											
26											
27											
28											
29											
30											

ANAMETRIX PERCENT RECOVERY LIMITS
(generated from sample data)

VO1	(DCE)	= 1,2-DICHLOROETHANE-D4	84-125%
VO2	(TOL)	= TOLUENE-D8	78-130%
VO3	(BFB)	= 4-BROMOFLUOROBENZENE	70-118%
A1	(2FP)	= 2-FLUOROPHENOL	24-82%
A2	(PHL)	= PHENOL-D5	27-94%
A3	(TBP)	= 2,4,6-TRIBROMOPHENOL	31-118%
BN1	(NBZ)	= NITROBENZENE-D5	21-75%
BN2	(FBH)	= 2-FLUOROBIPHENYL	29-87%
BN3	(TPH)	= TERPHENYL-D14	31-127%

(Laboratory Name)

408/374-9116

Attention: FRANK

CHAIN OF CUSTODY RECORD

PROJ. NO.	Site Name & Address
308-TP147	2896 CASTRO VALLEY BLVD.

SAMPLERS: (Signature) Frank Smith

Sample No.	DATE	TIME	Soil	Water	Location of Sample	NO OF CONTAINERS	Analyses Requested: TVH & BTX *	TEH *	VOC - EPA 8240 *	TOG EPA 503E *	REMARKS
TP147 A1	6/14/87		X			1	X				GASOLINE
TP147 A2	"		X			1	X				"
TP147 B1	"		X			1	X				"
TP147 B2	"		X			1	X				"
TP147 C1	"		X			1	X				"
TP147 C2	"		X			1	X				"
TP147 D	"		X			1		X	X	X	WASTE OIL
TP147 E	"		X			1	X				GASOLINE
TP147 F	"		X			1		X	X	X	WASTE OIL

Relinquished by: (Signature)	Date / Time	Received by: (Signature)	Relinquished by: (Signature)	Date / Time	Received by: (Signature)
Frank Smith	6/17/87 1100	M. Hasselman			
Relinquished by: (Signature)	Date / Time	Received by: (Signature)	Relinquished by: (Signature)	Date / Time	Received by: (Signature)
Relinquished by: (Signature)	Date / Time	Received for Laboratory by: (Signature)	Date / Time	Remarks: * Per RWQCB Guidelines	

jha
Geotechnical Consultants, Inc.
22654 Watkins Street • Hayward, California 94541 • (415) 582-1850

7910100

7857000

Howard D. Barlow P.E.

Project No. H86078-A28E4

Mr. Dick Bigelow
20656 Redwood Road
Castro Valley, California 94546

SUBJECT: Underground Tests
Soil Sampling and Hydrocarbon Testing
2896 Castro Valley Boulevard
Castro Valley, California

Dear Mr. Bigelow:

In accordance with our agreement, we have obtained a soil sample for hydrocarbon testing adjacent to each of the four existing underground storage tanks at the above referenced site. Three tanks contain gasoline and one tank contains waste oil.

The site was sampled using a mobile drill rig on September 25, 1986. We obtained the soil samples from the approximate level of the bottom of the tanks at four locations indicated on the Site Sketch, Figure 1. The logs of the four borings are included as Figures 2 through 5.

The soil samples were sealed and refrigerated until delivery to the analytical laboratory. The samples were then tested for total hydrocarbons. The chemical testing was performed by BSK & Associates. The results of the tests are as follows:

Soil Sample	Total Extractable Hydrocarbons (ppm)
B-1 at 10'	--
B-2 at 10'	--
B-3 at 10'	--
B-4 at 6'	1.3

If you have any questions regarding the information contained in this letter or if we can be of any further assistance to you, please do not hesitate to contact us.

Respectfully submitted,

JHA GEOTECHNICAL CONSULTANTS, INC.

