

R02634



HYDRO ANALYSIS, INC.

Environmental & Water Resources Engineering
Groundwater Consultants

January 24, 2006

Jerry Wickham
Alameda County Environmental Health
1131 Harbor Bay Parkway
Suite 250
Alameda, CA 94502-6577

Alameda County
JAN 25 2006
Environmental Health

Re: Reliable Trucking
51 El Charro Road, Pleasanton, CA
Fuel Leak Case No. RO0002634

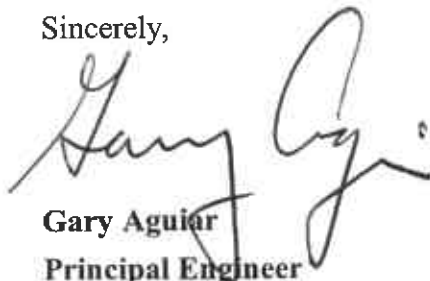
Dear Mr. Wickham:

Please find enclosed a copy of the report titled "Proposed Investigation Workplan, Reliable Trucking, 51 El Charro Road, Pleasanton, California" by Hydro Analysis, Inc., dated January 24, 2006.

As authorized agent for Reliable Trucking, I declare, under penalty of perjury, that the information contained in the attached document is true and correct to the best of my knowledge.

If you have any questions, please contact me at (510)620-0891.

Sincerely,



Gary Aguiar
Principal Engineer

R02634



HYDRO ANALYSIS, INC.

*Environmental & Water Resources Engineering
Groundwater Consultants*

**PROPOSED
INVESTIGATION WORKPLAN**

*Alameda County
JAN 25 2006
Environmental Health*

RELIABLE TRUCKING

51 El Charro Road
Pleasanton, California

January 24, 2006

TABLE OF CONTENTS

I.	INTRODUCTION	1
	Background Information	1
	Hydrogeology	5
	Purpose of Investigation	5
II.	PROPOSED SCOPE OF WORK	6
	Sampling Locations	6
	Permit	6
	Soil Sampling	6
	Groundwater Sampling	8
	Boring Logs	8
	Hole Sealing	8
	Equipment Decontamination	9
III.	LABORATORY ANALYSIS	10
IV.	REPORT	11
V.	SITE SAFETY PLAN	12

ATTACHMENT A -- Correspondence.

ATTACHMENT B -- Health and Safety Plan.

I. INTRODUCTION

The subject site is the Reliable Trucking facility located at 51 El Charro Road, Pleasanton, California. The location of the site is shown in Figure 1. The current layout of the site is shown in Figure 2.

Background Information

On March 10, 2004, one 10,000-gal underground Diesel storage tank was removed from the site. The excavation for the tank removal reached a total depth of 13 feet. Two sampling locations were advanced to 16 feet for the purpose of obtaining "native" soil samples. No layering or stratigraphic boundaries were observed in the walls of the excavation. No water or other liquids were observed in any portion of the excavation. Two additional soil samples were collected along the underground piping trench at depths of 4 feet and 6.5 feet, respectively.

The results of laboratory analysis of the four soil samples indicated no detectable concentrations of either BTEX, MTBE and other Fuel Oxygenates, 1-2 DCA or EDB. However, Diesel was detected at concentrations of up to 140 mg/kg (ppm). The results of soil sampling are presented in Figure 3.

