WORK PLAN:

SOIL REMEDIATION ACTIONS AND ELEMENTARY GROUNDWATER INVESTIGATION

JAMES PHILLIPSEN PROPERTY
1357 HIGH STREET
ALAMEDA, CALIFORNIA

PREPARED BY ENVIRONMENTAL BIO-SYSTEMS, INC.
FOR JAMES PHILLIPSEN
MAY 7, 1990

ENVIRONMENTAL BIO-SYSTEMS, INC.
30028 Industrial Pkwy, S.W.
Hayward, California 94544-6904
429-9988
Brenda McNabb

WORK PLAN FOR SITE INVESTIGATION AT
1357 HIGH STREET
ALAMEDA, CALIFORNIA

INTRODUCTION

The following section contains the purpose and scope of this work plan, a brief site history, and a summary of previous investigations.

Purpose and Scope

This work plan presents the scope of services to be performed in the removal and remediation of contaminated soils and investigation into the extent of impact on shallow groundwater beneath the site related to the underground storage tank (UST) formerly located immediately adjacent to the far eastern corner of the station building located at 1357 High Street, Alameda, California. (Refer to the site location map and site diagram in Appendix A).

This plan has been prepared in accordance with Alameda County's request for work plan letter dated February ~~2~~, 1990.

15

SITE HISTORY

The site has been operated as a Union 76 and Mobile service station since 1936. There are currently three underground gasoline storage tanks (4,000, 5,000, 6,000 gallons) and one 100 gallon waste oil tank in operation at the site. The dates of installation are unknown.

Previous Investigations

The responsible party retained R. L. Stevens Company to remove a 2,000 gallon steel gasoline tank in August of 1989. During tank removal operations conducted on August 15, 1989, personnel from Blaine Tech Services, Inc. collected soil samples from the material surrounding the tank and collected a water sample from groundwater which had entered the excavation after the tank had been removed.

The results of this investigation indicate that total petroleum hydrocarbons (TPH) calculated as gasoline were present in soils along the southeastern wall of the tank pit at concentrations as high as 3,200 parts per million (ppm). Soil samples were not collected from the remaining three walls of the excavation because of their instability at the time of tank removal. The water sample collected from the tank pit excavation contained TPH calculated as gasoline at a concentration of 29,000 parts per billion (ppb). Concentrations of benzene, toluene, ethylbenzene, and xylenes (BTEX) were also present at various concentrations in soil and water samples. Refer to Appendix B for a more detailed description of tank removal sampling procedures and analytical results.
The sampling report indicates that

SITE DESCRIPTION

The site is located at 1357 High Street, Alameda, California.

General Hydrogeologic Data

The generalized geologic characterization of the site includes predominantly sedimentary deposits consisting of sands.

Groundwater gradient determination has not been performed at the site.

Depth to groundwater was measured at approximately 8.0 feet below grade at the time of tank removal.

The site is not located within the 100 year floodplain.

DETERMINATION OF SOIL CONTAMINATION

Actions to be taken in the investigation and remediation of the site include the following: 1) removal and segregation of contaminated soil from areas adjacent to the form tank pit, 4) backfilling with uncontaminated soils, 5) execution of approved aeration or biological remediation of contaminated soil on site, 6) the installation, development and monitoring of three (3) two inch diameter groundwater monitoring wells for both quality and gradient determination. Depending upon the apparent quality of groundwater observed during site activities, a four inch diameter extraction well may be substituted for one of the three two inch wells.

Preliminary Measures

Prior to commencement of work, the appropriate state, local, and private entities will be contacted and all permission and permits necessary for the performance of work described within this plan will be applied for and obtained. A locating service will be contacted to map out all existing utilities on or near the proposed area of work at least 48 hours in advance of any underground activity.

The limits of the area to be excavated will be clearly marked as will be the soil storage areas and the areas designated for soil remediation.

Soil Excavation

Removal of the contaminated material will be performed in a logical, stepwise manner allowing continued access to the exposed areas of the anticipated soil contaminant plume. The quality of soils removed from this zone will be monitored by olfactory and visual inspection.

Soil removed during this phase will be segregated, based on the observed quality, and stockpiled at the northernmost corner of the property.

Excavation will be continued until monitoring suggests that the limits of lateral contamination have been defined. At this time, confirmation soil samples would be collected from the over excavated walls of the tank pit and analyzed to determine the presence of hydrocarbons. Excavation would be continued until confirmation samples indicate that only acceptable levels of hydrocarbon contaminated soil remain, or until excavation is no longer feasible.

The open pit will have temporary fencing constructed around the perimeter to prevent accidental entry.

Backfill and Compaction

Following the successful removal of contaminated material from within the pit as confirmed by certified laboratory analysis, the pit will be backfilled using clean imported fill material (as necessary).

The excavation will be filled to grade with an anticipated compaction standard of 95%. The exposed area will then be paved.

Remediation of Impacted Soil

If laboratory analysis confirms the presence of total petroleum hydrocarbons (TPH) calculated as gasoline, and/or related constituents, in concentrations that exceed levels acceptable to class III landfill facilities, the material will remain stockpiled on site until the necessary permits have been acquired to remediate the material by aeration or bioremediation.

Soil Disposition

Soil treatment would be carried out until the average detected contaminant concentration falls below 100 ppm, enabling disposition of the material at an accepting class III landfill.

Soil will be loaded out onto end-dump trailers and hauled to the nearest receptive landfill. Prior to hauling, a waste characterization form will be filed with the landfill (if mandated) and necessary permission and or permits will be acquired.

DETERMINATION OF GROUNDWATER QUALITY

Following completion of the excavation phase of the project, the impact (if any) to the shallow water bearing zone would be addressed through the installation, development, and monitoring of three (3) two inch diameter groundwater monitoring wells, or by the installation of two two inch diameter monitoring wells and one four inch diameter extraction well.

Placement of the wells will be based upon the assumed direction of groundwater flow beneath the site as well as the need to perform the triangulation necessary to calculate the local gradient.

