ALL ENVIRONMENTAL, INC.
Environmental Engineering & Construction
2641 Crow Canyon Rd., Ste. 5 • San Ramon, CA 94583 • (510) 820-3224

July 29, 1993

UNDERGROUND STORAGE TANK REMOVAL
FINAL REPORT

AT
Vic's Automotive Service
245 8th St.
Oakland, California

Sent to RWQCB 8/1
Sent to ACHCSD 8/3

8/3/93

Prepared for:

Mr. Vic Lum
245 8th St.
Oakland, Ca. 94607

Prepared by:

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1.0 INTRODUCTION

All Environmental Inc. (AEI) has prepared this final report to document underground storage tank removals performed at 245 8th St., Oakland, California (Figure 1). There were seven UST's on the property, of which 5 were removed. Four 1,000 gallon steel gasoline tanks and one 500 gallon steel waste oil tank were removed from the currently operating gasoline filling and auto service station. The gasoline tanks were given the designations Tank A-D, and the waste oil tank was Tank E (Figure 2). Tanks A, B, C, and D laid side by side along the sidewalk on Alice St. Tank E was located behind the southern wall of the garage building. The two remaining tanks are larger gasoline UST's which recently passed integrity testing of the tanks and product lines. They remain in use.

The following activities were performed in May, June and July, 1993:

1. Obtain permits and make notifications of tank removals;
2. Remove residual liquids from tanks, transport and dispose;
3. Excavate, remove, transport, dispose of UST's;
4. Sample soils, analyze samples;
5. Over excavate soil at select location;
6. Backfill and resurface excavations.

2.0 PERMITS, NOTIFICATIONS

An Underground Tank Closure Plan was approved by the Alameda County Health Care Services Agency on May 19, 1993. Ms. Jennifer Eberle was the Agency's Project Specialist/Inspector. A permit to excavate in the street, dated May 19, 1993, was obtained from the City of Oakland in that the 4- 1,000 gallon gasoline tanks were beneath the sidewalk along Alice St. A City of Oakland tank removal permit was acquired on June 3, 1993. On May 19, 1993, the Bay Area Air Quality Management District was notified of the UST activities. Cal OSHA was notified of the excavation plans on May 18, 1993. The excavation areas were marked and Dig Alert was notified of AEI's intentions to excavate, notification # 146482, updated through July 29.

Copies of the permits and notification documents are contained in Appendix A: Permits and Notifications.

3.0 LIQUID REMOVAL

On June 2, 1993, approximately 425 gallons of residual petroleum liquids were removed from the five tanks with a Waste Oil Recovery Systems, Inc. vacuum truck. The vacuum truck transported the liquid to the Demenno Kerdoon facility located at 2000 N. Alameda, Compton, Ca. for disposal. The hazardous waste manifest for these liquids can be found in Appendix B: Transport and Disposal Documents.

4.0 MOBILIZATION, EXCAVATION & REMOVAL

A health and safety plan for tank removal site operations was prepared and reviewed at a pre-work safety meeting (Appendix C: Health and Safety Plan). AEI removed the concrete and asphalt surface cover on June 1, 1993. Excavation of the tank pits was initiated on June 2. Excavated soil was stockpiled on plastic sheeting. Three distinct stockpiles were created and designated STKP 1A, STKP 2B, STKP 3C. STKP 1A and 2B resulted from the gasoline tank excavation and were about 70 cubic yards and 45 cubic yards, respectively. STKP 3C, from the waste oil tank excavation, was about 5 yards of soil. Temporary fencing was placed around the working areas.

On June 17, 1993 the tanks were further uncovered and readied for removal. Each of the four gasoline tanks A, B, C, D, were verified as being single wall steel tanks of 1,000 gallon capacity. The four tanks were close enough together so that a single excavation was left upon their removal. One fuel recovery line, one fuel product line, one electrical line, and one sewer line were encountered in the gas tank excavation. Each was either temporarily removed or re-routed, then permanently replaced during backfilling. The final electrical re-connection received inspection by a City of Oakland representative.

The waste oil tank E was found to be a 250 gallon single wall steel tank. It rested in a separate excavation near the garage building. Upon review of sample analyses, the waste oil tank pit was over excavated in early July to limits imposed by the proximity of the adjacent building.

No overspill prevention devices were in place. No groundwater was encountered.

Fill piping and product supply lines were removed to the limits of the excavations. The tanks were inerted with a total of 700 lbs. dry ice. The LEL and oxygen in each tank were noted to be safe and the tanks were removed from the excavations between 11 a.m. and 1 p.m. on June 18. Ms. Jennifer Eberle of the Alameda Health Care Services Agency and Mr. Gordon Gullett of the City of Oakland Fire Prevention Bureau were present during the tank removal and loading operation. Their reports are located in Appendix A.

The tanks were visually inspected prior to loading for transport. Tanks A, B, C, and D were noted to be slightly rusty with minor pitting and no obvious holes. Tank E was more rusted, moderately pitted, and with two visible holes, one on each end, top and bottom respectively.

The tank piping and tanks were loaded onto a Erickson, Inc. truck and transported under hazardous waste manifest to their facility at 255 Parr Blvd. in Richmond, Ca. There, the tanks were triple rinsed, cut, and scrapped.

STKP 2B was temporarily returned to the excavation to ensure the structural integrity of the street. Two weeks later, the soil was re-excavated and mixed with STKP 1 at the location of STKP 1. All stockpiled soil remains on site.

5.0 SAMPLING AND ANALYSIS

Soil samples were collected from the two excavations. The backhoe bucket was used to obtain native soil from one to two feet beneath the tank inverts, or about 8.5 to 10.5 feet below grade. The soil beneath tanks A-D was greenish gray clayey sand with a mild to moderate odor of aged gasoline. Six samples were obtained in a grid type pattern. The samples were designated by the tank from which they were under (A-D), and by which tank end (north-N or south-S) they came from.

Soils from under tank E were dark brown to black clayey sand with no odors. One sample was collected from beneath the middle of the tank, about 7.5 feet depth below grade, and designated "WO" for waste oil. Contamination was found to exist in the pit walls, primarily near the fill pipe.

Stockpiles STKP 1A, 2B, 3C were sampled at 5, 4, 3 point locations, respectively. The samples from each pile were composited at the lab for one analysis per stockpile.

After further excavation of the waste oil tank pit, verification samples were collected from the walls and floors of the excavation. The samples were designated according to their spatial orientation within the pit. "WO-E" corresponds to the waste oil tank pit excavation, eastern wall about 3 feet depth below grade.

All soil samples were collected into stainless steel tubes which were driven into the soil of interest until completely full, then sealed with aluminum foil, plastic caps, and tape. The secured sample tubes were placed into a cooler with ice. Chain of Custody documentation was initiated. The cooler and samples were brought to AEI offices and placed in a refrigerator. On June 21, the samples were picked up by Priority Labs personnel.