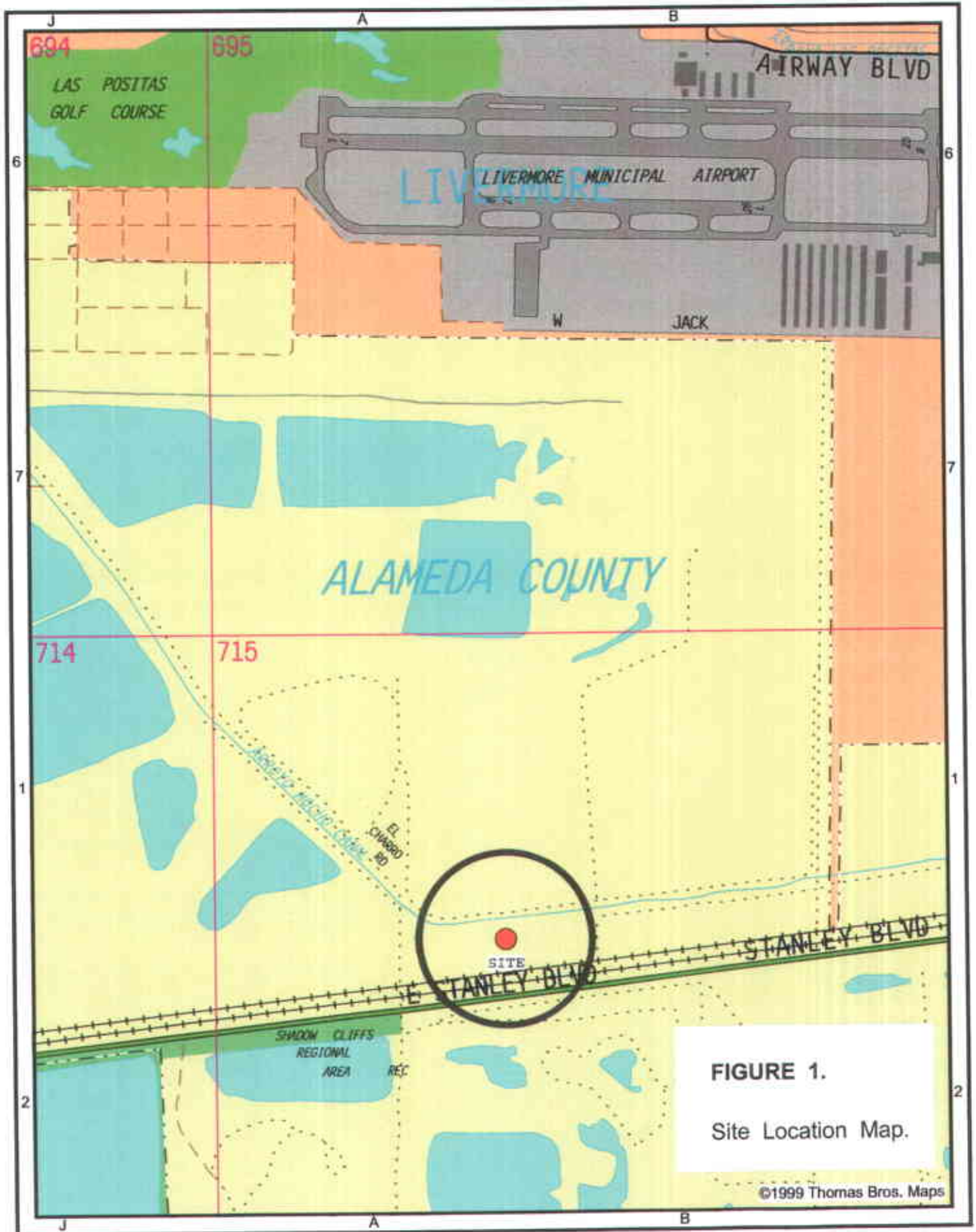
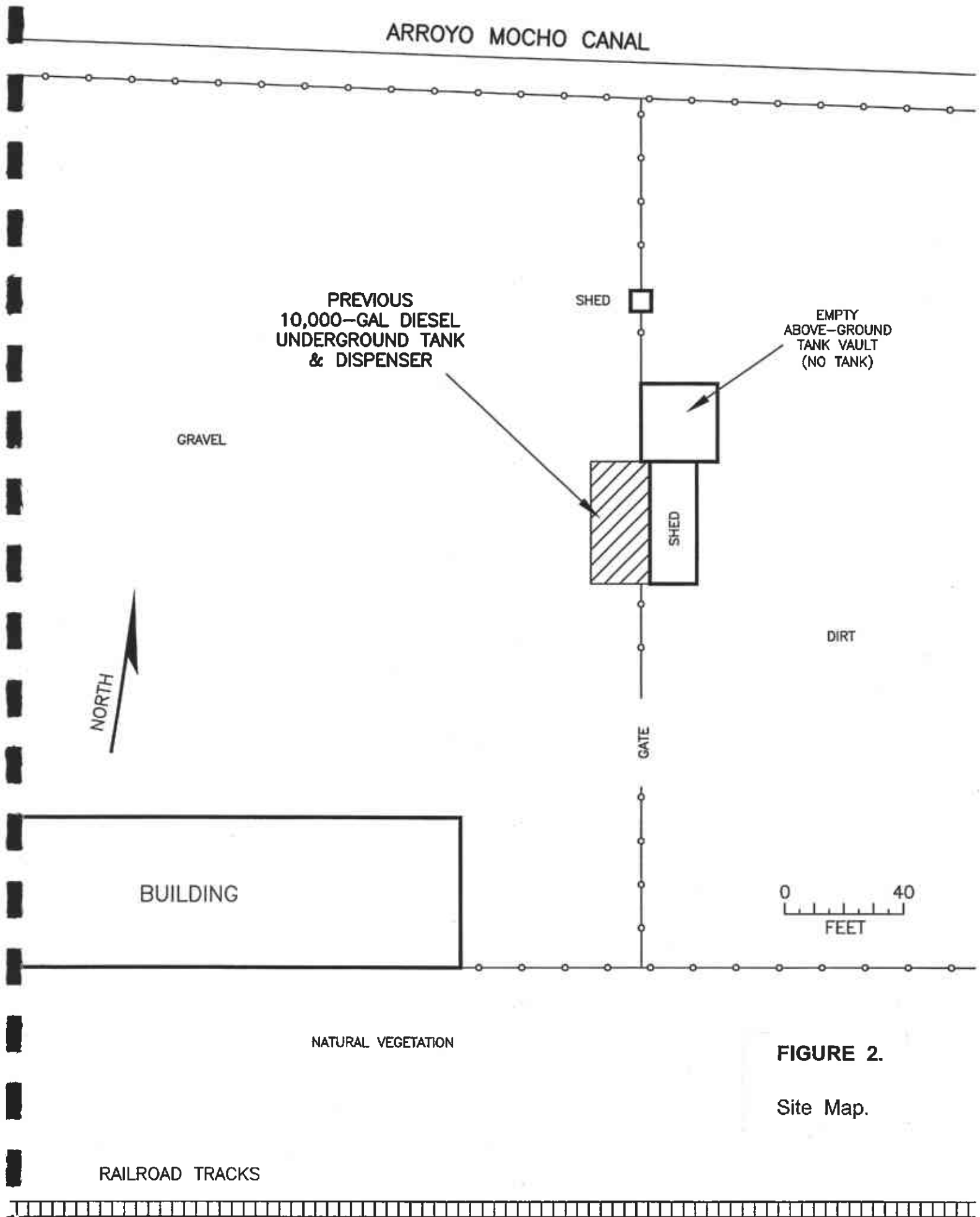


FIGURE 1.

Site Location Map.

ARROYO MOCHO CANAL



PREVIOUS
10,000-GAL DIESEL
UNDERGROUND TANK
& DISPENSER

SHED

EMPTY
ABOVE-GROUND
TANK VAULT
(NO TANK)

GRAVEL



NORTH

GATE

SHED

DIRT

BUILDING



NATURAL VEGETATION

FIGURE 2.

Site Map.