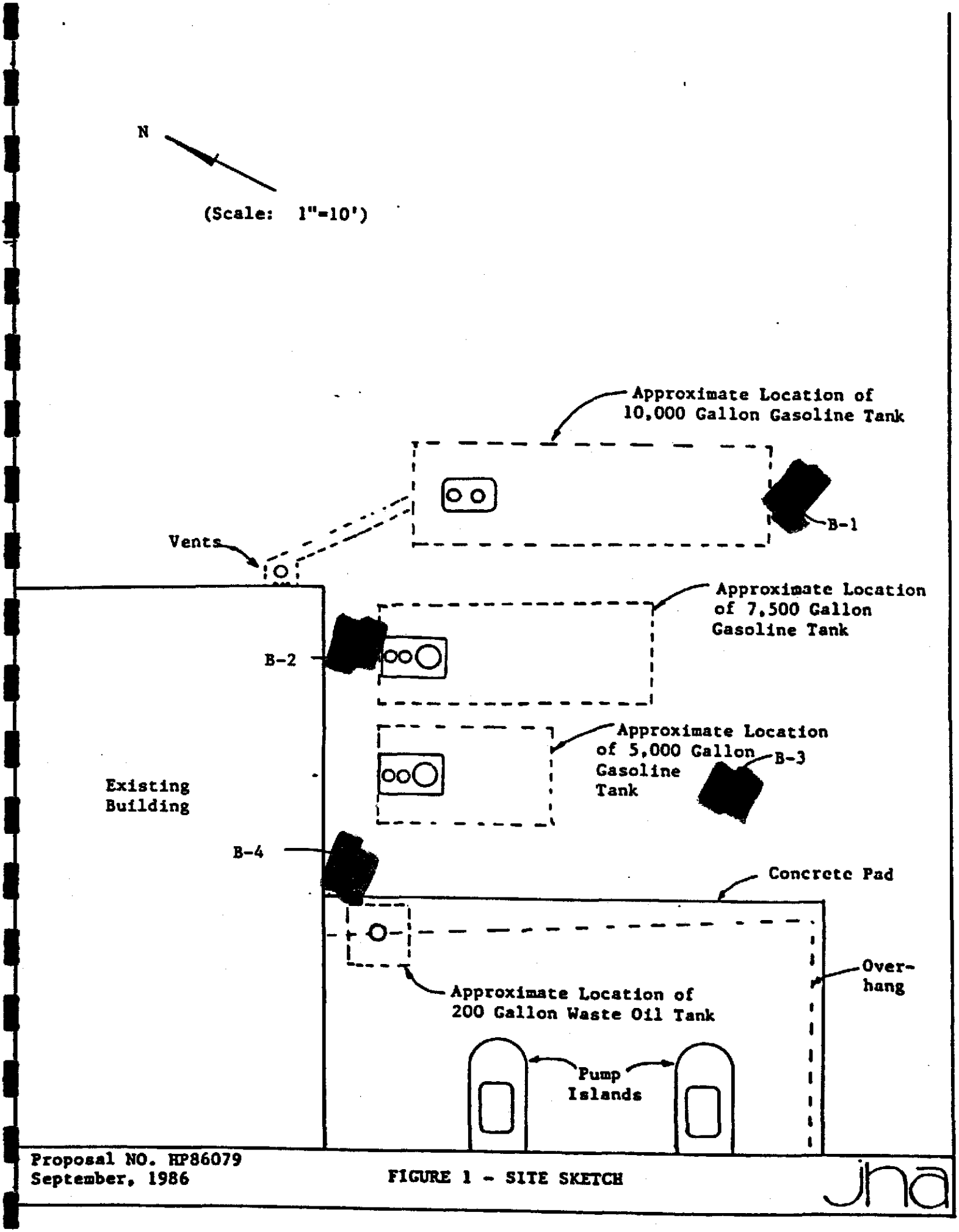
John C. Bird
Staff Geologist

Howard D. Barlow
Soil Engineer
C.E. 35734

JCB/HDB:kg
Enclosures

Distribution: Mr. Dick Bigelow (4 Copies)

jha



Proposal NO. HP86079
September, 1986

FIGURE 1 - SITE SKETCH

jna

Logged by: JCB Date: 9/25/86 Equipment: 4.5" Dia. Flight Auger Log of: [redacted]

Depth, ft.	Sample No. and Type	Symbol	MATERIAL DESCRIPTION	Unified Soil Classification	Blows/foot 350 ft-lbs.	Qu - t.s.f. Penetrometer	Dry Density p.c.f.	Moisture % dry wt.	MISC. LAB RESULTS
			Asphalt and Baserock						
1			BASEROCK: brown; dry to moist; coarse; FILL.	GP					
2									
3									
4			SANDY CLAY: brownish-black to brown; moist [redacted]	CL					
5									
6									
7									
8									
9									
10	VL								
11			Drilling terminated at 10.5'. No free groundwater encountered at time of drilling.						
12									
13									
14									
15									
16									
17									
18									
19									
20									
21									
22									
23									
24									

Stratification lines represent the approximate boundary between the engineer's description of material types and the actual transitions may be gradual and vary with time or location.

FIGURE No. 2

Logged by: JCB Date: 9/25/86 Equipment: 4.5" Dia. Flight Auger Log of [redacted]

Depth, ft.	Sample No. and Type	Symbol	MATERIAL DESCRIPTION	Unified Soil Classification	Blows/foot 350 ft-lbs.	Qu - t.s.f. Penetrometer	Dry Density p.c.f.	Moisture % dry wt.	MISC. LAB RESULTS
			Asphalt and Baserock						
1			BASEROCK: brown; dry to moist; coarse; FILL.	GP					
2									
3									
4			SANDY CLAY: brownish-black to brown; moist [redacted]	CL					
5									
6									
7									
8									
9									
10	VL								
11			Drilling terminated at 10.5'. No free groundwater encountered at time of drilling.						
12									
13									
14									
15									
16									
17									
18									
19									
20									
21									
22									
23									
24									

Stratification lines represent the approximate boundary between the engineer's description of material types and the actual transitions may be gradual and vary with time or location.

FIGURE No. 3

Logged by: JCB Date: 9/25/86 Equipment: 4.5" Dia. Flight Auger Log of: [redacted]

Depth, ft.	Sample No. and Type	Symbol	MATERIAL DESCRIPTION	Unified Soil Classification	Blows/foot 350 ft-lbs.	Qu - t.s.f. Penetrometer	Dry Density p.c.f.	Moisture % dry wt.	MISC. LAB RESULTS
			Asphalt and Baserock						
1			BASEROCK: brown; dry to moist; coarse; FILL.	GP					
2									
3									
4			SANDY CLAY: brownish-black to brown; moist [redacted]	CL					
5									
6									
7									
8									
9									
10	VL								
11			Drilling terminated at 10.5'. No free groundwater encountered at time of drilling.						
12									
13									
14									
15									
16									
17									
18									
19									
20									
21									
22									
23									
24									

Stratification lines represent the approximate boundary between the engineer's description of material types and the actual transitions may be gradual and vary with time or location.

FIGURE No. 4

Logged by: JCB Date: 9/25/86 Equipment: 4.5" Dia. Flight Auger Log of: [redacted]

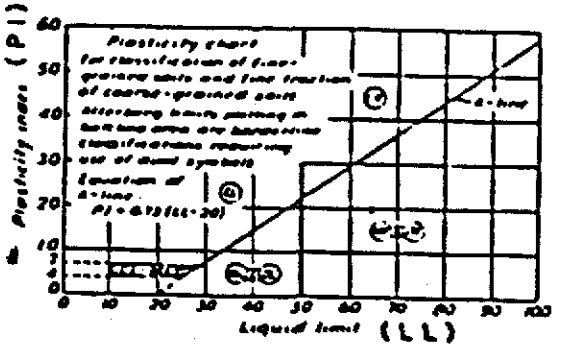
Depth, ft.	Sample No. and Type	Symbol	MATERIAL DESCRIPTION	Unified Soil Classification	Blows/foot 350 ft-lbs.	Qu - t.s.f. Penetrometer	Dry Density p.c.f.	Moisture % dry wt.	MISC. LAB RESULTS
			Asphalt and Baserock						
1			BASEROCK: brown; dry to moist; coarse; FILL.	GP					
2									
3									
4									
5			SANDY CLAY: brownish-black; moist; [redacted]	CL					
6	VL								
7			Drilling terminated at 6.5'. No free groundwater encountered at time of drilling.						
8									
9									
10									
11									
12									
13									
14									
15									
16									
17									
18									
19									
20									
21									
22									
23									
24									

Stratification lines represent the approximate boundary between the engineer's description of material types and the actual transitions may be gradual and vary with time or location.

