HAGEMAN-AGUIAR, INC.

Underground Contamination Investigations
Groundwater Consultants, Environmental Engineering

3732 Mt. Diablo Blvd. Suite 372
Lafayette, California 94549
(510) 284-1661
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March 5, 1992

PROPOSAL FOR SUBSURFACE INVESTIGATION

Quality Tune-Up
2780 Castro Valley Blvd
Castro Valley, CA

I. INTRODUCTION

The site location is the Quality Tune-up facility in Castro Valley, California. The location of the site is shown in Figure 1. In conjunction with a previous service station operation, the site has historically operated three underground fuel storage tanks for a number of years. The proposed scope of work involves the installation of three shallow groundwater monitoring wells following the removal of the underground storage tanks from the site. A map of the site is shown in Figure 2. This map shows the layout of the facility, along with the previous tank locations.

In February 1987 the two existing 7,500 Gasoline tanks and the one Waste Oil tank were removed by 4M Construction of Madera, California. Soil and groundwater samples were

FIGURE 1.
Site Location Map

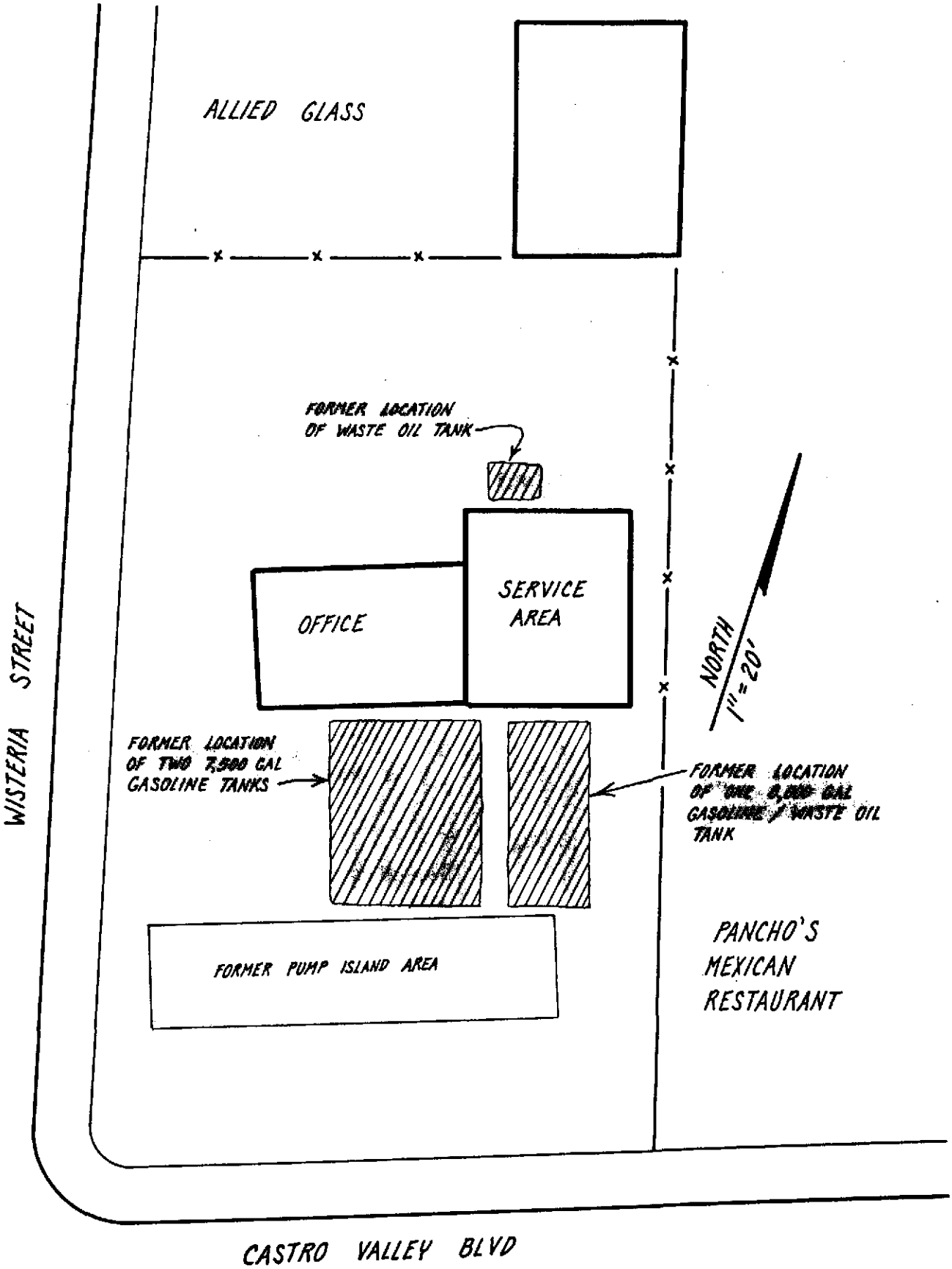


FIGURE 2.
Site Map.

collected, and were subsequently analyzed by Trace Analysis Laboratory, Inc. Of the seven soil samples collected, only "Extractable Hydrocarbons" were detected in those soil samples collected in the vicinity of the Waste Oil tank location. Analysis of the groundwater sample indicated 26 mg/L (ppm) of Volatile Hydrocarbons, 420 µg/L (ppb) of Benzene, 2,000 µg/L (ppb) of Toluene and 9,400 µg/L (ppb) of Total Xylenes.

On June 11, 1991, the final 8,000-gallon underground storage tank was removed from the site by Minter & Fahy Construction, Inc, Pacheco, California. This underground tank was utilized for Gasoline storage until February 1987, at which time it was converted to Waste Oil storage. At the time of removal, the tank was apparently being utilized for storage of Waste Oil. Soil samples were collected from the tank excavation and were subsequently analyzed by Chromalab Laboratory, Inc., San Ramon, California. The results of laboratory analyses indicated no detectable of concentrations of Diesel, Gasoline, Benzene, Oil & Grease, Halogenated Volatile Organics (EPA 8010), or Semi-Volatile Organics (EPA 8270). A groundwater sample was collected from the tank excavation and was subsequently analyzed. The results of laboratory analyses indicated no detectable of concentrations of Diesel, Gasoline, Benzene, Oil & Grease, Halogenated Volatile Organics (EPA 601), or Extractable Organics (EPA 625). Soil samples collected from the spoils pile indicated the presence of Gasoline at concentrations of up to 1.4 mg/kg (ppm), and Oil & Grease at concentrations of up to 24 mg/kg (ppm).

Soil pile not tank excavation area

Analytical results and other data pertaining to the previous underground tank removals are included in Attachment A.

II. SITE DESCRIPTION

Vicinity Description and Hydrogeologic Setting

The location of the site is shown on the site location map (Figure 1). The soils beneath the site consist of Quaternary Alluvium overlying uplifted Cretaceous Marine deposits that comprise the surrounding San Leandro Hills (Geologic Map of California, San Francisco Sheet, State of California Division of Mines and Geology, 1980). During the borings for the well installations, varying amounts of clay, sand, and gravel can be expected to be encountered.

Based upon the surface topography, as well as the various hydrologic features shown on the vicinity map, the general regional shallow groundwater can be expected to flow from the San Leandro Hills to the north and to the east of the site (areas of groundwater recharge) and move toward San Lorenzo Creek to the south of the site (area of discharge). Although the placement of the proposed monitoring wells are based upon this assumption of groundwater flow direction, water level data from the three wells will determine the exact flow direction of the shallow groundwater beneath the site.

During the most recent underground storage tank removal, shallow groundwater was encountered beneath the site at a depth of approximately 11.5 feet below ground surface.

Site Description

A map of the site is shown in Figure 2. This map shows the

layout of the facility, along with the locations of the previous tank excavation. At the present time, the entire site is covered by asphalt or concrete pavement.

III. EXTENT OF SOIL CONTAMINATION ON SITE

Based upon the information presented in Attachment A, analysis of soil samples collected during the most recent underground storage tank removal indicated the presence of **Gasoline at concentrations of up to 1.4 mg/kg (ppm), and Oil & Grease at concentrations of up to 24 mg/kg (ppm).**

The plan for determining groundwater contamination, as discussed in Section IV of this proposal, provides for the analysis of all soil samples for 1) total petroleum hydrocarbons as Diesel, 2) total petroleum hydrocarbons as Gasoline, 3) Benzene, Toluene, Ethylbenzene, and Total Xylenes (BTEX), and 4) Oil & Grease. In addition, all groundwater samples will be analyzed for Halogenated Volatile Organics and Semi-Volatile Organics. An attempt will be made to determine the concentrations of any detectable hydrocarbons that may still be remaining in the soil beneath the site. An attempt will also be made to correlate any new soil sampling data with those from the previous soil sample analyses.

IV. PLAN FOR DETERMINING GROUNDWATER CONTAMINATION

Placement of Monitoring Wells

The purpose of the proposed subsurface investigation is to install and sample three on-site monitoring wells in order to 1) determine the direction of shallow groundwater flow beneath the site, and 2) define the extent of any petroleum constituents that may be present in both the soil and the shallow groundwater beneath the site.

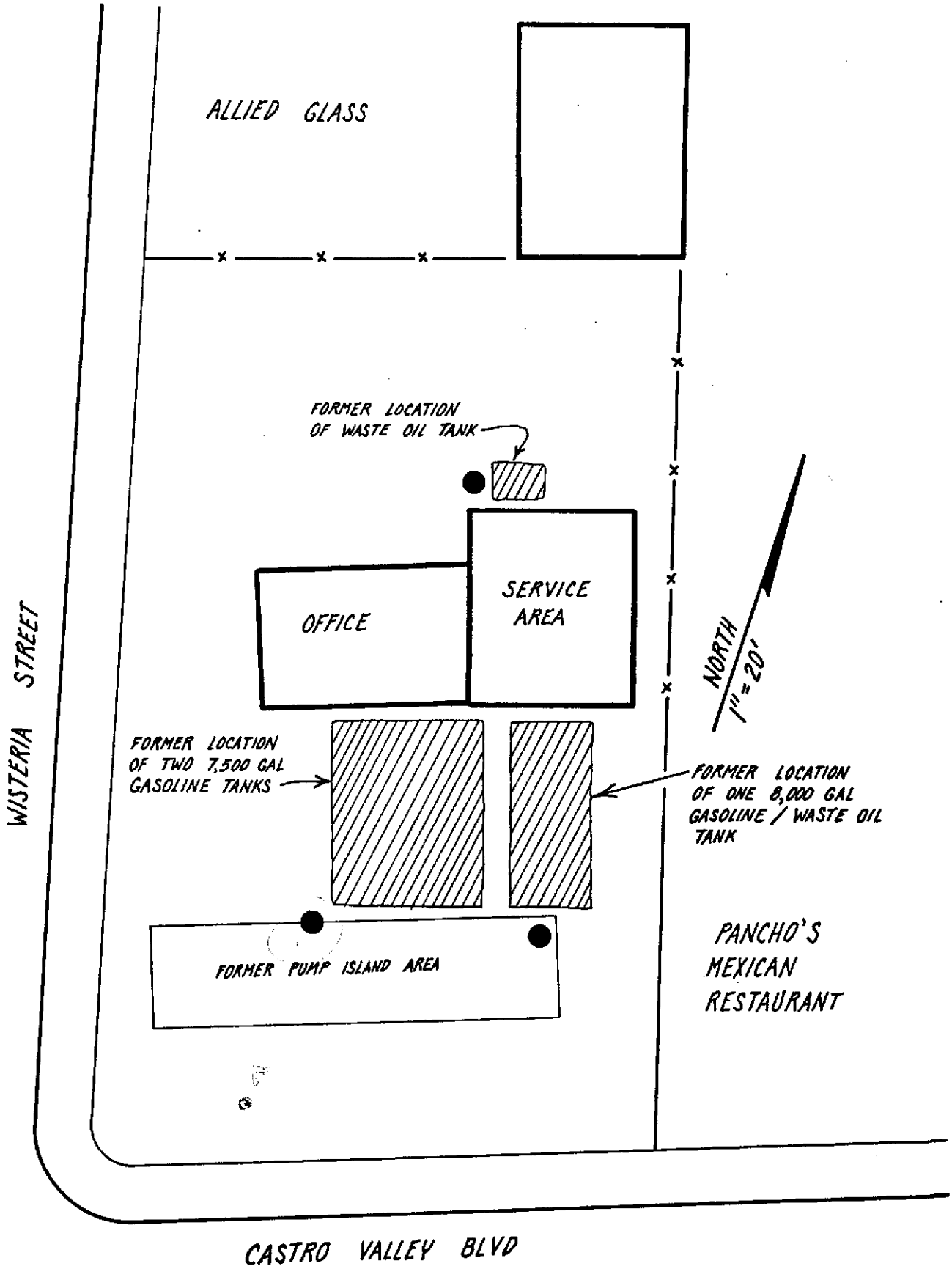
The proposed locations of the wells are shown in Figure 3. The locations have been selected based upon 1) known locations of soil contamination during the previous tank removal, 2) the expected shallow groundwater flow direction, and 3) what is believed to be good spacing between data points in order to achieve reasonable plume definitions of any contaminants that may be present in the shallow groundwater beneath the site.