The samples were taken to Priority Environmental Labs (State Certification # 1708) for certified chemical analysis. One sample from under each tank A-D, and samples STKP 1 and 2 were analyzed for Total Petroleum Hydrocarbons (TPH) as gasoline (EPA method 5030/8015) with Benzene, Toluene, Ethylbenzene, Xylenes (BTEX) distinction (EPA method 8020), and total lead (EPA method 7420). Samples AS and BN were held pending initial analyses (Table 1: Gasoline Tank Pit Sample Analyses).

Samples WO and STKP 3C were analyzed for TPH as gasoline with BTEX and lead, as well as TPH as diesel (EPA method 3550/8015), total oil and grease (EPA method 5520 D&E), volatile organics (EPA method 8240), and total cadmium, chromium, nickel, and zinc (EPA methods 7130, 7190, 7520, 7950, respectively)(Table 2: Waste Oil Tank Pit Analyses).

After over excavation, soil samples obtained from the walls of the waste oil tank pit were analyzed for total oil and grease and total lead. The floor or bottom sample EB-11' was analyzed for total oil and grease as well as TPH as gasoline with BTEX and lead.

The sampling locations are shown on Figure 3, Sample Location Map.

Samples AS 2, BS 4, CN 5, and DS 6 contained 1.3 parts per million (ppm), 1.1 ppm, 24 ppm, and 1.4 ppm TPH as gasoline, respectively. Only CN 5 yielded detectable BTEX results, with 19 parts per billion (ppb) benzene, 24 ppb toluene, 27 ppb ethylbenzene, and 90 ppb xylenes. Total lead levels ranged between 7.6 ppm in BS 4 and 8.4 ppm in AS 2. STKP 1A and STKP 2B, related to tanks A, B, C, D, contained 31 ppm and 17 TPH as gasoline, respectively. BTEX analysis of STKP 1 showed 6.6 ppb toluene, 14 ppb ethylbenzene, and 110 ppb xylenes. STKP 2B had 12 ppb ethylbenzene and 81 ppb xylenes. Soil sample AN 1, analyzed later to help verify apparent low level gasoline contamination, yielded 18 ppm TPH as gasoline with 19 ppb benzene, 33 ppb toluene, 34 ppb ethylbenzene, 120 ppb xylenes, and 7.9 ppm total lead (Table 1: Gasoline Tank Pit Sample Analyses).

Soil sample WO and sample STKP 3C, related to the waste oil tank, contained 3.5 and 2.6 ppm TPH as gasoline, 4.6 and 7.0 ppm TPH diesel, both N.D. (not detected) for benzene, 7.0 ppb and N.D. for toluene, 6.7 and N.D. ethylbenzene, 65 ppb and 10.9 ppb xylenes, N.D. and 1,100 ppm total oil and grease, respectively. Total cadmium in samples WO and STKP 3C showed at 0.7 and 0.6 ppm, with 30 ppm and 28 ppm total chromium, 11 ppm and 91 ppm total lead, 26 ppm and 14 ppm total nickel, and 31 ppm and 34 ppm total zinc, respectively.

After further excavation, the five over-excavation samples were analyzed. Sample EB-11' (excavation bottom, 11' depth), showed 3.9 ppm TPH as gasoline, 7.3 ppb benzene, 7.4 ppb toluene, 8.7 ppb ethylbenzene, 27 ppb xylenes, 6.5 ppm lead. The other four samples were analyzed only for oil and grease, and lead, with WO-E (east wall of pit) yielding the only positive oil and grease analysis at 2,100 ppm. Total lead analyses ranged from 4.5 ppm in WO-S to 70 ppm in WO-E. The results of soil sample analysis are depicted in the following tables.

Table 1: Gasoline Tank Pit Sample Analyses

Sample I.D.	Gasoline (mg/kg)	Total Lead (mg/kg)	Benzene (ug/kg)	Toluene (ug/kg)	Ethyl Benzene (ug/kg)	Xylenes (ug/
AN 1	18	7.9	19	33	34	120
AS 2	1.3	8.4	N.D.	N.D.	N.D.	21
BS-4	1.1	7.6	N.D.	N.D.	N.D.	16
CN 5	24	8.3	19	24	27	90
DS 6	1.4	8.1	N.D.	N.D.	5.4	28
STKP 1A*	31	120	N.D.	6.6	14	110
STKP 2B*	17	66	N.D.	N.D.	12	81

Table 2: Waste Oil Tank Pit Sample Analyses

Sample I.D.	Gas (mg/kg)	Diesel (mg/kg)	Oil and Grease (mg/kg)	Toluene (ug/kg)	Ethyl benzene (ug/kg)	Xylenes (ug/kg)
WO**	3.5	4.6	N.D.	7.0	6.7	65
STKP 3C*,**	2.6	7.0	1,100	N.D.	N.D.	10.9

Table 3: Waste Oil Tank Pit and Over Excavation Samples

Sample I.D.	Oil and Grease (mg/kg)	Total Cadmium (mg/kg)	Total Chromium (mg/kg)	Total Lead (mg/kg)	Total Nickel (mg/kg)	Total Zinc (mg/kg)
WO	N.D.	0.7	30	11	26	31
STKP 3C*	1100	0.6	28	91	14	34
WO-E	2100	----	----	70	----	----
WO-N	N.D.	----	----	3.5	----	----
WO-S	N.D.	----	----	4.5	----	----
W-W	N.D.	----	----	6.3	----	----
	Gas (mg/kg)	Benzene (ug/kg)	Toluene (ug/kg)	Ethyl benzene (ug/kg)	Xylenes (ug/kg)	
EB-11'	3.9	7.3	7.4	8.7	27	----

(mg/kg) = ppm or parts per million
(ug/kg) = ppb or parts per billion
N.D. = Not Detected
---- = not analyzed
* Composited soil samples
** Also analyzed N.D. for benzene and other EPA 8240 constituents

Copies of the analytical results and chain of custody are located in Appendix D: Sample Analytical Documentation.

6.0 BACKFILLING AND RESURFACING

On July 2 and July 7, 1993, the excavations were backfilled with clean, imported soil. The upper six inches is comprised of base rock. The excavations were backfilled in one foot lifts and compacted to approximately 90% compaction to prevent long term settling. The tank removal areas were not resurfaced, as requested by the client due to the possibility of future excavation.

7.0 DISCUSSION & CONCLUSIONS

Four 1,000 gallon and one 250 gallon underground storage tanks were removed from the property located at 245 8th St., Oakland,

California and transported as hazardous waste to the Erickson Disposal Facility in Richmond, California. Over excavation at a select location was performed. Soil sampling and analysis were performed on samples from beneath the UST's and after over excavation.

Soil sample analyses indicated low level gasoline contamination within the gasoline storage tank pit. Gasoline which had probably leaked in the distant past has aged within site soils to low levels. Oil and grease contamination at moderate levels, as well as low level diesel and gasoline contamination were detected in samples from the over excavated waste oil tank pit.