FIGURE No. 5

UNIFIED SOIL CLASSIFICATION SYSTEM (ASTM D-2487)

Major Divisions			Group Symbols	Typical Names	Classification Criteria
Coarse-Grained Soils More than 50% retained on No. 200 sieve	Gravels More than 50% of coarse fraction retained on No. 4 sieve	Clean Gravels	GW	Well-graded gravels and gravel-sand mixtures, little or no fines	$C_u = D_{60}/D_{10}$ Greater than 4 $C_c = \frac{(D_{30})^2}{D_{10} \times D_{60}}$ Between 1 and 3
			GP	Poorly graded gravels and gravel-sand mixtures, little or no fines	Not meeting both criteria for GW
		Gravels with Fines	GM	Silty gravels, gravel-sand-silt mixtures	Atterberg limits plot below "A" line or plasticity index less than 4 — Atterberg limits plotting in hatched area are borderline classifications requiring use of dual symbols
			GC	Clayey gravels, gravel-sand-clay mixtures	Atterberg limits plot above "A" line and plasticity index greater than 7
	Sands More than 50% of coarse fraction passes No. 4 sieve	Clean Sands	SW	Well-graded sands and gravelly sands, little or no fines	$C_u = D_{60}/D_{10}$ Greater than 6 $C_c = \frac{(D_{30})^2}{D_{10} \times D_{60}}$ Between 1 and 3
			SP	Poorly graded sands and gravelly sands, little or no fines	Not meeting both criteria for SW
		Sands with Fines	SM	Silty sands, sand-silt mixtures	Atterberg limits plot below "A" line or plasticity index less than 4 — Atterberg limits plotting in hatched area are borderline classifications requiring use of dual symbols
			SC	Clayey sands, sand-clay mixtures	Atterberg limits plot above "A" line and plasticity index greater than 7
Fine-Grained Soils 50% or more passes No. 200 sieve	Silts and Clays Liquid limit 50% or less		ML	Inorganic silts, very fine sands, rock flour, silty or clayey fine sands	Classification on basis of percentage of fines: Less than 5% Pass No. 200 sieve — GW, GP, SW, SP; More than 12% Pass No. 200 sieve — GM, GC, SM, SC; 5% to 12% Pass No. 200 sieve — Borderline classification requiring use of dual symbols
			CL	Inorganic clays of low to medium plasticity, gravelly clays, sandy clays, silty clays, lean clays	
			OL	Organic silts and organic silty clays of low plasticity	
	Silts and Clays Liquid limit greater than 50%		MH	Inorganic silts, micaceous or diatomaceous fine sands or silts, elastic silts	
			CH	Inorganic clays of high plasticity, fat clays	
			OH	Organic clays of medium to high plasticity	
Highly organic soils			Pt	Peat, muck and other highly organic soils	Visual-manual identification



Other Log Symbols

— Bag or Bulk Sample

— No Recovery Using Indicated Sampler

— "Undisturbed" Sample Using Indicated Sampler

— Elevation at Which Groundwater Encountered

Soil Sampler Types

L - Bullnose (3" O.D. - 2.375" I.D.)

C - California (2.5" O.D. - 1.9" I.D.)

T - Terzaghi (2" O.D. - 1.375" I.D.)

VL - (3.25" O.D. - 2.5" I.D.)

KEY TO LOGS FIGURE NO. 6

APPENDIX

The boring logs and related information enclosed in the appendix depict subsurface conditions only at the specific locations drilled and at the particular times designated on the logs. Soil conditions at other locations may differ from conditions occurring at these boring locations. Also the passage of time may result in a change in the soil conditions at the boring locations drilled.

MINIT LUBE APPENDIX INSERT — California

GEA — GILES ENGINEERING ASSOCIATES INC

I. Foundations
   (A) Conventional spread footings
      1. Founded at nominal depth on suitable existing (natural/fill) soil
      (2) Founded at nominal depth on structural fill replacing existing unsuitable soil/materials approximately 12 feet deep, or extended
   (B) Turned-down slab or monolithically poured foundation and floor slab
      1. Founded at nominal depth on suitable existing (natural/fill) soil
      (2) Founded at nominal depth on structural fill replacing existing unsuitable soil/materials approximately 12 feet deep, or extended
   C. Moderately rigid spread footing foundations
      1. Founded at nominal depth on suitable existing (natural/fill) soil
      2. Founded at nominal depth on structural fill replacing existing unsuitable soil/materials approximately _____ feet deep, or extended
   D. Grade beam footings
      1. Founded at nominal depth on suitable existing (natural/fill) soil
      2. Founded at nominal depth on structural fill replacing existing unsuitable soil/materials approximately _____ feet deep, or extended
   E. Deep foundations
      1. Drilled piers (approximate depth _____ feet)
      2. Driven piles (approximate depth _____ feet)
   F. Post tensioned slab or waffle slab
      1. Founded at nominal depth on suitable existing (natural/fill) soil
      2. Founded at nominal depth on structural fill replacing existing unsuitable soil/materials approximately _____ feet deep, or extended

II. Floor Slab
   (A) Conventional slab-on-grade (including turned-down slab)
   B. Moderately rigid slab-on-grade
   C. Rigid heavily reinforced slab
   D. Post tensioned or waffle slab incorporated into foundation system
   E. Structural slab supported by deep foundation system
   F. Over-excavation expected for subgrade preparation (See IV Below)

III. Pavement
   (A) Conventional asphalt pavement with granular base, OR
   (B) Conventional asphalt pavement with granular base and underlying geotextile
   (C) Full-depth asphalt pavement, OR
   (E) Plain Portland Cement concrete
   F. Reinforced Portland Cement concrete
   F. Over-excavation expected for subgrade preparation (See IV Below)

IV. Site Grading and Subgrade Preparation (Also Deals with II and III Above)
   A. Topsoil stripping
   (B) Moisture sensitive soils typically resulting in undercutting during wet periods
   (C) Over-excavation due to soft subgrade soils below topsoil
   (D) Over-excavation resulting from existing fill
   E. Difficult excavation due to:
      1. Existing fill containing rubble
      2. Loose granular materials
      3. Dense soils
      4. High cobble and boulder content
      5. Shallow rock
      6. Expansive Soil
   (F) Existing structures resulting in grading/excavation problems
   G. Existing or proposed slopes, possibly requiring retaining wall
   H. Springs within existing or cut slopes requiring special drainage/de-watering
   (I) Shallow water table possibly requiring underdrain or some form of temporary or permanent subdrainage system
   J. Existing drainage swale resulting in potential significant over-excavation for proper cleaning and development of firm subgrade
   K. Lime stabilization of subgrade due to expansive or metastable soil
   L. Other _____

V. Contamination, soil/groundwater (based on odors in samples, will be substanciated and elaborated, where relative, when current preliminary chemical testing is completed).
   A. Minor/localized problem (nominal over-excavation expected)
   (B) Major problem (Recommend additional special study) POSSIBLE GROUNDWATER CONTAMINATION

VI. Additional Field Exploration Recommended
   A. Test borings (Reason _____)
   B. Water observation wells (Reason _____)
   C. Test pits (Reason _____)
   D. Special contamination assessment study (Reason _____)
   E. Other (Reason _____)

II. Seismic Consideration
   A. Special study area
   (B) Not in Alquist-Priolo Special Studies Zone to date. But in UBC Zone 4.