Monitoring Well Installations

Well installation will begin as soon as possible, following approval by the appropriate regulatory agencies. Each well will be installed with a truck-mounted drill rig using 8-inch hollow-stem augers.

For at least one of the monitoring well borings, continuous logging will be conducted by advancing a split barrel sampler (five feet in length) during the drilling operation.

During the drilling, soil samples for chemical analyses will



[redacted] Proposed Locations of Shallow Monitoring Wells.

be collected at 5-foot intervals until the shallow water table is encountered at an expected depth of approximately 11.5 feet below the ground surface. Each soil sample will be collected by driving directly into the native soil below the augers with a 2-inch split-barrel sampler fitted with clean brass liners. All samples will be immediately placed on ice, then transported under chain-of-custody to the laboratory by the end of the work day.

The well borings will extend to approximately 10 feet below the shallow water table. Each well will be cased to approximately three to five feet above the shallow water table with 2-inch PVC slotted screen pipe (0.02" slots). The annular space of each well will be packed to one foot above the slotted section with #3 Monterey Sand. At least one foot of wetted bentonite pellets will be placed upon the sand pack, followed by a neat cement/bentonite seal up to the ground surface. Each well will be fitted with a locking steel traffic lid. The borings will be logged in the field by Gary Aguiar, Registered Civil Engineer #34262 (a statement of qualifications is included as Attachment B). A typical well construction diagram is shown in Figure 4.

Sand Pack Grain Size Selection

In the case of the three proposed shallow monitoring wells, it is not practical to conduct exploratory borings for aquifer samples as a separate program prior to the well installations. The selection of the screen slot size and sand pack grain size was based upon typical shallow aquifer material encountered in the Castro Valley area (coarse-grained alluvium). A well pack design based upon the d_{30} and the uniformity coefficient of a well-graded alluvial soil with sizes ranging from coarse sand to silt generally yields

TYPICAL MONITORING WELL CONSTRUCTION

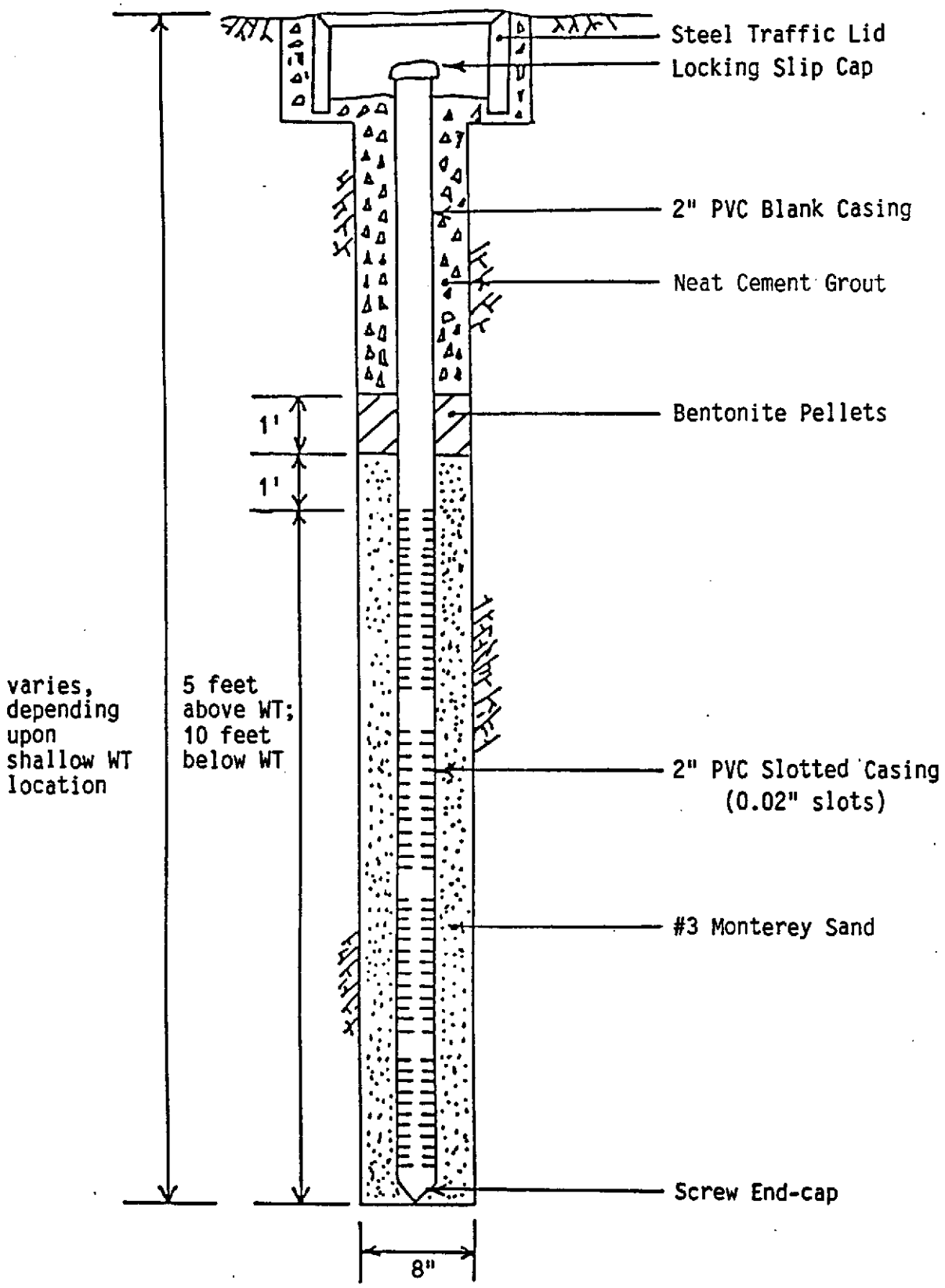


FIGURE 4.
Typical Monitoring Well Construction.

a design consisting of 0.02" slots and #3 Monterey sand. This design is therefore considered as a "general purpose" design, appropriate for many monitoring well conditions where well efficiency is not an important issue, but where silting should be kept to a minimum.

In the event that some unexpected and very different aquifer material is encountered, an attempt will be made to obtain and transport to the site alternate well material consisting of well screen with different slot size and sand pack of alternate grain size.

It should be noted that as a standard practice during each monitoring well installation, one or more aquifer material samples are collected for sieve analyses. The results of these sieve analyses will be presented in the final report, and will be used in the design of any recovery wells and/or additional monitoring wells, should they be warranted.

Decontamination

Prior to the installation of each well, all drilling equipment, including augers, drill stem, and split barrel samplers, will be steam-cleaned on-site. Prior to the installation of each well, all drilling equipment, including augers, drill stem, and split barrel samplers, will be steam-cleaned. All on-site steam-cleaning will be conducted within a temporary bermed area, covered by a plastic liner. Wash water collected in this area will subsequently be transferred into appropriate 55-gallon drums, and stored on-site until the results of laboratory analyses of water samples are obtained. Depending upon these results, the water will be sewered as a non-hazardous liquid waste in accordance with local sewering agency permit requirements, or else it will be

transported as a hazardous liquid waste under proper manifest to an appropriate TSD facility for treatment and disposal.

Waste Generation

All drill cuttings will be stockpiled and stored on-site until the results of laboratory analyses are obtained. Depending upon these results, the cuttings will be disposed of as either a non-hazardous waste, or else transported as a hazardous waste under proper manifest to an appropriate TSD facility. In the case of contaminated soil, it may be possible to remove residual Gasoline concentrations by aeration under permit from the Bay Area Air Quality Management District (BAAQMD), and thereby facilitate disposal as a non-hazardous waste.

Groundwater Sampling Plan

The development of the newly installed monitoring wells will not occur for at least 72 hours after construction. It is proposed that each well will be developed by removing water with a mechanical air-lift pump until the water is relatively clear, or until the apparent turbidity of the water being removed has stabilized. In the event that pumping does not appear to be providing adequate well development, a well development service truck can be brought to the site in order to attempt further development with mechanical surge block and bailer.

Prior to groundwater sampling, all three on-site monitoring wells will be purged by bailing 4 to 10 casing volumes of water. Field conductivity, temperature, and pH meters will

be present on-site during the monitoring well sampling. As the purging process proceeds, these three parameters will be monitored. Purging must continue until readings appear to have reasonably stabilized. After the water level has attained 80% or more of the original static water level in a particular monitoring well, a groundwater sample will be collected using a clean teflon bailer. The water sample will be placed inside appropriate 40 mL VOA vials and 1-liter amber bottles free of any headspace. The sample will immediately be placed on crushed ice, then transported under chain-of-custody to the laboratory at the end of the work day.

At the time each monitoring well is sampled, the following information will be recorded in the field: 1) depth-to-water prior to purging, using an electrical well sounding tape, 2) identification of any floating product, sheen, or odor prior to purging, using a clear teflon bailer, 3) sample pH, 4) sample temperature, and 5) specific conductance of the sample.

All water removed from the well during development and purging will be drummed and stored on-site until the results of laboratory analyses are obtained. Depending upon these results, the water will be sewered as a non-hazardous liquid waste in accordance with local sewering agency permit requirements, or else it will be transported as a hazardous liquid waste under proper manifest to an appropriate TSD facility for treatment and disposal.

Laboratory Analysis

All analyses will be conducted by a California State DOHS certified laboratory (Chromalab Laboratory, San Ramon, CA)

in accordance with EPA recommended procedures.

Soil samples will be analyzed for 1) total petroleum hydrocarbons as Diesel, 2) total petroleum hydrocarbons as Gasoline, 3) Benzene, Toluene, Ethylbenzene, and Total Xylenes (BTEX), and 4) Oil & Grease.

Groundwater samples will be analyzed for 1) total petroleum hydrocarbons as Diesel, 2) total petroleum hydrocarbons as Gasoline, 3) Benzene, Toluene, Ethylbenzene, and Total Xylenes (BTEX), 4) Oil & Grease, 5) Halogenated Volatile Organics (EPA 601), 6) Extractable Organics (EPA ~~625~~ 627), and 7) LUFT Metals (Cd, Cr, Pb, Ni, Zn).

Top-of-Casing Survey

In order to determine groundwater flow direction, the top-of-casing elevation at each monitoring well will be surveyed to within 0.01 feet Mean Sea Level (MSL) of an established City of Castro Valley or County of Alameda bench mark.

V. REPORT

A report will be written that will provide a description of all field work, present the geologic log, and present all laboratory results. The report will include, but not be limited to, the following:

1) a map showing well locations and elevations.
2) soil and formation conditions.
3) geologic logs.
4) geologic cross-sections.
5) depths to groundwater.
6) shallow groundwater contour map.
7 report of presence of free product.
8) results of laboratory analyses.
9) contaminant plume definitions.
10) contaminant source identification.
11) recommendations for further investigation and/or remediation, if deemed necessary.

VI. SITE SAFETY PLAN

A site-specific set of health and safety operating procedures for field investigations of underground spills of motor oil and petroleum distillate fuel is provided in Attachment C. In order to maintain a safe working environment for field personnel, a copy of these operating procedures will be kept on-site during the field operations, and will be followed in accordance with the magnitude of petroleum contamination encountered.

