

#### WORKPLAN/PROPOSAL FOR PRELIMINARY SITE INVESTIGATION

at

2896 Castro Valley Blvd. Castro Valley, Ca.

for
Lakesnore Financial
21060 Redwood Rd., #250
Castro Valley. Ca. 94846







April 27, 1990

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

Re: Workplan-Proposal for Soil and Groundwater Investigation Services at 2896 Castro Valley Blvd., Castro Valley

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:

A gas station operated at the site prior to June, 1987, when 1-5,000, 1-7,500, and 1-10,000 gallon gasoline storage tanks were removed, in addition to 1-300 gallon waste oil tank removal from a separate pit a few feet away. The details of the tank removal and associated sampling are summarized in the project report of June 30, 1987, by Geonomics Inc. (Appendix A).

The project report of October 26, 1986, by JHA Geotechnical Consultants details 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 Giles Engineering in January of 1988 showed motorfuel contamination of soils very near the soil groundwater interface (Appendix 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.

The sample from beneath the waste oil tank showed 5,300 ppm TPH as diesel/waste oil, 16,000 ppm total oil and grease, and BTXE concentrations indicative of gasoline contamination. 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. Another composited sample of soils from the waste oil tankpit showed 2,900 ppm TPH as diesel/waste oil and 7,100 ppm total oil and grease. The 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, up to 7 borings are proposed, three of which will be converted to monitoring wells. 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 boring locations, drilling will proceed down to first encountered water. 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 about 15 feet due south of the southwest corner of the building and a few feet southwest of 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. Well construction permits from Alameda County Water District, Zone 7 will be obtained prior to monitoring well drilling.

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. Wells will be tested for sheen and free product by filling the first bailer only half full. Odors will be checked for nasally. 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 8015/8020/602. Samples from MW-1 and B-1 will be additionally analyzed for total oil and grease (method 503d & e), TPH as diesel, chlorinated hydrocarbons using EPA method 8010/601, prioirty metals (ICAP/AA), and for PCBs, PCP, PNA, and creosote using EPA method 8270.

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. The safety plan will adhere to 29 CFR, Part 1910.120 (i) (2) guidelines.

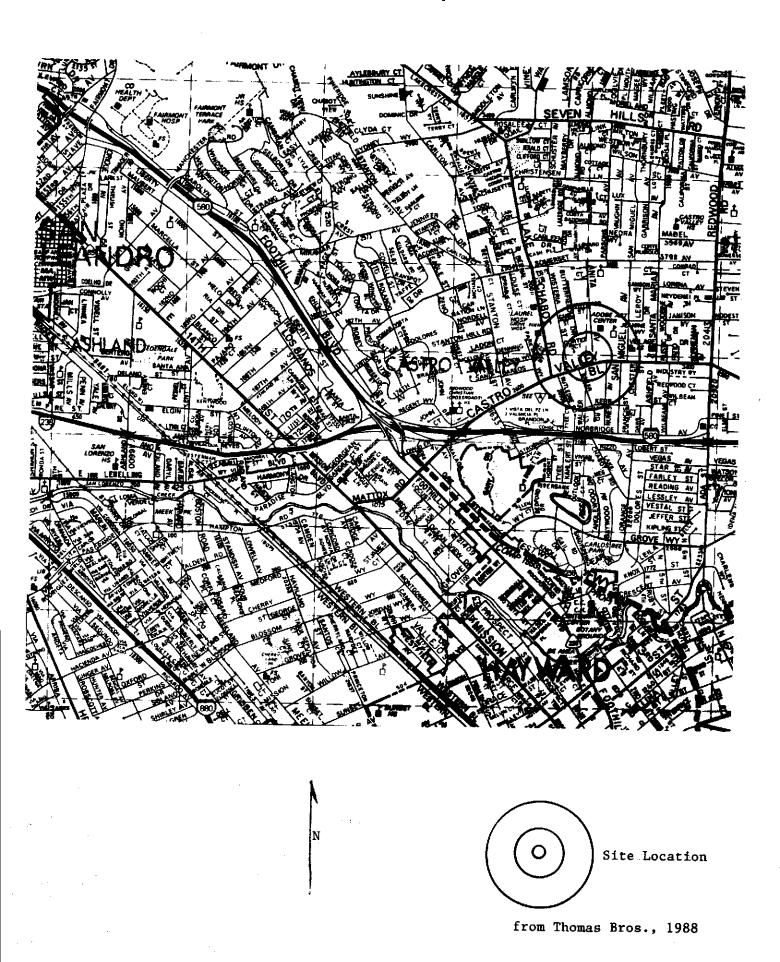
A working area will be established with barricades and warning tape to delineate the zone where hardhats, steel toed shoes must be worn, and where unauthorized personnel will not be allowed.

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, Callfornia-Registered Civil Engineer, Mr. Greg Burg (#C36208). Mr. Burg has implimented and managed dozens of site investigations for Aqua Science Engineers in the last 2 years.

Figure 1 Site Location Map



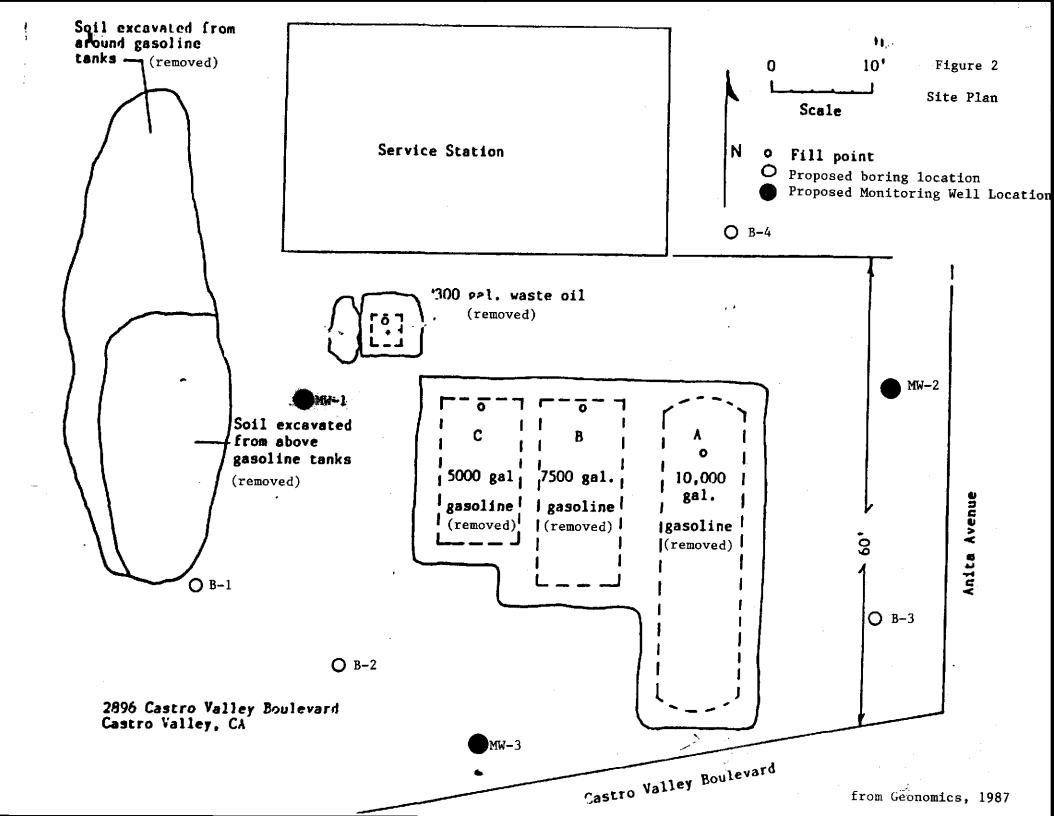
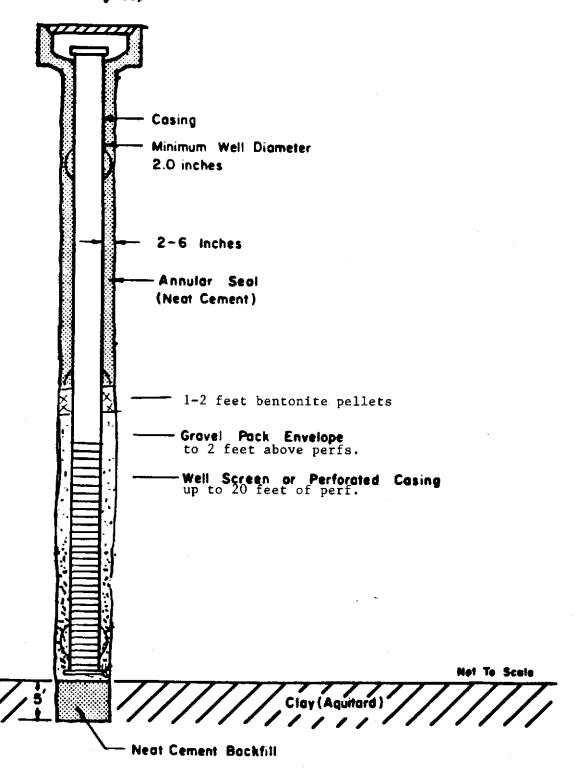


Figure 3
Typical Monitoring Well

#### Locking Lid or Locking Cap



#### APPENDIX A

## PREVIOUS INVESTIGATIVE WORK

SCOTT /

DEPARTMENT OF ENVIRONMENTAL HEALTH Hazardous Materials Program 80 Swan Way, Rm. 200 Oakland, CA 94621 (415) 271-4320