GEA577/kah

C-8601UB Castro Valley, [illegible]

MINIT LUBE APPENDIX INSERT

GILES ENGINEERING ASSOCIATES INC

I. Foundations
   (A) Conventional spread footings
      1. Founded at nominal depth on suitable existing (natural/fill) soil
      (2) Founded at nominal depth on structural fill replacing existing unsuitable soil/materials approximately 12 feet deep, or extended
   (B) Turned-down slab or monolithically poured foundation and floor slab
      1. Founded at nominal depth on suitable existing (natural/fill) soil
      (2) Founded at nominal depth on structural fill replacing existing unsuitable soil/materials approximately 12 feet deep, or extended
   C. Moderately rigid spread footing foundations
      1. Founded at nominal depth on suitable existing (natural/fill) soil
      2. Founded at nominal depth on structural fill replacing existing unsuitable soil/materials approximately _____ feet deep, or extended
   D. Grade beam footings
      1. Founded at nominal depth on suitable existing (natural/fill) soil
      2. Founded at nominal depth on structural fill replacing existing unsuitable soil/materials approximately _____ feet deep, or extended
   E. Deep foundations
      1. Drilled piers (approximate depth _____ feet)
      2. Driven piles (approximate depth _____ feet)
   F. Post tensioned slab or waffle slab
      1. Founded at nominal depth on suitable existing (natural/fill) soil
      2. Founded at nominal depth on structural fill replacing existing unsuitable soil/materials approximately _____ feet deep, or extended

II. Floor Slab
   (A) Conventional slab-on-grade (including turned-down slab)
   B. Moderately rigid slab-on-grade
   C. Rigid heavily reinforced slab
   D. Post tensioned or waffle slab incorporated into foundation system
   E. Structural slab supported by deep foundation system
   F. Over-excavation expected for subgrade preparation (See IV Below)

III. Pavement
   (A) Conventional asphalt pavement with granular base, OR
   B. Conventional asphalt pavement with granular base and underlying geotextile
   (C) Full-depth asphalt pavement , OR
   D. Plain Portland Cement concrete
   (E) Reinforced Portland Cement concrete
   F. Over-excavation expected for subgrade preparation (See IV Below)

IV. Site Grading and Subgrade Preparation (Also Deals with II and III Above)
   A. Topsoil stripping
   (B) Moisture sensitive soils typically resulting in undercutting during wet periods
   (C) Over-excavation due to soft subgrade soils below topsoil
   (D) Over-excavation resulting from existing fill
   E. Difficult excavation due to:
      1. Existing fill containing rubble
      2. Loose granular materials
      3. Dense soils
      4. High cobble and boulder content
      5. Shallow rock
      6. Expansive Soil
   (F) Existing structures resulting in grading/excavation problems
   G. Existing or proposed slopes, possibly requiring retaining wall
   H. Springs within existing or cut slopes requiring special drainage/de-watering
   (I) Shallow water table possibly requiring underdrain or some form of temporary or permanent subdrainage system
   J. Existing drainage swale resulting in potential significant over-excavation for proper cleaning and development of firm subgrade
   K. Lime stabilization of subgrade due to expansive or metastable soil
   L. Other _____

V. Contamination, soil/groundwater (based on odors in samples, will be substanciated and elaborated, where relative, when current preliminary chemical testing is completed).
   A. Minor/localized problem (nominal over-excavation expected)
   (B) Major problem (Recommend additional special study) POSSIBLE GROUNDWATER CONTAMINATION

VI. Additional Field Exploration Recommended
   A. Test borings (Reason _____)
   B. Water observation wells (Reason _____)
   C. Test pits (Reason _____)
   D. Special contamination assessment study (Reason _____)
   E. Other (Reason _____)

VII. Seismic Consideration
   A. Special study area
   (B) Not in Alquist-Priolo Special Studies Zone to date. But in UBC Zone 4.