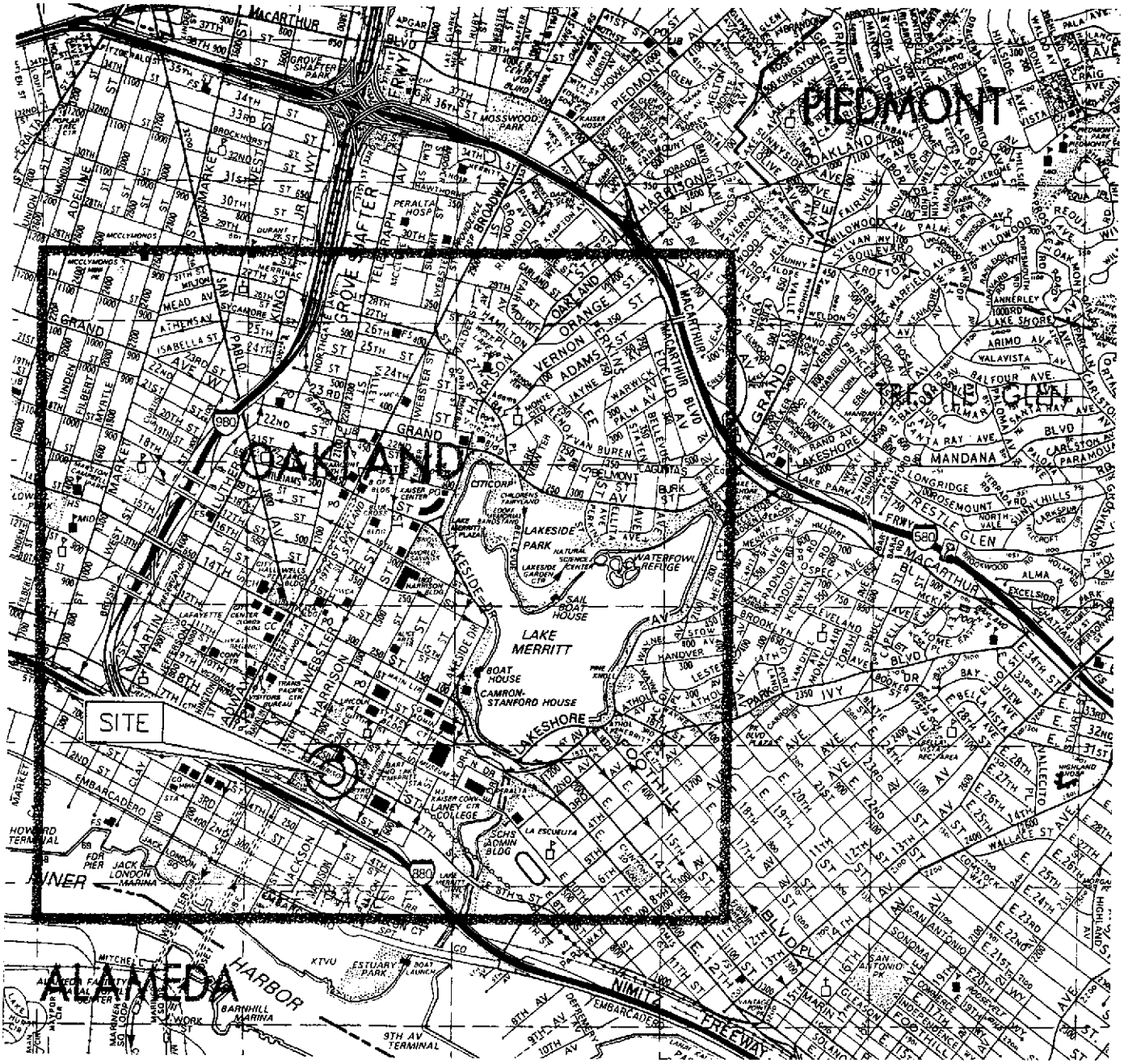
AEI recommends the placement of a single groundwater monitoring well at the location of each of the two excavations to determine if groundwater at those point locations has been impacted by residual petroleum products known to exist in site soils.

Groundwater samples from each well should be collected and analyzed quarterly for chemical constituents already detected in site soils. If 4 consecutive sampling and analysis events yield "N.D." results for the constituents of interest, then sampling can probably be discontinued and the wells properly destroyed.

8.0 REPORT LIMITATIONS

This report presents a summary of work completed by All Environmental, Inc., including observations and descriptions of site conditions encountered. Where appropriate, it includes analytical results for samples taken during the course of the work. The number and location of samples are chosen to provide required information, but it cannot be assumed that they are representative of areas not sampled. All conclusions and/or recommendations are based on these analyses and observations, and the governing regulations. Conclusions beyond those stated and reported herein should not be inferred from this document.

All Environmental, Inc. warrants that all services were performed in accordance with generally accepted practices, in the environmental engineering and construction field, which existed at the time and location of the work.



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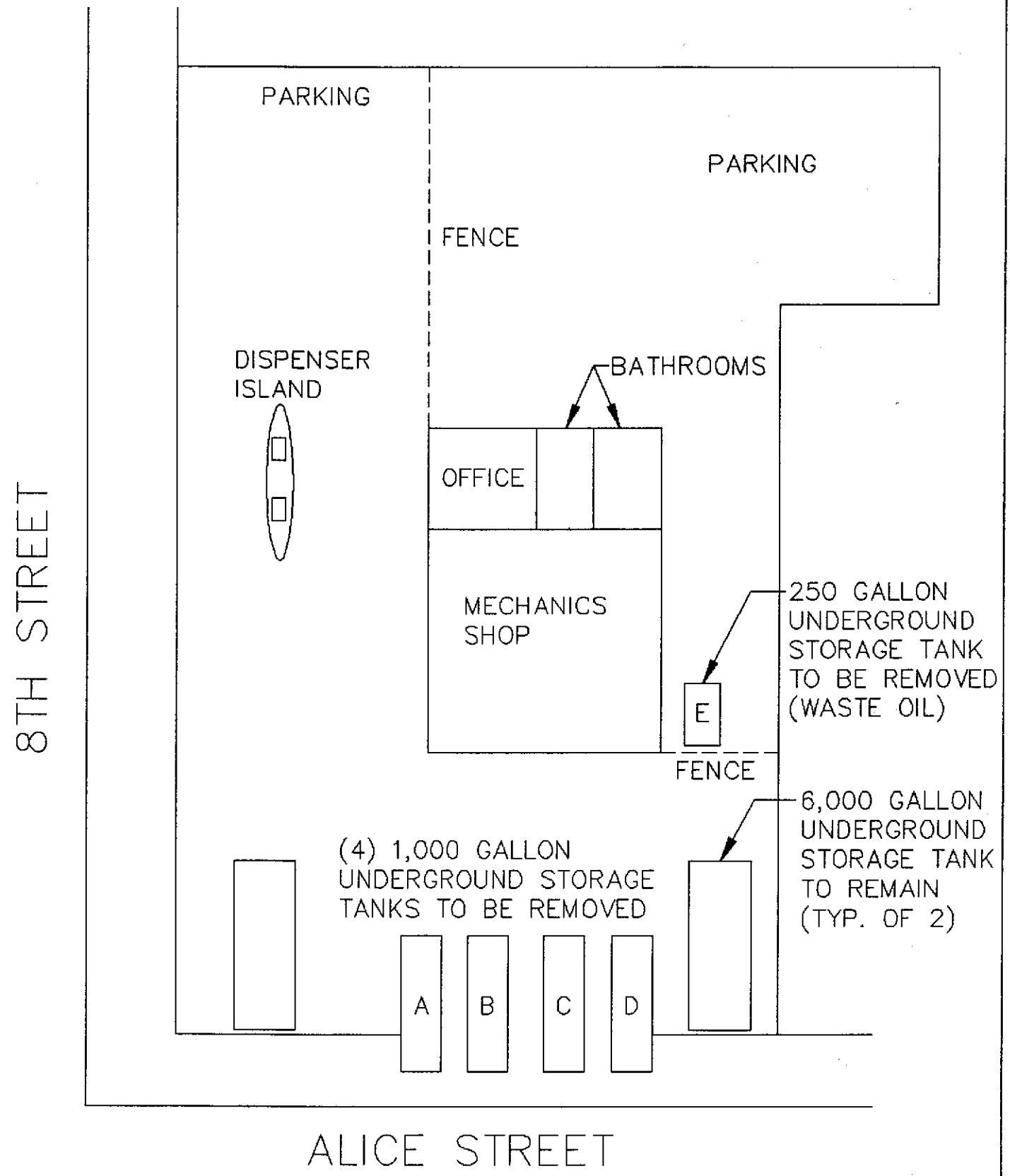
From Thomas Bros. Map – 1992