RAILROAD TRACKS

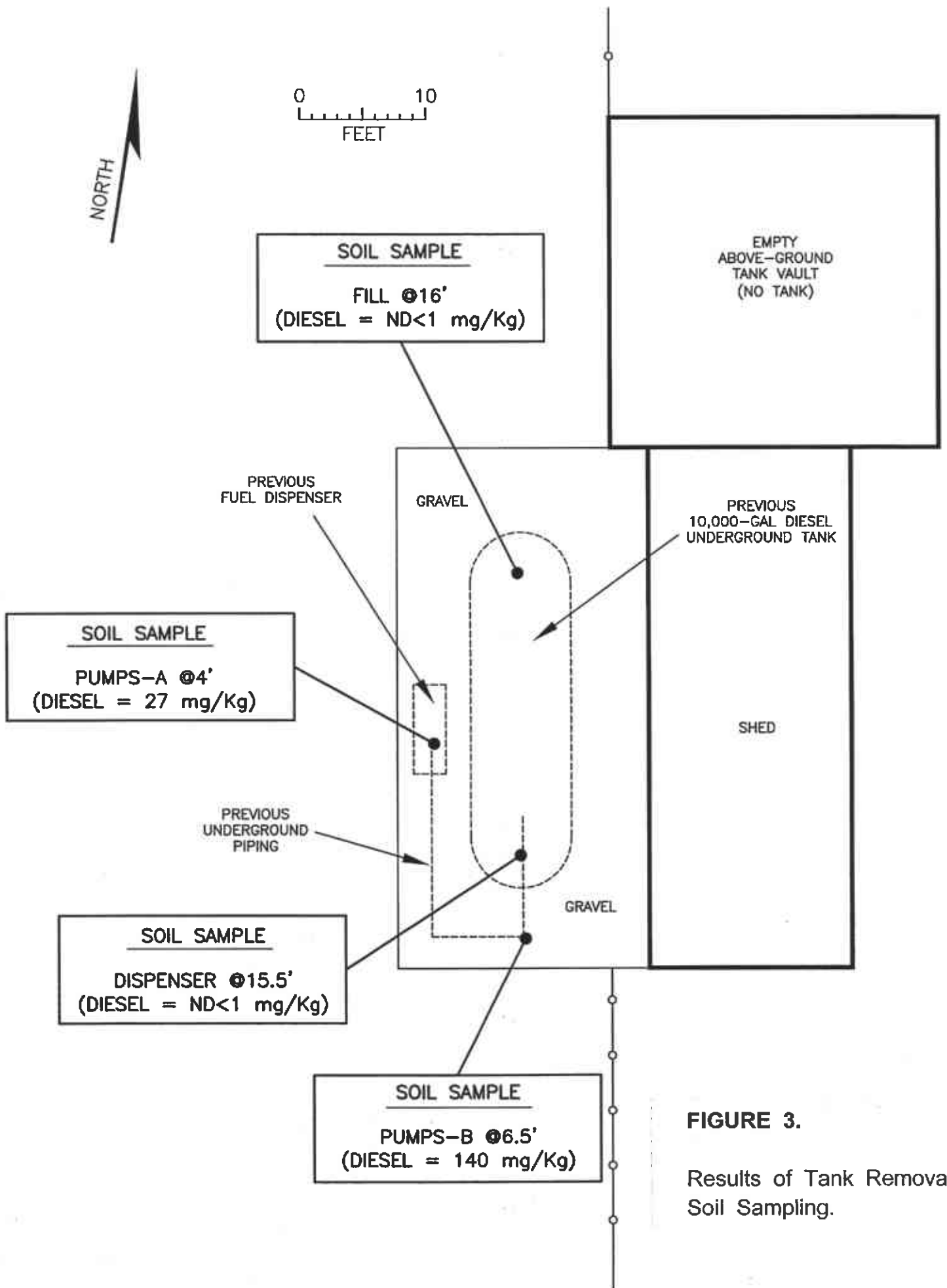


FIGURE 3.

Results of Tank Removal
Soil Sampling.

Hydrogeology

Based upon research of Zone-7 Water Agency groundwater monitoring data, as well as various reports and boring logs for the Leaking Underground Fuel Tank (LUFT) site located at 52 El Charro Road (Industrial Asphalt), the subsurface stratigraphy can be generalized as follows: 1) fine-grained sediments (silts and clays) from ground surface to approximately 30-foot depth, 2) sand and gravel down to approximately 100-foot depth, and 3) an aquitard between approximately 100-foot and 120-foot depths that separate the shallow aquifer from the deeper aquifer. The shallow aquifer water table is reported to be at approximately 90 feet below ground surface.

Active sand & gravel mining operations exist both to the north and to the south of the subject site. Based upon the nearby Industrial Asphalt LUFT site data, the shallow groundwater can be expected to move in an approximately northerly direction toward the Jaimeson gravel pit operation.

Purpose of Investigation

The purpose of this proposed subsurface investigation is to collect soil samples and a "grab" groundwater sample from one deep boring in order to 1) assess the vertical extent of any residual soil contamination that may be present beneath the former underground tank installation, and 2) assess the presence of any dissolved petroleum constituents in the first groundwater zone encountered beneath the site.

This proposed workplan is provided in response to a request by Jerry Wickham, Alameda County Environmental Health, in his letter to Reliable Trucking, dated November 10, 2005. A copy of the letter is provided in Attachment A.

II. PROPOSED SCOPE OF WORK

Sampling Locations

The proposed boring location is shown in Figure 4.

Permit

Prior to the conduct of field work at the site, a boring permit will be obtained from Zone-7 Water Agency.

Soil Sampling

Soil samples for chemical analyses were collected at 5-foot intervals until the shallow water table is encountered, at a depth of approximately 90 feet below 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. The ends of one 6-inch long brass liner from each 18-inch drive will be sealed with Teflon film, over which is placed a plastic end-cap. The end-cap is then sealed onto the brass tube with clean adhesive tape. All samples will be immediately placed on crushed ice, then transported under chain-of-custody to the laboratory upon completion of the field work.