EXP. 9-30-95

Gary Aguiar **RCE 34262**

ALAMEDA COUNTY
HEALTH CARE SERVICES
AGENCY
DAVID J. KEARS, Agency Director

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

Certified Mailer #

November 7, 1991

Mr. Larry Armstrong
Quality Tune-Up Shops - Side B Corporation
286 E. Hamilton Avenue
Campbell, CA 95008

RE: PRELIMINARY SITE ASSESSMENT PROPOSAL REQUEST; QUALITY TUNE-UP SHOP #30, 2780 CASTRO VALLEY BLVD., CASTRO VALLEY

Dear Mr. Armstrong:

The Alameda County Environmental Health Department, Hazardous Materials Division, has completed a review of reports and other facts associated with closure June 11, 1991 of one (1) 8000 gallon underground storage tank (UST) from the referenced Castro Valley facility, and the analyses of both soil and ground water samples collected following closure. The noted tank was used most recently to store waste oil, although it had reportedly been used previously for storing gasoline. This Division has also reviewed information reflecting the 1987 closure of three (3) other USTs from this same site. Be advised that the opinions and decisions expressed in this letter were reached with concurrence from the San Francisco Bay Regional Water Quality Control Board (RWQCB).

During the recent UST closure, ground water was noted welling into the UST pit at a depth of approximately 11.5 feet below grade. A slight product odor was detected emanating from the UST pit. Of the two (2) soil samples collected from native material, one from below each end of the tank, that sample collected from the south (fill) end of the tank had obvious product odor, and both samples were saturated. Further, ground water at the south end of the pit exhibited apparent product sheen. Ground water samples were collected from the ground water which exhibited this apparent product sheen.

On June 20, 1991, Mr. Matt Mintner of Minter & Fahy Construction Company, Inc., FAXed copies of the laboratory results reporting the analyses performed upon the samples collected. The analyses results reflect much lower concentrations of target compounds than what were expected based upon observations made in the field at the time of closure. Because the results were inconsistent with field observations, Chromalab, Inc., the certified laboratory performing the analyses, was contacted by this Department and requested to report the condition of the samples when submitted.

Chromalab's report, dated June 25, 1991 and authored by Mr. Eric Tam, Lab Director, indicated that the original soil and water samples were received in good condition on June 11, 1991: refrigerated and no head space. The samples were checked in under Chromalab File # 0691072. On the next morning (June 12), Mr. Kieth Jay of Hageman-Aguiar, the consultant collecting samples, phoned Chromalab to request that the initial water sample be placed on "hold." Apparently Mr. Jay delivered another water sample to Chromalab that same day, and requested that this new sample replace the original one. This sample was also in acceptable condition, and was checked in under Chromalab File # 0691078. It is this sample which was analyzed and reported. Mr. Tam notes that the original water sample was inspected by him personally after the Department's inquiry, and of the two 1-liter bottles, one of them had an obvious hydrocarbon odor and the other seemed "relatively clean."

Chromalab's policy is to hold all submitted samples for one month (unless requested otherwise by the client). On June 28, 1991, I contacted Mr. Bruce Hageman of Hageman-Aguiar and requested that the initial water sample be analyzed for total petroleum hydrocarbons as gasoline and diesel (TPH-G/D) and for total oil and grease (TOG). I then contacted Mr. Tam to inform him that Hageman-Aguiar would be contacting him to request the analysis of the initial water sample. On August 16, 1991, an attempt was made to contact Mr. Hageman to learn of the results of the analyses of the noted water sample. Mr. Hageman was not in his office when the call was placed. A message was left with his answering service. To date, this Department has not been contacted by Mr. Hageman regarding this issue.

On November 6, 1991, Chromalab's Mr. Tam was contacted by this Department to determine whether the noted water sample had been analyzed, and to learn of the results. Mr. Tam indicated that he was never contacted by Hageman-Aguiar and requested to analyze the sample. Hence, as is consistent with Chromalab policy, the noted sample has been destroyed and was never analyzed.

The Department has been in contact with 4 M Construction of Madera, CA, the contractor which performed the previous (1987) UST closures, since August 1991. We have been in contact with 4 M because you have apparently not been successful in your efforts to receive information from them which documents the results of these earlier tank closures. The Department finally received closure information from 4 M on November 6, 1991. This information reveals that three (3) USTs, two gasoline and one waste oil, were closed at the subject site on or around February 19, 1987. Soil and ground water samples were collected, and subsequently analyzed by Trace Analysis Laboratory, Inc. Of the seven soil samples collected, only "extractable

hydrocarbons" were detected in those soil samples collected proximal to the waste oil tank. No other analytes were detected. However, the ground water sample exhibited 26 mg/l of volatile hydrocarbons, 420 ug/l of benzene, 2000 ug/l toluene, and 9400 ug/l of xylene, all constituents of gasoline.

The RWQCB requires additional environmental investigations to be performed when hydrocarbon compounds are detected in soil samples collected at or below the seasonal high ground water level. Should ground water be impacted, as determined by water samples collected at the time of closure, an investigation is further warranted. Both of these scenarios indicate that an "unauthorized release" has occurred.

Ground water and soils at or below the seasonal high water level have been impacted at the subject site, as documented during both the 1987 and 1991 UST closures. Hence, further investigation is required. The purpose of this investigation is to determine the lateral and vertical extent, and severity, of soil and ground water contamination which may have resulted from this unauthorized release.

Such an investigation shall be in the form of a **Preliminary Site Assessment**, or PSA. The information gathered by the PSA will be used to determine an appropriate course of action to remediate the site, if deemed necessary. The PSA must be conducted in accordance with the RWQCB Staff Recommendations for the 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 a site investigation, you should obtain professional services of a reputable environmental/geotechnical firm. Your responsibility is to have the consultant submit for review a proposal outlining planned activities pertinent to meeting the criteria broadly outlined in this letter and the attached Appendix A.

This Department will oversee the assessment and remediation on your site. Our oversight will include the review of and comment on work proposals and technical guidance on appropriate investigative approaches and monitoring schedules. The issuance of well drilling permits, however, will be through the Alameda County Flood Control and Water Conservation District, Zone 7. The RWQCB may choose to take over as lead agency if it is determined following the completion of the initial assessment that there has been a substantial impact upon ground water.

The PSA proposal is due within 45 days of the date of this letter, or by December 23, 1991. Once this proposal has been reviewed and approved, work should commence no later than January 23, 1992. The Department will continue to draw from your current deposit/refund account at the current rate of $67 per hour as time is dedicated to the project until the account is depleted, at which time additional monies will be requested.

A report must be submitted within 45 days after the completion of this phase of work at the site. Subsequent reports must be submitted quarterly until this site qualifies for final RWQCB "sign off". Such quarterly reports are due the first day of the second month of each subsequent quarter (i.e., May 1, August 1, November 1, and February 1).

The referenced initial and quarterly reports must describe the status of the investigation and must include, among others, the following elements:

- Details and results of all work performed during the designated period of time: records of field observations and data, boring and well construction logs, water level data, chain-of-custody forms, laboratory results for all samples collected and analyzed, tabulations of free product thicknesses and dissolved fractions, etc.
- Status of ground water contamination characterization
- Interpretation of results: water level contour maps showing gradients, free and dissolved product plume definition maps for each target component, geologic cross sections, etc.
- Recommendations or plans for additional investigative work or remediation

All reports and proposals must be submitted under seal of a California-Registered Geologist, -Certified Engineering Geologist, or -Registered Civil Engineer. Please include a statement of qualifications for each lead professional involved with this project.

Please be advised that this is a formal request for technical reports pursuant to California Water Code Section 13267 (b). Failure to respond or a late response could result in the referral of this case to the RWQCB for enforcement, possibly subjecting the responsible party to civil penalties to a maximum of $1,000 per day. Any extensions of the stated deadlines, or modifications of the required tasks, must be confirmed in writing by either this agency or

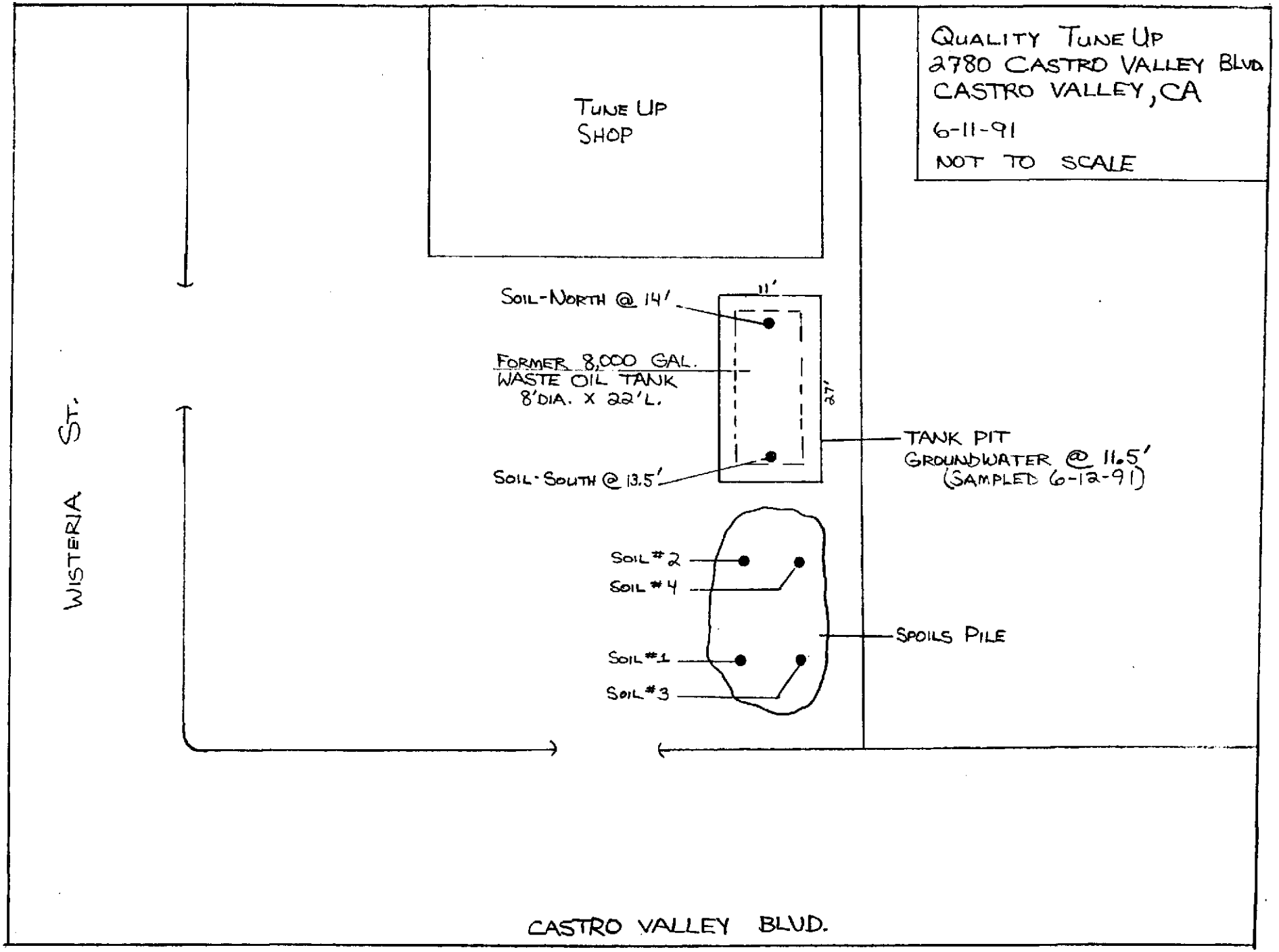
Should you have any questions about the content of this letter, please call me at 510/271-4320.

Sincerely,

Scott O. Seery, CHMM
Hazardous Materials Specialist

enclosure

cc: Rafat A. Shahid, Assistant Agency Director, Environmental Health
Gary Howell, Chief, Hazardous Materials Division
Gil Jensen, Alameda County District Attorney's Office
Lester Feldman, EHSD
[illegible]


QUALITY TUNE UP
2780 CASTRO VALLEY BLVD
CASTRO VALLEY, CA
6-11-91
NOT TO SCALE
TUNE UP
SHOP
SOIL-NORTH @ 14'
11'
FORMER 8,000 GAL.
WASTE OIL TANK
8' DIA. X 22' L.
27'
TANK PIT
GROUNDWATER @ 11.5'
(SAMPLED 6-12-91)
SOIL-SOUTH @ 13.5'
SOIL #2
SOIL #4
SPOILS PILE
SOIL #1
SOIL #3
WISTERIA ST.
CASTRO VALLEY BLVD.