GEA677/kah

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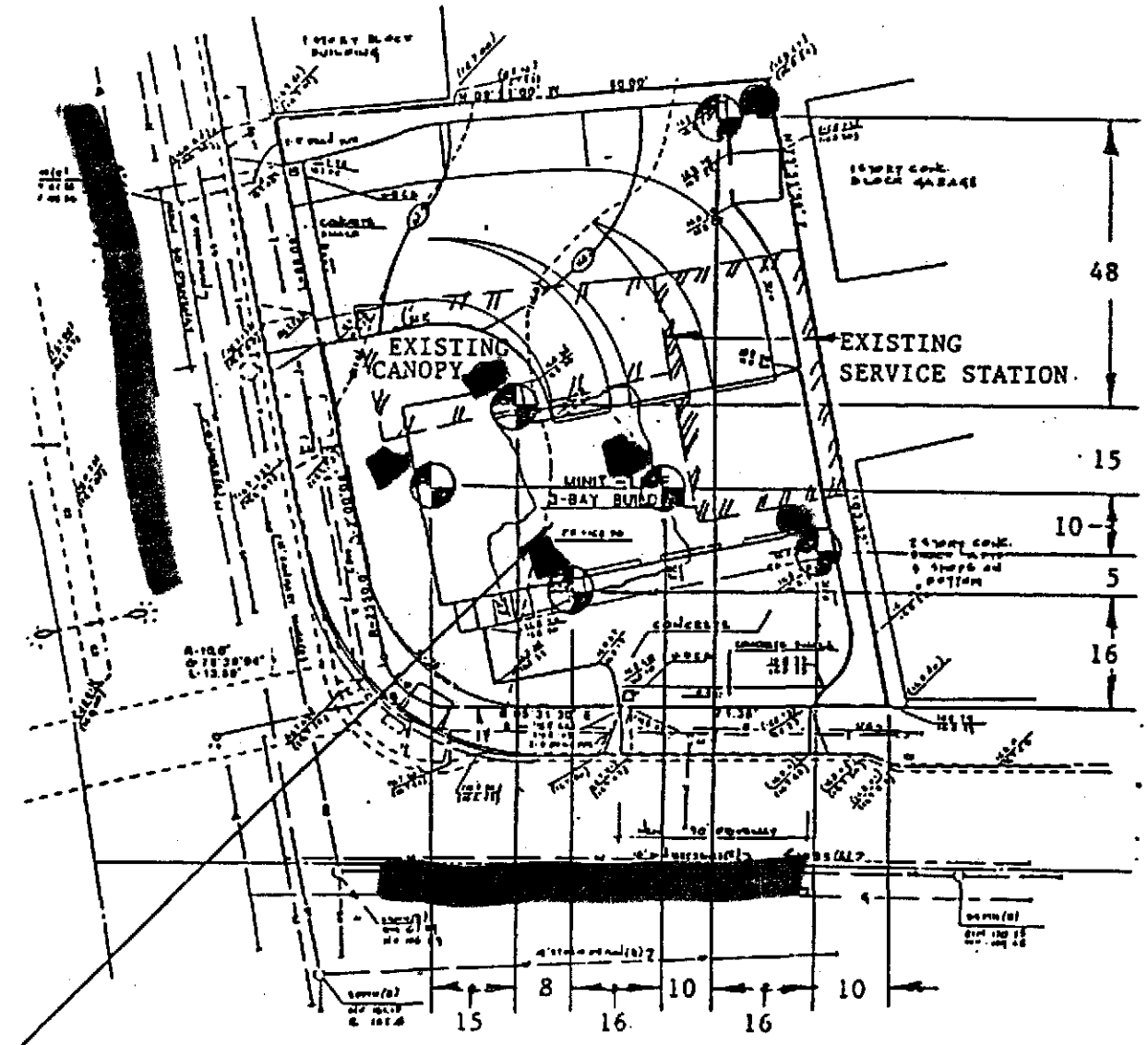
Remove unsuitable, unstable existing soils below the topsoil to develop a stable subgrad
and replace with structural compacted fill
a. Select sand and gravel or crushed stone (well-graded granular material)
(b) Common soil (silt, clay, sand, gravel mixture)
Provide, place, and compact structural fill as general site fil
including pavement and floor slab areas, BUT WALL BACKFILL IMPORTED FREE DRAINING
a. Select sand and gravel or crushed stone (well-graded granular material)
(b) Common soil (silt, clay, sand, gravel mixture), WALL BACKFILL FREE DRAINING
Provide, place, and compact structural fill in foundation excavations
a. Select sand and gravel or crushed stone (well-graded granular material)
(b) Common soil (silt, clay, sand, gravel mixture)
Excessive topsoil stripping (depth estimate inches)
Subgrade preparation with hydrated lime (6%± by dry weight mixed int
top 6 to 8 inches and compacted to proper in-place density)
Subgrade preparation with Portland Cement (8%± by dry weight mixed int
top 6 to 8 inches, moist cured, and compacted to proper in-place density)
Geotextile underlayment below pavement base course on top of properl
prepared subgrade (____ ounce)
Excavation of building debris fill (including concrete, asphalt, and possibly other rubble
Removal of large tree root balls, where requires over-excavation belo
typical subgrade excavation depth
Provision, placement, and compaction of working mat (coarse granular material such a
coarse crushed stone) for stabilization of surface soils may include a geotextil
overlayment, but geotextile where necessary not to be included in this item. BASEMENT
Remove and dispose of existing asphalt and/or concrete paving
Hard rock excavation (including blasting and/or ripping where necessary)
Soft rock and/or dense soil excavations (including ripping where necessary)
Construction de-watering
(a.) Sump pits with pump (POSSIBLY WORKABLE)
b. French drain (3 to 4 foot depth with geotextile rap and perforated pipe)
c. Blanket drain (geotextile envelope with free draining granular material 6 to 8 inches
in thickness and perforated pipe discharge)
(d.) Well points (10 to 15 foot depth with appropriate header and pumps)
e. Deep wells (with appropriate perforated liner and down hole pump)
Permanent and/or temporary subdrainage system
(a.) Underdrain system with proper incorporation of geotextile and perforated pipe placed
at * ~~feet on center~~ throughout required area WALL PERIMETER
b. French drain with a geotextile rap and perforated drain pipe (3 to 4± foot depth)
c. Blanket drain with geotextile envelope and 6 to 8 inch free draining granular material
discharged with perforated pipe
Rerouting of existing drain pipe where encountered in excavation to preserve its function
and prevent plugging
Bracing of excavations extending into unstable materials (special de-watering requirements
to also be included in this item where required and not duplicated under the construction
de-watering item)
- Additional longitudinal reinforcement of conventional strip footing pads (total of six No.
5 rebars-3 top and 3 bottom)
Additional reinforcement of conventional slab-on-grade floor slab (consisting of No. 3
rebars) with floor slab increased to minimum 5 inch thickness
a. 12 inches on-center each way
b. 18 inches on-center each way

669/kah

NOTE: Dimensions indicate approximate method of locating test borings in the field with respect to apparent property lines All dimensions in feet.