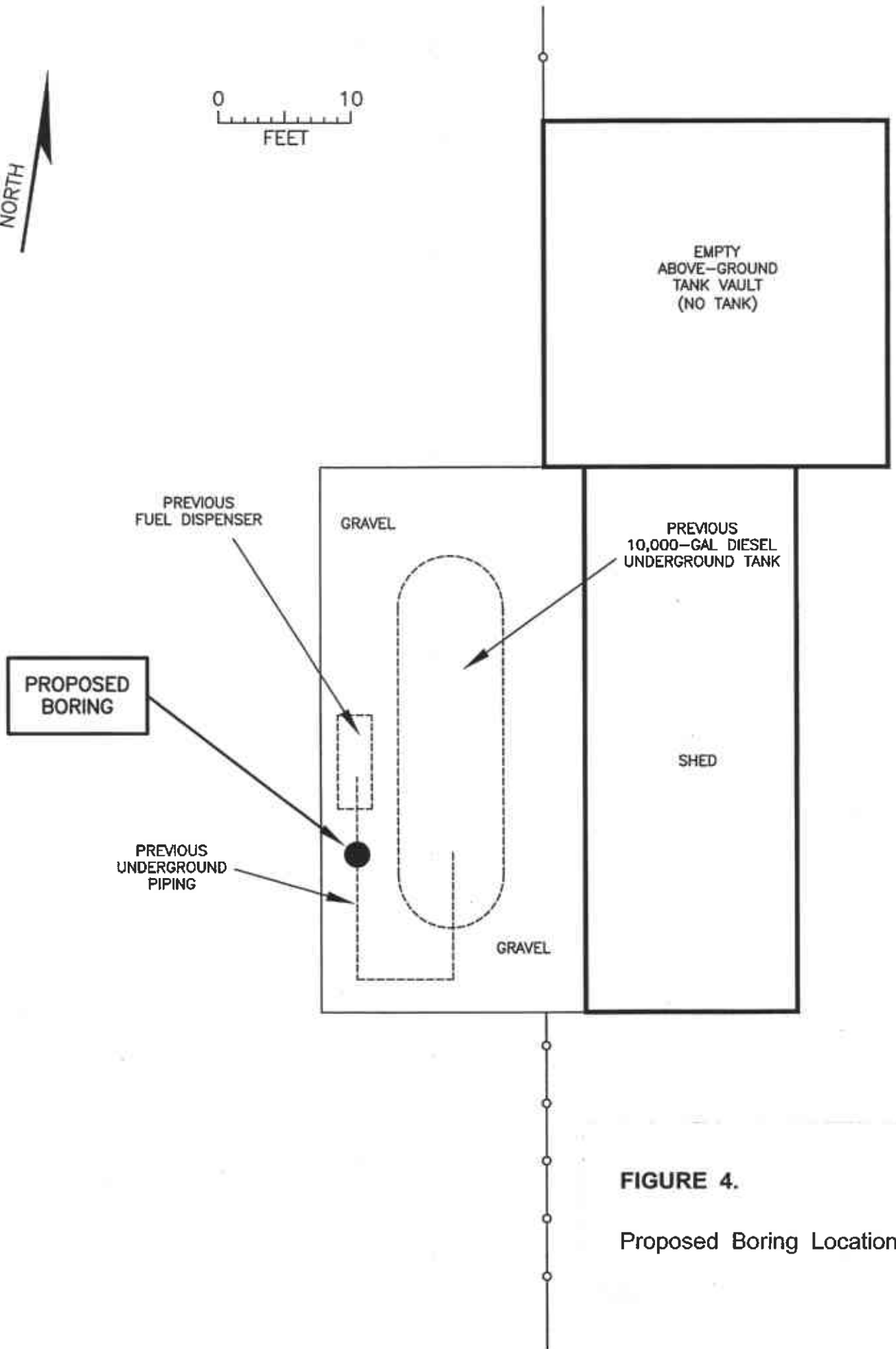


FIGURE 4.

Proposed Boring Location.

Groundwater Sampling

Upon completion of the soil sampling activities, 1" PVC casing and slotted well screen will be placed inside the borehole. A "grab" groundwater sample will be immediately collected using a new disposable bailer. The water samples will be placed inside 40 ml VOA vials free of any headspace and 1-liter amber bottles. The water samples will be immediately placed on crushed ice and transported under chain-of-custody protocol to the laboratory at the conclusion of the field work.

Boring Logs

The boring operation will be directed by qualified field personnel under the supervision of a California registered civil engineer or a California professional geologist. Completed boring logs will be provided to the appropriate Agencies in accordance with the boring permit conditions.

Hole Sealing

Following the completion of the sampling operation, the borehole will be filled with neat cement grout.

Equipment Decontamination

Prior to the conduct of field work, all equipment, including auger and drill rods, will have been steam-cleaned. During the boring operation, field decontamination of sampling barrels and other equipment will be conducted by washing in a water/TSP solution, followed by a double water rinse.

III. LABORATORY ANALYSIS

All analyses will be conducted by a California State DOHS certified in accordance with EPA recommended procedures.

Based upon physical appearance and field-screening with a portable OVM meter, some soil samples may be archived for later laboratory analysis. Selected soil samples will be analyzed for:

- 1) Total Extractable Petroleum Hydrocarbons as Diesel (EPA method 8015M)
- 2) Total Petroleum Hydrocarbons as Gasoline (EPA method 8260B)
- 3) Benzene, Toluene, Ethylbenzene, Total Xylenes, MTBE (EPA method 8260B)

All "grab" groundwater samples will be analyzed for:

- 1) Total Extractable Petroleum Hydrocarbons as Diesel (EPA method 8015M)
- 2) Total Petroleum Hydrocarbons as Gasoline (EPA method 8260B)
- 3) Benzene, Toluene, Ethylbenzene, Total Xylenes, MTBE (EPA method 8260B)

IV. REPORT

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

- 1) map showing boring locations.
- 2) boring logs.
- 3) results of laboratory analyses.
- 4) data analysis.
- 5) conclusions and recommendations.