CHROMALAB, INC.

Analytical Laboratory (E694)

5 DAYS TURNAROUND

June 17, 1991 ChromaLab File No.: 0691078

MINTER & FAHY CONSTRUCTION CO. Attn: Keith Jay / Matt Minter

RE: One water sample for Gasoline/BTEX, Diesel, Oil & Grease, Cadmium, Chromium, Lead, Nickel, and Zinc analyses

Project Name: QUALITY TUNEUP
Project Location: Castro Valley
Date Sampled: June 12, 1991
Date Submitted: June 12, 1991
Date Extracted: June 17-18, 1991
Date Analyzed: June 17-18,1991

RESULTS:

Sample No.	Gasoline (µg/l)	Diesel (µg/l)	Benzene (µg/l)	Toluene (µg/l)	Ethyl Benzene (µg/l)	Total Xylenes (µg/l)
PIT WATER	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.
BLANK	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.
SPIKE REC.	88.5%	81.3%	92.8%	102.0%	98.9%	105.7%
DET. LIMIT	50	50	0.5	0.5	0.5	0.5
METHOD OF ANALYSIS	5030/ 8015	3510/ 8015	602	602	602	602

Sample No.	Oil & Grease (mg/l)	Cadmium (mg/l)	Chromium (mg/l)	Lead (mg/l)	Nickel (mg/l)	Zinc (mg/l)
PIT WATER	0.9	N.D.	N.D.	N.D.	N.D.	0.011
BLANK	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.
SPIKE REC.	----	99.2%	103.2%	102.8%	104.1%	94.9%
DET. LIMIT	0.5	0.005	0.05	0.05	0.04	0.005
METHOD OF ANALYSIS	5520 B&F	7130	7190	7420	7590	7950

ChromaLab, Inc.

David Duong
Chief Chemist

Eric Tam
Laboratory Director

2239 Omega Road, #1 • San Ramon, California 94583
415/831-1788 • Facsimile 415/831-8798
Federal ID #68-0140157

CHROMALAB, INC.

Analytical Laboratory (E694)

5 DAYS TURNAROUND

June 17, 1991 ChromaLab File No.: 0691072

MINTER & FAHY CONSTRUCTION CO. Attn: Keith Jay / Matt Minter

RE: Three soil samples for Gasoline/BTEX, Diesel, Oil & Grease, Cadmium, Chromium, Lead, Nickel, and Zinc analyses

Project Name: QUALITY TUNEUP Project Location: Castro Valley
Date Sampled: June 11, 1991 Date Submitted: June 11, 1991
Date Extracted: June 17-18, 1991 Date Analyzed: June 17-18,1991

RESULTS:

Sample No.	Gasoline (mg/kg)	Diesel (mg/kg)	Benzene (µg/kg)	Toluene (µg/kg)	Ethyl Benzene (µg/kg)	Total Xylenes (µg/kg)
SOIL-NO.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.
SOIL-SO.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.
SOIL-1,2,3,4	1.4	N.D.	N.D.	88	10	210
BLANK	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.
SPIKE REC.	88.5%	81.3%	92.8%	102.0%	98.9%	105.7%
DUP SPIKE REC	92.9%	91.8%	82.3%	95.1%	90.8%	92.0%
DET. LIMIT	1.0	1.0	5.0	5.0	5.0	5.0
METHOD OF ANALYSIS	5030/ 8015	3550/ 8015	8020	8020	8020	8020

Sample No.	Oil & Grease (mg/kg)	Cadmium (mg/kg)	Chromium (mg/kg)	Lead (mg/kg)	Nickel (mg/kg)	Zinc (mg/kg)
SOIL-NO.	N.D.	0.543	6.17	1.86	6.08	11.6
SOIL-SO.	N.D.	0.266	5.66	1.62	5.60	11.0
SOIL-1,2,3,4	24	0.321	6.66	1.73	6.77	10.3
BLANK	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.
SPIKE REC.	----	99.2%	103.2%	102.8%	104.1%	94.9%
DUP SPIKE REC	----	94.3%	89.9%	96.0%	91.7%	101.5%
DET. LIMIT	10	0.005	0.05	0.05	0.04	0.005
METHOD OF ANALYSIS	5520 E&F	7130	7190	7420	7590	7950

ChromaLab, Inc.

David Duong
Chief Chemist

Eric Tam
Laboratory Director

2239 Omega Road, #1 • San Ramon, California 94583
415/831-1788 • Facsimile 415/831-8798
Federal ID #68-0140157

CHROMALAB, INC.

Analytical Laboratory (E694)

5 DAYS TURNAROUND

June 19, 1991

ChromaLab File # 0691072 A

Client: Minter & Fahy Const. Co.
Attn: Matt Minter
Date Sampled: June 11, 1991
Date Submitted: June 11, 1991
Date of Analysis: June 19, 1991

Project Name: Quality Tuneup
Sample I.D.: SOIL-No.
Method of Analysis: EPA 8010
Detection Limit: 5.0 ug/kg

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

ChromaLab, Inc.

David Duong
Chief Chemist

Eric Tam
Lab Director

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415/831-1788 • Facsimile 415/831-8798
Federal ID #68-0140157

CHROMALAB, INC.

Analytical Laboratory (E694)

5 DAYS TURNAROUND

June 19, 1991 — ChromaLab File # 0691072 B

Client: Minter & Fahy Const. Co. — Attn: Matt Minter
Date Sampled: June 11, 1991 — Date Submitted: June 11, 1991
Date of Analysis: June 19, 1991

Project Name: Quality Tuneup
Sample I.D.: SOIL-Sp.
Method of Analysis: EPA 8010 — Detection Limit: 5.0 ug/kg

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

ChromaLab, Inc.

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CHROMALAB, INC.

Analytical Laboratory (E694)

5 DAYS TURNAROUND

June 19, 1991 — ChromaLab File # 0691072 C

Client: Minter & Fahy Const. Co. — Attn: Matt Minter
Date Sampled: June 11, 1991 — Date Submitted: June 11, 1991
Date of Analysis: June 19, 1991

Project Name: Quality Tuneup
Sample I.D.: SOIL-1,2,3,4
Method of Analysis: EPA 8010 — Detection Limit: 5.0 ug/kg

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

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CHROMALAB, INC.

Analytical Laboratory (E694)

5 DAYS TURNAROUND

June 19, 1991

ChromaLab File # 0691072 A

Client: Minter & Fahy Const. Co.
Attn: Matt Minter
Date Sampled: June 11, 1991
Date Submitted: June 11, 1991
Date Extracted: June 18, 1991
Date of Analysis: June 19, 1991

Project Name: Quality Tuneup
Sample I.D.: SOIL-No.
Method of Analysis: EPA 8270
Matrix: soil

COMPOUND NAME	Sample mg/Kg	MDL mg/Kg	Spike Recovery
PHENOL	N.D.	0.5	-----
BIS(2-CHLOROETHYL) ETHER	N.D.	0.5	104.2% 96.2%
2-CHLOROPHENOL	N.D.	0.5	-----
1,3-DICHLOROBENZENE	N.D.	0.5	-----
1,4-DICHLOROBENZENE	N.D.	0.5	-----
BENZYL ALCOHOL	N.D.	1.0	-----
1,2-DICHLOROBENZENE	N.D.	0.5	-----
2-METHYLPHENOL	N.D.	0.5	-----
BIS(2-CHLOROISOPROPYL)ETHER	N.D.	0.5	-----
4-METHYLPHENOL	N.D.	0.5	-----
N-NITROSO-DI-N-PROPYLAMINE	N.D.	0.5	-----
HEXACHLOROETHANE	N.D.	0.5	-----
NITROBENZENE	N.D.	0.5	-----
ISOPHORONE	N.D.	0.5	-----
2-NITROPHENOL	N.D.	0.5	-----
2,4-DIMETHYLPHENOL	N.D.	0.5	-----
BENZOIC ACID	N.D.	2.5	-----
BIS(2-CHLOROETHOXY)METHANE	N.D.	0.5	95.3% 93.0%
2,4-DICHLOROPHENOL	N.D.	0.5	-----
1,2,4-TRICHLOROBENZENE	N.D.	0.5	-----
NAPHTHALENE	N.D.	0.5	-----
4-CHLOROANILINE	N.D.	1.0	-----
HEXACHLOROBUTADIENE	N.D.	0.5	-----
4-CHLORO-3-METHYLPHENOL	N.D.	1.0	-----
2-METHYLNAPHTHALENE	N.D.	0.5	-----
HEXACHLOROCYCLOPENTADIENE	N.D.	0.5	-----
2,4,6-TRICHLOROPHENOL	N.D.	0.5	-----
2,4,5-TRICHLOROPHENOL	N.D.	0.5	-----
2-CHLORONAPHTHALENE	N.D.	0.5	-----
2-NITROANILINE	N.D.	2.5	-----
DIMETHYL PHTHALATE	N.D.	0.5	-----
ACENAPHTHYLENE	N.D.	0.5	-----
3-NITROANILINE	N.D.	2.5	-----
ACENAPHTHENE	N.D.	0.5	110.0% 100.0%
2,4-DINITROPHENOL	N.D.	2.5	-----
4-NITROPHENOL	N.D.	2.5	-----
DIBENZOFURAN	N.D.	0.5	-----

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CHROMALAB, INC.

Analytical Laboratory (E694)

5 DAYS TURNAROUND

ChromaLab File # 0691072 A

Project Name: Quality Tuneup
Sample I.D.: SOIL-No.
Method of Analysis: EPA 8270 Matrix: soil

COMPOUND NAME	Sample mg/Kg	MDL mg/Kg	Spike Recovery
2,4-DINITROTOLUENE	N.D.	0.5	-----
2,6-DINITROTOLUENE	N.D.	0.5	110.1% 116.0%
DIETHYL PHTHALATE	N.D.	0.5	-----
4-CHLORO-PHENYL PHENYL ETHER	N.D.	0.5	-----
FLUORENE	N.D.	0.5	-----
4-NITROANILINE	N.D.	2.5	-----
4,6-DINITRO-2-METHYL PHENOL	N.D.	2.5	-----
N-NITROSODIPHENYLAMINE	N.D.	0.5	-----
4-BROMOPHENYL PHENYL ETHER	N.D.	0.5	-----
HEXACHLOROBENZENE	N.D.	0.5	-----
PENTACHLOROPHENOL	N.D.	2.5	-----
PHENANTHRENE	N.D.	0.5	-----
ANTHRACENE	N.D.	0.5	-----
DI-N-BUTYL PHTHALATE	N.D.	0.5	-----
FLUORANTHENE	N.D.	0.5	-----
PYRENE	N.D.	0.5	-----
BUTYLBENZYLPHTHALATE	N.D.	0.5	-----
3,3'-DICHLOROBENZIDINE	N.D.	1.0	-----
BENZO(A)ANTHRACENE	N.D.	0.5	-----
BIS(2-ETHYLHEXYL)PHTHALATE	N.D.	0.5	-----
CHRYSENE	N.D.	0.5	110.0% 98.7%
DI-N-OCTYLPHTHALATE	N.D.	0.5	-----
BENZO(B)FLUORANTHENE	N.D.	0.5	-----
BENZO(K)FLUORANTHENE	N.D.	0.5	-----
BENZO(A)PYRENE	N.D.	0.5	-----
INDENO(1,2,3 C,D)PYRENE	N.D.	0.5	-----
DIBENZO(A,H)ANTHRACENE	N.D.	0.5	-----
BENZO(G,H,I)PERYLENE	N.D.	0.5	-----

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Federal ID #68-0140157

CHROMALAB, INC.