NORTH

1 INCH = 30 FEET APPROXIMATELY



APPROXIMATE LOCATION OF TANK REMOVAL AREA

DRAWING REFERENCE: "Grading Plan" by Michael J. Majors Civil Engineers, Inc., Dated 12/8/86

BORING LOCATION PLAN
FIGURE 1

Proposed Minit-Lube
Castro Valley, California
GEA Project No. C-880106

GILES ENGINEERING ASSOCIATES, INC.
CONSULTING SOIL AND FOUNDATION ENGINEERS

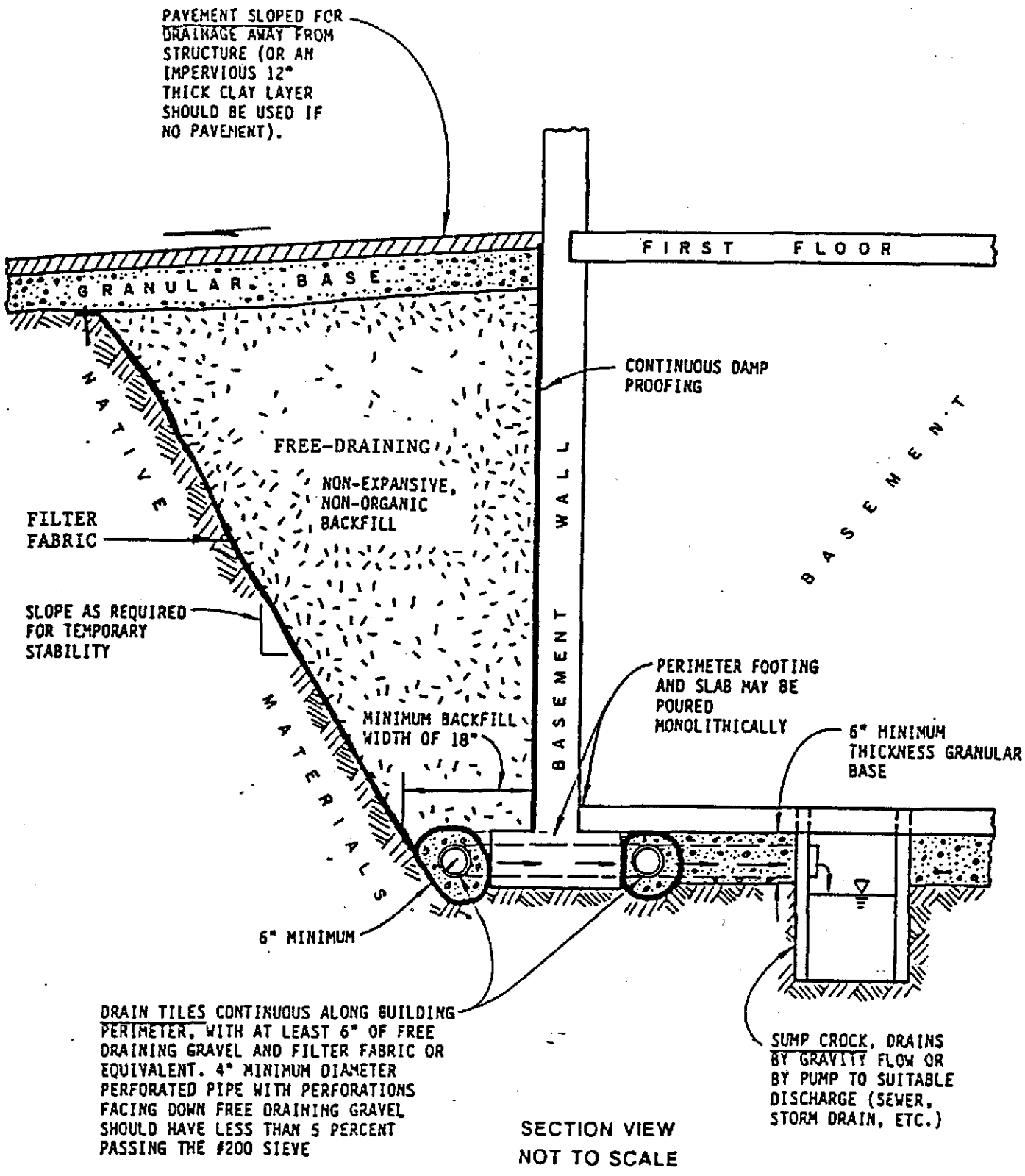


FIGURE 2
SCHEMATIC DRAINAGE SYSTEM

GEA C-880106

GEO ENGINEERING ASSOCIATES, INC.
CONSULTING SOIL AND FOUNDATION ENGINEERS

[redacted] (North of tanks)	GEA PROJECT NO. C-880106
DATE 1/22/88	FIELD REPRESENTATIVE John Moser
PROJECT Proposed Minit-Lube	
[redacted] Castro Valley, California	

GILES ENGINEERING ASSOCIATES, INC.
CONSULTING SOIL AND FOUNDATION ENGINEERS

DESCRIPTION Ground Surface Elevation 168'±	Depth Below Surface	Sample No. & Type	N	q_u	q_p	q_s	w	*PID
FILL: 2± inches BASE: crushed aggregate Greenish Gray Brown fine Sand, with some Silt (uniform)		1-AU	-					ND
[redacted]n to Dark Brown fine rounded [redacted]ravelly Silt, trace of fine to coarse [redacted]nd and Clay (POSSIBLE FILL)		2-SS	9				6	ND
	5'	3-SS	12		0.5		24	ND
		4-SS	5				12	ND
NOTE A	10'	5-SS	1	-	-	-	[redacted]	[redacted]
[redacted]own with some Black and Greenish [redacted]own fine to coarse Sandy Silt, [redacted]t fine rounded Gravel	15'	6-SS	14		1.5		17	ND
	20'	7-SS	25				-	ND
[redacted]g Terminated at 20'								
[redacted]D = Results of vapor analysis conducted on representative samples utilizing a Photoionization Detector-equipped with a 10.2 eV Lamp Calibrated to Benzene reported as parts per million (ND = Not Detectable)	25'							
[redacted]: Dark Brown to Black fine Gravelly Silt, trace of fine to coarse Sand and Cla[redacted] (POSSIBLE FILL)	30'							
[redacted] & BTX: Sample [redacted]ydrocarbon testing	35'							
	40'							
[redacted]ter encountered at 13 ft. while drilling								
Water at 9 ft. at completion								
Water at ____ ft. after ____ hours	45'							

[redacted] of strata indicated by the lines are approximate boundary between soil types. The actual transition may be gradual and may [redacted]cably between boring locations. Dashed lines should be interpreted as more approximate than solid lines.