ALL ENVIRONMENTAL, INC. 2641 CROW CANYON RD, SAN RAMON		
SCALE: 1 INCH = 2200 FEET	APPROVED BY:	DRAWN BY: C.H.
DATE: 7/25/93		REVISED: C.H.
SITE LOCATION MAP		
VIC'S AUTOMOTIVE		DRAWING NUMBER: FIGURE 1



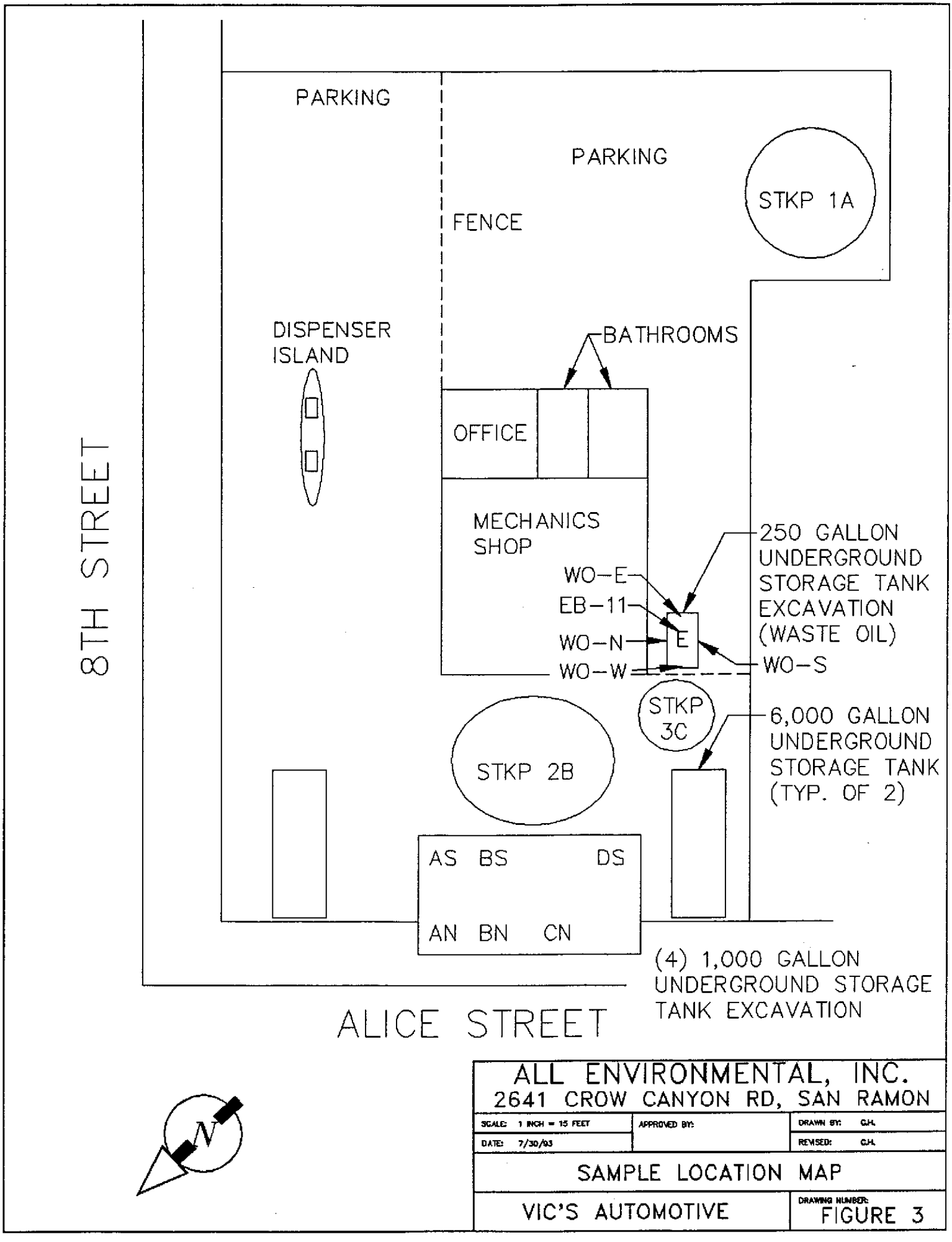
ALL ENVIRONMENTAL, INC.
2641 CROW CANYON RD, SAN RAMON

SCALE: 1 INCH = 15 FEET	APPROVED BY:	DRAWN BY: C.H.
DATE: 7/30/93		REVISED: C.H.

SITE MAP

VIC'S AUTOMOTIVE

DRAWING NUMBER: FIGURE 2



ALL ENVIRONMENTAL, INC. 2641 CROW CANYON RD, SAN RAMON		
SCALE: 1 INCH = 15 FEET	APPROVED BY:	DRAWN BY: C.H.
DATE: 7/30/03		REVISED: C.H.
SAMPLE LOCATION MAP		
VIC'S AUTOMOTIVE		DRAWING NUMBER: FIGURE 3

APPENDIX B

HEALTH & SAFETY PLAN

HEALTH AND SAFETY PLAN

Prepared for:

Mr. Vic Lum Jobsite
Vic's Automotive
245 8th St.
Oakland, CA 94607

Prepared by:

ALL ENVIRONMENTAL, INC.
2641 Crow Canyon Rd., Suite 5
San Ramon, CA 94583

A. INTRODUCTION

This Site Specific Health and Safety Plan is written for the soil and groundwater investigation of the gasoline filling and auto service station located at 245 8th St., Oakland, Ca., owned by Mr. Vic Lum. All job site personnel will follow CAL OSHA safe operating practices as outlined in 29 CFR 1910 and 1926, as well as established guidelines set forth by All Environmental, Inc. or their respective companies.