The wells would be installed by use of a truck mounted mobile drilling rig equipped with eight inch hollow stemmed augers. After advancing borings to a depth approximately fifteen to twenty feet below that depth at which water is first encountered, two inch or four inch diameter PVC casing will be inserted through the augers and completed as per LUFT manual specifications for groundwater monitoring wells. Such completion will include a gravel pack of #3 sand, two foot bentonite clay seals, portland cement fill, traffic boxes set in concrete, and locking type well caps (for a more detailed description of well installation protocol see Appendix C).

Monitoring Well Development & Sampling

After allowing at least forty-eight (48) hours to elapse subsequent to completion of the groundwater monitoring wells, each of the wells will be developed.

Development of the wells will be performed by evacuating water from within the wells with a peristaltic or piston type pump until the effluent is found to run free of silt or until at least ten well volumes have been evacuated and parameters indicate that the well has stabilized.

In order to confirm stabilization, periodic monitoring of the pH, temperature, and conductivity will be performed in an effort to ensure that a representative volume of groundwater from outside the zone of impact from installation and excavation is being accessed for sampling. When all three parameters are found to have stabilized, a water sample will be collected.

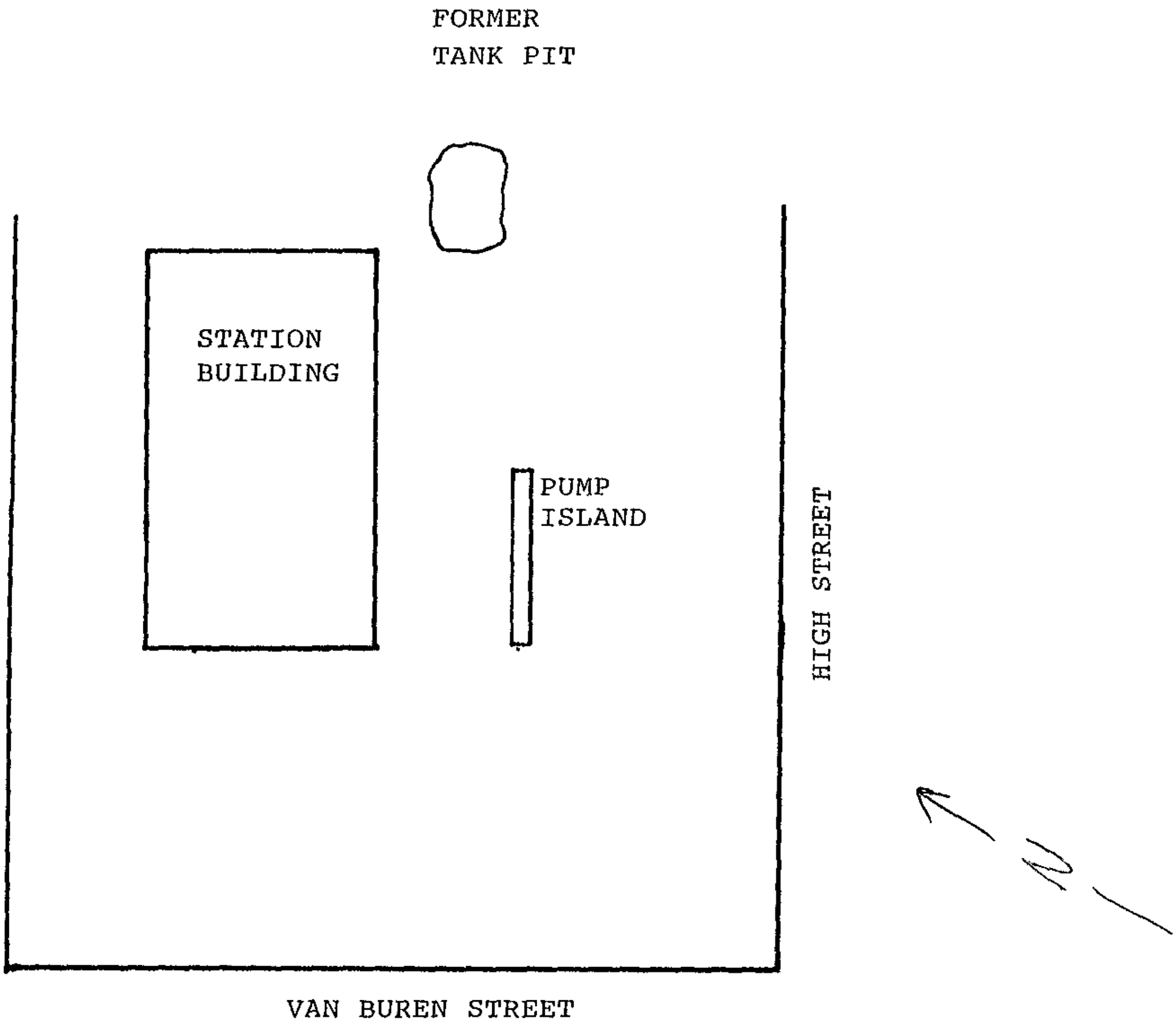
Sampling will be performed using a clean Teflon or stainless steel bailer. The samples will be analyzed for TPH as gasoline and BTX&E at a certified hazardous materials testing laboratory.

PROJECT REPORTAGE

Upon completion of the work described within this work plan, a report describing field and laboratory procedures, soil encountered in the soil borings, interpretation of the soil strata, well construction, and laboratory results will be prepared and submitted to the responsible party. Interpretations of the site conditions and results of analyses will be provided as well as any further recommend actions. Documentation will include logs of soil borings, copies of the chain of custody forms and laboratory reports, tabulated data, and interpretative figures as needed.