Analytical Laboratory (E694)

5 DAYS TURNAROUND

June 19, 1991

ChromaLab File # 0691072 B

Client: Minter & Fahy Const. Co.
Attn: Matt Minter
Date Sampled: June 11, 1991
Date Submitted: June 11, 1991
Date Extracted: June 18, 1991
Date of Analysis: June 19, 1991

Project Name: Quality Tuneup
Sample I.D.: SOIL-So.
Method of Analysis: EPA 8270
Matrix: soil

COMPOUND NAME	Sample mg/Kg	MDL mg/Kg	Spike Recovery
PHENOL	N.D.	0.5	-----
BIS(2-CHLOROETHYL) ETHER	N.D.	0.5	104.2% 96.2%
2-CHLOROPHENOL	N.D.	0.5	-----
1,3-DICHLOROBENZENE	N.D.	0.5	-----
1,4-DICHLOROBENZENE	N.D.	0.5	-----
BENZYL ALCOHOL	N.D.	1.0	-----
1,2-DICHLOROBENZENE	N.D.	0.5	-----
2-METHYLPHENOL	N.D.	0.5	-----
BIS(2-CHLOROISOPROPYL)ETHER	N.D.	0.5	-----
4-METHYLPHENOL	N.D.	0.5	-----
N-NITROSO-DI-N-PROPYLAMINE	N.D.	0.5	-----
HEXACHLOROETHANE	N.D.	0.5	-----
NITROBENZENE	N.D.	0.5	-----
ISOPHORONE	N.D.	0.5	-----
2-NITROPHENOL	N.D.	0.5	-----
2,4-DIMETHYLPHENOL	N.D.	0.5	-----
BENZOIC ACID	N.D.	2.5	-----
BIS(2-CHLOROETHOXY)METHANE	N.D.	0.5	95.3% 93.0%
2,4-DICHLOROPHENOL	N.D.	0.5	-----
1,2,4-TRICHLOROBENZENE	N.D.	0.5	-----
NAPHTHALENE	N.D.	0.5	-----
4-CHLOROANILINE	N.D.	1.0	-----
HEXACHLOROBUTADIENE	N.D.	0.5	-----
4-CHLORO-3-METHYLPHENOL	N.D.	1.0	-----
2-METHYLNAPHTHALENE	N.D.	0.5	-----
HEXACHLOROCYCLOPENTADIENE	N.D.	0.5	-----
2,4,6-TRICHLOROPHENOL	N.D.	0.5	-----
2,4,5-TRICHLOROPHENOL	N.D.	0.5	-----
2-CHLORONAPHTHALENE	N.D.	0.5	-----
2-NITROANILINE	N.D.	2.5	-----
DIMETHYL PHTHALATE	N.D.	0.5	-----
ACENAPHTHYLENE	N.D.	0.5	-----
3-NITROANILINE	N.D.	2.5	-----
ACENAPHTHENE	N.D.	0.5	110.0% 100.0%
2,4-DINITROPHENOL	N.D.	2.5	-----
4-NITROPHENOL	N.D.	2.5	-----
DIBENZOFURAN	N.D.	0.5	-----

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CHROMALAB, INC.

Analytical Laboratory (E694)

5 DAYS TURNAROUND

ChromaLab File # 0691072 B

Project Name: Quality Tuneup
Sample I.D.: SOIL-So.
Method of Analysis: EPA 8270 Matrix: soil

COMPOUND NAME	Sample mg/Kg	MDL mg/Kg	Spike Recovery
2,4-DINITROTOLUENE	N.D.	0.5	-----
2,6-DINITROTOLUENE	N.D.	0.5	110.1% 116.0%
DIETHYL PHTHALATE	N.D.	0.5	-----
4-CHLORO-PHENYL PHENYL ETHER	N.D.	0.5	-----
FLUORENE	N.D.	0.5	-----
4-NITROANILINE	N.D.	2.5	-----
4,6-DINITRO-2-METHYL PHENOL	N.D.	2.5	-----
N-NITROSODIPHENYLAMINE	N.D.	0.5	-----
4-BROMOPHENYL PHENYL ETHER	N.D.	0.5	-----
HEXACHLOROBENZENE	N.D.	0.5	-----
PENTACHLOROPHENOL	N.D.	2.5	-----
PHENANTHRENE	N.D.	0.5	-----
ANTHRACENE	N.D.	0.5	-----
DI-N-BUTYL PHTHALATE	N.D.	0.5	-----
FLUORANTHENE	N.D.	0.5	-----
PYRENE	N.D.	0.5	-----
BUTYLBENZYLPHTHALATE	N.D.	0.5	-----
3,3'-DICHLOROBENZIDINE	N.D.	1.0	-----
BENZO(A)ANTHRACENE	N.D.	0.5	-----
BIS(2-ETHYLHEXYL)PHTHALATE	N.D.	0.5	-----
CHRYSENE	N.D.	0.5	110.0% 98.7%
DI-N-OCTYLPHTHALATE	N.D.	0.5	-----
BENZO(B)FLUORANTHENE	N.D.	0.5	-----
BENZO(K)FLUORANTHENE	N.D.	0.5	-----
BENZO(A)PYRENE	N.D.	0.5	-----
INDENO(1,2,3 C,D)PYRENE	N.D.	0.5	-----
DIBENZO(A,H)ANTHRACENE	N.D.	0.5	-----
BENZO(G,H,I)PERYLENE	N.D.	0.5	-----

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CHROMALAB, INC.

Analytical Laboratory (E694)

5 DAYS TURNAROUND

June 19, 1991

ChromaLab File # 0691072 O

Client: Minter & Fahy Const. Co.
Attn: Matt Minter
Date Sampled: June 11, 1991
Date Submitted: June 11, 1991
Date Extracted: June 18, 1991
Date of Analysis: June 19, 1991

Project Name: Quality Tuneup
Sample I.D.: SOIL-1,2,3,4
Method of Analysis: EPA 8270
Matrix: soil

COMPOUND NAME	Sample mg/Kg	MDL mg/Kg	Spike Recovery
PHENOL	N.D.	0.5	-----
BIS(2-CHLOROETHYL) ETHER	N.D.	0.5	104.2% 96.2%
2-CHLOROPHENOL	N.D.	0.5	-----
1,3-DICHLOROBENZENE	N.D.	0.5	-----
1,4-DICHLOROBENZENE	N.D.	0.5	-----
BENZYL ALCOHOL	N.D.	1.0	-----
1,2-DICHLOROBENZENE	N.D.	0.5	-----
2-METHYLPHENOL	N.D.	0.5	-----
BIS(2-CHLOROISOPROPYL)ETHER	N.D.	0.5	-----
4-METHYLPHENOL	N.D.	0.5	-----
N-NITROSO-DI-N-PROPYLAMINE	N.D.	0.5	-----
HEXACHLOROETHANE	N.D.	0.5	-----
NITROBENZENE	N.D.	0.5	-----
ISOPHORONE	N.D.	0.5	-----
2-NITROPHENOL	N.D.	0.5	-----
2,4-DIMETHYLPHENOL	N.D.	0.5	-----
BENZOIC ACID	N.D.	2.5	-----
BIS(2-CHLOROETHOXY)METHANE	N.D.	0.5	95.3% 93.0%
2,4-DICHLOROPHENOL	N.D.	0.5	-----
1,2,4-TRICHLOROBENZENE	N.D.	0.5	-----
NAPHTHALENE	N.D.	0.5	-----
4-CHLOROANILINE	N.D.	1.0	-----
HEXACHLOROBUTADIENE	N.D.	0.5	-----
4-CHLORO-3-METHYLPHENOL	N.D.	1.0	-----
2-METHYLNAPHTHALENE	N.D.	0.5	-----
HEXACHLOROCYCLOPENTADIENE	N.D.	0.5	-----
2,4,6-TRICHLOROPHENOL	N.D.	0.5	-----
2,4,5-TRICHLOROPHENOL	N.D.	0.5	-----
2-CHLORONAPHTHALENE	N.D.	0.5	-----
2-NITROANILINE	N.D.	2.5	-----
DIMETHYL PHTHALATE	N.D.	0.5	-----
ACENAPHTHYLENE	N.D.	0.5	-----
3-NITROANILINE	N.D.	2.5	-----
ACENAPHTHENE	N.D.	0.5	110.0% 100.0%
2,4-DINITROPHENOL	N.D.	2.5	-----
4-NITROPHENOL	N.D.	2.5	-----
DIBENZOFURAN	N.D.	0.5	-----

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CHROMALAB, INC.

Analytical Laboratory (E694)

5 DAYS TURNAROUND

ChromaLab File # 0691072 C

Project Name: Quality Tuneup
Sample I.D.: SOIL-1,2,3,4
Method of Analysis: EPA 8270 Matrix: soil

COMPOUND NAME	Sample mg/Kg	MDL mg/Kg	Spike Recovery
2,4-DINITROTOLUENE	N.D.	0.5	-----
2,6-DINITROTOLUENE	N.D.	0.5	110.1% 116.0%
DIETHYL PHTHALATE	N.D.	0.5	-----
4-CHLORO-PHENYL PHENYL ETHER	N.D.	0.5	-----
FLUORENE	N.D.	0.5	-----
4-NITROANILINE	N.D.	2.5	-----
4,6-DINITRO-2-METHYL PHENOL	N.D.	2.5	-----
N-NITROSODIPHENYLAMINE	N.D.	0.5	-----
4-BROMOPHENYL PHENYL ETHER	N.D.	0.5	-----
HEXACHLOROBENZENE	N.D.	0.5	-----
PENTACHLOROPHENOL	N.D.	2.5	-----
PHENANTHRENE	N.D.	0.5	-----
ANTHRACENE	N.D.	0.5	-----
DI-N-BUTYL PHTHALATE	N.D.	0.5	-----
FLUORANTHENE	N.D.	0.5	-----
PYRENE	N.D.	0.5	-----
BUTYLBENZYLPHTHALATE	N.D.	0.5	-----
3,3'-DICHLOROBENZIDINE	N.D.	1.0	-----
BENZO(A)ANTHRACENE	N.D.	0.5	-----
BIS(2-ETHYLHEXYL)PHTHALATE	N.D.	0.5	-----
CHRYSENE	N.D.	0.5	110.0% 98.7%
DI-N-OCTYLPHTHALATE	N.D.	0.5	-----
BENZO(B)FLUORANTHENE	N.D.	0.5	-----
BENZO(K)FLUORANTHENE	N.D.	0.5	-----
BENZO(A)PYRENE	N.D.	0.5	-----
INDENO(1,2,3 C,D)PYRENE	N.D.	0.5	-----
DIBENZO(A,H)ANTHRACENE	N.D.	0.5	-----
BENZO(G,H,I)PERYLENE	N.D.	0.5	-----

ChromaLab, Inc.

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Senior Chemist

Eric Tam
Lab Director

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CHROMALAB FILE # 691072

CHAIN OF CUSTODY RECORD

2525

PROJECT NAME AND ADDRESS:
QUALITY TUNEUP
2780 CASTRO VALLEY BVD
CASTRO VALLEY, CA.

SAMPLER: (Signature) Keith Jay

MINTER & FAHY CONST. CO.
411 N. Buchanan Circle, #2
Pacheco, CA 94553
(415)674-8800 (415)674-9067 (FAX)

CROSS REFERENCE NUMBER	DATE	TIME	SOIL	WATER	STATION LOCATION	TPH-G+D	BTEX	OIL+GREASE	REMARKS
PIT WATER	6-11-91	12:00		X	PIT WATER	X	X	X	24 HR. TAT
SOIL-NO.	6-11-91	12:05	X		NO. END OF PIT @ 14'	X	X	X	"
SOIL-SO.	6-11-91	12:10	X		SO. END OF PIT @ 13.5'	X	X	X	"
SOIL-1	6-11-91	12:40	X						HOLD
-2	↓	12:45	X						↓
-3		12:50	↓						
-4	↓	12:55	↓						

RELINQUISHED BY: (Signature) Keith Jay	DATE 6-11-91 TIME 14:10	RECEIVED BY: (Signature)	DATE TIME
RELINQUISHED BY: (Signature)	DATE TIME	RECEIVED BY: (Signature)	DATE TIME
RELINQUISHED BY: (Signature)	DATE TIME	RECEIVED BY: (Signature)	DATE TIME
RELINQUISHED BY: (Signature)	DATE TIME	RECEIVED FOR LABORATORY BY: (Signature)	DATE 6/11/91 TIME 14:10

CHROMALAB, INC.

Analytical Laboratory (E694)

5 DAYS TURNAROUND

June 19, 1991

ChromaLab File # 0691078

Client: Minter & Fahy Const. Co.
Attn: Matt Minter
Date Sampled: June 12, 1991
Date Submitted: June 12, 1991
Date of Analysis: June 19, 1991

Project Name: Quality Tuneup
Sample I.D.: PIT WATER
Method of Analysis: EPA 601
Detection Limit: 0.5 ug/l

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

ChromaLab, Inc.