B. WORK DESCRIPTION

Prepared by: Greg Gouvea, Project Geologist

Site Manager: Greg Gouvea

Start Date: October 20, 1993

Site Address: 245 8th St., Oakland, CA

Scope of Work: Drill and install 1 groundwater monitoring well, sample soils and groundwater.

C. SITE/WASTE CHARACTERISTICS

Hazard Level:	Serious:		Low: XXX
	Moderate:		Unknown:
Waste Type:	Solid:	Oil & Grease contaminated soil	
	Sludge:	None	
	Liquid:	Oil & Grease contaminated water	
	Gas:	Potential hydrocarbon vapors	

Hazard Characteristics: Combustible, Toxic

There will be a working area delineated by caution tape and/or barricades. The working area will surround all equipment and on site activity. Only qualified and authorized personnel will be allowed to enter. All personnel arriving or departing the site should log in before entering the working area. All activities on site must be cleared through the Project Manager.

D. HAZARD EVALUATION

Potential chemical hazards include skin and eye contact or inhalation exposure to low concentrations of hydrocarbon vapors. The potentially toxic compounds that may exist at the site are listed below with descriptions of specific health effects of

each. The list includes the primary potential toxic constituents that may be found in motor fuel or oil.

1. Benzene
   a. Colorless to light yellow, flammable liquid with an aromatic odor.
   b. Exposure may irritate eyes, nose and respiratory system and may cause acute restlessness, convulsions, nausea, or depression.
   c. Permissible exposure level (PEL) for a time weighted average (TWA) over an eight hour period is 1.0 ppm.

2. Toluene
   a. Colorless liquid with a sweet pungent, benzene like odor.
   b. Exposure may cause fatigue, weakness, confusion, euphoria, dizziness, headaches, dilated pupils, lacrimation, nervousness, insomnia, paresthesia, and dermatitis.
   c. Permissible exposure level for a time weighted average over an ten hour period is 100 ppm.

3. Xylene
   a. Colorless liquid with an aromatic odor.
   b. Exposure may irritate eyes nose and throat and may cause dizziness, excitement, drowsiness, incoordination, corneal vacuolization, anorexia, nausea, vomiting, and dermatitis.
   c. Permissible exposure level for a time weighted average over an ten hour period is 100 ppm.

4. Ethylbenzene
   a. Colorless liquid with an aromatic odor.
   b. Exposure may irritate eyes and mucous membrane and may cause headaches, dermatitis, narcosis and loss of consciousness.
   c. Permissible exposure level for a time weighted average over an ten hour period is 100 ppm.

5. Lead
   a. A heavy ductile soft grey metal.
   b. Exposure may cause weakness, nausea, lassitude, diarrhea, insomnia, anorexia, inflamed mucous membranes and abdominal pains. Lead is carcinogenic.
   c. Permissible exposure level for a time weighted average over an eight hour period is .05 ppb.

Greg Gouvea has been designated to coordinate access control and security on site. All work will follow OSHA guidelines.

Additional on site hazards include those associated with operation of powered equipment with moving parts, and heavy

lifting of awkward materials and equipment. Only 40 hour trained personnel will operate equipment or perform any duty associated with this project. A hard hat and steel toed boots are mandatory for all personnel associated with the materials, heavy lifting, and equipment use. The site will inspected daily for safety.

No smoking will be permitted in areas where organic vapors are detected.

A FIRST AID KIT AND AT A 40 POUND BC FIRE EXTINGUISHER WILL BE AVAILABLE ON SITE.

EMERGENCY SERVICES ARE AVAILABLE BY DIALING **911** ON THE TELEPHONE WHICH WILL BE DESIGNATED FOR USE.

E. PERSONAL PROTECTIVE CLOTHING

Based on evaluation of potential hazards, level 'D' protective clothing has been designated as the appropriate protection for this project. The level of protective clothing will be upgraded if the organic vapor levels in the operator's breathing zone exceeds 5 ppm above background levels continuously for more then five minutes. If this occurs then level C protection will be used. If the organic vapor concentration in the operator's breathing zone exceed's 200 ppm for 5 minutes and/or the organic vapor concentration two feet above the excavation exceeds 2,000 ppm or 25% of the lower explosive limit, then the equipment will be shut down and the site evacuated. If organic vapor concentrations exceed 200 ppm and work continues then level B or C protection will be required.

Loose clothing will not be worn in the immediate vicinity of the drill rig's moving parts.

"EPA Standard Operating Safety Guidelines" defines the levels of protective clothing as follows:

LEVEL A:
Fully encapsulating suit / SCBA / Hard hat / Steel toe boots / Safety gloves.

LEVEL B:
Splash resistant suit / SCBA / Hard Hat / Steel toe boots / Safety gloves.

LEVEL C:
Half face respirator / Hard hat / Safety glasses / Steel toe boots
Coveralls / Gloves.

LEVEL D:
Coveralls / Hard hat / Safety Glasses / Steel toe boots / Gloves.

If air purifying respirators are required, organic vapor cartridges will be used. A competent individual has determined that all criteria for using this type of respiratory protection have been met.

NO CHANGES TO THE SPECIFIED LEVELS OF PROTECTION SHALL BE MADE WITHOUT THE APPROVAL OF THE SITE SAFETY OFFICER.

F. MONITORING INSTRUMENTS

The following environmental monitoring instruments shall be used on site as hydrocarbon vapors are detected.

An Organic Vapor Meter will be used to ensure that a safe atmosphere exists in the working area.

G. EMERGENCY HOSPITAL

The closest hospital is:

HIGHLAND HOSPITAL (510) 437-4148
1411 E. 31st ST.

DIRECTIONS FROM THE JOB SITE:

EXIT JOBSITE AND GO:

LEFT ON ALICE ST.

LEFT ON 7TH STREET

ACROSS MERRITT CHANNEL, TURNS INTO 8TH ST.

LEFT ON 14TH AVE.

LEFT ON E. 31ST ST. TO HOSPITAL ON LEFT

H. READ AND SIGN

The work party was briefed on the contents of this plan and other recognized site specific hazards on October ___, 1993 at _____. All site personnel are familiar with the safety plan and required safe practices.

NAME:	SIGNATURE:	COMPANY NAME:

APPENDIX C

SAMPLING QA/QC PROCEDURES

PRIORITY ENVIRONMENTAL LABS

Precision Environmental Analytical Laboratory

QUALITY ASSURANCE MANUAL

1764 Houret Court Milpitas, CA. 95035 Tel: 408-946-9636 Fax: 408-946-9663

TABLE OF CONTENTS

I. QA OBJECTIVES:

We, at Priority Environmental Labs (PEL), commit to a quality assurance program designed to guarantee our analytical results are valid and properly documented.