APPENDIX A

LOCATION MAP & DIAGRAMS



JAMES PHILLIPSEN PROPERTY
1357 HIGH STREET
ALAMEDA, CALIFORNIA

Scale:
1" = 20 feet

FIGURE 1 - SITE DIAGRAM

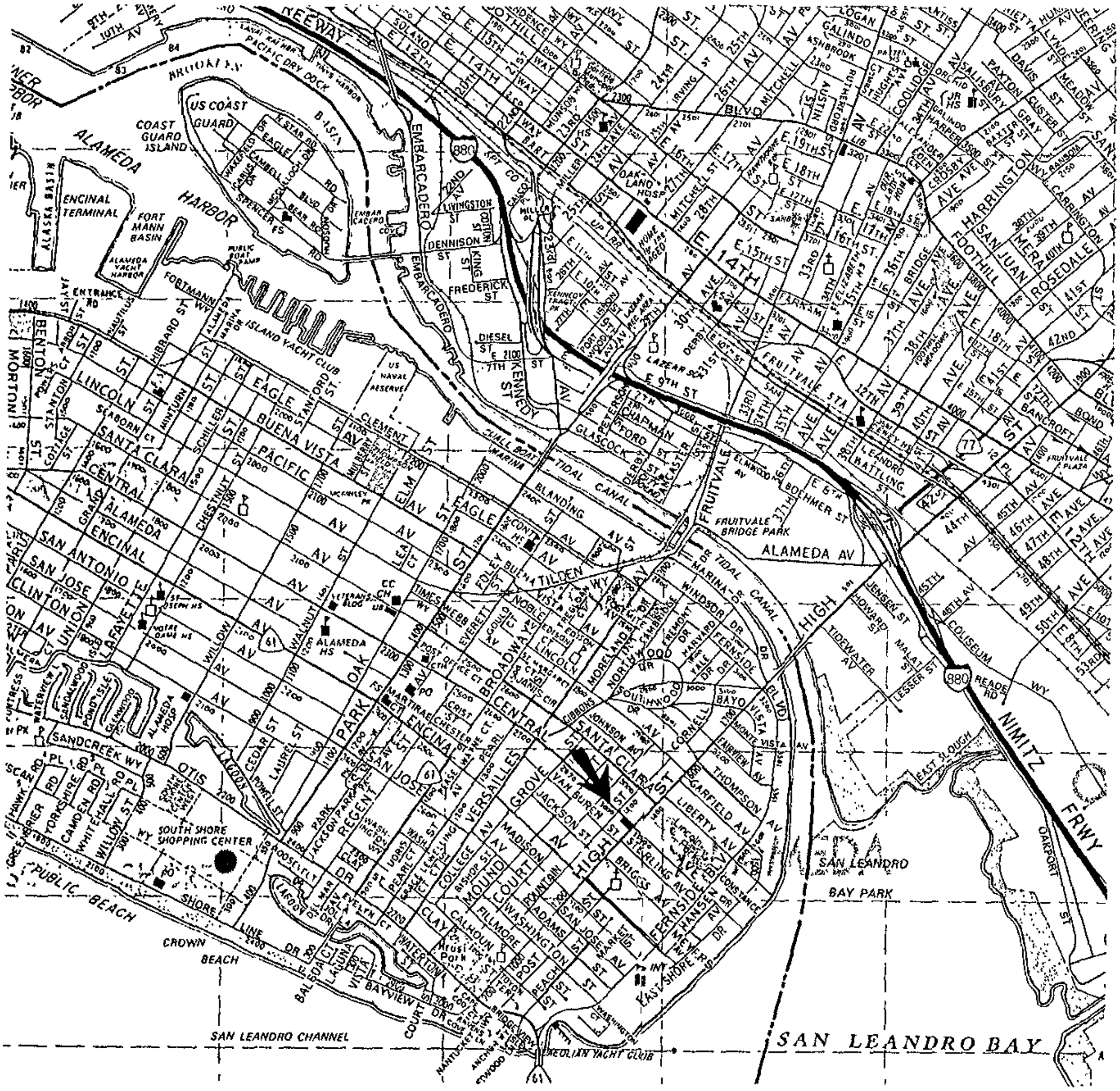


FIGURE 2 - SITE LOCATION MAP

-N-

Scale:
1" = 2200 feet

APPENDIX B

TANK REMOVAL SAMPLING REPORT

BLAINE
TECH SERVICES INC.

1370 TULLY RD., SUITE 505
SAN JOSE, CA 95122
(408) 995-5535

August 30, 1989

R.L. Stevens Company
P.O. Box 361
San Leandro, CA 94577

Attention: Bob Stevens

SITE:
James Phillipsen Property
1357 High Street
Alameda, California

PROJECT:
Tank Removal

SAMPLED ON:
August 15, 1989

TANK REMOVAL SAMPLING REPORT 890815-M-1

Blaine Tech Services, Inc. performs specialized environmental sampling and documentation as an independent third party. In order to avoid compromising the objectivity necessary for the proper and disinterested performance of this work, Blaine Tech Services, Inc. does not participate in the interpretation of analytical results or become involved with the marketing or installation of remedial systems. The interpretation of results should be performed by representatives of interested regulatory agencies and/or those professionals who are engaged as paid consultants in the business of providing opinions and proposals for further investigation or clean-up activities.

This report describes the initial environmental sampling and documentation performed by our firm on this project. In addition to the text of the Sampling Report, supporting documents are provided as attachments. These include the chain of custody and the certified analytical laboratory report. All of these documents should be kept together and preserved as a file of interrelated records which, together, comprise the documentation of the work performed at the site.

Scope of Requested Services

In accordance with your request, field personnel would be dispatched to the site to observe the tank removal, collect samples, arrange for the proper analyses of the samples, and maintain adequate documentation resulting in the issuance of a formal Sampling Report. The collection of environmental samples was to be performed in accordance with the requirements of the State Water Resources Control Board and the specific directions of the Local Implementing Agency (LIA) inspector present at the site at the time of removal.

Execution of the Tank Removal Sampling

The subject site is located within the overall jurisdiction of the Regional Water Quality Control Board -- San Francisco Bay Region. Initial inspection and evaluation of the site is customarily conducted by the local implementing agency (LIA), which was the Alameda County Health Agency. The local implementing agency was represented by Mr. Lawrence Seto, Senior Hazardous Materials Specialist, who was present to observe the tank removal and sampling.

Personnel were dispatched from our office and arrived at the subject site on Tuesday, August 15, 1989. Other interested parties included Mr. Marvin Helms, Fire Prevention Captain, of the Alameda Fire Department.