V. SITE SAFETY PLAN

A site-specific set of health and safety operating procedures is provided in Attachment B. 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 any contamination encountered.

PROPOSED INVESTIGATION WORKPLAN

RELIABLE TRUCKING

51 El Charro Road, Pleasanton, CA

January 24, 2006



Gary Aguiar

EXP. 9-30-08

Gary Aguiar

RCE 34262

ATTACHMENT A

Correspondence

ALAMEDA COUNTY
HEALTH CARE SERVICES

AGENCY

DAVID J. KEARS, Agency Director



ENVIRONMENTAL HEALTH SERVICES
ENVIRONMENTAL PROTECTION
1131 Harbor Bay Parkway, Suite 250
Alameda, CA 94502-6577
(510) 567-6700
FAX (510) 337-9335

November 10, 2005

Mr. Carlos Murillo
Reliable Trucking, Inc.
5141 Commercial Circle
Concord, CA 94520-8523

Mr. Don Kahler
Jamieson Company
P.O. Box 850
Pleasanton, CA 94566

Subject: Fuel Leak Case No. RO0002634, Reliable Trucking, 51 El Charro Road, Pleasanton, CA
– Request for Work Plan

Dear Mr. Murillo and Mr. Kahler:

I am the caseworker recently assigned to your case. Please send future correspondence or inquiries regarding this case to my attention. Alameda County Environmental Health (ACEH) staff has reviewed the case file for the above referenced site and the report entitled, "Certification of Underground Storage Tank Removal," dated May 12, 2004, prepared on your behalf by Hydro Analysis, Inc. The report summarizes the results from the removal of one 10,000-gallon diesel underground storage tanks (UST). Total petroleum hydrocarbons as diesel (TPHd) were detected in soil at concentrations up to 140 milligrams per kilogram (mg/kg).

The site is within the Livermore-Amador Valley, which is an area where groundwater is actively used as a drinking water supply. Groundwater within the Livermore-Amador Groundwater Basin constitutes a valuable current and future resource. Due to the location of your site within a groundwater basin where groundwater is used for drinking water, we request that you conduct an investigation to assess whether groundwater at the site has been impacted.

Please submit a work plan detailing your proposal to define the extent of soil and groundwater contamination by **January 26, 2006**. This report is being requested pursuant to the Regional Water Quality Control Board's (Regional Board) authority under Section 13267 of the California Water Code.

TECHNICAL REPORT REQUEST

Please submit technical reports to Alameda County Environmental Health (Attention: Mr. Jerry Wickham), according to the following schedule:

- **January 26, 2006 – Work Plan for Site Assessment**

These reports are being requested pursuant to California Health and Safety Code Section 25296.10. 23 CCR Sections 2652 through 2654, and 2721 through 2728 outline the

Mr. Carlos Murillo
Mr. Don Kahler
November 10, 2005
Page 2

responsibilities of a responsible party in response to an unauthorized release from a petroleum UST system, and require your compliance with this request.

ELECTRONIC SUBMITTAL OF REPORTS

ACEH's Environmental Cleanup Oversight Programs (LOP and SLIC) now request submission of reports in electronic form. The electronic copy is intended to replace the need for a paper copy and is expected to be used for all public information requests, regulatory review, and compliance/enforcement activities. Instructions for submission of electronic documents to the Alameda County Environmental Cleanup Oversight Program FTP site are provided on the attached "Electronic Report Upload Instructions." Submission of reports to the Alameda County FTP site is an addition to existing requirements for electronic submittal of information to the State Water Resources Control Board (SWRCB) Geotracker website. In September 2004, the SWRCB adopted regulations that require electronic submittal of information for groundwater cleanup programs. For several years, responsible parties for cleanup of leaks from underground storage tanks (USTs) have been required to submit groundwater analytical data, surveyed locations of monitoring wells, and other data to the Geotracker database over the Internet. Beginning July 1, 2005, electronic submittal of a complete copy of all reports is required in Geotracker (in PDF format). Please visit the State Water Resources Control Board for more information on these requirements (http://www.swrcb.ca.gov/ust/cleanup/electronic_reporting).

PERJURY STATEMENT

All work plans, technical reports, or technical documents submitted to ACEH must be accompanied by a cover letter from the responsible party that states, at a minimum, the following: "I declare, under penalty of perjury, that the information and/or recommendations contained in the attached document or report is true and correct to the best of my knowledge." This letter must be signed by an officer or legally authorized representative of your company. Please include a cover letter satisfying these requirements with all future reports and technical documents submitted for this fuel leak case.

PROFESSIONAL CERTIFICATION & CONCLUSIONS/RECOMMENDATIONS

The California Business and Professions Code (Sections 6735, 6835, and 7835.1) requires that work plans and technical or implementation reports containing geologic or engineering evaluations and/or judgments be performed under the direction of an appropriately registered or certified professional. For your submittal to be considered a valid technical report, you are to present site specific data, data interpretations, and recommendations prepared by an appropriately licensed professional and include the professional registration stamp, signature, and statement of professional certification. Please ensure all that all technical reports submitted for this fuel leak case meet this requirement.