David Duong
Chief Chemist

Eric Tam
Lab Director

2239 Omega Road, #1 • San Ramon, California 94583
415/831-1788 • Facsimile 415/831-8798
Federal ID #68-0140157

CHROMALAB, INC.

Analytical Laboratory (E694)

5 DAYS TURNAROUND

June 19, 1991

ChromaLab File # 0691078

Client: Minter & Fahy Const. Co.
Attn: Matt Minter
Date Sampled: June 12, 1991
Date Submitted: June 12, 1991
Date Extracted: June 18, 1991
Date of Analysis: June 19, 1991

Project Name: Quality Tuneup
Sample I.D.: PIT WATER
Method of Analysis: EPA 625
Matrix: water

COMPOUND NAME	Sample mg/L	MDL mg/L	Spike Recovery
PHENOL	N.D.	0.01	-----
BIS(2-CHLOROETHYL) ETHER	N.D.	0.01	82.1% 79.6%
2-CHLOROPHENOL	N.D.	0.01	-----
1,3-DICHLOROBENZENE	N.D.	0.01	-----
1,4-DICHLOROBENZENE	N.D.	0.01	-----
BENZYL ALCOHOL	N.D.	0.02	-----
1,2-DICHLOROBENZENE	N.D.	0.01	-----
2-METHYLPHENOL	N.D.	0.01	85.1% 81.7%
BIS(2-CHLOROISOPROPYL)ETHER	N.D.	0.01	-----
4-METHYLPHENOL	N.D.	0.01	-----
N-NITROSO-DI-N-PROPYLAMINE	N.D.	0.01	-----
HEXACHLOROETHANE	N.D.	0.01	-----
NITROBENZENE	N.D.	0.01	-----
ISOPHORONE	N.D.	0.01	-----
2-NITROPHENOL	N.D.	0.01	-----
2,4-DIMETHYLPHENOL	N.D.	0.01	-----
BENZOIC ACID	N.D.	0.05	-----
BIS(2-CHLOROETHOXY)METHANE	N.D.	0.01	87.1% 101.3%
2,4-DICHLOROPHENOL	N.D.	0.01	-----
1,2,4-TRICHLOROBENZENE	N.D.	0.01	-----
NAPHTHALENE	N.D.	0.01	-----
4-CHLOROANILINE	N.D.	0.02	-----
HEXACHLOROBUTADIENE	N.D.	0.01	-----
4-CHLORO-3-METHYLPHENOL	N.D.	0.02	-----
2-METHYLNAPHTHALENE	N.D.	0.01	107.9% 91.5%
HEXACHLOROCYCLOPENTADIENE	N.D.	0.01	-----
2,4,6-TRICHLOROPHENOL	N.D.	0.01	- - - - -
2,4,5-TRICHLOROPHENOL	N.D.	0.01	-----
2-CHLORONAPHTHALENE	N.D.	0.01	-----
2-NITROANILINE	N.D.	0.05	-----
DIMETHYL PHTHALATE	N.D.	0.01	-----
ACENAPHTHYLENE	N.D.	0.01	-----
3-NITROANILINE	N.D.	0.05	-----
ACENAPHTHENE	N.D.	0.01	82.4% 75.6%
2,4-DINITROPHENOL	N.D.	0.05	-----
4-NITROPHENOL	N.D.	0.05	-----
DIBENZOFURAN	N.D.	0.01	-----

(continued on next page)

2239 Omega Road, #1 • San Ramon, California 94583
415/831-1788 • Facsimile 415/831-8798
Federal ID #68-0140157

CHROMALAB, INC.
Analytical Laboratory (E694)

5 DAYS TURNAROUND

ChromaLab File # 0691078

Project Name: Quality Tuneup
Sample I.D.: PIT WATER
Method of Analysis: EPA 625 Matrix: water

COMPOUND NAME	Sample mg/L	MDL mg/L	Spike Recovery
2,4-DINITROTOLUENE	N.D.	0.01	-----
2,6-DINITROTOLUENE	N.D.	0.01	113.1% 90.2%
DIETHYL PHTHALATE	N.D.	0.01	-----
4-CHLORO-PHENYL PHENYL ETHER	N.D.	0.01	-----
FLUORENE	N.D.	0.01	-----
4-NITROANILINE	N.D.	0.05	-----
4,6-DINITRO-2-METHYL PHENOL	N.D.	0.05	-----
N-NITROSODIPHENYLAMINE	N.D.	0.01	-----
4-BROMOPHENYL PHENYL ETHER	N.D.	0.01	-----
HEXACHLOROBENZENE	N.D.	0.01	-----
PENTACHLOROPHENOL	N.D.	0.05	82.1% 75.3%
PHENANTHRENE	N.D.	0.01	-----
ANTHRACENE	N.D.	0.01	-----
DI-N-BUTYL PHTHALATE	N.D.	0.01	-----
FLUORANTHENE	N.D.	0.01	-----
PYRENE	N.D.	0.01	-----
BUTYLBENZYLPHTHALATE	N.D.	0.01	-----
3,3'-DICHLOROBENZIDINE	N.D.	0.02	-----
BENZO(A)ANTHRACENE	N.D.	0.01	-----
BIS(2-ETHYLHEXYL)PHTHALATE	N.D.	0.01	-----
CHRYSENE	N.D.	0.01	89.1% 87.5%
DI-N-OCTYLPHTHALATE	N.D.	0.01	-----
BENZO(B)FLUORANTHENE	N.D.	0.01	-----
BENZO(K)FLUORANTHENE	N.D.	0.01	-----
BENZO(A)PYRENE	N.D.	0.01	-----
INDENO(1,2,3 C,D)PYRENE	N.D.	0.01	-----
DIBENZO(A,H)ANTHRACENE	N.D.	0.01	-----
BENZO(G,H,I)PERYLENE	N.D.	0.01	-----

ChromaLab, Inc.

David Duong
Senior Chemist

Eric Tam
Lab Director

2239 Omega Road, #1 • San Ramon, California 94583
415/831-1788 • Facsimile 415/831-8798
Federal ID #68-0140157

CHROMALAB FILE # 69107B

Order # 2531

CHAIN OF CUSTODY RECORD

PROJECT NAME AND ADDRESS:
QUALITY TUNE UP
3780 CASTRO VALLEY Blvd.
CASTRO VALLEY, CA

SAMPLER: (Signature) Keith Jay

MINTER & FAHY CONST. CO.
411 N. Buchanan Circle, #2
Pacheco, CA 94553
(415)674-8800 (415)674-9067 (FAX)

CROSS REFERENCE NUMBER	DATE	TIME	SOIL	WATER	STATION LOCATION	TPH-G+D	BTEX	CLHC (8010)	TOTAL OIL & GREASE	8270	METALS (Cd, Cr, Pb, Zn, Ni)	REMARKS
PIT WATER	6-12-91	8:10		X	PIT WATER SAMPLE	X	X	X	X	X	X	5 DAY - TAT

ANALYSIS REQUESTED

RELINQUISHED BY: (Signature)	DATE / TIME	RECEIVED BY: (Signature)	DATE / TIME
Keith Jay	6-12-91 10:30		
RELINQUISHED BY: (Signature)	DATE / TIME	RECEIVED BY: (Signature)	DATE / TIME
RELINQUISHED BY: (Signature)	DATE / TIME	RECEIVED BY: (Signature)	DATE / TIME
RELINQUISHED BY: (Signature)	DATE / TIME	RECEIVED FOR LABORATORY BY: (Signature)	DATE / TIME
		Gary Cook	6-12-91 1015

Advisory Committe member: Member of advisory committee for U.C. Berkeley Hazardous Materials Management Certificate Program.

CALIFORNIA STATE UNIVERSITY CONSORTIUM, Hayward, Ca.

9/83 - 12/83

Assistant Professor: Developed and taught a course on the engineering aspects of environmental planning.

RESOURCE SEMINARS, Berkeley, Ca.

1/81 - 9/83

Lecturer: Lectured on the principles of groundwater hydrology at seminars given in various U.S. cities.

- Other Qualifications:

Water Treatment Plant Operator Grade III Certificate, California State Department of Health.

Basic Qualified Earth Shorer Certificate, American Society of Safety Engineers.

Radiation Safety / Nuclear Soils Gauge Operator Certificate, Campbell Pacific Nuclear Corp.

- Professional Affiliations:

Member, American Chemical Society
Member, American Water Works Association
Member, National Water Well Association

Gary Aguiar began a private consulting practice in 1984. The first project was the installation of three deep monitoring wells within the drinking water aquifer beneath McKesson Chemical Company's Union City chemical packaging facility. This project involved casing a highly contaminated upper zone prior to drilling through the Newark aquitard. After supervising the drilling operations, properly disposing of the drilling spoils, and sampling the wells, a detailed report was prepared that presented an analysis of the data, as well as an assessment of the impact that shallow groundwater contamination has had upon the quality of the drinking water in the area.

The following is a list of typical projects for which Gary Aguiar has provided technical services:

- Assessment of local hydrogeology around solvent recycling sites located in Denver, Co. and Azusa, Ca., prior to purchase by a national chemical recycler.

- Consultation to a local geologic firm concerning the design of a dewatering and contaminant removal system in tight clays at an electronics factory site located in Santa Clara County.

- Design of a pump test to determine aquifer characteristics prior to design of an extraction system for the removal of gasoline from an underground tank site in Morgan Hill, Ca.

- Hydrogeologic analysis and design of a recovery system for the remediation of gasoline contamination that threatened a drinking water supply in Woodside, Ca.

- Data analysis and professional representation in negotiations with the Regional Water Quality Control Board for a commercial property owner in Santa Clara County. Solvent contamination had been discovered beneath the site.

- In association with a local hydrogeologic consulting firm, a site assessment of a laser manufacturing plant in Palo Alto, Ca. This project involved assessing the local hydrogeology, sampling surface and groudwaters, formulating a risk assessment in terms of contaminants that may enter the groundwater due to factory processes, and removing hazardous wastes that have been left from past operations.

- Consultation to a local geologic firm concerning the results of soil and groundwater sampling at a large oil refinery in Hanford, Ca. This project has involved assessing the local hydrogeology, relating the presence of subsurface contaminants to specific above-ground refinery processes, and recommending specific chemical analyses to be performed. An assessment of the impact of subsurface contamination was made in terms of the potential for deep migration. In addition, an assessment of the legal impact was made in terms of applicable hazardous waste laws (Title 22 and 40CFR).

- Analysis of hydrogeologic/groundwater quality data for a chemical facility in Freeport, Grand Bahama Island. This project currently involves an assessment of potential contaminant migration, as well as remedial action plan development. The assessment is complicated by karst geology, a strong tidal influence and the occurence of groundwater in a freshwater lens.

- Project management of a soil and groundwater study in and around the chrome plating shop at Mare Island Naval Base, Vallejo, CA. This project has included the installation of a number of monitoring wells, collection of soil samples, and determining the influence of nearby tidal action. The study is complicated by hard-rock geology, a significant tidal influence, the occurence of groundwater in confined gravel lenses, and the heterogeneity of soils within fill

areas.

- Analysis of hydrogeologic/groundwater quality data for production facilities in Clarecastle, Ireland, and in Cuernavaca, Mexico. The work is part of an in-house program of environmental auditing and regulatory compliance being conducted by a large pharmaceuticals company at all of their facilities.

- Implementation of groundwater contamination remediation program at a service station in Prunedale, CA. This project has involved the installation of 16 monitoring wells, the design of a free product extraction and recovery system, design of an air-stripping treatment system, and design of an injection groundwater injection system for treated water.

By providing education for the professional community, Gary Aguiar has maintained close contact with the University of California. Through this contact, experts in particular fields can be easily networked, while maintaining low operating overhead costs. In addition, the latest technologies in sampling and contamination remediation are continually evaluated and made available to the client.