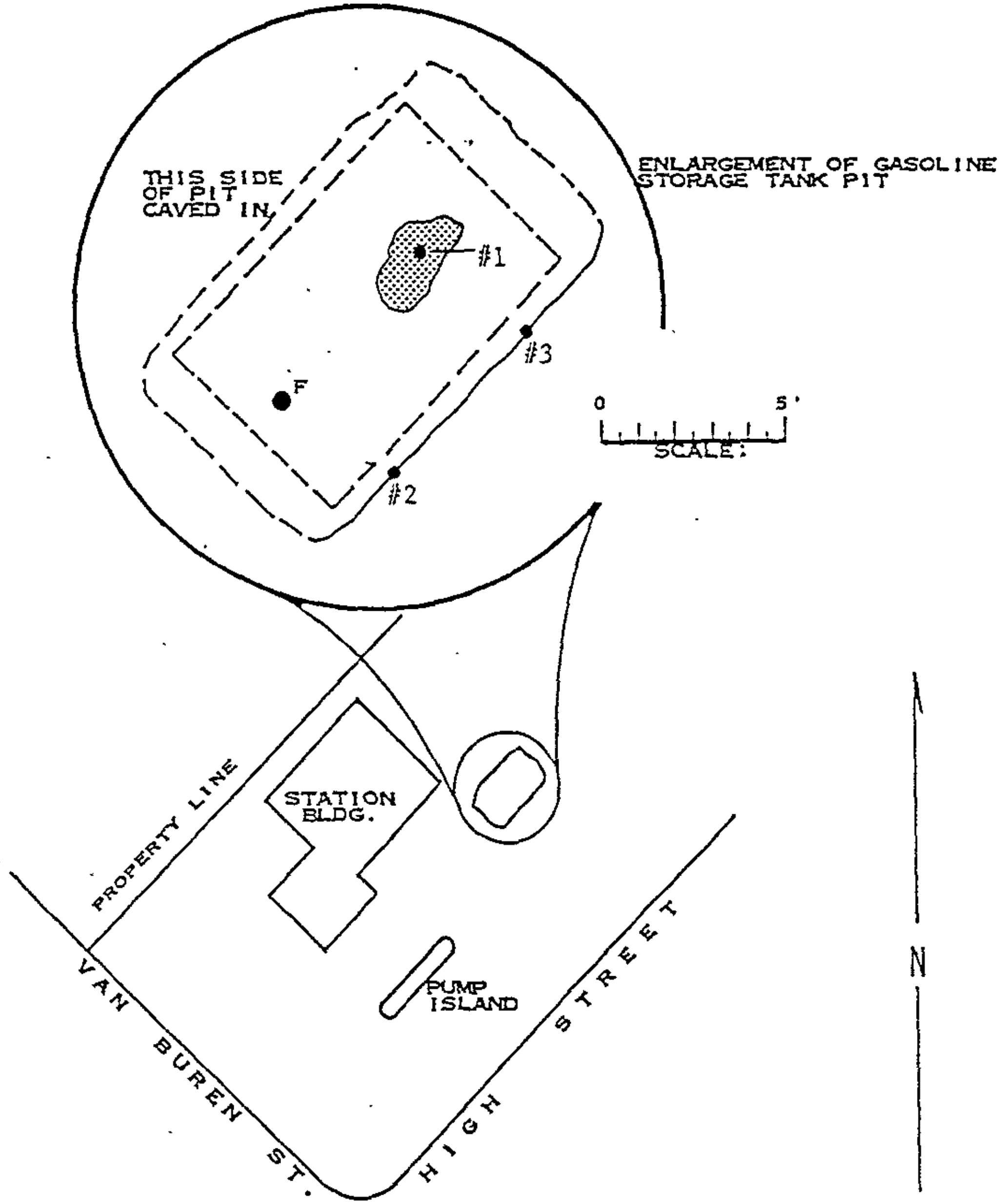
In accordance with the local regulations and the field judgment of the LIA representative, a detailed inspection was conducted in which the tank was visually inspected and likely failure points were probed with small pointed metal examination tools. No holes were observed in the tank.

TANK I.D.	SIZE IN GALLONS	TANK CONTENT	MATERIAL OF CONSTRUCTION	INSPECTION FOUND
A	2,000	GASOLINE	STEEL	NO HOLES

Water was present inside of the 2,000 gallon tank. This water had to be pumped out of the tank before the tank could be removed from the subsurface. Water was also present in the excavated pit and was standing at eight feet (8') below grade prior to the removal of the tank. Once the water was pumped out of the tank, the tank was removed. Subsequently, the water was pumped put of the excavated pit. Ground water entered into the pit fairly rapidly and sample #1 was collected from this water at a depth of eight and a half feet (8.5') below grade, using a subsurface water device.

Two capillary zone samples were obtained from the same sidewall at either end of the tank. Sample #2 was obtained at the fill pipe end at a depth of six and a half (6.5') below grade. Sample #3 was obtained at the end opposite the fill pipe at a depth of seven feet (7') below grade. The remaining three sidewalls were not sampled due to their unstable condition.

The location of individual sampling points is shown on the diagram on page three. Additional information on the exact method of sample collection will be found in the **Sampling Methodology** section of this report.



SCALE: 0 50'

LEGEND: ▨ = WATER IN PIT

MAP REF: THOMAS BROS.
ALAMEDA CO.
P.11 E-6

#1 SUBSURFACE WATER SAMPLE
ANALYSIS FOR TOTAL PETROLEUM
HYDROCARBONS(TPH) AS GASOLINE,
AND BENZENE, TOLUENE, XYLENES
AND ETHYLBENZENE(BTXE) AT
SEQUOIA ANALYTICAL LABORATORY
SEQUOIA LAB NO. 908-1637

#2 SOIL SAMPLE FROM WALL AT 6.5'
ANALYSIS FOR TPH AS GASOLINE
AND BTXE
SEQUOIA LAB NO. 908-1638

#3 SOIL SAMPLE FROM WALL AT 7'
ANALYSIS FOR TPH AS GASOLINE
AND BTXE
SEQUOIA LAB NO. 908-1639

SAMPLING PERFORMED BY MARGO MACKEY
DIAGRAM PREPARED BY BRENT ADAMS

After completion of the field work, the sample containers were delivered to Sequoia Analytical Laboratory in Redwood City, California. Sequoia Analytical Laboratory is a California Department of Health Services certified Hazardous Materials Testing Laboratory and is listed as DOHS HMTL #145.