LANDOWNER NOTIFICATION REQUIREMENTS

Pursuant to California Health & Safety Code Section 25297.15, the active or primary responsible party for a fuel leak case must inform all current property owners of the site of cleanup actions or requests for closure. Furthermore, ACEH may not consider any cleanup proposals or requests

Mr. Carlos Murillo
Mr. Don Kahler
November 10, 2005
Page 3

for case closure without assurance that this notification requirement has been met. Additionally, the active or primary responsible party is required to forward to ACEH a complete mailing list of all record fee title holders to the site. If you have not already submitted a list of record fee title owners in response to the Notice of Responsibility we require that you submit a complete mailing list of all record fee title owners of the site by **December 14, 2005**, which states, at a minimum, the following:

A. *In accordance with section 25297.15(a) of Chapter 6.7 of the Health & Safety Code, I, (name of primary responsible party), certify that the following is a complete list of current record fee title owners and their mailing addresses for the above site:*

- OR -

B. *In accordance with section 25297.15(a) of Chapter 6.7 of the Health & Safety Code, I, (name of primary responsible party), certify that I am the sole landowner for the above site.*

(Note: Complete item A if there are multiple site landowners. If you are the sole site landowner, skip item A and complete item B.)

In the future, for you to meet these requirements when submitting cleanup proposals or requests for case closure, ACEH requires that you:

1. Notify all current record owners of fee title to the site of any cleanup proposals or requests for case closure;
2. Submit a letter to ACEH which certifies that the notification requirement in 25297.15(a) of the Health and Safety Code has been met;
3. Forward to ACEH a copy of your complete mailing list of all record fee title holders to the site; and
4. Update your mailing list of all record fee title holders, and repeat the process outlined above prior to submittal of any additional *Corrective Action Plan* or your *Request for Case Closure*.

Your written certification to ACEH (Item 2 above) must state, at a minimum, the following:

A. *In accordance with Section 25297.15(a) of the Health & Safety Code, I, (name of primary responsible party), certify that I have notified all responsible landowners of the enclosed proposed action. (Check space for applicable proposed action(s)):*

cleanup proposal (Corrective Action Plan)

request for case closure

local agency intention to make a determination that no further action is required

local agency intention to issue a closure letter

- OR -

B. *In accordance with section 25297.15(a) of Chapter 6.7 of the Health & Safety Code, I, (name of primary responsible party), certify that I am the sole landowner for the above site.*

01/06/06 Redding-Port Chicago - Drive
051364 well survey
051282
82

01/09/2006 ^{Equipment} Deliver to Karl Busche
⁴¹⁰ 051502 ^{Taniguchi} Signatures - Hew Drilling
051364 Sunnyvale Lumber - Sys Ck and
138 maintenance (Blown Fuse), Tedlar's,
Samples to Entech.

01/11/2006 Prime - Quarterly
051645 Samples to STL
051502
143

01/17/2006 Sunnyvale Lumber - Sys Ck
051760 Purge V-4 & V-3
051645
115

RON ASKHAM
(925) 681-6657

Mr. Carlos Murillo
Mr. Don Kahler
November 10, 2005
Page 4

(Note: Complete item A if there are multiple site landowners. If you are the sole site landowner, skip item A and complete item B.)

UNDERGROUND STORAGE TANK CLEANUP FUND

Please be aware that you may be eligible for reimbursement of the costs of investigation from the California Underground Storage Tank Cleanup Fund (Fund). In some cases, a deductible amount may apply. If you believe you meet the eligibility requirements, I strongly encourage you to call the Fund for an application.

AGENCY OVERSIGHT

If it appears as though significant delays are occurring or reports are not submitted as requested, we will consider referring your case to the Regional Board or other appropriate agency, including the County District Attorney, for possible enforcement actions. California Health and Safety Code, Section 25299.76 authorizes enforcement including administrative action or monetary penalties of up to \$10,000 per day for each day of violation.

If you have any questions, please call me at (510) 567-6791.

Sincerely,



Jerry Wickham
Hazardous Materials Specialist

Enclosure: ACEH Electronic Report Upload (ftp) Instructions

cc: Colleen Winey, QIC 80201
Zone 7 Water Agency
100 North Canyons Parkway
Livermore, CA 94551

Randal Wilson
Hydro Analysis, Inc.
11100 San Pablo Avenue, Suite 200-A
El Cerrito, CA 94530

Donna Drogos, ACEH
Jerry Wickham, ACEH
File

ATTACHMENT B

Health and Safety Plan

HEALTH & SAFETY PLAN

Reliable Trucking

51 El Charro Road
Pleasanton, California

January 20, 2006

SITE SPECIFIC SAFETY PLAN

Owner's Name: Reliable Trucking, Inc.
Site Address: 51 El Charro Road
Pleasanton, California

Directions to Site: Freeway 580 eastbound from 580/680 interchange. Exit El Charro Road - turn right.
Proceed approx. 1 mile to end of road. Site is trucking facility on left side (east) of road.

Consultant On-Site: Hydro Analysis, Inc. Phone Number: (510) 620-0891
Site Safety Officer: Gary Aguiar Phone Number: (510) 620-0891

Type of Facility: Truck parking / maintenance yard

Site Activities:

- | | | |
|--|---|---|
| <input checked="" type="checkbox"/> Drilling | <input type="checkbox"/> Construction | <input type="checkbox"/> Tank Excavation |
| <input type="checkbox"/> Soil Excavation | <input checked="" type="checkbox"/> Work in Traffic Areas | <input type="checkbox"/> Groundwater Extraction |
| <input type="checkbox"/> Vapor Extraction | <input type="checkbox"/> In Situ Remediation | <input type="checkbox"/> Above Ground Remediation |
| <input type="checkbox"/> Other: _____ | | |

HAZARDOUS SUBSTANCE

Name (CAS #)	Expected Concentration	
Gasoline	Soil: < 100 mg/Kg (ppm)	Water: < 100 mg/L (ppm)
Diesel	Soil: < 200 mg/Kg (ppm)	Water: < 100 mg/L (ppm)

Health Effects: Dizziness, eye irritation, headache, nose & throat irritation.