II. SAMPLING PROCEDURES:

Sampling should be done according to EPA guidelines. Precautions are taken to avoid sample contamination and to maintain sample integrity. Proper containers and preservation techniques are used if necessary (See Table 1 of this manual). For examples, with water samples requiring volatile organic analysis, 40 ml vials with teflon-lined septa are used. For water samples requiring semi-volatile organic analysis, 1-liter glass bottles with teflon-lined septa are used.

In cases we provide these containers for our clients, we buy only EPA - approved containers. Once they arrive, they are washed in detergent and rinsed first with tap water then with deionized water.

III. SAMPLE CUSTODY:

The sampler is required to secure his samples upon arrival at the laboratory. Next, samples are inspected by our receiver to assure that proper containers, their conditions, and needed preservatives are used. Our receiver also inspects all necessary information such as sample identification, time of collection, sampling techniques, analysis required, etc. are submitted. If needed, we can provide clients with our chain of custody (See Table 2 of this manual). A PEL file number is assigned to each batch of samples to identify it.

Finally, samples are ready to be stored in refrigerators which are daily monitored to make sure their temperatures are less than 4 degrees centigrade (See Table 3,4, and 5 of this manual).

IV. CALIBRATION PROCEDURES AND FREQUENCY:

For routine analyses, a five - point calibration curve is used. Then, a mid - point standard is run every day. If the response factor of this mid - point standard is less than 20% of the calibration curve, the average response factor from the calibration will be used for calculation. Otherwise, a new calibration curve will be established after needed correction measures are performed.

For non - routine analyses, a three - point calibration curve will be established and its average response factor is used for calculation. (See Table 6 for a list of suppliers of standards and reagents that we used).

V. ANALYTICAL PROCEDURES:

Analyses are performed according to methods in Test Methods for Evaluating Solid Waste, SW-846, Third Edition, LUFT, Methods for Organic Chemical Analysis of Municipal and Industrial Waste Water, EPA - 600 / 4-82-057, and other methods approved by either EPA or DHS.

In general, before analyzing samples, we run a reagent water blank to make sure that our instrument, glassware, and reagents are free of contamination.

For each batch of samples, we analyze a sample blank by running a reagent water blank or a clean sample of similar matrix to that of real sample through all steps of preparation and measurement.

Next, a mid - point standard is run to check the validity of our existing calibration curve. Now, we are ready to analyze samples. A duplicate sample and a spiked sample are to be run for anybatch of samples or for every ten samples to check the precision of the result and the percentage of recovery of compounds spiked.

VI. DATA REDUCTION, VALIDATION, AND REPORTING:

Analyst who is responsible for the analysis will perform data reduction and validation by strictly following guideline set by appropriate approved methods.

Later, his data interpretation and calculation will be checked by a supervisor for validity before a typed report is issued. Both the analyst and his supervisor will proofread the report for any error before sending it to the client.

A copy of the report along with a copy of chain of custody, chromatograms if any, calculation sheets, and other information related to the analysis will be kept on file.

VII. INTERNAL QUALITY CONTROL CHECKS:

For every batch of sample, a quality control check sample will be run. This check sample will have all analytes needed to be determined in real samples. If any problem occurs, the correspond supervisor will dertermine the appropriate corrective action.

VIII. PERFORMANCE AND SYSTEM AUDITS:

Several times a month, the supervisor will test the measurement systems with samples of known compositions or behavior to evaluate precision and accuracy without the knowledge of the analyst to determine whether the measurement systems are being used appropriately.

IX. PREVENTIVE MAINTENANCE:

All instruments in the laboratory are regularly checked and maintained following manufacturer's suggestions. Any replacement, modification is timely recorded in an instrument record logbook.

X. PROCEDURES FOR DATA PRECISION AND ACCURACY:

We follow the quality assurance criteria set by California Department of Health Services (See Table 7 of this manual).

XI. CORRECTIVE ACTION:

Whenever a problem occurs, we will apply the following procedires:

- Identifying and defining the problem.
- Assigning responsibility for investigating the problem.
- Investigating the cause of the problem.
- Determining a corrective action to eliminate the problem which may be a combination of :
    * A thourough check of instruments.
    * A thourough check of standards, reagents, deionized water.
- Accepting responsibility for the corrective action.
- Evaluating its effectiveness.
- Verifying that the corrective action has eliminate the problem.

XII. QUALITY ASSURANCE REPORT:

Our quality assurance program are maintained periodically. Q/C data are recorded in different logbooks for different methods of analyses. These logbooks are weekly reviewed by our laboratory director.

The final report sent to our clients also includes all quality control data obtained while running samples.

TABLE 1

SAMPLE CONTAINERS, PREVERVATION TECHNIQUES AND HOLDING TIMES

WATER TESTS

DESCRIPTION	METHOD	SAMPLE SIZE	HOLDING TIME	* PRESERVATIVE
TPH gasoline/BTEX	5030/8015/602	2-40 ml VOA	14 days	HCl to pH<2
TPH extractables (diesel , kerrosene)	3510/8015	2-1 ltr btls	14 days	HCl to pH<2
TPH extractables (motor oil)	3510/8015	2-1 ltr btls	14 days	HCl to pH<2
Purgeable halocarbons	601	2-40 ml VOA	14 days	HCl to pH<2
Purgeable aromatics	602	2-40 ml VOA	14 days	HCl to pH<2
Volatile organics	624	2-40 ml VOA	14 days	4 drops HCl
Base neutrals & acids (semivolatile organics)	625	1 liter btl	14 days	HCl to pH<2
Phenols	604	1 liter btl	7 days	.008% $Na_2S_2O_3$
Pesticides & PCB's	608	1 liter btl	7 days	none
Oil and grease	5520 C & F	2-1 ltr btls	28 days	HCL to pH<2
Metals	various	200 ml	14 days	HNO3 to pH<2

* All samples are held at 4 degrees centigrade.

TABLE 1 (Continued)

SOIL TESTS

DESCRIPTION	METHOD	SAMPLE SIZE	HOLDING TIME	* PRESERVATIVE
TPH gasoline/BTEX	5030/8015/8020	1 brass tube	14 days	none
TPH extractables (diesel , kerrosene)	3550 / 8015	1 brass tube	14 days	none
TPH extractables (motor oil)	3550/8015	1 brass tube	14 days	none
Purgeable halocarbons	8010	1 brass tube	14 days	none
Purgeable aromatics	8020	1 brass tube	14 days	none
Volatile organics	8240	1 brass tube	14 days	none
Base neutrals & acids (semivolatile organics)	8270	1 brass tube	14 days	none
Phenols	8240	1 brass tube	7 days	none
Pesticides & PCB's	8080	1 brass tube	7 days	none
Oil and grease	5520 D & F	1 brass tube	28 days	none
Metals	various	50 grams	14 days	none

* All samples are held at 4 degrees centigrade .

TABLE 2

STANDARD REFRIGERATOR # TEMPERATURE RECORD

Month :

Year :

Start Date :

End Date :

Acceptable Range : < 5° C

DATE	TEMP.	INITIAL

DATE	TEMP.	INITIAL

1764 Houret Court Milpitas, CA. 95035 Tel: 408-946-9636 Fax: 408-946-9663

PRIORITY ENVIRONMENTAL LABS

Chain of Custody

1764 Houret Ct. Milpitas,CA.95035 Tel:408-946-9636 Fax:408-946-9663

DATE:____/____/____ PAGE:____ OF:____

PROJECT MGR.:_____

COMPANY:_____

ADDRESS:_____

:_____

PHONE:_____-_____-_____ FAX:_____-_____-_____

SIGNATURE:_____

SAMPLE ID	DATE	TIME	MATRIX	TPH-Gasoline (EPA 5030,8015)	TPH-Gasoline(5030,8015) w/BTEX(EPA 602,8020)	TPH-Diesel (EPA 3510/3550,8015)	PURGEABLE AROMATICS BTEX (EPA 602,8020)	TOTAL OIL & GREASE (EPA 5520 C,D&F)	PESTICIDES/PCB (EPA 608,8080)	TOTAL RECOVERABL HYDROCARBONS (EPA 418.1)	CHLORINATED HYDROCARBONS (EPA 601,8010)									NUMBER OF CONTAINERS

PROJECT INFORMATION

PROJECT NAME::

PROJECT NUMBER:

SAMPLE RECEIPT

TOTAL # OF CONTAINERS	
RECD. GOOD COND./COLD	

INSTRUCTIONS & COMMENTS:_____

RELINQUISHED BY: 1	RECEIVED BY: 1	RELINQUISHED BY: 2	RECEIVED BY: 2
SIGNATURE:	SIGNATURE:	SIGNATURE:	SIGNATURE:
Date: Time:	Date: Time:	Date: Time:	Date: Time:
COMPANY:	COMPANY:	COMPANY:	COMPANY:

TABLE 3

TABLE 4

SAMPLE CHECK-IN PROCEDURE

1.When samples first arrive,they are checked for leakage and/or breakage of containers.Any non-conformity is noted in the sample log book even if a sample is lost and not able to be analyzed.

2. A PEL sample number is assigned to each sample. The sample number is a 7-digit number in which the first two digits depict the month,the next two digits represent the year and the last three digits are the chronological order of the samples received in a month.For example:0288027 is assigned to the 27th sample that comes in during February of 1988.For the correct number to be assigned,consult the last entry in the sample log book.

3.If more than one sample is submitted at one time,they can share the same sample number followed by an alpha bet which is used to distinguish individual samples.For example,0288027-A,0288027-B.

4. PEL stickers with sample number and arrival date are to be affixed to every sample container.The numbers on the stickers will agree with those in the sample log book.

5.Followingthe format of the sample check-in form,(see inside front cover of sample log book)take down all relevant information regarding samples being submitted.The person who checks in the samples will initialize the page in the sample log book.

6.If not analyzed immediately,the same person will transfer the samples to appropriate storage area.e.g. refrigerator.

7.A copy of the page in the sample log book will be handed to the analyst who is responsible for carrying out the analysis.

TABLE 5

PRIORITY ENVIRONMENTAL LABS

PEL # _____

INVOICE #_____

LOG-BOOK

DATE RECEIVED:_____ TIME:_____

CUSTOMER:_____

ADDRESS:_____

CITY:_____ STATE:____ ZIP-CODE:_____

PHONE :_____-_____-_____ FAX :_____-_____-_____

CONTACT :_____

	SAMPLE DESCRIPTION	ANALYSIS	CHARGE
1			
2			
3			
4			
5			
6			
7			
8			
9			
10			
11			
12			
		TOTAL	

INSTRUCTION:_____

_____

TECHNICIAN RECEIVED SAMPLES:_____

DATE COMPLETED:_____ INITIAL:_____

TABLE 6

ACCEPTABLE SOURCES OF REAGENTS AND STANDARDS

Reagents

VWR Scientific
Baxter Scientific/Burdick and Jackson
Mallinckrodt
Fisher Scientific
J.T. Baker
EM Science
MCB
Aldrich Chemical
Alltech
Supelco

Standards

EPA
National Bureau of Standards
Chem Service
Sigma
Aldrich
Alltech
Supelco
Varian Associates

Table 7 QUALITY ASSURANCE CRITERIA
California Department of Health Services
Hazardous Materials Laboratory, 1985

A. WATER ANALYSIS

CATEGORY	METHOD NO.	REF	DETECTION LIMIT(ug/L)	ACCURACY %	PRECISION %	QA/QC CRITERIA
Sb,As,Be,Ba Cd,Cr,Co,Cu Pb,Mo,Ni,Se Ag,T1,V,Zn	200's	d	10-100	80-120	20	A,B,C,D,E
Mercury	245	d	0.5	80-120	20	A,B,C,D,E
Chromium(VI)	218.5	d	50	85-115	10	A,B,C,D,E
Sulfide	376	d	50	85-115	10	A,B,C,D,E
Cyanide	335	d	10	85-115	10	A,B,C,D,E
Fluoride	340/300 h	d	0.1	85-115	15	A,B,C,D,E
CHloride	325/300 h	d	10	85-115	15	A,B,C,D,E
Nitrite	354/300 h	d	1	85-115	15	A,B,C,D,E
Nitrate	352/300 h	d	1	85-115	15	A,B,C,D,E
Sulfate	375/300	d	1	85-115	15	A,B,C,D,E
Purgeable Halocarbons	601	e	0.02-2 b	70-110 b	25	A,B,C,D,E
Purgeable Aromatics	602	e	0.2 -4 b	40-110 b	25	A,B,C,D,E
Phenol	604	e	0.2-20 b	40-110 b	20	A,B,C,D,E
Nitrosamines	607	e	0.1-1.0 b	30-100 b	10	A,B,C,D,E
Organochlorine Pesticides and PCBs	608	e	0.02-1.0 b	85-115 b	10	A,B,C,D,E
PAHs	610	j	0.02-2.5 b	80-120 b	15	A,B,C,D,E
Organophosphorus Pesticides	614/622	a	0.02-5 b	50-120 b	20	A,B,C,D,E
Chlorophenoxy Herbicides	509B f	f	10	60-110 b	15	A,B,C,D,E

Purgeables	624	e	5-10 [b]	60-145 [b]	25	A,B,C,D,E
Base/Neutral & Acids	625	e	10-50 [b]	10-130 [b]	50	A,B,C,D,E
Carbamates	632	a	0.01-0.5 [b]	40-110 [b]	15	A,B,C,D,E
pH	150	d				A,C
Fish Bioassay	Section 66696	g				A,F,C

Notes and References:

a Methods for Nonconventional Pesticides Chemicals Analysis of Industrial and Municipal Wastewater, Test Methods, EPA-440/1-83/079-C.
b Maximum Range for group.
c Maximum relative percent difference (RPD) of duplicates at ten or more times the limit of detection.
d Methods for Chemical Analysis of Water & Wastes,EPA 600/4-79-020.
e "Guidelines Establishing Test Procedures for the Analysis for Pollutants Under the Clean Water Act", 40 CFR part 136, EPA, October 26, 1984.
f Standard Methods for the Examination of Water and Wastewater, 16th Edition,1985.
g California Administration Code, Title 22, Chapter 30, Article 11 "Criteriafor Identification of Hazardous and Extremely Hazardous Wastes".
h The Determination of Inorganic Anions in Water by Ion Chromatograph Method 300.0, Test method, EPA 600/4-84-017,March 1984.

QA/QC CRITERIA:

A All QA/QC procedures required by the methods.
B One method blank for every ten samples or batch of samples or type of matrix, whichever is more frequent.
C One sample analyzed in duplicate for every ten samples or batch of samples or type of matrix, whichever is more frequent.
D One spiked sample for every ten samples or batch of samples or type of matrix, whichever is more frequent. Spike shall be made at ten times the detection limit or at the analyte level.
E Analyze quality control sample with every ten samples or batch of samples or type of matrix, whichever is more ferquent.
F One control for each sample.
G Bioassay screening as 250 mg/L and 750 mg/L, at a minimum.

B. SOIL, LIQUID WASTE AND SOLID WASTE ANALYSIS

CATEGORY	METHOD NO.	REFERENCE	DETECTION LIMIT(mg/kg)	ACCURACY %	PREC. %	QA/QC CRITERIA
Sb,As,Be,Ba Cd,Cr,Co,Cu Pb,Mo,Ni,Se, Ag,T1,V,Zn	Section 6 and/or 7	g	1	75-125	35	A,B,C,D,E
Mercury Hg	7471	g	1	75-125	35	A,B,C,D,E
Chromium (VI)	7195/6/7	g	0.5	80-120	35	A,B,C,D,E
Sulfide	9030	g	10	80-120	15	A,B,C,D,E
Cyanide	9010[a]	g	5	80-120	15	A,B,C,D,E
Fluoride	340[h] /300[b]	b,h	10	80-120	20	A,B,C,D,E
Chloride	325[h] /300[b]	b,h	100	80-120	20	A,B,C,D,E
Nitrite	354[h] /300[b]	b,h	10	80-120	20	A,B,C,D,E
Nitrate	352[h] /300[b]	b,h	10	80-120	20	A,B,C,D,E
Sulfate	375 /300	b,h	100	80-120	20	A,B,C,D,E
Waste Extraction Test (WET)	Section 1 66700	i	0.1 mg/1	75-125	35	A,B,C
Halogenated Volatile Organics	8010	g	0.2 -20[e]	30-110[e]	50	A,B,C,D,E
Aromatic Volatile Organics	8020	g	2 -40[e]	30-110[e]	50	A,B,C,D,E
Phenols	8040	g	0.2 -20[e]	30-140[e]	40	A,B,C,D,E
PAHs	8100/8310	g	0.2-2.0[e]	50-120[e]	25	A,B,C,D,E
Organochlorine Pesticides and PCBs	8080	g	0.5 -10[e]	25-140[e]	25	A,B,C,D,E
Organophosphorus Pesticides	8140	g	1 -20[e]	50-120[e]	25	A,B,C,D,E

Chlorophenoxy Herbicides	8150	g	1	50-110[e]	20	A,B,C,D,E
GC/MS Method for Volatile Organics	8240	g	1	60-140[e]	20	A,B,C,D,E
GC/MS Method for Semi-Volatile Organics	8250/8270	g	1 -5[e]	30-140[e]		A,B,C,D,E
Carbamates	8320	j	1 -5[e]	30-140[e]	20	A,B,C,D,E
pH	9040	g				A
Fish Bioassay	Section 66696(a)(4)	i				A,F,C
Ignitability	1010/1020	g				A
Corrosivity[c]	Section 66708	i				A
Reactivity[d]	Section 66705	i				A

NOTE AND REFERENCE:

a Method may be modified to use specific ion electrode or colorimetry.

b The Determination of Inorganic Anions in Water by Ion Chromatography Method 300.0, Test Method, EPA 600/4-84-017, March. Sample preparation such as aquaous extractions may be needed.

c Test by corrosivity toward steel.

d Water reactivity and cyanide and sulfide screening.

e Maximum range for group.

f Maximum relative percent difference (RPD) of duplicates, at ten or more times the limit of detection.

g Test Methods for Evaluating Solid Waste, Physical/Chemical Methods, SW-846, 2nd Edition, USEPA, revised April 1984.

h Methods for Chemical Analysis of Water and Wastes. EPA-600/4-79-020.

i California Administrative Code, Title 22, Chapter 30,Article 11, "Criteria for Indentification of Hazardous and Extremley Hazardous Wastes".

j Proposed sampling and Analytical Methodologies for addition to Test Methods for Evaluating Solid Waste, Physical/Chemical Methods, SW-846, 2nd Edition, USEPA, 1984.

k Extraction and analysis of antimony, arsenic, beryllium, cadmium, chromium, cobalt, copper, lead, molybdenum, nickel, selenium, silver, thallium, vanadium, zinc, and mercury.

QA/QC CRITERIA:

A All QA/QC procedures required by the methods.

B One method blank for every sample or batch of samples or type of matrix, whichever is more frequent.

C One sample analyzed in duplicate for every sample or batch of samples or type of matrix, whichever is more frequent.

D One spiked sample for every sample or batch of samples or type of matrix, whichever is more frequent. Spike shall be made at ten times the detection limit or at the analyte level.

E Analyze EPA quality control sample and/or NBS traceable standards (if available) with every ten samples or batch of samples or type of matrix, whichever is more frequent.

F One control for each sample.

G Bioassay screening as 250 mg/L and 750 mg/L, at a minimum.

DAVID DUONG

Education:

- San Jose State University, M.S. Materials Engineering Dec. 1987.
- University of California,Berkeley, B.S. Chemistry, May 1985.

Professional Experience:

Jan 1992- Present: Laboratory Director

Priority Environmental Labs Milpitas,CA
Responsibilities include obtaining the Hazardous Waste Laboratory Certification awarded by DHS, modifying and developing methods used in the laboratory, training chemists and technicians to carry out chemical analysis of environmental samples, and preparing final reports.

Jan 1990- Dec. 1991: Chief Chemist

Chromalab,Inc. San Ramon,CA
Responsibilities include developing methods used in the lab, enforcing QA/QC procedures, and supervising other chemists to carry out analyses using GC,GC/MS,AA,ICP, and other equipments.

Dec. 1988- Dec. 1989: Senior Chemist

Chromalab,Inc.San Ramon,CA
Responsible for day to day operation of the GC and Metals sections, writing final reports, supervising other chemists and technicians to perform assigned tasks.

June 1988-Dec. 1988: Organic Section Leader

Precision Analytical, San Francisco,CA.
Responsible for the operation of the GC section of the laboratory. Carry out all required organic analyses from start to end.

March 1987-June 1988:Analytical Chemist

Anresco,San Francisco,CA.
Perform chemical analyses on environmental samples and food products using EPA, DHS, and FDA methods.

November 1986- March 1987: QA Chemist

Sclavo, The West Coast,Sunnyvale,CA.
Perform quality assurance checks on biological products.