[redacted] east of tanks)

GEA PROJECT NO. C-880106

DATE 1/22/88

FIELD REPRESENTATIVE John Moser

PROJECT
Proposed Minit-Lube
[redacted]
Castro Valley, California

GILES ENGINEERING ASSOCIATES, INC.
CONSULTING SOIL AND FOUNDATION ENGINEERS

DESCRIPTION Ground Surface Elevation 168'±	Depth Below Surface	Sample No. & Type	N	q_u	q_p	q_s	w	*PID
FILL: 3± inches BASE: crushed aggregate Greenish Gray Brown fine Sand, some Silt (uniform)		1-AU	-					ND
		2-SS	14				12	ND
[redacted]rk Brown Silty Clay, trace of fine [redacted]avel and fine to coarse sand (POSSIBLE FILL)	5'	3-SS	18		2.2		14	ND
		4-SS	6		0.8		19	ND
NOTE A	10'	5-SS	9				-	ND
Brown fine to coarse Sandy Silt, [redacted]th rounded fine Gravel, and trace [redacted] Clay	15'	6-SS	17				18	ND
	20'	7-SS	26		4.5+		18	ND
[redacted]ring Terminated at 20'	25'							
* PID = Results of vapor analysis conducted on representative samples utilizing a Photoionization Detector equipped with a 10.2 eV Lamp Calibrated to Benzene reported as parts per million. (ND = Not Detectable)	30'							
NOTE A: Dark Brown to Black Clayey Silt, trace of fine Gravel and fine to coarse Sand	35'							
	40'							
▽ Water encountered at 12½ ft. while drilling ▼ Water at 8½ ft. at completion ▼ Water at ____ ft. after ____ hours	45'							

[redacted]anges of strata indicated by the lines are approximate boundary between soil types. The actual transition may be gradual and may [redacted]r considerably between boring locations. Dashed lines should be interpreted as more approximate than solid lines.

ING NO. (S. of new building)	GEA JECT NO. C-880106
DATE 1/22/88	FIELD REPRESENTATIVE John Moser
PROJECT Proposed Minit-Lube	
Castro Valley, California	

GILES ENGINEERING ASSOCIATES, INC.
CONSULTING SOIL AND FOUNDATION ENGINEERS

DESCRIPTION Ground Surface Elevation 168'±	Depth Below Surface	Sample No. & Type	N	q_u	q_p	q_s	w	*PID
ILL: NOTE A		1-AU	-					ND
n fine well-rounded Gravelly Silt (SSIBLE FILL)		2-SS	3				10	ND
ark Brown to Black Clayey Silt (SSIBLE FILL)	5'	3-SS	2		0.8		18	ND
		4-SS	11		0.8		22	ND
y Greenish Brown Clayey Silt	10'	5-SS	10		1.8		18	ND
k Brown and Gray Brown mottled yey Silt, with fine rounded Gravel, ome Clay	15'	6-SS	12		2.5		27	ND
	20'	7-SS	5	-	-	-	** TPH BTX	2
ing Terminated at 20'	25'							
OTE A: 2± inches Asphalt 3± inches BASE: crushed aggregate Dark Brown angular Gravelly Silt, with fine to coarse Sand	30'							
PID = Results of vapor analysis conducted on representative samples utilizing a Photoionization Detector equipped with a 10.2 eV Lamp Calibrated to Benzene reported as parts per million (ND = Not Detectable)	35'							
TPH & BTX: Sample sent for hydrocarbon testing	40'							
▽ Water encountered at 13 ft. while drilling ▽ Water at 9½ ft. at completion Water at ____ ft. after ____ hours	45'							

s of strata indicated by the lines are approximate boundary between soil types. The actual transition may be gradual and may y considerably between boring locations. Dashed lines should be interpreted as more approximate than solid lines.

BORING NO. (new trash corral)

GEAPROJECT NO. C-880106

DATE 1/22/88

FIELD REPRESENTATIVE John Moser

PROJECT Proposed Minit-Lube

Castro Valley, California

GILES ENGINEERING ASSOCIATES, INC.
CONSULTING SOIL AND FOUNDATION ENGINEERS

DESCRIPTION Ground Surface Elevation 169'±	Depth Below Surface	Sample No. & Type	N	q_u	q_p	q_s	w	*PID
		1-AU	-					ND
FILL: NOTE A Brown, Gray Brown and Black mottled fine Gravelly Silt		2-SS	4		1.2		19	ND
Brown fine Sandy Silt, trace of Clay and fine Gravel (POSSIBLE FILL)	5'	3-SS	4		1.8		16	ND
Boring Terminated at 5'								
▽ Groundwater Encountered	10'							
NOTE A: 2± inches Asphalt 3± inches BASE: crushed aggregate								
PID = Results of vapor analysis conducted on representative samples utilizing a Photoionization Detector equipped with a 10.2 eV Lamp Calibrated to Benzene. (ND = Not Detectable)	15'							
	20'							
	25'							
	30'							
	35'							
	40'							
▽ Water encountered at ____ft. while drilling ▽ Water at ____ ft. at completion ▼ Water at ____ft. after ____hours	45'							

Changes of strata indicated by the lines are approximate boundary between soil types. The actual transition may be gradual and may vary considerably between boring locations. Dashed lines should be interpreted as more approximate than solid lines.

SAMPLE IDENTIFICATION

GILES ENGINEERING ASSOCIATES, INC.

All sample classifications reviewed by Geotechnical Engineer in accordance with Unified Soil Classification System (ASTM D-2487)

DESCRIPTIVE TERM (% BY DRY WEIGHT)	
Trace:	1-10%
Little:	11-20%
Some:	21-35%
And/Adjactive	36-50%

PARTICLE SIZE (DIAMETER)		
Boulders:	8 in and larger	
Cobbles:	3 in to 8 in	
Gravel:	coarse-	3/4 to 3 in
	fine-	No. 4 (4.76mm) to 3/4 in
Sand:	coarse-	No. 4 (4.76mm) to No. 10 (2.0mm)
	medium-	No. 10 (2.0mm) to No. 40 (0.42mm)
	fine-	No. 40 (0.42mm) to No. 200 (0.074mm)
Silt:	No. 200 (0.074mm) and smaller (Non-plastic)	
Clay:	No. 200 (0.074mm) and smaller (Plastic)	