May 8, 1989

Mr. Walter Quigley 4662 Lockridge Way Castro Valley, CA 94546

RE: SOIL AND GROUNDWATER CONTAMINATION, 2896 CASTRO VALLEY BLVD., CASTRO VALLEY: REQUEST FOR SITE ASSESSMENT

Dear Mr. Quigley:

Our office has completed a review of several geotechnical reports and tank closure documents generated by various consultants, dating from October 28, 1336 to February 2, 1988, concerning the referenced As was outlined in the most recent report by Giles Engineering Associates, Inc. for Quaker State Minit-Lube, Inc. of Salt Lake City, Utah and dated February 2, 1988, significant soil contamination was evidenced in several borings advanced during site exploration activities performed by this firm. Prior reports by Geonomics, and JHA Geotechnical Consultants, Inc., dated June 30, 1987 and October 28, 1986, respectively, confirm the presence of hydrocarbon contamination in soils associated with the fuel tank cluster and waste oil tank. The referenced Geonomics, Inc. report was generated following closure in June 1987 of three (3) fuel and one (1) waste oil underground storage tanks (UST). This report identified groundwater contamination in the vicinity of the 5000-gallon gasoline tank. Further, soil samples collected from native soil below the waste oil UST contained up to 1.6% (16,000 ppm) of total oil and grease (TOG) and 5300 ppm of total petroleum hydrocarbons characterized as gasoline (TPH-G). The waste oil UST was also observed to suffer from severe corrosion and multiple holes. Contamination of this magnitude (≥ 100 ppm) is referred to as a "confirmed release" by the Regional Water Quality Control Board - San Francisco Bay Region (RWQCB).

Due to this site's "confirmed release" status and the groundwater contamination already identified at this site, additional investigative work must be performed to further define the extent of vertical and lateral impact upon groundwater and soils resulting from the noted contamination. The information gathered by this investigation must be used to determine an appropriate course of action to

Mr. Walter Quigley

RE: 2896 Castro Valley Blvd.

Castro Valley May 8, 1989 Page 2 of 3

remediate the site. This site assessment should be conducted in accordance with the RWQCB Staff Recommendations for Initial Evaluation and Investigation of Underground Tanks. The major elements of such an investigation are summarized in the attached Appendix A.

In order to proceed with the site investigation, you should obtain professional services from a reputable engineering/geotechnical consulting firm. The responsibility of your consultant is to submit for review a proposal outlining planned activities pertinent to meeting the criteria outlined in this letter and the attached Appendix A. Once the site assessment has been completed, a technical report summarizing site related activities and conclusions must be submitted to this office and RWQCB. All reports and proposals must be submitted under seal of a California-Certified Engineering Geologist, California-Registered Geologist, or California-Registered Civil Engineer.

This office will oversee the site assessment for the referenced site. This oversight will include our review and comment on work proposals, and technical guidance on appropriate investigative approaches. However, the issuance of monitoring well installation permits will be through Zone 7. The RWQCB may choose to take over as lead agency if it is determined following the site assessment that there has been a substantial impact upon groundwater.

Please submit a Site Assessment proposal within 30 days of the receipt of this letter. Accompanying this proposal must be a check totalling \$831 to help defer the cost of our review of this plan and our oversight of the remediation process. This check should be made out to the County of Alameda. A copy of this proposal should also be sent to the RWQCB (Attn: Scott Hugenberger) for their review.

Further, as was discussed previously in a telephone conversation between yourself and Mr. Scott Seery of this office several weeks ago, the storage of the waste oil UST in its current location, abovegrade on the east side of the station building, constitutes a safety hazard. As such, it is in violation of the Uniform Fire Code and California Hazardous Waste Laws to continue to allow this tank to remain on-site. Therefore, you must properly dispose of this tank as a hazardous waste at a licensed treatment, storage, or disposal (TSD) facility. The tank must be accompanied by a Uniform Hazardous Waste Manifest. This activity must also occur within thirty (30) days of your receipt of this letter. You must provide a copy to this office of the manifest used to document this tank's disposal.

Telephone Number: (415)

March 1, 1990

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

RE: SOIL/GROUNDWATER WORKPLAN PROPOSAL, 2896 CASTRO VALLEY BLVD.,

Dear Mr. Gouvea:

This letter is in response to our review of the January 10, 1990 Aqua Science Engineers, Inc. workplan proposal for the investigation of subsurface contamination at the referenced site. The noted workplan may be approved for this stage of site contaminant assessment providing the following issues are resolved to the satisfaction of this office:

- 1) All reports <u>and</u> proposals must be submitted under seal of a California-Registered Geologist, -Certified Engineering Geologist, or -Registered Civil Engineer. Include a statement of qualifications;
- 2) Based upon local topography and surface water drainage patterns within the Castro Valley basin, the approximate groundwater flow direction is presumed to be to the south or southwest, towards Chabot(?) Creek. Therefore, it is mw-1 be moved approximately 15-20 feet to the southeast from and somewhat southwest of the former waste oil tank pit, soil and groundwater derived from leaks associated with the waste oil tank.

TELVEN

MA COURSE

Mr. Greg Gouvea RE: 2896 Castro Valley Blvd.

March 1, 1990 Page 2 of 3

Concerns about potential contaminant migration in the direction of the original location of proposed MW-1 can be resolved through advancement of an additional boring in this area. Following completion of the current phase of work and determination of the actual groundwater flow direction, additional wells/borings may be required;

- 3) All borings <u>not</u> completed as wells should be advanced to first groundwater, at a minimum. As indicated in the January 10 proposal, soil samples from all borings should be collected at 5-foot intervals. Additional samples are required at any significant changes in lithology or zones where field screening techniques identify auger cuttings which appear "hot";
- 4) Describe methods for free product measurement, and observation of sheen and/or odor. This topic was not discussed in the referenced Pratt Consulting Company monitoring protocol (Appendix B);
- 5) Consistant with RWQCB guidelines, soil samples collected from MW-1 and other borings in proximity to the former waste oil tank pit, as well as water samples collected from MW-1 after development, should also be analyzed for: TPH-D; priority metals (ICAP/AA); PCB, PCP, PNA and creosote (EPA Method 8270). These tests are in addition to TPH-G, TOG (Method 503 A/D & E) and ClHC (Method 8010/601) analyses previously cited in this proposal. Further, be certain that the method used for TPH-G/D detection is that outlined by the LUFT program (GC/FID), and provide a discussion of applicable preservation techniques;
- 6) Please be certain that the proposed Site Safety Plan adheres to guidelines specified under Part 1910.120 (i)(2) of 29 CFR;
- 7) Provide assurance that wells will be constructed under appropriate Zone 7 permits;

Mr. Greg Gouvea

RE: 2896 Casro Valley Blvd.

March 1, 1990 Page 3 of 3

Please submit, in a timely fashion, a response which adequately addresses the previous list of items. This submittal may be in the form of an addendum to the January 10 proposal. Additionally, please submit copies of <u>all</u> reports, proposals and addenda to the RWQCB (Attn: Lester Feldman), including the January 10 proposal.

Should you have any questions, please call me at 415/271-4320.

sincerely,

scott 0. Seery

Hazardous Materials Specialist

sos:mam

cc: Rafat A. Shahid, Assistant Agency Director, Alameda County
Department of Environmental Health

Lester Feldman, RWQCB

Howard Hatayama, DHS Mike Hood, Alameda County Building and Inspection Department

Bob Bohman, Castro Valley Fire Dept.

Gil Jensen, Alameda County District Attorney, Consumer and Environmental Protection Division

Dan Dineen, Lakeshore Financial

Files

'e 212 West Rincon Avenue Campbell, CA 95008



(408) 374-9116

June 30, 1987

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

#### Dear Chief Wade:

The attached report describes the soil sampling and laboratory test results for a tank removal project 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** 

Page 1 of 3 (408) 374-9116

**ENVIRONMENTAL SERVICES DIVISION** 

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

7,500 gal., gasoline, unwrapped steel, 12' 5,000 gal., gasoline, unwrapped steel, 12'

C:

300 gal., waste oil, unwrapped steel, 5' D:

#### Soil samples:

Note: The water table was encountered at 11.0 ft, approximately 1 foot above the bottom of each of the three large tanks. It was decided, therefore, to collect soil samples from native soil adjacent to both ends of those tanks, immediately above the water table. A sheen was showing on the surface of the water in the vicinity of tank C. There was sheen on the surface of the water in the vicinity of tank B, but less than that near tank C. 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 Mnp)
TP147A-1	11.0	Native soil adjacent to fill end of tank A.
<u>TP147A-2</u>	11.0	Native soil adjacent to end opposite fill end of tank A.
TP147B-1	11.0	Native soil adjacent to fill end of tank B.
<u>TP1478-2</u>	11.0	Native soil adjacent to end opposite fill end of tank B.
TP147C-1	11.0	Native soil adjacent to fill end of tank C.
<u>TP147C-2</u>	11.0	Native soil adjacent to end opposite fill end of tank C.

#### Soil samples (Continued):

TP147D	7.0	Native soil below center of tank D.
TP147B	N/A	Composite sample of backfill soil excavated from around gasoline tanks.
TP147F	N/A	Composite sample of backfill soil excavated

#### Condition of tanks:

A: Good condition, no holes observed.

B: Some rust and pitting but no holes onserved. There was gasoline soaked soil around the vapor recovery line which was connected to the fill riser.

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

D: Very rusted and corroded. Multiple holes observed.

Condition of soil taken for samples from excavation pit: The backfill soil from the large tank pit was medium sand with a petroleum odor. Much of it was stained green. 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. Sample TP147D, from below the waste oil tank, was stained and had a nonspecific hydrocarbon odor.