It was requested that the analytical procedures used for these analyses be those specified by the Regional Water Quality Control Board -- San Francisco Bay Region. The methods are defined in attachments to the San Francisco RWQCB (Region 2) publication, Guidelines For Addressing Fuel Leaks and in documents issued to clarify the Board's interpretation of the California LUFT Manual.

SAMPLING METHODOLOGIES USED ON THIS PROJECT

Subsurface Water Sample: Subsurface water samples are obtained with a proprietary device which duplicates the functioning of several EPA, commercial, and industrial sampling devices. The device goes beyond the EPA weighted bottle device to include both the ability to position the sample at an exact depth (via an extendible pole) and to securely re-seal the sample bottle prior to bringing the sample container up through the surface of the liquid being sampled. Though the device can be used to skim the surface, or obtain aggregate samples of all the water in the pit, the most common application for the device is the collection of samples of that water which is below the surface and petroleum fuel contaminants that may be floating on the surface.

Requests for subsurface samples are usually made by regulatory agency inspectors seeking information to determine if there are large amounts of dissolved constituents in the main body of water (indicating that lost fuel has been in contact with the water for a sufficient length of time to allow a significant discharge of benzene and other soluble compounds into the water) or if a petroleum film on the water may be only the result of fuel contaminated soil falling into the pit in the course of the present tank excavation work. The frequency of requests for sampling of this sort in several San Francisco Bay area counties lead to the development of the current version of the device and its issue to all our field personnel.

The "subsurface" designation indicates that the device was used in the following manner: The device was lowered into the body of water with the sample container closed against the intrusion of liquid; the sample container was not opened until it was below the surface of the liquid and any free petroleum that might be floating on the surface; the sample container was opened below the surface and allowed to fill with subsurface liquid; the device was closed before being brought back up through the surface of the body of water.

The ordinary "water sample" designation indicates that the device was used without any attempt to collect subsurface water. In this application the device is lowered into the water with the seal open so as to include both the surface and subsurface water in an aggregate sample. In this application the device duplicates the functioning of another EPA device which consists of a simple bottle or open jar attached to a pole. Ordinary "water samples" may also be collected in bailers which are made of either acrylic plastic, Teflon, or stainless steel. These, however, are usually designated "bailer" samples.

Capillary Zone Soil Sample: The capillary zone is the soil horizon immediately above the surface of standing groundwater into which moisture is drawn by capillary action. Capillary zone sampling is most often requested in open pit and open trench situations where lost petroleum products are evident or suspected. In these cases, it is reasoned that a sample of the capillary zone will demonstrate whether or not fuel has been drawn up into the soil above the groundwater and, thereby, provide a rough indication of the volume and duration of the lost fuel condition.

Engineers of the Region 2 RWQCB staff have specified the correct sampling area as being from zero to six inches above the surface of the standing perched water and no more than twelve inches back into the native soil from the lateral backfill/native soil interface.

There are two weaknesses which tend to invalidate capillary zone sampling on the basis of inconsistent results. First, is the difficulty encountered in locating the true surface of the perched water above which the capillary zone resides. The removal of the tank and backfill material tends to artificially lower the water in the immediate vicinity of the tank pit below the true standing water level and mislead observers attempting to evaluate where the capillary zone is located. Second, the zone itself is a narrow horizon which is bordered on the top and bottom by soil which would not be expected to contain nearly the concentration of fuel hydrocarbons as the capillary zone proper. Collecting the correct material is complicated by conditions at the site which usually consist of a broad excavation, with vertical walls descending into a water filled pit. Because of these conditions, direct approach to the sampling area is difficult, dangerous, or impossible.

Assuming that the true and original surface of the perched water can be determined, samples can be safely obtained by one of the following methods. The backhoe bucket can be used to dig up a segment of the pit wall that contains the capillary zone and bring it up for inspection and sampling. An alternative method is to use sections of light weight drill rod and a drive shoe which contains a brass sample liner. This train can be extended across the pit, positioned, and used to drive an undisturbed soil sample.

SAMPLE CONTAINERS

Our firm uses new sample containers of the type specified by either EPA or the RWQCB for the collection of samples at sites where underground storage tanks are involved. Water samples are contained in 40 ml volatile organic analysis vials (VOAs) when analysis for gasoline and similar light volatile compounds is intended. These containers are prepared according to EPA SW 846 and will contain a small amount of preservative when the analysis is for TPH as gasoline or EPA 602. Vials intended for EPA 601 analysis and EPA 624 GCMS procedures are not preserved. Closure is accomplished with an open headed (syringe accessible) plastic screw cap brought down on top of a Teflon faced septum which is used to seal the sample without headspace.

Water samples intended for semivolatile and nonvolatile analysis such as total oil and grease (TOG) and diesel (TPH-HBF) are collected and transported in properly prepared new glass liter bottles. Dark amber glass is used in the manufacture of these bottles to reduce any adverse effect on the sample by sunlight. Antimicrobial preservative may be added to the sample liquid if a prolonged holding time is expected prior to analysis. Closure is accomplished with a heavy plastic screw cap.

Soil samples for volatile, semivolatile and nonvolatile analyses are all collected in properly prepared new brass liners which are 2 inches in diameter by 4 inches in length. Closure is accomplished with press fit plastic end caps which are fitted to the open ends of brass tube liners after a sheet of aluminum foil is wrapped over the exposed sample material.
A noncontributing/nonsubtractive tape is wrapped completely around the joint areas where the plastic caps meet the outer wall of the brass tube. No preservative other than cold storage is used on samples captured in sample containers of this type.