SOIL PROPERTY SYMBOLS

Dd: Dry Density, pcf
LL: Liquid Limit
PL: Plastic Limit
SL: Shrinkage Limit
LI: Liquidity Index[(w - PL)/PI]
PI: Plasticity Index (LL-PL)
Gs: Specific Gravity
K: Coefficient of Permeability
w: Moisture Content
qp: Calibrated Penetrometer Resistance, tsf
qs: Vane-Shear Strength, tsf
qu: Unconfined Compressive Strength, tsf
N: Penetration Resistance per foot or fraction thereof for standard 2 inch O.D., 1 3/8 inch I.D.,split spoon sampler driven with a 140 pound weight free-falling 30 inches, in accordance with Standard Penetration Test Specifications (ASTM D-1586)
Nc: Penetration Resistance per foot or fraction thereof for standard Cone Penetrometer driven with a 140 pound weight free-falling 30 inches
▼: Apparent groundwater level at the time noted after completion
: Depth to which boring caved during water level readings

DRILLING AND SAMPLING SYMBOLS

SS: Split-Spoon
ST: Shelby Tube - 3" O.D. (except where noted)
AU: Auger Sample
DB: Diamond Bit
CB: Carbide Bit
WS: Wash Sample
RB: Rock-Roller Bit
BS: Bag Sample

SOIL STRENGTH CHARACTERISTICS

COHESIVE (CLAYEY) SOILS

COMPARATIVE CONSISTENCY	BLOWS PER FOOT (N)	UNCONFINED COMPRESSIVE STRENGTH (TSF)
Very Soft	0-2	0 - 0.25
Soft	3-4	0.25 - 0.50
Medium Stiff	5-8	0.50 - 1.00
Stiff	9-15	1.00 - 2.00
Very Stiff	16-30	2.00 - 4.00
Hard	31+	4.00+

DEGREE OF PLASTICITY	PI
None to Slight	0-4
Slight	5-10
Medium	11-30
High to Very High	31+

DEGREE OF EXPANSIVE POTENTIAL	PI
Low	0-15
Medium	15-25
High	25+

NON-COHESIVE (GRANULAR) SOILS

RELATIVE DENSITY	BLOWS PER FOOT (N)
Very Loose	0-4
Loose	5-10
Firm	11-30
Dense	31-50
Very Dense	51+

GEA446/kah

APPENDIX B

MONITORING WELL SAMPLING PROTOCOL

PRATT CONSULTING COMPANY

ENVIRONMENTAL CONSULTANTS
& PROJECT MANAGERS

1081 Clayton Road
Suite 236
Concord, California 94521

1-(415)-686-9496 Office
1-(415)-682-9968 24 Hrs
1-(415)-687-7974 Fax

PRATT CONSULTING COMPANY

WELL MONITORING PROTOCOL

ADOPTED APRIL 1989

The following is a list of the steps that we use when monitoring and sampling, monitoring and recovery wells for sample collection and analysis:

1) Remove well box cover at grade and remove cap on well pipe checking the integrity of each and making sure not to allow any standing water or soil/sand to fall into the well pipe. The size of the well and condition of both caps is then noted on the monitoring well field log.

2) Using a water level indicator we measure the distance between the top of the well casing and groundwater level before bailing or sampling. This distance is then noted in the monitoring well field log.

3) Using the water level indicator we then measure the approximate total depth of usable column. This distance is then noted in the monitoring well field log.

4) After finishing with the water level indicator we wash and clean it. (SEE "CLEANING THE EQUIPMENT")

5) We calculate the well diameter and the total depth of usable column to determine how many gallons of groundwater we would have to bail from the well to achieve 5 well volumes of groundwater. This is then noted in the monitoring well field log.

6) Depending on the size of the well and the depth to groundwater PCC uses 3 different methods to remove the required amount of groundwater. All 3 methods require the use of precleaned equipment. (SEE "CLEANING THE EQUIPMENT")

Method 1 — We use standard 1.66", 2" or 3.65" PVC or Acrylic bailers. We use fresh nylon mesh rope for each well. We bail the required amount of water out and empty it into a trough which is then pumped up into the holding tanks on the truck. The amount of groundwater which is removed is then noted in the monitoring well field log.

Method 2 — On 2" wells where groundwater is shallow we use a 3/4" suction pump with precleaned sections of pipe which pumps the groundwater directly into the holding tanks on the truck.

Method 3 — On 4" or larger wells where groundwater is shallow we use a 1,1/2" suction pump with precleaned sections of pipe which pumps the groundwater directly into the holding tanks on the truck.

7) After finishing with the suction pumps, pipe sections, or bailers we wash and clean them between wells. (SEE "CLEANING THE EQUIPMENT")

8) Using a water level indicator we measure the distance between the top of the well casing and groundwater level after bailing and before sampling. This distance is then noted in the monitoring well field log.

9) We allow the well to recover to a minimum of 80% of it's original level before taking the required samples for analysis. The level of the groundwater at the time of sampling is then noted in the monitoring well field log.

10) We preclean a TEFLON 12" bailer (SEE "CLEANING THE EQUIPMENT") and after the final rinse we refill it with distilled or de-ionized water. We collect a sample for analysis from the bailer using a 40 ml VOA vial for quality control purposes. This sample is also submitted to the laboratory.

11) After the well has recovered we use a precleaned TEFLON 12" bailer with sampling ends and a new piece of nylon mesh rope to obtain the groundwater sample in the well. We then carefully fill 2, 40 ml VOA vials and cap them and verify there is no head space present. The VOA vials are then carefully labeled and placed in a zip lock bag in a cooler to be stored until delivered to the laboratory. The temperature in the cooler is kept at 4 degrees Celsius.

12) After finishing with the TEFLON bailer we wash and clean it. (SEE "CLEANING THE EQUIPMENT")

13) We close the well up making sure not to spill any water, sand etc. into the well.

CLEANING THE EQUIPMENT

We use three different types of cleaning solutions depending upon the site specific data available. They are; TSP, Alquinox and liquinox. We always use distilled or de-ionized water for cleaning and rinsing the equipment. If the equipment has been contaminated to the point where we do not feel safe with it before thorough cleaning we take that piece of equipment out of service for the duration of that days project. On occasion that the equipment has been heavily contaminated we use pesticide grade Isopropenahl to clean the equipment followed by rinsing. The equipment consists of pumps, pipe sections, bailers, samplers, water level indicator, and wash buckets.

We reference for sampling the protocol indicated in the EPA's Operating Procedures and Quality Assurance Manual put out in April of 1986. This was written by EPA Region 4. There are additional tests that can be performed such as; PH level, conductivity, and additional analysis that can be performed. Please feel free to contact our office with your questions and concerns.

Sincerely,
PRATT CONSULTING COMPANY

John Pratt