STATE OF CALIFORNIA
DEPARTMENT OF
Consumer Affairs

Board of Registration for Professional Engineers & Land Surveyors

1428 HOWE AVENUE-SUITE 56
SACRAMENTO, CA 95825-3298
916 920-7466

CIVIL ENGINEER

CERTIFICATE NO. C 34262

EXPIRATION DATE 09/30/95

GARY HENRY AGUIAR
5919 NO ARLINGTON BLVD
SAN PABLO CA 94806

Signature Gary Aguiar

RECEIPT NO. 22701434

PPRC 03/02/89

STATEMENT OF QUALIFICATIONS

Bruce Hageman:

- B.A., Business Administration,
  San Jose State College, 1954

- Thirty five years experience in the petroleum industry, including five years as Vice President of Marketing and Operations, Mohawk Petroleum Corporation and Getty Refining and Marketing Company.

- Principle Responsibilities: design and construction of retail and wholesale marketing facilities (service stations, bulk fuel distribution facilities, etc.), management of all company operated service stations in the states of California, Oregon and Nevada.

- Extensive experience in corporate financial planning and budgeting policies.

- Bruce Hageman has testified as a witness before many local and state governmental committees during the formulation of air quality legislation. Also served on the ad hoc committee for the public right-to-know legislation for the city and county of San Francisco.

Bruce Hageman founded Hageman-Schank, Inc., an environmental services company in 1985. The company has been involved in many areas of the environmental industry. The following is a list of typical projects:

- Precision testing of standby fuel tanks for American Telephone and Telegraph in their remote microwave facilities in Northern California. In addition, tank removals and the installation of new above-ground storage tanks at their satellite facility in Livermore.

- Tank removals and new installations for Intel Corporation's standby fuel storage. This project also included the installation of vadose zone monitoring equipment.

- The removal of thirty five underground storage tanks at the United States Navy Postgraduate School in Monterey, California. This project included the removal of one 50,000 gallon underground jet fuel storage tank, as well as all necessary soil sampling, laboratory analyses, and reporting.

- Tank removals and tank abandonments for Emporium-Capwell at all Emporium stores in the San Francisco Bay Area.

- Groundwater monitoring well installation at the City of South San Francisco maintenance yard.

- Underground storage tank removals, groundwater monitoring well installations, field supervision, and project management for the John Berry Organization/Mariner Warehouse in Alameda, California. This project involved the excavation and remediation of approximately 2500 cubic yards of soil that was found to be contaminated by oil and solvents. Prepared reports and recommendations for remediation, to

be submitted to the Alameda County Health Department for approval.

- Installation of 16 shallow groundwater monitoring wells at a gasoline service station in Prunedale, California. This project, undertaken for Sturdy Oil Company, involved the design and installation of an air stripping system to treat and remediate shallow groundwater that had become impacted as a result of gasoline-contaminated soil. This project also included application and approval for an NPDES permit, issued by the Regional Water Quality Control Board.

The purpose of Hageman-Schank, Inc. is to provide its clients with the expertise to solve a wide variety of environmental problems in a cost-effective manner. Particular emphasis is placed upon underground storage tanks, soil and groundwater investigations, and remediation of soil and groundwater contamination.

STATEMENT OF QUALIFICATIONS

Keith Jay:

- B.A., Biochemistry,
  University of Wisconsin, Madison, 1977.

- Twelve years experience in the field of applied chemistry, including: chemical process design, analytical laboratory techniques, chemical process control, and environmental chemistry.

- His extensive past chemistry experience includes the following:

  1989 - 1990

  Environmental Chemist: Field sampling supervisor, project QA/QC, sample collection, hydrocarbon vapor monitoring, supervisor of all monitoring well development and sampling activities, and liaison with analytical laboratories, for an environmental services company located in San Francisco, CA.

1988 - 1989

Environmental Chemist: Provide EPA compliance assistance for the mining industry while working for Nevada Environmental Consultants, Inc.

1985 - 1988

Plant Manager: Managed precious metals recovery plant employing chemical extraction techniques with full laboratory capabilities in trace metal detection.

1979 - 1985

Chemist: Laboratory analysis and process control for a metallurgical plant conducting chemical extraction of precious metals.

In April 1990 Keith Jay joined Hageman-Aguiar, Inc., as an environmental chemist. The following is a list of typical environmental projects that Keith Jay has participated in:

- Technical support for the implementation of groundwater contamination remediation program conducted by Hageman-Aguiar, Inc., at a gasoline service station in Prunedale, CA. Field sampling, water treatment system monitoring, project QA/QC. This project has involved the installation of 22 monitoring wells, the operation of a free product extraction and recovery system, operation and monitoring of an air-stripping treatment system, and the operation of an injection system for treated water.

- Field supervision, sample collection, and hydrocarbon vapor monitoring at various underground storage tank removals and associated contaminated soil excavations conducted by Hageman-Aguiar, Inc.

- Field supervision and sample QA/QC during various monitoring well installations conducted by Hageman-Aguiar, Inc. In addition, Keith Jay is the supervisor of all monitoring well development and sampling activities, with specific attention to such items as sample QA/QC, sample preservation, measurement of field parameters, and liaison with the analytical laboratories.

- Carry out investigations at various regulatory agencies, as well as conduct site inspections and neighboring property reconnaissance, in conjunction with various Environmental Site Assessments conducted by Hageman-Aguiar, Inc.

SITE HAZARD INFORMATION

FC 1006 (05-11-90)

PLEASE PROVIDE THE FOLLOWING INFORMATION FOR THE SITE

Owners Name: Mr. Larry Armstrong

Site Address: 2780 Castro Valley Blvd.

Castro Valley, CA

Directions to Site: _____

Consultant On Site: Hageman-Aguiar, Inc. Phone Number: (510-284-1661

Site Safety Officer: Gary Aguiar Phone Number: (510-284-1661

Type of Facility: Automotive Tuneup Service Mobile Phone: 415-710-2844

Site Activities: ☒ Drilling ☐ Construction ☐ Tank Excavation ☐ Soil Excavation ☐ Work In Traffic Area

☐ Groundwater Extraction ☐ Vapor Extraction ☐ In Situ Remediation ☐ Above Ground Remediation

☐ Other: _____

Hazardous Substance

Name (CAS#)	Expected Concentration ☒ Soil ☐ Water ☐ Air	Health Affects
Gasoline	<1,000 mg/kg (ppm)	dizziness, eye irritation,
Diesel	<1,000 mg/kg (ppm)	headache, nose & throat irrit.

Physical Hazards

☐ Noise ☐ Excavations/Trenches

☐ Traffic ☐ Other _____

☐ Underground Hazards

☐ Overhead Hazards

Potential Explosion and Fire Hazards (Flammable Range = 1% to 10% Gas Vapor): _____

Level Of Protection Equipment

☐ A ☐ B ☒ C ☒ D ☐ See Personal Protective Equipment

Personal Protective Equipment

R = Required A = As Needed

R	Hard Hat	R	Safety Eyewear (Type) safety glasses
R	Safety Boots	A	Respirator (Type) half-face, carbon (organic vapor)
____	Orange Vest		Filter (Type) _____
A	Hearing Protection	R	Gloves (Type) Rubber
A	Tyvek Coveralls	____	Other _____
____	5 Minute Escape Respirator		

SITE HAZARD INFORMATION

FC 1006 (05-11-90)

Monitoring Equipment on Site

☐	Organic Vapor Analyzer	☐	PID with lamp of _____ eV
☐	Oxygen Meter	☐	Draeger Tube _____
☒	Combustible Gas Meter	☐	Passive Dosimeter
☐	H_2S Meter	☐	Air Sampling Pump
☐	W.B.G.T.	☐	Filter Media _____

Site Control Measures FID meter on site. Public access restricted by existing perimeter fencing.

Decontamination Procedures Equipment steam-cleaned on-site. Rinseate stored in DOT 17H drums. Gloves, tyvek suits to be disposed of with drill cuttings. Personnel to wash with soap and water prior to eating and/or leaving site.

Hospital/Clinic John Muir Emergi-Center Phone (510) 838-0809

Hospital Address Crow Canyon & Porter Drive

Paramedic 911 or 670-5880 Fire Dept. 670-5880 Police Dept. 911 or 272-6878

Emergency/Contingency Plans & Procedures _____

Site Hazard Information Provided By: Gary Aguiar (Print) Phone Number: (510) 284-1661

Gary Aguiar (Signature) Date: 3/5/92

HEALTH AND SAFETY PROCEDURES
FOR
FIELD INVESTIGATION OF UNDERGROUND SPILLS OF
MOTOR OIL AND PETROLEUM DISTILLATE FUEL

1.0 PURPOSE

This operating procedure established minimum procedures for protecting personnel against the hazardous properties of motor oil and petroleum distillate fuels during the performance of field investigations of known and suspected underground releases of such materials. The procedure was developed to enable health and safety personnel and project managers to quickly prepare and issue site safety plans for investigations of such releases.

2.0 APPLICABILITY

This procedure is applicable to field investigations of underground releases of the substances listed below and involving one or more of the activities listed below.

Substances

Motor oil (used and unused)
Leaded and unleaded gasoline
No. 1 Fuel oil (kerosene, JP-1)
No. 1-D Fuel oil (light diesel)
No. 2 Fuel oil (home heating oil)
No. 2-D Fuel oil (medium diesel)
No. 4 Fuel oil (residual fuel oil)
No. 5 Fuel oil (residual fuel oil)
No. 6 Fuel oil (Bunker C fuel oil)
JP-3, 4 & 5 (jet fuels)
Gasahol

Activities

Collection of samples of subsurface soil with aid of truck-mounted drill rig, hand-held power auger or hand auger.

Construction, completion and testing of groundwater monitoring wells.

Collection of groundwater samples from new and existing wells.

Observing removal of underground fuel pipes and storage tanks.

This procedure must not be used for confined space entry (including trench entry) or for installing or operating pilot and full-scale fuel recovery systems.

No safety plans needed for non-intrusive geophysical surveys, reconnaissance surveys and collection of surface soil, surface water and biota.

3.0 RESPONSIBILITY AND AUTHORITY

Personnel responsible for project safety are the Business Unit Health and Safety Officer (HSO), the Project Manager (PM) and the Site Safety Officer (SSO).

The HSO is responsible for reviewing and approving site safety plans and any addenda and for advising both PM and SSO on health and safety matters. The HSO has the authority to audit compliance with the provisions of site safety plans. suspend work or modify work practices for safety reasons, and to dismiss from the site any individual whose conduct on site endangers the health and safety of others.

The PM is responsible for having site safety plans prepared and distributing them to all field personnel and to an authorized representative of each firm contracted to assist with on-site work. The PM is also responsible for ensuring that the provisions of safety plans and their addenda are carried out.

The SSO is responsible for assisting the PM with on site implementation of site safety plans. Responsibilities include:

1. Maintaining safety equipment supplies.

2. Performing or supervising air quality measurements.

3. Directing decontamination operations and emergency response operations.

4. Setting up work zone markers and signs if such zones are specified in the site safety plan.

5. Reporting all accidents, incidents and infractions of safety rules and requirements.

6. Directing other personnel to wear protective equipment when use conditions described in Section 5.0 are met.

The SSO may suspend work anytime he/she determines that the provisions of the site safety plan are inadequate to ensure worker safety and inform the PM and HSO of individuals who on-site behavior jeopardizes their health and safety or the health and safety of others.

4.0 HAZARD EVALUATION

Motor oil and petroleum distillate fuels are mixtures of aliphatic and aromatic hydrocarbons. The predominant classes of compounds in motor oil, gasoline, kerosene and jet fuels are the paraffins (e.g., benzene, toluene). Gasoline contains about 80 percent paraffins, 6 percent naphthenes, and 14 percent aromatic. Kerosene and jet fuels contain 42-48 percent paraffins, 36-38 percent naphthenes, and 16-20 percent aromatic. Diesel fuels and heating oils contain less than 10 percent paraffins, 14-23 percent naphthenes, and 68-78 percent non-volatile aromatic. These heavier fuels contain almost no volatile aromatic compounds. Chemicals are usually added to automotive and aviation fuels to improve their burning properties. Examples are tetraethyl-lead and ethylene dibromide. Most additives are proprietary materials.

Flammability

Crude oil and petroleum distillate fuels possess two intrinsic hazardous properties, namely, flammability and toxicity. The flammable property of the oil and fuels presents a far greater hazard to field personnel than toxicity because it is difficult to protect against and can result in catastrophic consequences. Being

flammable, the vapors of volatile components of crude oil and the fuels can be explosive when confined.