SAMPLE HANDLING PROCEDURES

Solid sample material is captured by advancing the liner into the soil. This may be done by pushing the liner into soft soils or by containing the liner in a drive shoe which can be advanced and then retracted by means of a slide hammer. The open ends of the sample liner are covered with aluminum foil and plastic end caps. Excess aluminum foil is removed and the edge of the plastic end caps is tightly sealed against the outer surface of the brass liner with an unbroken wrap made with a tape which has been tested to confirm that it does not contribute compounds that would be detected in the type of analyses intended for the sample contained inside of the brass liner. The brass liner is then labeled with the appropriate identification numbers which specify the sampling activity designation number, sample collection area, depth etc. that apply to that particular sample. The sample liner is then placed in an ice chest which contains pre-frozen blocks of an inert ice substitute such a Blue Ice or Super Ice.

Water samples are collected in any of several appropriate devices such as bailers, Coliwasas, Middleburg sampling pumps etc. which are described in detail only as warranted by their employment at a given site. Sample liquid is decanted into new sample containers in a manner which reduces the loss of volatile constituents and follows the applicable EPA procedures for handling volatile organic and semi-volatile compounds. Only two variations from the EPA methods are generally employed. First, preservative is added to the sample container prior to addition of the sample liquid. This method was pioneered by Stoner Laboratories in 1982 and subsequently adopted by laboratories and environmental consulting firms as a practical means of reducing the time that a liquid is allowed to aerate prior to closure of the sampling container. Second, because tests have shown that the preservative readily mixes with sample liquid, glass stirring rods are not used to agitate the sample/preservative mixture.

SAMPLE DESIGNATIONS

All sample containers are identified with both a sampling event number and a discrete sample identification number. Please note that the sampling event number is the number that appears on our chain of custody. It is roughly equivalent to a job number, but applies only to work done on a particular day of the year rather than spanning several days as jobs and projects often do. This is followed by the sample I.D. number which is usually a simple number such as #1, #2, #3.

CHAIN OF CUSTODY

Samples are continuously maintained in either a chilled ice chest, refrigerator, or freezer from the time of collection until acceptance by the State certified Hazardous Materials Testing Laboratory selected to perform the analytical procedures. If the samples are taken charge of by a different party (such as another person from our office, a courier, etc.) prior to being delivered to the laboratory, appropriate release and acceptance records are made on the chain of custody (time, date, and signature of person releasing the samples followed by the time, date and signature of the person accepting custody of the samples).

LABORATORY IDENTIFICATION NUMBERS

Following receipt of the samples and completion of the Chain of Custody form, the laboratory then assigns their own identification numbers to the samples. Different laboratories use different numbering systems and, according to their own internal conventions, may or may not assign sequential numbers to samples which are placed on temporary "hold", pending the results of other analyses. Laboratory identification numbers (if assigned and available) are included on the DIAGRAM page, and will be found on the certified analytical report by the analytical laboratory.

CERTIFIED ANALYTICAL REPORT

The certified analytical report generated by the laboratory is the official document in which they issue their findings. The certified analytical report should be closely reviewed when samples are taken from below waste oil tanks as <u>any</u> detection of the EPA halogenated and purgeable aromatic compounds may be grounds for requiring further action. The certified analytical report is included as an attachment at the close of this report.

GENERAL ADVISORY ON POSITIVE RESULTS

Blaine Tech Services, Inc. provides sampling and documentation. The proper technical execution of this work demands a high level of dedication to the principle that data gathering should be performed by impartial individuals who are also disinterested in the outcome of the analytical procedures. To function as a disinterested and independent third party Blaine Tech Services, Inc. makes it a policy to not become involved in either the interpretation of results or the sale of any consulting services or remediation packages. There are an ample number of firms who can provide consulting services and make proposal on whatever level of work they feel should be undertaken.

Even though we do not engage in the interpretation of analytical results, the making of recommendations, or the issuance of proposals on how best to remediate environmental conditions, we have been asked by the engineering staff of the Regional Water Quality Control Board to include in our reports an advisory section outlining the general type of additional actions which may be required when contamination is found. This advisory is not intended to characterize conditions at this particular site or replace the services of a consulting firm specializing in the investigation, characterization and remediation of such conditions as may exist. Rather, it is intended to advise you that such additional actions may be required even though some time may elapse before you are contacted by one of the interested regulatory agencies.

In Region 2 (which is regulated by the San Francisco Regional Water Quality Control Board), the thresholds are readily defined in the Board's publication, <u>Guidelines For Addressing Fuel Leaks</u>. According to this document, soil which has less than 100 parts per million total petroleum fuel hydrocarbon (TPH) contamination does not generally require immediate additional action. Board engineers emphasize that this does not mean that some action might not be required in the future. Still, the site is assigned a low priority unless it is situated in an area of high hydrogeologic concern.

The detection of more than 100 ppm TPH in the native soil beneath a tank is generally considered grounds for requiring an additional investigation in the form of soil borings and installation of at least one groundwater monitoring well followed by periodic monitoring. The detection of 1000 ppm TPH is usually viewed by the Board as an unacceptable level of fuel saturation which will mandate excavation of the effected ground down to the furthest practicable reach of conventional excavating machinery followed by soil borings and installation of groundwater monitoring wells.

Other regions use different standards for determining when a groundwater investigation will be required. For example benzene is often used in lieu of TPH. Even very low levels of benzene are often seen as grounds for requiring a subsurface investigation. This criteria may be relaxed or stiffened depending on the location of the site in relation to different groundwater systems, the depth to water, type of soil, and the concentrations of benzene involved.

The above standards apply only to fuels. When samples taken in connection with a waste oil tank or a solvent tank are found to contain even small amounts of any of the EPA priority pollutants (such as TCE, PCE, DCE etc. which are detected by EPA methods 8010, 8020, and 8240) more stringent standards are often applied. In these cases, soil borings and monitoring well installation may be required if there is any detectable amount of any of the EPA priority pollutant compounds.

When contaminants are found to have reached the water underlying a site, the Board customarily requires that additional work be undertaken in order to define the extent of the contamination.