PHYSICAL HAZARDS

- | | | |
|--|---|--|
| <input checked="" type="checkbox"/> Noise | <input checked="" type="checkbox"/> Traffic | <input checked="" type="checkbox"/> Moving Machinery |
| <input type="checkbox"/> Underground Hazards | <input type="checkbox"/> Overhead Hazards | <input type="checkbox"/> Excavation / Trenches |
| <input type="checkbox"/> Other | <input type="checkbox"/> Vapor Hazards | <input type="checkbox"/> Biological Hazards |

LEVEL OF PROTECTION EQUIPMENT

- A B C D

SITE SPECIFIC SAFETY PLAN

PERSONAL PROTECTIVE EQUIPMENT

R = Required

A = As Needed

<u>R</u> Hard Hat	<u>R</u> Safety Eyewear (Type):	Safety Glasses
<u>A</u> Safety Boots	<u>A</u> Respirator (Type):	Half - Face
<u>R</u> Orange Vest	<u>A</u> Filter (Type):	Carbon (organic vapor)
<u>A</u> Hearing Protection	<u>A</u> Gloves (Type):	Nitrile
<u>A</u> Tyvek Overalls	<u>R</u> Other:	Soapy water to wash skin.

MONITORING EQUIPMENT ON SITE

<input checked="" type="checkbox"/> Organic Vapor Analyzer	or	<input checked="" type="checkbox"/> PID with lamp of:	10.2 eV
<input type="checkbox"/> Oxygen Meter		<input type="checkbox"/> Draeger Tube:	
<input type="checkbox"/> Combustible Gas Meter		<input type="checkbox"/> Passive Dosimeter:	
<input type="checkbox"/> Hydrogen Sulfide Meter		<input type="checkbox"/> Air Sampling Pump:	
<input type="checkbox"/> W.B.G.T.		<input type="checkbox"/> Filter Media:	

Site Control Measures: FID or PID meter on-site. Public restricted by work zone delineators (signs, 'CAUTION' tape, temporary barriers). Site will be continuously supervised.

Decontamination Procedures: Equipment to be cleaned on-site as feasible. Drill rig and augers to be cleaned at drilling company's off-site permanent facilities. Disposables to be disposed of with drill cuttings in 55 gallon drums or in site waste receptacle. Personnel to wash with soap and water prior to eating, smoking, or leaving site.

EMERGENCY INFORMATION

Hospital / Clinic: ValleyCare Medical Center Phone #: (925) 847-3000
Hospital Address: 5555 W. Las Positas, CA 94588
Paramedic: 911 Fire Dept.: 911 Police Dept.: 911

Emergency / Contingency Plans & Procedures:

Shut off equipment in area if possible.

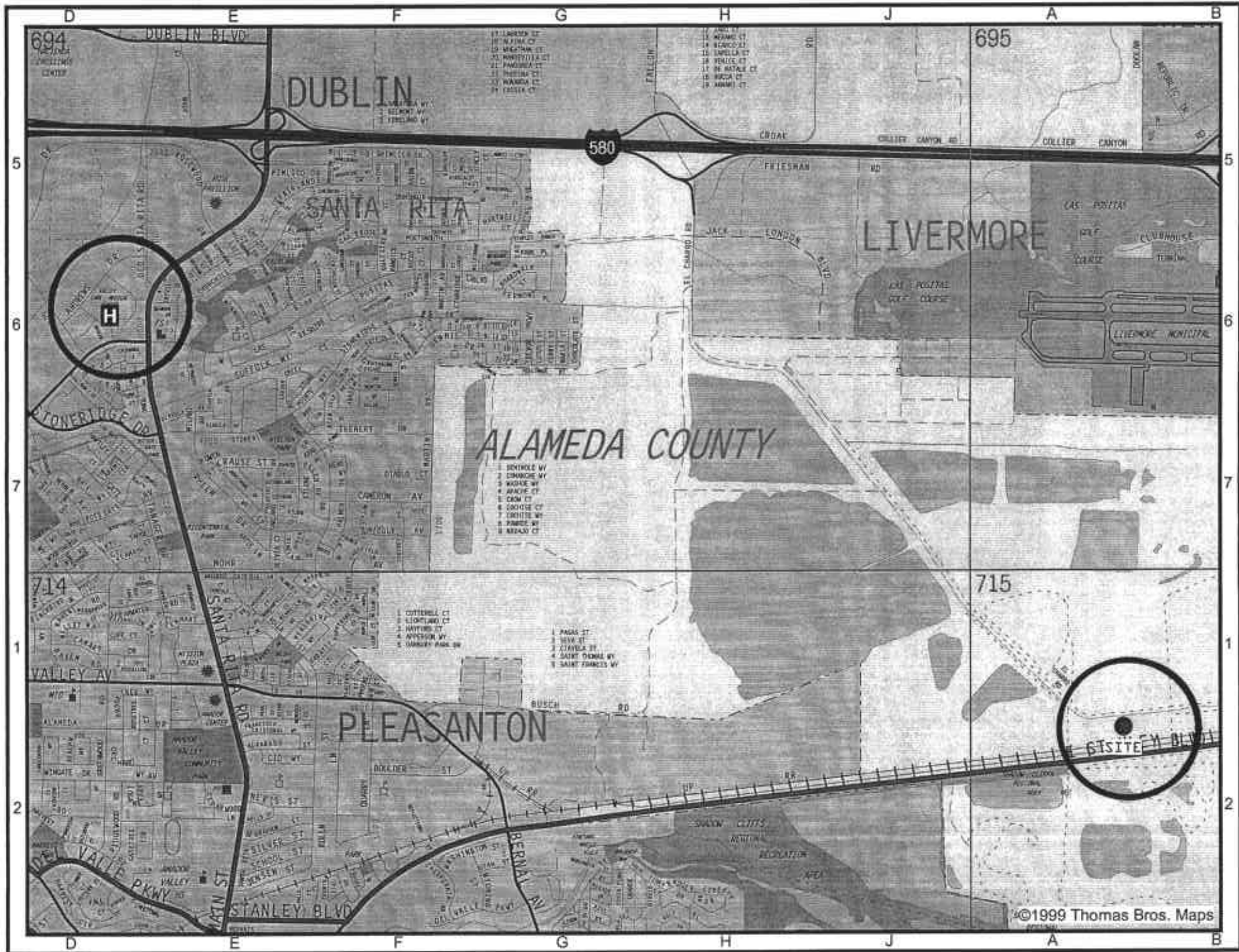
Use emergency shut-off switch on drill rig.