The lower flammable or explosive limits (LFL or LEL) of the fuels listed in SEction 508.2 range from 0.6 percent for JP-5 to 1.4 percent for gasolines. LFL and LEL are synonyms. Flash points range from -36°F for gasoline to greater than 150°F for No. 6 fuel oil. JP-5 has a flash point of 140°F. Although it has a lower LEL than gasoline, it can be considered less hazardous because its vapors must be heated to a higher temperature to ignite.

Crude oil and petroleum distillate fuels will not burn in the liquid form; only the vapors will burn and only if the vapor concentration is between the upper and lower flammable limits, sufficient oxygen is present, and an ignition source is present. If these conditions occur in a confined area an explosion may result.

The probability of fire and explosion can be minimized by eliminating any one of the three factors needed to produce combustion. Two of the factors -- ignition source and vapor concentration -- can be controlled in many cases. Ignition can be controlled by prohibiting open fires and smoking on site, installing spark arrestors on drill rig engines, and turning the engines off when LELs are approached. Vapor concentrations can be reduced by using fans. In fuel tanks, vapor concentrations in the head space can be reduced by introducing dry ice (solid carbon dioxide) into the tank; the carbon dioxide gas will displace the combustible vapors.

Toxicity

Crude oil and petroleum distillate fuels exhibit relatively low acute inhalation and dermal toxicity. Concentrations of 160 to 270 ppm gasoline vapor have been reported to cause eye, nose and throat irritation after several hours of exposure. Levels of 500 to 900 ppm can cause irritation and dizziness in one hour, and 2000 ppm produces mile anesthesia in 30 minutes. Headaches have been reported with exposure to 25 ppm or more of gasoline vapors measured with a photoionization meter. Most fuels, particularly gasoline, kerosene and jet fuels are capable of causing skin irritation after several hours contact with the skin.

Petroleum fuels exhibit moderate oral toxicity. The lethal dose of gasoline in children has been reported to be as low as 10-15 grams (2-3 teaspoons). In adults, ingestion of 20-50 grams of gasoline may produce severe symptoms of poisoning. If liquid fuel aspirated (passed in to the lungs) gasoline and other petroleum distillate fuels may cause secondary pneumonia.

Some of the additives to gasoline, such as ethylene dichloride, ethylene dibromide, and tetraethyl and tetramethyl lead, are highly toxic; however, they are present in such low concentrations that their contribution to the overall toxicity of gasoline and other fuels is negligible in most instances.

OSHA has not developed permissible workplace exposure limits for crude oil and petroleum distillate fuels. It recommends using permissible exposure limits for individual components, such as benzene. ACGIH has established a permissible exposure limit of 300 ppm for gasoline. The limit took into consideration the average concentration of benzene in gasoline (one percent) as well as its common additives. Exposure limits established by other countries range from 250 to 500 ppm. Chemical data sheets, prepared for the U.S. Coast Guard's Chemical Hazard Information System (CHRIS), list 200 ppm as the permissible exposure limit for kerosene and jet fuels. This limit was not developed by NIOSH/OSHA or ACGIH.

5.0 HEALTH AND SAFETY DIRECTIVES

5.1 Site-Specific Safety Briefing

Before field work beings, all field personnel, including subcontractor employees, must be briefed on their work assignments and safety procedures contained in this document.

5.2 Personal Protective Equipment

The following equipment should be available on-site to each member of the field team:

- NIOSH-approved full or half-face respirator with organic vapor cartridges (color coded black)
- Saranex or polyethylene-coated Tyvek coveralls
- Splash-proof safety goggles
- Nitrile or neoprene gloves
- Neoprene or butyl boots, calf-length with steel toe and shank
- Hardhat

Equipment Usage

Chemical-resistant safety boots must be worn during the performance of work where surface soil is obviously contaminated with oil or fuel, when product quantities of oil or fuel are likely to be encountered, and within 10 feet of operating heavy equipment.

Respirators must be worn whenever total airborne hydrocarbons levels in the breathing zone of field personnel reach or exceed a 15-minute average of 25 ppm. If total airborne hydrocarbons in the breathing zone exceeds 100 ppm, work must be suspended, personnel directed to move a safe distance from the source, and the HSO or designee consulted.

Chemical resistant gloves must be worn whenever soil or water known or suspected of containing petroleum hydrocarbons is collected or otherwise handled.

Chemical resistant coveralls must be worn whenever product quantities of fuel are actually encountered and when oil or fuel-saturated soil is handled.

Safety goggles must be worn when working within 10 feet of any operating heavy equipment (e.g., drill rig, backhoe). Splash-proof goggles or face shields must be worn whenever product quantities of oil or fuel are encountered.

Hardhats must be worn when working within 10 feet of an operating drill rig, backhoe or other heavy equipment.

Operators of some facilities, such as refineries, often require all personnel working within facility boundaries to wear certain specified safety equipment. Such requirements shall be strictly observed

5.3 Vapor Monitoring

Required Equipment

--- Organic vapor meter with flame or photoionization detector
--- Combustible gas meter

Monitoring Requirements and Guidelines

Vapor monitoring shall be performed as often as necessary and whenever necessary to protect field personnel from hazardous vapors. Monitoring must be performed by individuals trained in the use and care of the monitoring equipment.

During drilling operations, vapor emissions from boreholes must be measured whenever the auger is removed from the boring and whenever flights are added or removed from hollow-stem augers. This requirement does not apply to borings less than five feet deep and borings of any depth made to install monitoring wells in uncontaminated soils. Measurements should be made initially with an organic vapor meter, followed with a combustible gas meter if vapor levels exceed the highest concentration measurable with the organic vapor meter.

Initially measurements shall be made about 12 inches from the bore hole, both upwind and downwind positions. If the total hydrocarbon concentrations exceed the respirator use action level (See Section 508.5.2), measurements must be made in the breathing zone of the individual(s) working closest to the borehole. Decisions regarding respiratory protection should be made using vapor concentrations in the breathing zone.

Organic vapor meters capable of being operated continuously without attention may be operated in that fashion if desired. However, the instrument must be equipped with an alarm set to sound when vapor concentrations reach 25 ppm and must be protected against physical damage and soilage.

If total organic vapor concentrations within 12 inches of the borehole exceed the capacity of the organic vapor meter, a combustible gas meter (CGM) must be used to determine if explosive conditions exist. Operations must be suspended, the drill rig motor shut down, and corrective action taken if combustible gas concentrations reach 40 percent of LEL within a 12-inch radius of

the borehole or 10 percent of LEL at a distance greater than 24 inches from the borehole. This procedure must also be followed whenever the organic vapor meter goes offscale at its highest range and no CGM is available. If corrective action cannot be taken, field personnel and all other individuals in the vicinity of the borehole must be directed to move to a safe are and the local fire department and facility management must be alerted.

Organic vapor meters with flame ionization detectors (FID) are much more sensitive to paraffins, with the major component of gasoline, kerosene, and jet fuels, then are meters with 10.0 or 10.2 eV photoionization detectors. As the data in Table 1 show, an FID instrument, such as the Century Systems OVA (Foxboro Analytical), will detect 70-90 percent of actual paraffin concentrations, whereas PID instruments, such as the HNU Model PI-101, AID Model 580, and Photovac TIP with 10.0 to 10.2 eV lamp will detect only 17-25 percent of actual paraffin concentrations when calibrated with benzene and only 24-35 percent when calibrated with isobutylene. Both types of meters are equally sensitive to most aromatic, including benzene, toluene, xylene and ethylbenzene. For these compounds, meter readings equal or exceed 100 percent of actual concentrations. PIDs with 11.7 eV lamps are extremely sensitive to paraffins and aromatic. When calibrated to isobutylene, an 11.7 eV PID will register about twice actual paraffin concentrations and 100 percent or more of actual concentrations of benzene, toluene, and xylene.

An FID meter, recently calibrated with methane and in good working condition, can be expected to provide readings close enough to actual petroleum hydrocarbon concentrations to make corrections unnecessary. Value obtained with a PID must be corrected when measuring for paraffins. For 10.0 and 10.2 eV PIDs, the meter reading should be multiplied by 5 if the instrument is calibrated with benzene. If the instrument is calibrated with isobutylene, the meter readings should be multiplied by 3. If the instrument is equipped with an 11.7 eV probe and is calibrated with isobutylene, the meter reading should be divided by 2.

5.4 Area Control

Access to hazardous and potential hazardous areas of spill sites must be controlled to reduce the probability of occurrence of physical injury and chemical exposure of field personnel, visitors and the public. A hazardous or potentially hazardous area includes any area where

1. Field personnel are required to wear respirators.

2. Borings are being drilled with powered augers.

3. Excavating operations with heavy equipment are being performed.

The boundaries of hazardous and potentially hazardous areas must be identified by cordons, barricades, or emergency traffic cones or posts, depending on conditions. If such areas are left unattended, signs warning of the danger and forbidding entry must be placed around the perimeter if the areas are accessible to the public. Trenches and other large holes must be guarded with wooded or metal barricades spaced no further than 20 feet apart and connected with yellow or yellow and black nylon tape not less and 3/4-inches wide. The barricades must be placed no less than two feet from the edge of the excavation or hole.

Entry to hazardous areas shall be limited to individuals who must work in those areas. Unofficial visitors must not be permitted to enter hazardous areas while work in those areas is in progress. Official visitors should be discouraged from entering hazardous areas, but may be allowed to enter only if they agree to abide by the provisions of this document, follow orders issued by the site safety officer and are informed of the potential dangers that could be encountered in the areas.

5.5 Decontamination

Field decontamination of personnel and equipment is not required except when contamination is obvious (visually or by odor). Recommended decontamination procedures follow:

Personnel

Gasoline, kerosene, jet fuel, heating oil, gasahol and diesel oil should be removed from skin using a mild detergent and water. Hot water is more effective than cold. Liquid dishwashing detergent is more effective than hand soap. Motor oil and the heavier fuel oils (No. 4-6) can be removed with dishwashing detergent and hot ware also; however, if weathered to an asphaltic condition, mechanic's waterless hand cleaner is recommended for initial cleaning followed by detergent and water.

Equipment

Gloves, respirators, hardhats, boots and goggles should be cleaned as described under personnel; however, if boots do not become clean after washing with detergent and water, wash them with a strong solution of trisodium phosphate and hot water and, if this fails, clean them with diesel oil followed by detergent and water to remove diesel oil.

Sampling equipment, augers, vehicle undercarriages and tires should be steam cleaned. The steam cleaner is a convenient source of hot water for personnel and protective equipment cleaning.

5.6 Smoking

Smoking and open flames are strictly prohibited at sites under investigation.

TABLE 1
RELATIVE SENSITIVITIES OF FID AND PID INSTRUMENTS TO SELECTED COMPONENTS OF OILS AND PETROLEUM DISTILLATE FUELS

Component	Sensitivity in Percent of Standard		
	FID	PID	
		10.2 eV[a]	11.7 eV[b]
Paraffins			
Pentane	65	--	141
Hexane	70	22 (31)	189
Heptane	75	17 (24)	221
Octane	80	25 (35)	--
Nonane	90		--
Decane	75	--	--
Napthenes			
Cyclopentane	--	--	--
Methylcyclopentane	80	--	--
Cyclohexane	85	34 (40)	--
Methylcyclohexane	100	--	--
Aromatic			
Benzene	150	100 (143)	122
Toluene	110	100 (143)	100
Ethylbenzene	100	--	--
p-Xylene	116	114 (60)	--
Cumene	100	--	--
n-Propylbenzene	--	--	--
Napthaeine	--	--	--

[a] Values are relative to benzene standard. Values in parentheses are relative to isobutylene standard and were calculated.

[b] Values are relative to isobutylene standard.

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March 9 ,1992

Mr. Scott Seery
Alameda County Health Services
Environmental Health Department
80 Swan Way
Oakland, CA 94612

RE: Quality Tune-Up Shop
2780 Castro Valley Blvd.
Castro Valley, CA

Dear Mr. Seery:

Please find the **Proposed Work Plan** for the **Subsurface Investigation** requested by your office.

Please review and advise of your approval.

Should you have any questions concerning the Proposed Plan, do not hesitate to call our office and we will be happy to discuss them with you.

Sincerely,

Bruce Hageman
Hageman - Aguiar, Inc.
encl.
cc. Mr. Larry Armstrong, Quality Tune-Up