REPORTAGE

Submission to the Regional Water Quality Control Board and the local implementing agency should include copies of the sampling report, the chain of custody, and the certified analytical report issued by the Hazardous Materials Testing Laboratory. The property owner should attach a cover letter and submit all documents together in a package.

The following addresses have been listed here for your convenience:

Water Quality Control Board
San Francisco Bay Region
1111 Jackson Street
Room 6040
Oakland, CA 94607
ATTN: Greg Zentner

Alameda County Health
Hazardous Materials Management
420 27th Street
Oakland, CA 94612
ATTN: Lawrence Seto

Alameda Fire Dept.
1300 Park Street
Alameda, CA 94501
ATTN: Marvin Helms

Please call if we can be of any further assistance.

for (Sigrid Blaine)
Richard C. Blaine

RCB/rfs

attachments: supporting documents

BLAINE
TECH SERVICES INC.

1370 TULLY ROAD, SUITE 505
SAN JOSE, CA 95122
(408) 995-5535

CHAIN OF CUSTODY # 890815M1

SITE SPECIFICATION R.L. Stevens Co. ②
James Phillipsen Property
1357 High Street
Alameda, CA

☒ Bill BLAINE TECH SERVICES, Inc.
☐ Bill

SPECIAL INSTRUCTIONS

SAMPLE I.D.	QUANTITY	TYPE	OK	ANALYSIS TO DETECT	STATUS	RESULTS	LAB NUMBER
#1	4	liquid		TPH as GAS, BTXE	1 week		
#2	1	soil		" "	"		
#3	1	soil		" "	"		

Field sampling was performed by Marty Mackey

Sampling was completed at 7:15 AM/[✓ PM] 8-15-1989

RELEASE OF SAMPLES FROM (name,time,date) --->>>>> INTO THE CUSTODY OF (name,time,date)

from M. Mackey @ 11:05 [✓ AM]/PM 8/16 -89 -> to Ka @ 11:05 [✓ AM]/PM 8/16 -88

from ____ @ __:__ AM/PM ____ -88 -> to ____ @ __:__ AM/PM ____ -88

from ____ @ __:__ AM/PM ____ -88 -> to ____ @ __:__ AM/PM ____ -88

The laboratory designated to perform these analyses is: Sequoia DHS HMTL # 145
NOTE: Procedures and detection limits must confrom to RWQCB Region 2 specifications.
Please include chain of custody number and site specification on reports and invoices.

SEQUOIA ANALYTICAL
680 Chesapeake Drive • Redwood City, CA 94063
(415) 364-9600 • FAX (415) 364-9233

Blaine Tech Services	Client Project ID: BTS #890815M1, R.L.Stevens @	Sampled:	Aug 15, 1989
1370 Tully Rd., Suite 505	Sample Descript.: Water, #1 James Phillipsen Prop., Alameda	Received:	Aug 16, 1989
San Jose, CA 95122	Analysis Method: EPA 5030/ 8015/8020	Analyzed:	Aug 21, 1989
Attention: Richard Blaine	Lab Number: 908-1637 A-D	Reported:	Aug 23, 1989

TOTAL PETROLEUM FUEL HYDROCARBONS WITH BTEX DISTINCTION (EPA 8015/8020)

Analyte	Detection Limit µg/L (ppb)	Sample Results µg/L (ppb)
Low to Medium Boiling Point Hydrocarbons	30.0	29,000
Benzene	0.3	410
Toluene	0.3	1,600
Ethyl Benzene	0.3	1,100
Xylenes	0.3	7,000

Low to Medium Boiling Point Hydrocarbons are quantitated against a gasoline standard.
Analytes reported as N.D. were not present above the stated limit of detection.

SEQUOIA ANALYTICAL

Arthur G. Burton
Laboratory Director

SEQUOIA ANALYTICAL
680 Chesapeake Drive • Redwood City, CA 94063
(415) 364-9600 • FAX (415) 364-9233

Blaine Tech Services	Client Project ID: BTS #890815M1, R.L. Stevens @	Sampled:	Aug 15, 1989
1370 Tully Rd., Suite 505	Matrix Descript: Soil Jamaes Phillipsen Prop., Alameda	Received:	Aug 16, 1989
San Jose, CA 95122	Analysis Method: EPA 5030/8015/8020	Analyzed:	Aug 23, 1989
Attention: Richard Blaine	First Sample #: 908-1638	Reported:	Aug 23, 1989

TOTAL PETROLEUM FUEL HYDROCARBONS with BTEX DISTINCTION (EPA 8015/8020)

Sample Number	Sample Description	Low/Medium B.P. Hydrocarbons mg/kg (ppm)	Benzene mg/kg (ppm)	Toluene mg/kg (ppm)	Ethyl Benzene mg/kg (ppm)	Xylenes mg/kg (ppm)
908-1638	#2	3,200	1.8	97	11	880
908-1639	#3	600	1.3	25	21	110
Detection Limits:		1.0	0.05	0.1	0.1	0.1

Low to Medium Boiling Point Hydrocarbons are quantitated against a gasoline standard.
Analytes reported as N.D. were not present above the stated limit of detection.

SEQUOIA ANALYTICAL

Arthur G. Burton
Laboratory Director

APPENDIX C

SAMPLING PROTOCOL

SAMPLING METHODOLOGY

Individual soil samples will be removed from the pit in a backhoe bucket. After removing the first 3 to 4 inches of soil, presumably slough, the samples will be contained by driving clean brass tubes (1.92" x 6") into the exposed layer just above the teeth of the bucket. Soil will be packed into the tubes to eliminate the possibility of headspace within the sample container. Thus prepared, the ends of the tubes will be wrapped with aluminum foil and sealed with plastic caps. After removing excess foil, electrical tape will be applied to the seams between cap and tube in an effort to reduce the evaporative loss of volatile constituents.

Soil samples collected during drilling will be taken using a California modified split-spoon sampler driven by the drill rig. The sample tubes will be removed immediately upon opening of the sampler and sealed. Aluminum foil will be placed underneath snug fitting plastic caps. Excess foil will be removed and electrical tape applied to the seams between cap and tube in an effort to reduce the evaporative loss of volatile constituents. The sampler will be washed thoroughly with trisodium phosphate cleanser and rinsed with distilled water in between samples.

Water samples will be collected using a 3' steel or Teflon bailer which has first been cleansed using trisodium phosphate cleanser and then rinsed with distilled water.

Water samples will be containerized within clean amber liter bottles sealed with screw caps, and/or clean 40 ml volatile organic analysis vials (VOA's) covered with a Teflon septa and screw caps.

Samples will be place on ice in a cooler and transported under chain of custody documentation to a certified hazardous materials testing laboratory for subsequent analysis.

APPENDIX D

WELL INSTALLATION PROTOCOL

MONITORING WELL INSTALLATION SPECIFICATIONS

The proposed work will include the following tasks:

1) Acquiring the appropriate permits for advancing soil borings and installing groundwater monitoring wells.

2) Observing the drilling of three soil borings adjacent to the old storage tank pit to depths approximately 20 feet below the groundwater table.

3) Collecting and classifying samples of relatively undisturbed soil from 5 foot deep intervals from the ground surface to the total depths of the borings. Soil samples will be screened as they are recovered.

4) Logging subsurface conditions as encountered in the borings.

5) Returning one to two samples from each boring to a State of California certified hazardous materials testing laboratory (HMTL).

6) Constructing and developing a two inch diameter groundwater monitoring well in all three borings or constructing of two two inch and one four inch diameter wells.

7) Purging the wells and collecting one groundwater sample from each well for analysis for TPH as gasoline and BTEX.

8) Evaluating the local groundwater gradient using relative groundwater elevations in the wells.

9) Interpreting field and laboratory data and preparing a report summarizing the information and providing conclusions and recommendations.

Methods for performing the listed tasks are described as follows:

I. Advancement of Boreholes, Sampling and Classification of Soil

The soil borings will be advanced using a truck mounted hollow stemmed auger drill rig. To reduce the chances of cross contamination among samples, augers will be steam cleaned prior to advancing each borehole. The boreholes will be advanced to either 20 feet into the aquifer or until a competent clay layer or aquitard greater than five feet in depth is encountered.

Drill cuttings will be evaluated in the field and segregated by the observed presence of odor or discoloration. The cuttings will be segregated and stockpiled on the site on top of and covered with a hydrocarbon resistant liner for future treatment and subsequent disposal at the direction of the responsible party.

Soil samples will be collected from five foot intervals within the borings. To collect the samples, a California-modified split spoon barrel sampler will be driven into the soil by a 140 pound weight falling 30 inches. The sampler will be driven a total of 18 inches. After the first six inches, the number of blows required to drive it the remaining 12 inches will be counted as an indicator of the relative density of granular soil and the consistency of cohesive soil. The relative vapor content of the soil samples will be measured with a photoionization detector and noted on the boring logs. The samples retained for laboratory analysis will be sealed in brass liners from the sampler. They will be labelled, stored on ice, delivered to the HMTL, maintained and transferred in keeping with chain of custody procedures.

As the soil borings are advanced and samples are collected, the soil will be classified and noted on logs of the borings by an engineer or geologist. Field classification will be based on observed characteristics of the soil. Logs will indicate the depths, classifications, blow counts, water level information, and methods of advancing and maintaining the borings.

Construction and Development of Monitoring Wells

Each well will be constructed of poly vinyl chloride (PVC) casing with threaded joints, a threaded bottom end-plug, and a slip cap. The screened portion of the well will extend from approximately five feet above the upper saturation zone to the full depth of the boring to allow for monitoring during seasonal fluctuations of the ground water level. The screened portion of the well will be perforated by the factory with 0.020 inch wide slots. Unperforated pipe will be used to complete the upper portion of the well. Filter sand will extend about 2 feet above the perforated portion of the pipe, and a one to two foot thick seal of bentonite will be placed above the sand. The upper annulus will be sealed with cement or cement/bentonite grout to within one foot below ground surface. A well cover will be placed over each well head and secured in place with concrete. The well cover will have a watertight seal and protective lock to guard against infiltration of surface water and other disturbances.

Each well will be developed after construction with a surge pump until the water produced is relatively free from sediment or until measurements of pH, conductance, and temperature are shown to have stabilized. If the well is pumped dry during development, recharge rates will be recorded. No water or chemicals will be introduced during development.

Groundwater Sampling

The wells will be allowed to equilibrate after development. A sample will be collected from each well by lowering a clean Teflon or steel bailer into the fluid. The recovered sample will be examined. If floating hydrocarbon product is present in the sample, the well will not be purged, but the thickness of the product will be measured with a fluid level sounder. If no floating hydrocarbon product is observed, the well will be purged of approximately four well volumes of water which will be stored on site in appropriate drums for waste liquids. These drums remain the responsibility of the property owner and should be kept on site pending the results of analysis of the groundwater samples.

Time will be allowed for the wells return to static conditions after purging and before sampling to obtain groundwater samples for analysis. A clean Teflon or steel bailer will be used to collect the sample material and transfer it to clean glass containers. The bailer will be cleaned with distilled water and trisodium phosphate cleanser after each sample is collected to prevent cross contamination. Sample containers will be sealed with Teflon lined lids, labeled and stored on ice while transferred to an HMTL.

Evaluation of Groundwater Gradient

Surveying equipment will be used to measure the difference in elevation of the top of each well casing relative to the others. The depth of the groundwater below the top of each well casing will also be measured with a water level indicator. These measurements will be used to evaluate the elevation differences of the water levels among the wells. A surface map of the water levels in wells without floating product will be made. The difference in hydraulic head and the direction of groundwater flow across the site will be measured from the map.

Laboratory Analyses

Samples selected for analysis will be transferred to a laboratory certified by the State of California to perform the specified analysis.

Soil and water samples will by analyzed for TPH as gasoline and BTEX using EPA methods 8015 and 8020. Detection limits appropriate to the matrix and the requested test will be stated on the laboratory reports.