### Laboratory results: (lab report attached)

Sample Number	Tested for:	Test results (ug/g = ppm) (ug/kg = ppb)
♣ <u>TP147A-1</u>	Total hydrocarbons (gasoline) Benzene	U*
	Toluene Total xylenes	<u> </u>
TP147A-2	Total hydrocarbons (gasoline) Benzene Toluene Total xylenes	U U
<u>TP147B-1</u>	Total hydrocarbons (gasoling) Benzene Toluene Total xylenes	U
<u>TP1478-2</u>	Total hydrocarbons (gasoline) Benzene Toluene Total xylenes	U U

### Laboratory results (Continued):

	TP147C-1	Total hydrocarbons (gasoline) Benzene Toluene Total xylenes	<u> </u>
;	TP147C-2	Total hydrocarbons (gasoline) Benzene Toluene	100.0 pp
	<u>TP147D</u>	Total xylenes Diesel/waste oil	0.2 ррв 2.2 ррв
		Total oil & grease	5,300 ppm 16,000 ppm
		EPA 8240 Volatile hydrocarbone (Priority pollutants). Those detected were:	
		Benzene Toluene Ethylbenzene Total xylenes	220 ppb 90 ppb 300 pph 1,500 pph
	TP147E	Total hydrocarbons (gasoline) Benzene Toluene	15.0 ppm
	TP147F	Total xylenes  Diesel/waste oil	1.1 ppm
		Total oil & grease	7,100 ppm
		PA 8240 Volatile hydrocarbons (Priority pollutants). None detected	
# U = The	COMPOUND NAME AND I		4

\* U = The compound was analyzed for but was not detected.
(Rev. 5/20/87)

### ANAMETRIX, INC.

ENVIRONMENTAL • ANALYTICAL SERVICES
2754 AJELLO DRIVE • SAN JOSE CA 95111 • (408) 629 1137

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	11
-03	81	u
-04	22	•
-05	C1	**
-06	C2	bb .
-07	D	8210/2550/5001
-08	É	8240/3550/503A
-09	F	5020 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

GC/MS Supervisor

PBG/qp

→Date sampled : 6-16-87

Date extracted : NA

Date analyzed : 6-19-87

Weight extracted : NA

Same a graph of : 375 Supervisor

Date released : 6-26-87

CAS #	Compound Name	Det. Limit (ug/g)	(ug/g)		Q
71-43-2 108-88-3	Benzene	1 0.2	1	1	U I
108-88-3	Toluene	0.2	İ	İ	U
	Total Xylenes	0.2	İ	i	ָ ט
	Gasoline	1 10	i	i	U
	Diesel / Waste Oil	10	Ì	i	NR
i	Total Oil & Grease	j 30	i	i	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 Anametrix I.D.: 8706061 01

Matrix : SOIL Analyst

Supervisor : 515 Date sampled : 6-16-87

Date extracted : NA Date released : 6-26-87

Date analyzed : 6-22-87

Weight extracted: NA

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

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 : 715.

Date released : 6-26-87

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

Anametrix I.D.: 8706061-03

Sample I.D. : TP147-B1
Matrix : SOIL
Date sampled : 6-16-87 Analyst : 205 Supervisor : 50

Date extracted : NA
Date analyzed : 6-19-87 Date released: 6-26-87

Weight extracted : NA

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

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.

Same I.D. : TP147-B2

: SOIL -Ma'ix

Marix : SOIL Dre sampled : 6-16-87 nte extracted : NA

Jate analyzed : 6-22-87

Weight extracted: NA

An . x I.D. : 8706061-04

Analyst : Supervisor

Date released : 6-26-87

   CAS #	Compound Name	Det. Limit (ug/g)	(ug/g)	•	Q	-    -  -
71-43-2	Benzene	0.2	1	1	ับ	ŀ
108-88-3	Toluene	0.2	i ·	i	U	ì
ĺ	Total Xylenes	0.2	i	i	U	ì
l	Gasoline	10	Ì	i	U	i
l	Diesel / Waste Oil	10	i ·	i	NR	i
1	Total Oil & Grease	30	İ	i	NR	İ

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 Anametrix I.D.: 8706061-05

: SOIL Matrix جام : جام : Analyst Date sampled 4 : 6-16-87 Supervisor : Dui

Date released : 6-26-87

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

Weight extracted: NA

   CAS #	Compound Name	Det. Limit (ug/g)	(ug/g)	 Q	1
71-43-2  108-88-3	Benzene  Toluene  Total Xylenes  Gasoline  Diesel / Waste Oil  Total Oil & Grease	0.2   0.2   0.2   10   10		U U U U 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.

\_Matrix

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

g/g) (	ug/g)	Q
0.2   0.2   10	0.2 2.2 100	U   +   +   NR   NR
	0.2   0.2   0.2   0.2   10   10	0.2   0.2   0.2   0.2   0.2   2.2   10   100

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

Anametrix I.D.: 8706061-06

Sample I.D. : TP147-C2 DUPLICATE
Matrix : SOIL
Date sampled : 6-16-87
Date extracted : NA
Date analyzed : 6-22-87 Analyst : (\*\*) Supervisor : 515

Date released : 6-26-87

Weight extracted: NA

CAS #	Compound Name	Det. Limit (ug/g)	(ug/g)		Q	-
71-43-2	Benzene	0.2	!	ļ	U	1
108-88-3 	Toluene  Total Xylenes	0.2	0.2		+	1
	Gasoline  Diesel / Waste Oil	) 10 1 10	135	i	+ NR	1
	Total Oil & Gréase	30		i	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.

Sample I.D. : TP147-D Anametrix I.D. : 8706061-07

Analyst : から Supervisor : あじ

Matrix : SOIL

Date sampled : 6-16-87

Date extracted : 6-18-87

Date analyzed : 6-19-87

Weight extracted: 30 g

Date released : 6-26-87

Det. Limit (ug/g) CAS # Compound Name (ug/g) 171-43-2 Benzene 0.2 1108-88-3 Toluene 0.2 | NR | Total Xylenes | NR ] 0.2 | [Gasoline 10 1 | NR | |Diesel / Waste Oil 5300 | + | |Total Oil & Grease 30 1 16000 | + [

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 2-9.

#### ORGANIC ANALYSIS DATA SHEET - HYDROCARBON COMPOUNDS

Anametrix I.D. : 8706061-07

Analyst : C')
Supervisor : 5%

Sample I.D. : TP147-D DUPLICATE
Matrix : SOIL
Date sampled : 6-16-87
Date extracted : 6-18-87
Date analyzed : 6-19-87 Date released : 6-26-87

Weight extracted : 30 g

CAS #	Compound Name	Det. Limit (ug/g)	(ug/g)	     Q
71-43-2  108-88-3	Benzene  Toluene  Total Xylenes  Gasoline  Diesel / Waste Oil  Total Oil & Grease	0.2   0.2   0.2   10   10	       6900   18000	NR     NR     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.

DEMPTE TIME : SOIL Matrix Date sampled : 6-16-87
Date analyzed : 6-25-87

Dilution

: 1:10

Analyst Supervisor : 14

Date released : 6-26-87

	Connected Name	Det. Limit	(ug/kg)	9
CAS #	Compound Name			
174-87-3	* Chloromethane	· 70	ļ ļ	ויט
74-83-9	* Bromomethane	70	ļ ļ	ן ט
75-01-4	* Vinyl Chloride	70	<u> </u>	U
75-00-3	* Chloroethane	70	<u> </u>	บ
75-09-2	* Methylene Chloride	20	!!	ו ט
67-64-1	**Acetone	100	<u> </u>	ן ט
79-69-4	* Trichlorofluoromethane	20	!!!	U
75-15-0	**Carbondisulfide	20.	į į	וַ ט
75-35-4	* 1,1-Dichloroethene	20	ļ ļ	ן ט
75-34-3	* 1,1-Dichloroethane	20	!	ן ט
	* Trans-1,2-Dichloroethene	20	!	ָּט ט
156-59-2	* Cis-1,2-Dichloroethene	20	1	ָ ו ט
67-66-3	* Chloroform	20	ļ ļ	U
76-13-1	# Trichlorotrifluoroethane	20	<u> </u>	ן טן טן
107-06-2	* 1,2-Dichloroethane	20   100	!	ו טו
78-93-3	**2-Butanone	1	1	ו ט
71-55-6	* 1,1,1-Trichloroethane	1 20	<b>.</b>	ו ט ו
56-23-5	* Carbon Tetrachloride	20	1	ו ט ו
108-05-4	**Vinyl Acetate	1 20	ł ·	ו טו
75-27-4	* Bromodichloromethane	20	 	ו ט ו
78-87-5	* 1,2-Dichloropropane	1 20	i i	ו טו
10061-02-6		20	}	וֹ טֹוֹ
79-01-6	* Trichloroethene	1 20	1	וֹטוֹ
124-48-1	* Dibromochloromethane  * 1,1,2-Trichloroethane	20	1	וֹטוֹ
79-00-5	* Benzene	20	220	1 + 1
71-43-2  10061-01-5	•	20	1	
1110-75-8	* 2-Chloroethylvinylether	20	i	i v i
75-25-2	* Bromoform	20	i	ivi
1591-78-6	**2-Hexanone	100	i	i vi
108-10-1	**4-Methyl-2-Pentanone	100	i	jvi
1127-18-4	* Tetrachloroethene	20	i	j v j
179-34-5	* 1,1,2,2-Tetrachloroethane	20	Ì	j v j
108-88-3	* Toluene	20	90	j + j
108-90-7	* Chlorobenzene	20	İ	j u j
100-41-4	* Ethylbenzene	20	300	1 + 1
100-42-5	**Styrene	20	1	ן טן
	**Total Xylenes	1 20	1500	1 + 1
541-73-1	* 1,3-Dichlorobenzene	20	1	טן
95-50-1	* 1,2-Dichlorobenzene	20		ן ט
106-46-7	* 1,4-Dichlorobenzene	1 20	l	ן ט

A 624/8240 approved compound (Federal Register, 10/26/84)

For reporting purposes, the following qualifiers (Q) are used:

<sup>\*\*</sup> A compound on the U.S. EPA CLP Hazardous Substance List (HSL) # A compound added by Anametrix, Inc.

<sup>+ :</sup> A value greater than or equal to the method detection limit.

U: The compound was analyzed for but was not detected.

Sample I.D. : TP147-D 1:10 DILUTION Anametrix I.D. : 8706061-07

Matrix : SOIL Analyst : いし Date Sampled : 6-16-87 Supervisor : ヴ Analyzed VOA : 6-25-87 Date Released : 6-26-87

Analyzed SV : NA

CAS #   Scan#   Volatile Fraction   Limit   Compound Name   Ppb   Pp				, 
594-82-1   319   2,2,3,3-tetramethylbutane	CAS #	Scan#	•	[Limit]
594-82-1   319   2,2,3,3-tetramethylbutane		181	2-methylpentane	50   60
111-84-2		319		
S25-73-8				•
1120-21-4   1338   undecane	•		decane	j 50 j 140
CAS #   Scan#   Semivolatile Fraction   Limit   Compound Name   ppb   pp   pp   pp   pp   pp   pp	,		1,2,3-trimethylbenzene	j 50 j 110
CAS #   Scan#   Semivolatile Fraction   Limit   Compound Name   ppb   pp   pp   pp   pp   pp   pp	1120-21-4	1338	undecane	50 71
CAS #   Scan#   Semivolatile Fraction   Limit   Compound Name   ppb   pp   pp   pp   pp   pp   pp		ļ	1	j 50 j
CAS #   Scan#   Semivolatile Fraction   Limit   Compound Name   ppb   pp   pp   pp   pp   pp   pp	!	Ţ		50
CAS #   Scan#   Semivolatile Fraction   Limit   Compound Name   ppb   pp   pp   pp   pp   pp   pp		ļ		
CAS #   Scan#   Semivolatile Fraction   Limit   Compound Name   ppb   pp   pp   pp   pp   pp   pp	 			50
Compound Name   ppb   pp   pp   pp   pp   pp   pp		!	[	
10	CAS#	Scan#	•	Limit
10	 		Compound Name	ppb   pp
10	į	1	I	10
10		Į		10
10	!	Į.		• •
10	<u>[</u>	į		
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10 10 10 10 10 10 10 10 10 10 10 10	!	ļ		•
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10	 	ļ		•
10	1 1	1	 	
10	! <b> </b>	1	<b>!</b> !	
10	! !	i	1	•
10	ι [		! !	• •
10   10   10   10   10   10   10   10	<u>,</u>	i	1. 	• •
10   10   10   10   10   10   10   10	i	.	1	. ,
10	į			, ,
ļ ļ ļ j 10 j	İ	i	i	• •
	i ·	i	İ	•
		i		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.

Sample I.D. : TP147-E

Matrix : SOIL

Date sampled : 6-16-87

Date extracted : NA

Date analyzed : 6-22-87

Weight extracted : NA

Anametrix I.D.: 8706061-08
Analyst : (2)
Supervisor : 515
Date released : 6-26-87

10

1 30

For reporting purposes, the following qualifiers (Q) are used:

|Diesel / Waste Oil |Total Oil & Grease

+ : 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

     CAS #	Compound Name	Det. Limit (ug/g)	{ug/g}	Q
171-43-2	Benzene	1 0.2	1	NR
108-88-3	Toluene	1 0.2	Ï	NR
	Total Xylenes	i 0.2	i	NR
1	Gasoline	i 10	ì	NR
1	Diesel / Waste Oil	j <u>1</u> 0	i 2900	+
	Total Oil & Grease	30	7100	i + i

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.

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

Anametrix I.D. : 8706061-09 Analyst : kM Supervisor : R;

Date released : 6-26-87

CAS #	Compound Name	Det. Limit (ug/kg)	(ug/kg)		
CAS #	* Chloromethane  * Bromomethane  * Vinyl Chloride  * Chloroethane  * Methylene Chloride  **Acetone  * Trichlorofluoromethane  **Carbondisulfide  * 1,1-Dichloroethene  * 1,1-Dichloroethane  * Trans-1,2-Dichloroethene  * Cis-1,2-Dichloroethene  * Chloroform  * Trichlorotrifluoroethane  * 1,2-Dichloroethane  * 1,2-Dichloroethane  * 2-Butanone  * 1,1,1-Trichloroethane  * Carbon Tetrachloride	(ug/kg)  7 7 7 7 10 2 10 2 2 2 2 2 2 12 2 12 2	(ug/kg)	ט ט ט ט ט ט ט ט ט ט ט ט ט ט ט ט ט ט ט	
75-27-4  78-87-5  10061-02-6  79-01-6  124-48-1  79-00-5  71-43-2  10061-01-5  110-75-8  75-25-2  591-78-6  108-10-1	**Vinyl Acetate  * Bromodichloromethane  * 1,2-Dichloropropane  * Trans-1,3-Dichloropropene  * Trichloroethene  * Dibromochloromethane  * 1,1,2-Trichloroethane  * Benzene  * cis-1,3-Dichloropropene  * 2-Chloroethylvinylether  * Bromoform  **2-Hexanone  **4-Methyl-2-Pentanone  * Tetrachloroethene  * 1,1,2,2-Tetrachloroethane  * Toluene  * Chlorobenzene  * Ethylbenzene  **Styrene  **Total Xylenes  * 1,3-Dichlorobenzene  * 1,2-Dichlorobenzene  * 1,4-Dichlorobenzene	10 2 2 2 2 2 2 2 2 2 2 2 10 10 10 2 2 2 2			

A 624/8240 approved compound (Federal Register, 10/26/84)

<sup>\*\*</sup> 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:

<sup>+ :</sup> A value greater than or equal to the method detection limit.

U : The compound was analyzed for but was not detected.

### SOIL VOLATILE/SEMIVOLATILE SURROGATE RECOVERY SUMMARY

ANAMETRIX WORKORDER# : 8706061

CLIENT PROJECT# : 308-TP147

SUPERVISOR : PG

HA:

8-TP147 ANALYST

#	SAMPLE	ID	VO1 (DCE)	VO2	VO3 (BFB)	A1 (2FP)	A2 (PHL)	A3 (TBP)	BN1 (NBZ)	BN2 (FBH)	BN3 (TPH)	TOTAL OUT
	TP-147-D TP-147-F		103	109	113							0
03	11-141-1		97	96	79							0
04												
05												
06												
07												
108												
09												
110												
11												
12												i
13				•								
14							-					
15												i I
16  17				•								i
118												ï
19												i
20												į
21	•											i
22	•											
23												!
24												1
25												ļ
26												
27			-									[
28												
29												Į
30												} 1

# ANAMETRIX PERCENT RECOVERY LIMITS (generated from sample data)

V02	(TOL)	=	1,2-DICHLOROETHANE-D4 TOLUENE-D8 4-BROMOFLUOROBENZENE	84-125% 78-130% 70-118%
A3 BN1 BN2	(PHL) (TBP) (NBZ) (FBH)	# #	2-FLUOROPHENOL PHENOL-D5 2,4,6-TRIBROMOPHENOL NITROBENZENE-D5 2-FLUOROBIPHENYL TERPHENYL-D14	24-82% 27-94% 31-118% 21-75% 29-87% 31-127%

Geotechnical Consultants, Inc.

7 - 1520 22654 Watkins Street • Hayward, California 94541 • [415] 582-1830

Block (Dea) KANDING 121.

Howard () Barlow, P.E.

Project No. H86078-A28E4 October 28, 1986

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. Petroleum odors were noted in each of the borings during

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 Volatile Hydrocarbons (ppm)	Total Extractable Hydrocarbons (ppm)
B-1 at 10'	173	-
B-2 at 10'	267	
B-3 at 10'	15.4	
B-4 at 6'	1.3	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,

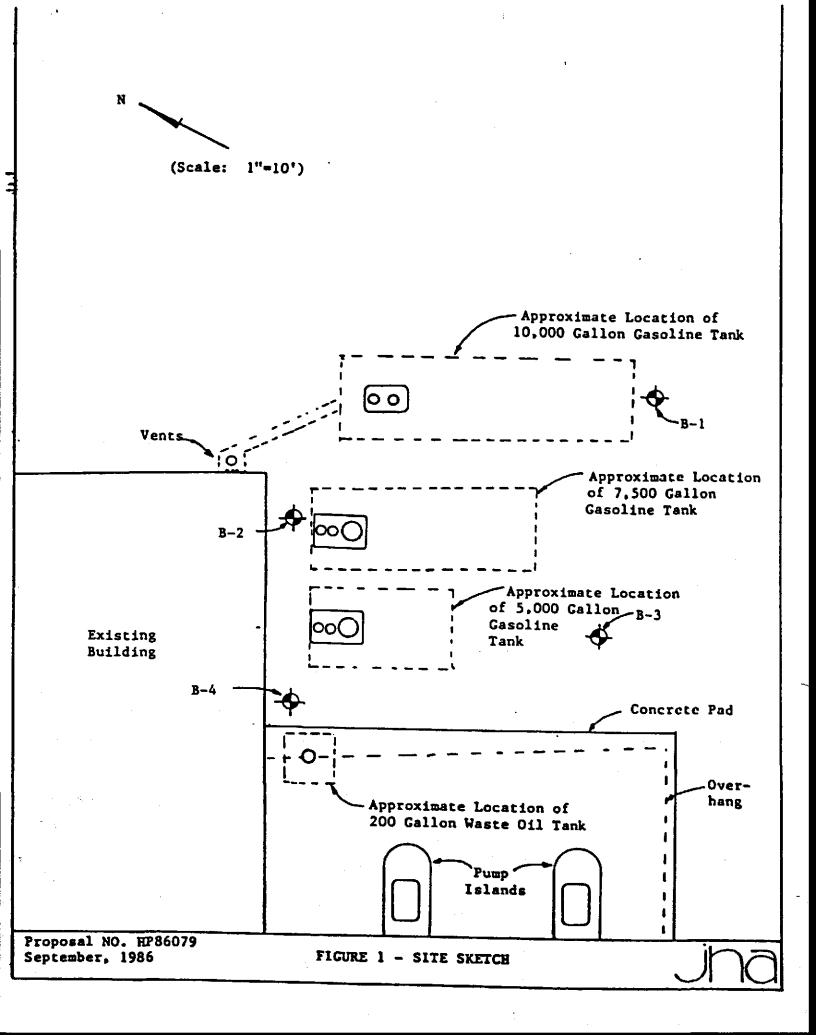
JHA GEOTECHNICAL CONSULTANTS, INC.

John C. Bird Staff Geologist

Howard D. Barlow Soil Engineer C.E. 35734

JCB/HDB:kg Enclosures

Distribution: Mr. Dick Bigelow (4 Copies)



1 - 2 - 3 - 4 - 5 - 6 - 7 - 8 - 9 - VL 11 - 12 - 13 - 14 - 15 - 15		MATERIAL DESCRIPTION  Asphalt and Baserock  BASEROCK: brown; dry to moist; coarse; FILL.  SANDY CLAY: brownish-black to brown; moist; petroleum odor.  Drilling terminated at 10.5'. No free groundwater encountered at time	Classification	Blown/foot 360 ft-be.	Qu - t. s. t. Penetrometer	Dry Denetty P.c.1.	Mointure % dry wf.	MISC. LAB RESULTS
3 - 4 - 5 - 6 - 7 - 8 - 9 - VL 11 - 12 - 13 - 14 - 14 - 14 - 14 - 14 - 14 - 14		BASEROCK: brown; dry to moist; coarse;  FILL.  SANDY CLAY: brownish-black to brown; moist; petroleum odor.  Drilling terminated at 10.5'.						
3 - 4 - 5 - 6 - 7 - 8 - 9 - VL 11 - 12 - 13 - 14 - 14 - 14 - 14 - 14 - 14 - 14		SANDY CLAY: brownish-black to brown; moist; petroleum odor.  Drilling terminated at 10.5'.						
4 - 5 - 6 - 7 - 8 - 9 - VL 11 - 12 - 13 - 14 - 14 - 14 - 14 - 14 - 14 - 14		Drilling terminated at 10.5'.	CL					
7 - 8 - 9 - 10 vl. 11 - 12 - 13 - 14 - 14 - 14 - 14 - 14 - 14 - 14		Drilling terminated at 10.5'.						
10 VL 11 - 12 - 13 - 14 -		Drilling terminated at 10.5'.						
12 - 13 - 14 -		Drilling terminated at 10.5'.						
- 1		of drilling.						·
16-		•						
17-								
19- 20-								
21- 22- 23-								
74- ratification material #	ines:	represent the approximate boundary between the engineer's of and the actual transitions may be gradual and vary with time or i	loecripti	OU [27	GURE	- N		11:75:3

Depth, ft.	Bample No. and Type	Symbol	MATERIAL DESCRIPTION	Unified Soil Classification	Blows/foot 350 ft-lbs.	Ou - L e. L Penetrometer	Dry Density p.c.f.	Moleture % dry wt.	MISC. LAB RESULTS
-			Asphalt and Baserock						
1 - 2 - 3 -			BASEROCK: brown; dry to moist; coarse; FILL.	GP					
5 - 1			SANDY CLAY: brownish-black to brown; moist; petroleum odor.	CL					
7 - 3 - 9 -									
ה בר	VL.								
1 - 2 - 3 -			Drilling terminated at 10.5'. No free groundwater encountered at time of drilling.						•
5-1-5-1			•				:		
7-1 3-1 3-1					:				
9-1									
2 - 3 -									
ᄪ	etion	Hree	represent the approximate boundary between the engineer's	1	tran I			L	

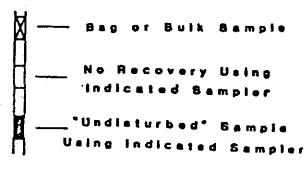
:	Log	ged	Ьу	:JCB Date: 9/25/86 Equipment: 4.5" Dia.	Fligh	nt <sup>†</sup> Λυ	ger_	Log	of:	
	Depth, ft.	Bample No.			Unified Soil Classification	Biowe/foot 360 ft-be.	- B	2	ہ ج	
				Asphalt and Baserock	<del>                                     </del>					
1.11.	- 2 -			BASEROCK: brown; dry to moist; coarse; FILL.	GP					
	- 4 - - 5 - - 6 -			SANDY CLAY: brownish-black to brown; moist; petroleum odor.	CL					
	7 - 8 - 9 -								·	
I ⊩	10	VL		Drilling terminated at 10.5'.						
	12 - 13 - 14 -		•	No free groundwater encountered at time of drilling.						
	15 16			•						:
۱ŀ	17   18   19									. ;
	20-									: :. !
	22 - 23 - 24 -									
8t	materia	icn ir d sys	100 St.	present the approximate boundary between the engineer's dot of the actual transitions may be gradual and vary with time or loc	eription	FIG	URE	 No	_	11.7.= >
				7 min (min 0) (0)	- IOIL	1, 10		170.	<b>4</b> [.	Л (С ] -

	Logged by: JCB Date: 9/25/86 Equipment: 4.5" Dia. Flight Auger Log of: 18-4												
	Logo	jed	DX:	JCB Date: 9/25/86 Equipment: 4.5" Dia.						H-4			
	Depth, ft.	Sample No. and Type	Symbol	MATERIAL DESCRIPTION	Unified Soil Classification	Blows/foot 360 ft-fbs.	Ou - L a. L Penetoneter	Dry Denaity p.c.f.	Moistus % dry wt.	MISC. LAB RESULTS			
				Asphalt and Baserock									
14.	- 1 - - 2 - - 3 -			BASEROCK: brown; dry to moist; coarse; FILL.	GP								
	5 6	۷Ľ		SANDY CLAY: brownish-black; moist; strong petroleum odor.	CL								
	7 - 8 - 9 - 10 - 11 - 12 - 15 - 16 - 17 - 19 - 20 -			Drilling terminated at 6.5'.  No free groundwater encountered at time of drilling.									
	21- 22- 23- 24-								·				
Ŀ	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)

7 [7]	FIED	<u> </u>	IL C	LASSIFICATION	ON SYSTEM (ASTM D-2487
L	Majur Divisions Symbols			Typical Names	Classification Criteria
	:	]	CM.	Well-graded gravels and gravel-and missings, little or no bace	Co - Dad Dos Greater 1888 4  Co - (Das)  Between 1 and 3
	1	Chas	GP	Poorly graded gravels and gravel-and mistures, little as no fines	Not merting both criteria for GW
41 41	Gravels 30% or more of course draction retained an No. 4 pleve	Gravels With Fines	GH .	Silty gravels, gravel-sead- silt mustures	and the training Bids
Course Crained Soils	E	3,-	cc	Clayey gravels, gravel. sand-clay murtules	& platticity under
Coeree.C	7. of fon stave	Clrs Sands	SR*	Well-graded ainds and gravelly sands, little or no boss	$C_{*} = D_{m}/D_{m} \qquad \text{Greater than 8}$ $\frac{1}{2} = \frac{1}{2} $
	Sands More than 50% of caore fraction parses No. 4 sheve		SF	Poorly graded sands and gravelly cands, little or on fines	Not meeting both criteria for SH'
4	Hore	Sands with Fines	5M	Silty sands, sand-silt mistures	Co = Dw/Din Greater than 8  Co = Dw/Din Greater than 8  Co = Owler Greater than 8  Co = Owler Greater than 8  Between 1 and 3  Between 1 and 3  Power of the SW  Attemberg limits plot ting in hatched area are bridgeting class than 8  Co = Owler Greater than 8  Attemberg limits plot ting in hatched area are bridgeting classifications requiring than 8  Attemberg limits plot and plasticity index  Attemberg limits plot  Attemberg limits plot  Attemberg limits plot  above "A" line and  Jack plasticity index
		<b>N</b> - <b>L</b>	sc	Clayey made, sand-clay mixtures	Atterberg limits plat  above "A" line and plasticity index greater than 7
8-	Cleye		ML	Inorganic cilta very fine monds, ruck flour, cilty ar clayey fine minds	a 60 Producing court
Flac Grand Solls	Silve and Clays Linuid limit 50% or Inc		CT	Inorganic clays of low to medium planticity, gravelly clays, sandy clays, sity clays, less clays	- and the constitution of floor.
Tar G	5 1 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2	1	OL	Organic silts and organic silty clays of low plastication	10
8	Silts and Clays Liquid Hink Frester than 30%		мн	leargenic silts, micacyous or distemecyous fine sands or silts, classic silts	1 19 1 1 1 1
	1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1		CN	Inergenic clays of high planucity, for clays	CID   CID
<u> </u>	·		ОН	Organic clays of medium to high planticity	Liquid limit ([L])
Highly organic soils			Pt	Prat. much and other highly organic soils	Vieusi-manusi identification

## Other Log Symbols



Groundwater Encountered

# Soil Sampler Types

L-Bulinose (3°QQ-2,376°LD)

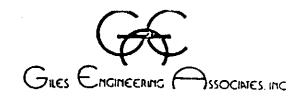
C-California (2.5°0.Q-1.9°1,Q)

T-Terzaghi (2°0,0,-1.376°t0.)

VL - (3.25"0.D. - 2.5"I.D.)

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.

# SPECIFICATIONS FOR SUBGRAD. AND GRADE PREPARATION FOR FILL, FOUNDATIONS, FLOOR SLABS, AND PAVEMENT SUPPORT; AND SELECTION, PLACEMENT AND COMPACTION OF FILL SOILS USING MODIFIED PROCTOR PROCEDURES



- Inspection and testing of subgrades and grades for fill, foundation, floor slab and pavement; and fill selection, placement and compaction shall be performed under the supervision of an experienced soils engineer.
- 2. All subgrades and grades shall consist of and be (a) underlain by suitable bearing material, (b) free of all organic, frozen, or other deleterious material, and (c) inspected and approved by qualified engineering personnel under the supervision of an experienced soils engineer. Preparation of subgrades after stripping vegetation, organic or other unsuitable materials shall consist of (a) proof-rolling to detect soft, wet, yielding soils or other unstable materials that must be undercut, (b) scarifying top 6 to 8 inches, and (c) recompaction to same minimum in-situ density required for similar materials indicated under item 5. Note: Compaction requirements for pavement subgrade higher than other areas.
- 3. In undercut and fill areas, the compacted fill must extend (a) a minimum 1 foot beyond the edge of the foundation or pavement at grade and down to compacted fill subgrade on a maximum 2(V):1(H) slope, (b) 1 foot above footing grade outside the building, and (c) to floor subgrade inside the building. Fill shall be placed and compacted on a maximum 1(V):5(H) slope or must be stepped or benched as required to flatten if not specifically approved by qualified personnel under the direction of an experienced soils engineer.
- 4. The compacted fill materials shall be free of deleterious, organic or frozen matter, and shall have a maximum Liquid Limit (ASTM D-423) and Plasticity Index (ASTM D-424) of 30 and 10, respectively, unless specifically tested and found to have low expansive properties and approved by an experienced soils engineer. The top 12 inches of compacted fill should have a maximum 3 inch particle diameter and all underlying compacted fill a maximum 6 inch diameter unless specifically approved by an experienced soils engineer. All fill material must be tested and approved under the direction and supervision of an experienced soils engineer prior to placement. If the fill is to provide non-frost susceptible characteristics, it must be classified as a clean GW, GP, SW or SP per Unified Soil Classification System (ASTM D-2487).
- 5. The density of the structural compacted fill and scarified subgrade and grades shall not be less than 90 and 95 percent of the maximum dry density as determined by Modified Proctor (ASTM D-1557) for cohesive and granular materials, respectively, with the exception of the top 12 inches of pavement subgrade which shall have a minimum in-situ density of 95 and 100 percent of maximum dry density for cohesive and granular soils, respectively, or 5 percent higher than underlying fill materials. The moisture content of cohesive soil shall not vary by more than -1 to +3 percent and granular soil ±3 percent of optimum when placed and compacted or recompacted. The fill shall be placed in layers with a maximum loose thickness of 8 inches for foundations and 10 inches for floor slabs and pavements unless specifically approved by a qualified soils engineer taking into consideration the type of materials and compaction equipment being used. The compaction equipment must be approved by personnel under the direction of a qualified soils engineer who is also performing the inspection of fill placement and compaction to ensure that it is suitable for the type of materials being compacted. Under no circumstances may bulldozers or similar tracked vehicles be used for compaction equipment.
- 6. Excavation, filling, subgrade and grade preparation shall be performed in a manner and sequence that will provide drainage at all times and proper control of erosion. Precipitation, springs, and seepage water encountered shall be pumped or drained to provide a suitable working platform. Springs or water seepage encountered during grading/foundation construction must be called to the soil engineer's attention immediately, for possible revision or inclusion of an underdrain system.
- 7. Non-structural fill adjacent to structural fill shall be placed in unison to provide lateral support. Backfill along building walls must be placed and compacted with care to ensure excessive unbalanced lateral pressures do not develop. The type of fill material placed adjacent to below grade walls (i.e. basement walls and retaining walls) must be properly tested and approved by an experienced soils engineer with consideration for the lateral earth pressure used in the wall design.

•	East	undations		
1.	7. 1	Conventional spread footings		
	(A.)	Conventional spread footings  In Founded at nominal death on suitable spread  Ones Engine	IERING ( )	SOCIMES IUC
		1. Founded at nominal depth on suitable existing (natural/fill) soil		
		2) Founded at nominal depth on structural fill replacing existing unsui	table	
	(3)	soil/materials approximately 12 feet deep, or extended		
	U.	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 unsui	table	
	c.	soil/materials approximately 12 feet deep, or extended		
	٠.			
		1. Founded at nominal depth on suitable existing (natural/fill) soil		
		2. Founded at nominal depth on structural fill replacing existing unsui	table	•;
		solithmaterials approximately legt deep, or extended		
	. 0.	Grade beam footings		
		1. Founded at nominal depth on suitable existing (natural/fill) soil		
		<ol> <li>rounded at nominal depth on Structural fill replacing existing uncul;</li> </ol>	table	
	_	solithmaterials approximately feet deep, or extended		
	E.	veed toungations		** *
		1- Drilled piers (approximate depth feet)		<u>.</u> .
		c. of the bites (applicatinate delity table)		:
	F.	Post tensioned slab or waffle slab		
		<ol> <li>Founded at nominal depth on suitable existing (natural/fill) soil</li> </ol>		
		4. Pounded at nominal depth on structural fill replacing existing unsuit	able	
		501/materials approximately feet deep, or extended	,4012	
H.		ØL 219D		
	(A)	Conventional slab-on-grade (including turned-down slab)		
	Ŧ.	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)		
111	. Pave	ement cybroged to landings bisharation (266 IA Below)		
	(A)	Conventional asphalt pavement with granular base, OR		
	Ÿ	Conventional asphalt payment with granular dase, OR		
	~~~	Conventional asphalt pavement with granular base and underlying geotextil Full-depth asphalt pavement , OR	e	
	Ψ	Plain Portland Cement concrete		
*	(F)	Reinforced Portland Cement concrete		
		Over-exclusion expected for exhaust		
IV.	5110	Over-excavation expected for subgrade preparation (See IV Below)		
•••	A	e Grading and Subgrade Preparation (Also Deals with II and III Above) Topsoil stripping		
		Modeling employing		
	\ <del>\$</del> \	Moisture sensitive soils typically resulting in undercutting during wet per	ariods —	
	X	Over-excavation due to soft subgrade soils below topsoil		
	Y	Over-excavation resulting from existing fill		
	<b>5.</b>	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		
	E)	Existing structures resulting in grading/excavation problems		
	te.	EXISTING OF PRODUCED SIGNEY POSSIBLY requiring retaining wall		
	Ι.	oprings within existing or cut slopes requiring special drainage/decuatori	ла	
	V.	- Judium mater table possibly requiring undordrain or come form of a	emporary or	
		hermoneur annataluade ZAZIEW		
	J.	Existing drainage swale resulting in potential significant over-excavation	n for proper	
		arearing and development of thin thinking	or proper	
	K.	Lime Stabilization of subgrade due to expansive or metastable soil		
	<u></u>	OCHEF		
Y.	Conta	amination, soil/groundwater (based on odors in samples, will be		
	2502 F	Lanulated and Elaborated, where relative when success and their and		
	CHEINT	tear reserved to completed)	•	
	$\wedge$	Minor/localized problem (nominal over-excavation expected)		
	47 J	- Pastr problem trecommend additional charial residut DOCCIDIE COMMININITY	FFR CONTAM	INATION
VI.		elongi ilelo expibilation apcommended	TEN COUTAIN	TOUTION
	A	Test borings (Reason	•	
	8, 1	Water observation wells (Reason		
	C. '	Test pits (Reason	{	•
	D. 3	Special contamination assessment study (Reason Other (Reason	?	
			/	
YII.	Sefsmi	iic Consideration	)	
	<b>A</b> . 9	Special study area		4
(	B) 1	Not in Alquist-Priolo Special Studies Zone to date. But in	a UBC Zone	4.

GEAST//kah

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INI	T LUBI	APPENDIX INSERT	
t	Found	diations G F	
•	(A)	Conventional spread footings TIES UNGINEERING   1550	OCIVIES IUC
	_	Founded at nominal depth on Suitable existing (natural/fill) 501!	•
		Founded at nominal depth on structural fill replacing existing unsuitable	
	_	snil/materials approximately 12 reet deep, or extended	
	<b>(B)</b>	Turned-down slab or monolithically poured foundation and floor slab	
	-	1. Founded at nominal depth on suitable existing (natural/fill) soil	
		Founded at nominal depth on structural fill replacing existing unsuitable soil/materials approximately 12 feet deep, or extended.	
	-	Moderately rigid spread footing foundations	
	ζ.	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	
	0.	Grade beam footings	
	٠.	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)	<del>:</del>
		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	
[].	٥٥٥ کئر	r Slab	
	A)	Conventional slab-on-grade (including turned-down slab)	
	B.	Hoderately rigid slab-on-grade	
	Ç.	Rigid heavily reinforced slab	
	0.	Post tensioned or waffle slab incorporated into foundation system	
	Ē.	Structural slab supported by deep foundation system	
	F.	Over-excavation expected for subgrade preparation (See IV Below)	
111.	Paver	ment	
		Conventional asphalt pavement with granular base, $\overline{OR}$ Conventional asphalt pavement with granular base and underlying geotextile	
	٨	Full-depth asphalt pavement, OR	
	$\mathbf{G}$	Plain Portland Cement concrete	
	Ä	Reinforced Portland Cement concrete	
	9	Over-excavation expected for subgrade preparation (See IV Below)	
IY.	Site	Grading and Subgrade Preparation (Also Deals with II and III Above)	
		Tonsoil stripping	
	-1 <del>000</del>	Moisture sensitive soils typically resulting in undercutting during wet periods	
	₪	Over-excavation due to soft subgrade soils below topsoil	
	<b>o</b>	Over-excavation resulting from existing fill	
	٤.	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	-
	(C)	6. Expansive Soil Existing structures resulting in grading/excavation problems	
	$\mathbf{\varphi}$	Existing or proposed slopes, possibly requiring retaining wall	
	u.	Springs within existing or cut slopes requiring special drainage/de-watering	
	() ()	Shallow water table possibly requiring underdrain or some form of temporary or	
	<b>V</b>	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	
	٤.	Other	
٧.	Cont	amination, soil/groundwater (based on odors in samples, will be	
		tanciated and elaborated, where relative, when current preliminary	
	chem	ical testing is completed).	
٠.	$\lambda$	Minor/localized problem (nominal over-excavation expected)	(TNATION
	(9)	Major problem (Recommend additional special study) POSSIBLE GROUNDWATER CONTAL	ITNYITON
VI.		tional Field Exploration Recommended	
		Test borings (Reason	
	8. C.	Water observation wells (Reason) Test pits (Reason)	
	D.	Special contamination assessment study (Reason)	
	٤.	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 All rights reserved. No part of this work may be reproduced or copies in any form or by any means without written permission of the publisher.

Remove unsuitable, unstable existing soils below the topsoil to develop a stable subgrace and replace with structural compacted fill

Select sand and gravel or crushed stone (well-graded granular material)

Common soil (silt, clay, sand, gravel mixture)

Provide. and compact structural fill fil including pavement and floor slab areas, BUT WALL BACKFILL IMPORTED FREE DRAINING

Select sand and gravel or crushed stone (well-graded granular material)

**(**(**)** Common soil (silt, clay, sand, gravel mixture), WALL BACKFILL FREE DRAINING

Provide, place, and compact structural fill in foundation excavations 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)

preparation with hydrated lime dry weight mixed (6%± int

top 6 to 8 inches and compacted to proper in-place density)

Portland preparation with Cement bν dry weight mixed int top 6 to 8 inches, moist cured, and compacted to proper in-place density)

Geotextile underlayment below pavement base course top of properl

prepared subgrade ( ounce)

Excavation of building debris fill (including concrete, asphalt, and possibly other rubble tree root balls, where requires over-excavation of large typical subgrade excavation depth

Provision, placement, and compaction of working mat (coarse granular material such as coarse crushed stone) for stabilization of surface soils may include a geotextile 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

Sump pits with pump (POSSIBLY WORKABLE)

French drain (3 to 4 foot depth with geotextile rap and perforated pipe)

Blanket drain (geotextile envelope with free draining granular material 6 to 8 inches c. in thickness and perforated pipe discharge)

**(**b) Well points (10 to 15 foot depth with appropriate header and pumps)

Deep wells (with appropriate perforated liner and down hole pump)

Permanent and/or temporary subdrainage system

Underdrain system with proper incorporation of geotextile and perforated pipe placed (a) fent on genter throughout required area WALL PERIMETER

French drain with a geotextile rap and perforated drain pipe (3 to 4± foot depth) b.

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

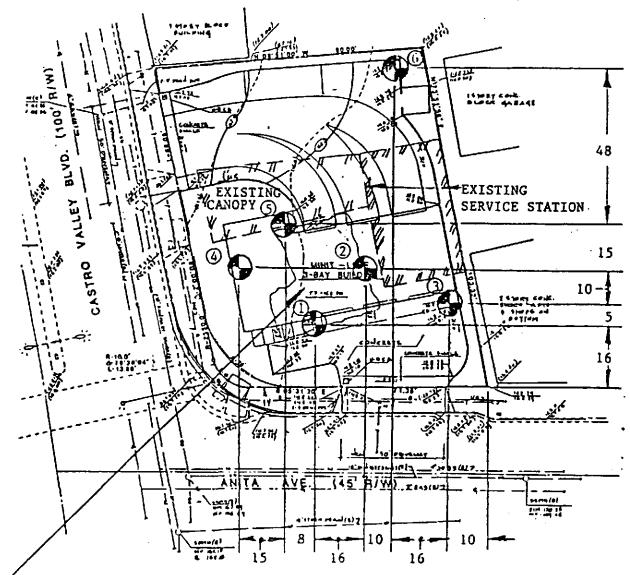
12 Inches on-center each way 18 inches on-center each way

#### 1669/kah

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





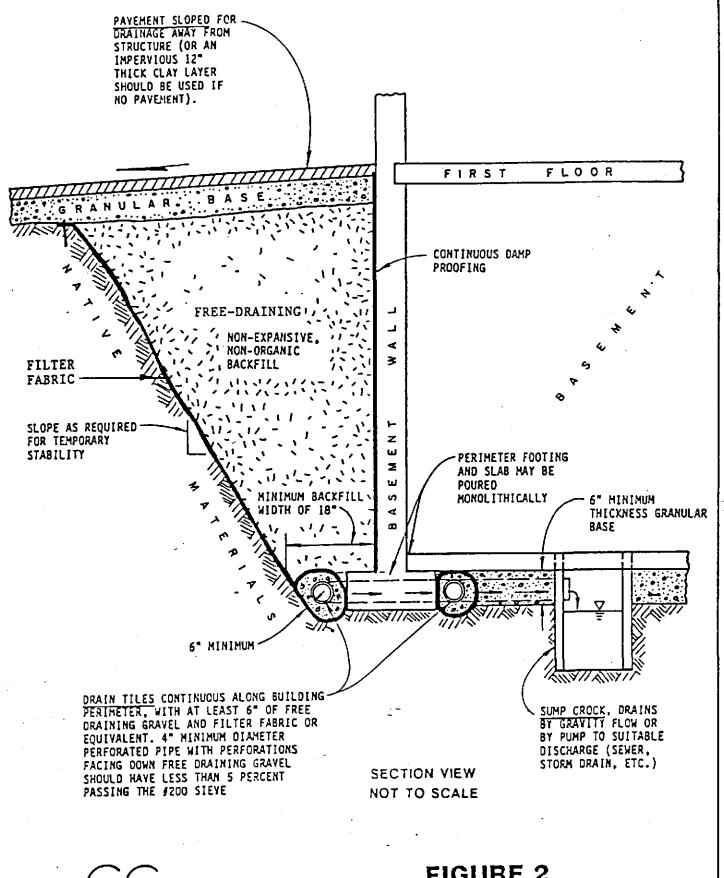
-APPROXIMATE LOCATION OF TANK REMOVAL AREA

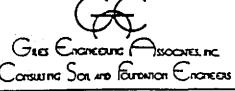
DRAWING REFERENCE: "Grading Plan" by Michael J. Majors Civil Engineers, Inc., Dated 12/8/86

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

BORING NO.	GEAP ECT	NO.				\	こノノ	1		
2 (north of	tanks) C-88	30106				<i>-</i>	4	7		
DATE	FIELD REPRESENTATIV	E	·	7		es En	CIMEERIN		SSOCIN	ES INC
1/22/88	John Moser									
PROJECT				(	<b>Ousns</b>	ic drit	OIL AND	ITAGNUO	on t	naneers
Proposed Mini	t-Lube									
Castro Valley	. California									
DESCRI Ground Surfa	PTION 1681±	Depth Balow Surface	Sample No. & Type	N	q <sub>ü</sub>	q <sub>p</sub>	q,	w	*PID	
FIEL: 2± inches BA	SE: crushed		1-AU	-			1		ND	<del>                                     </del>
aggregate Greenish Gray with some Sil	Brown fine Sand, (uniform)		2-55	9				6	ND	
Brown to Dark Brown Gravelly Silt, trace Sand and Clay (POS:	n fine rounded of fine to coarse SIBLE FILL)	5'-	3-SS	12		0.5		24	ND	
			4-ss	5	İ			12	סא	
NOTE A		10.	5~\$S	1	_	_	_	** TPH BTX	140	77
Brown with some Bla Brown fine to coars with fine rounded (	e Sandv Silt.	-								
		15'	6-55	14		1.5		17	ИD	
		-    	7-SS	25			į		,	
		20' 🕂	7 33						ND	4 5
Boring Terminated a	t 20'	-			, i	.				-
samples uti Photoioniza equipped wi	n representative lizing a tion Detector. th a 10.2 eV	25' -								-
	ated to Benzene parts per million	30, -								-

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

35'

40'

(ND = Not Detectable)

Gravelly Silt, trace of fine to coarse Sand and

Clay (PETROLEUM ODOR)

OTE A: Dark Brown to Black fine

(POSSIBLE FILL)

hydrocarbon testing

Sample

 $\nabla$  Water encountered at <u>13</u> ft, while drilling

Water at 9 ft, at completion
Water at \_\_\_\_\_ft, after \_\_\_\_\_hours

\*TPH & BTX:

**				
BORING NO.		GEAP	ECT NO.	
l (east of ta	anks)	c	-880106	
DATE		REPRESEA	SVITATI	
1/22/88				
PROJECT	-			<del></del>

GILES ENGINEERING SSOCIATES, INC.
CONSULTING SOIL AND FOUNDATION ENGINEERS

Proposed Minit-Lube

Castro Valley, California	astro Valley, California								
DESCRIPTION Ground Surface Elevation 168'±	Depth Below Surface	Semple No. & Type	2	q <sub>u</sub>	d⁵	q,	w	*PID	
FILL: 3t inches BASE: crushed aggregate	_	1-AU	-					ND	-
Greenish Gray Brown fine Sand, some Silt (uniform)	<del>-</del>	2-SS	14				12	ND	
Dark Brown Silty Clay, trace of fine Gravel and fine to coarse sand (POSSIBLE FILL)	5' <u>-</u>	3-55	18		2.2		14	מא	
(FUSSIBLE FILL)	_	4-SS	6		0.8	! !	19	ND	77-
NOTE A	10' -	5 <b>-</b> SS	9				_	ND	- ]
Brown fine to coarse Sandy Silt, with rounded fine Gravel, and trace of Clay	-								$\nabla$
	- 15' -	6-88	17				18	ND	-
		_							מח ריי
	20' -	7-SS	26		4.5		18	ND	
Boring Terminated at 20'	-								-
* <u>PID</u> = Results of vapor analysis conducted on representative samples utilizing a Photoionization Detector	25' -								- - - -
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' -								-
<ul> <li>✓ Water encountered at 12½ ft, while drilling</li> <li>✓ Water at 8½ ft, at completion</li> </ul>	40'-	:							
▼ Water atft. afterhours	45' -								

anges 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.

SORING NO.	GEA. JECT NO.
4 (S. of new building)	
DATE FIELD R	EPRESENTATIVE
1/22/88	John Moser
ROJECT	

GILES ENGINEERING ASSOCIALES, INC.

CONSULTING SOIL AND FOUNDATION ENGINEERS

Proposed Minit-Lube

Castro Valley, California									
DESCRIPTION Ground Surface Elevation 1681±	Depth Below Surface	Sample No. & Type	N	q <sub>u</sub>	q <sub>p</sub>	q,	w	*PID	
ILL: NOTE A rown fine well-rounded Gravelly Silt (POSSIBLE FILL)		1-AU 2-SS	3				10	ND ND	-
ark Brown to Black Clayey Silt POSSIBLE FILL)	5' -	3-88	2		0.8		18	ND	-
		4-SS	11		0.8		22	ND	. <del>-</del>
ray Greenish Brown Clayey Silt	10' -	5-88	10		1.8		18	ИD	<u>.</u>
ark Brown and Gray Brown mottled layey Silt, with fine rounded Grave ome Clay	1, -								$\nabla$
	15'	6-SS	12		2.5		27	סא	-
	20'	7-SS	5	-	_	_	** TPH BTX	2	
ring Terminated at 20'									-
TE A: 2± inches Asphalt 3± inches BASE: crushed aggregate Dark Brown angular Gravelly Silt, with fine to coarse Sand	25' -								
PID = Results of vapor analysis conducted on representative samples utilizing a Photoionization Detector	30' -								-
equipped with a 10.2 eV Lamp Calibrated to Benzene reported as parts per million (ND = Not Detectable)	35'								1
TPH & BTX: Sample sent for hydrocarbon testing	40' -								-
♥ Water encountered at <u>13 ft. while drilling</u> ■ Water at <u>91 ft.</u> at completion  ■ Water atft. afterhours	-								-
es of strata indicated by the lives are approximate	45' -								-

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

### SAMPLE IDENTIFICATION

No. 200 (0.074mm) and smaller (Plastic)

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

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

SOIL PROPERTY SYMBOLS DRILLING AND SAMPLING SYMBOLS Dd: Dry Density, pcf SS: Split-Spoon LL: Liquid Limit ST: Shelby Tube - 3" O.D. (except where noted) PL: Plastic Limit AU: Auger Sample

SL: Shrinkage Limit DB: Diamond Bit LI: Liquidity Index[(w - PL)/PI] CS: Carbide Bit PI: Plasticity Index (LL-PL) WS: Wash Sample Gs: Specific Gravity RB: Rock-Roller Bit K: Coefficient of Permeability BS: Bag Sample

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 Come Penetrometer driven with a 140 pound weight free-falling 30 inches

lacksquare: Apparent groundwater level at the time noted after completion

: Depth to which boring caved during water level readings

## SOIL STRENGTH CHARACTERISTICS

 COMPARATIVE CONSISTENCY Very Soft Soft Medium Stiff Stiff Very Stiff Hard	COHESIV  BLCHS PER  FOOT (N)  0-2  3-4  5-8  9-15  16-30	UNCONFINED COMPRESSIVE STRENGTH (TSF) 0 - 0.25 0.25 - 0.50 0.50 - 1.00 1.00 - 2.00 2.60 - 4.00	<del></del>	NON-COHESIVE (O  RELATIVE DENSITY Very Loose Loose Firm Dense Very Dense	GRANULAR) SOILS  BLOWS PER  FOOT (M)  0-4  5-10  11-30  31-30  51+	
DEGREE OF PLASTICITY None to Slight Slight Medium		4.00+ EE OF NSIVE POTENTIAL Low Medium High	<u>PT</u> 0-15 15-25 25+			

High to Very High 31+

## APPENDIX B

MONITORING WELL SAMPLING PROTOCOL

& PROJECT MANAGERS.

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#### PRATT CONSULTING COMPANY

#### WELL MONITORING PROTOCOL

#### ADOPTED APRIL 1989

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

- 1) Bessive well best cover at grade and resove cap on well pipe checking the integrity of each and making ourse 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 leg.
- 2) Using a veter level indicator we execute the distance between the top of the well casing and groundwater level before building or sampling. This distance is then noted in the manitoring well field log.
- 3) Using the mater level indicator we then measure the approximate total depth of meable column. This distance is then noted in the menitoring well field log.
- 4) After finishing with the water level indicator we week and clean it. (SEE "CLEANING THE EMMINYEMT")
- 5) We calculate the well dismeter and the total dupth of usable column to determine how many gallens of groundwater we would have to bail from the well to achieve 5 well volumes of groundwater. This is then noted in the manitoring well field leg.
- 6) Depending on the size of the well and the depth to groundwater PCC uses 3 different methods to remove the required assunt of groundwater. All 3 methods require the use of preclamed equipment. (SEE "CLEANING THE BOULDWENT")
- Method 1 We use standard 1.66°, 2° or 3.65° PVC or Acrylic beliers. We use fresh mylen much rape for each well. We belt the required amount of uster out and empty it into a trough which is then pusped up into the helding tanks on the truck. The amount of groundwater which is removed is then noted in the manitoring well field log.
- Method 2 On 2" wells where groundwater is shellow 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 precisened sections of pipe which pumps the groundwater directly into the heiding tanks on the truck.
- 7) After finishing with the suction pumps, pipe sections, or bailors we wash and clean them between wells.
  (SEE "CLEANING THE EQUIPMENT")
- 8) Using a meter 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 munitaring well field log.

- The oblice the upli to recover to a minimum of SSE of it's original level before taking the required complex for employee. The level of the grandumter at the time of compling is then nated in the mentaring upli field lep-
- The proclem a TEPLEN 12" bailer (SEE "CLEANING THE BENIFICENT") and after the final rines we refill it with distilled or de-lemined water. We collect a sample for analysis from the bailer using a 40 mil 100 viol for quality sentral purposes. This sample is also submitted to the laboratory.
- After the well has receivered us use a precleared TEFLOR 12" bailer with sampling ends and a new place of mylen much rape to election the groundwater sample in the well. We then correlally fill 2, 40 mil VOA viels are then carefully labeled viels and cap them and verify there is no head space present. The VOA viels are then carefully labeled and placed in a zip lock beg in a cooler to be stored until delivered to the laboratory. The temperature in the cooler is kept at 4 degrees Colsius.
- 12) After finishing with the TEFLES belier us useh and clean it. (SEE "CLEANING THE EGUIPMENT")
- 12) After finishing with the large met to spill any meter, sand etc. into the well.

  13) We close the well up suking ours not to spill any meter, sand etc. into the well.

## CLEMING THE EQUIPMENT

We use three different types of cleaning solutions depending upon the site specific data available. They are; TSP, Alquines and Liquines. We cleaning use distilled or de-lenized mater for cleaning and rinsing the equipment. If the equipment has been contaminated to the point where we do not feel safe with it before therough cleaning we take that piece of equipment aux of service for the duration of that days project. On occasion that the equipment has been heavily contaminated we use posticide grade temporability clean the equipment followed by rinsing. The equipment consists of pumps, pipe sections, bellers, samplers, uster level indicator, and mash bushets.

We reference for sampling the pretacet indicated in the EPA's Operating Precedures and Quality Assurance Harmat put out in April of 1986. This use 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. Places feet free to contact sur office with your questions and concerns.

Sincerely, PRATT COMBULTING COMPANY

John Prett

underground Tank Removel / Tank Installation / Tank Hamitoring Systems / Lovel Indicators / Soil Gas Surveys Site Characterizations / Henitaring Volls / Securery Volls / Air Stripping / Soil Ventilation Systems Srinking unter Surveys / Hazardous Naterials Hanagement Plans / Analytical Laboratory Voll Henitaring / Sample Collection

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