Clear the area. Meet at pre-designated staging area.

Call 911

Site Hazard Information Provided By:

Signature: Randal Wilson Date: 01/23/2006
Randal Wilson Phone Number: (510) 620-0891



694

695

580

715

ALAMEDA COUNTY

©1999 Thomas Bros. Maps

- 1. BENTLEY CT
- 2. CHANCE WY
- 3. KAYE WY
- 4. WACE CT
- 5. CUM CT
- 6. DOCK CT
- 7. GENTE WY
- 8. PINE WY
- 9. BRADY CT

- 1. PAGE ST
- 2. NEW ST
- 3. CLAY ST
- 4. SAINT THOMAS WY
- 5. SAINT FRANCIS WY

- 1. CUTLER CT
- 2. LINDEN CT
- 3. HAYDEN CT
- 4. APPISON WY
- 5. GARNEY PARK DR

HYDRO ANALYSIS, INC.
Standard Operating Procedure HS-01

HEALTH AND SAFETY PROCEDURES

FOR

FIELD INVESTIGATION OF UNDERGROUND SPILLS OF
MOTOR OIL AND PETROLEUM DISTILLATE FUEL

April 2005

CONTENTS

1. PURPOSE	1
2. APPLICABILITY	2
2.1 Substances	
2.2 Activities	
3. RESPONSIBILITY & AUTHORITY.....	3
4. HAZARD EVALUATION.....	4
4.1 Flammability	
4.2 Toxicity	
5. HEALTH AND SAFETY DIRECTIVES.....	5
5.1 Site-Specific Safety Briefing	
5.2 Personal Protective Equipment	
5.2.1 Equipment Usage	
5.3 Vapor Monitoring	
5.3.1 Required Equipment	
5.3.2 Monitoring Requirements and Guidelines	
5.4 Area Control	
5.5 Decontamination	
5.5.1 Personnel	
5.5.2 Equipment	
5.6 Smoking	

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

1. PURPOSE

This operating procedure establishes 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 Hydro Analysis, Inc., health and safety personnel and project managers to quickly prepare and issue site safety plans for investigations of such releases.

2. APPLICABILITY

This procedure is applicable to field investigations conducted by Hydro Analysis, Inc., of underground releases of the substances listed below and involving one or more of the activities listed below:

2.1 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)
1,1,2-Trichloroethane
JP-3, 4 & 5 (jet fuels)
Gasohol

2.2 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).

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

3. RESPONSIBILITY & AUTHORITY

Personnel responsible for project safety during Hydro Analysis, Inc., field activities are the Corporate 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 distributed 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 whose on-site behavior jeopardizes their health and safety of the health and safety of others.

4. 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 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.

4.1 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 2.1) range from 0.6 percent for JP-5 to 1.4 percent for gasoline. 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.

4.2 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 mild 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 of 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 (passes into the lungs), gasoline and other petroleum distillate fuels may cause secondary pneumonia.

Some of the additives to gasoline, such as ethylene dichloride, ethylene dibromide, 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. The American Conference of Government Industrial Hygienists (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. HEALTH AND SAFETY DIRECTIVES

5.1 Site-Specific Safety Briefing

Before field work begins, 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
- Hardhats

5.2.1 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 hydrocarbon 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 exceed 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

5.3.1 Required Equipment

- Organic vapor meter - either flameionization or photoionization detector
- Combustible gas meter (LEL)

5.3.2 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 solid. 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, 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 meter 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 spoilage.

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 shot down, and corrective action taken if combustible gas concentrations reach 40 percent of LEL within a 12-inch radius of the borehole of 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 off-scale 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 area and the local fire department and facility management must be alerted.

Organic vapor meter with flame ionization detectors (FID) are much more sensitive to paraffins, with the major component of gasoline, kerosene, and jet fuels, than 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. Values obtained with a PID must be corrected when measured for paraffins. For 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 than 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:

5.5.1 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 efficient 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 water also; however, if weathered to an asphaltic condition, mechanic's waterless hand cleaner is recommended for initial cleaning followed by detergent and water.

5.5.2 Equipment

Gloves, respirators, hardhats, boots and goggles should be cleaned as described under personnel. If boots do not become clean after washing with detergent and water, wash them with a strong solution of trisodium phosphate and hot water.

Sampling equipment, augers, vehicle under-carriages 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	<u>Sensitivity in Percent of Standard</u>		
	FID	PID	
		10.2 eV ^a	11.7 eV ^b
<u>Paraffins</u>			
Pentane	65	---	141
Hexane	70	22 (31)	189
Heptane	75	17 (24)	221
Octane	80	25 (35)	---
Nonane	90	---	---
Decane	75	---	---
<u>Napthenes</u>			
Cyclopentane	---	---	---
Methylcyclopentane	80	---	---
Cyclohexane	85	34 (40)	---
Ethylcyclohexane	100	---	---
<u>Aromatic</u>			
Benzene	150	100 (143)	122
Toluene	110	100 (143)	100
Ethylbenzene	100	---	---
p-Xylene	116	114 (60)	---
Cumene	100	---	---
n-Propylbenzene	---	---	---
Naphthalene	---	---	---

^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.

TAIL-GATE SAFETY MEETING

DATE:

TIME:

SITE:

PROPOSED WORK:

TOPICS COVERED:

ATTENDEES:
