WEST & HANSEN ENGINEERS, INC.
P. O. Box 5891, Vacaville, California 95696 • (707) 451-1360
90 JAN 25 AM 11:57

January 22, 1990

Ms. Katherine Chesick
Alameda County Health Care Services Agency
Department of Environmental Health
Hazardous Materials Program
80 Swan Way, Room 200
Oakland, CA 94621

Subject: Site Assessment Workplan; OMS No. 35, San Lorenzo

Dear Ms. Chesnick

West & Hansen Engineers, Inc. is pleased to submit our proposed Site Assessment Workplan for the gasoline tank site at the Organizational Maintenance Shop No. 35, 16501 Ashland Ave, San Lorenzo. We believe you will find the enclosed plan in conformance with San Francisco Regional and State Water Quality Control Board guidelines regarding sub-surface and groundwater investigations. We believe the proposed site assessment described in this report will adequately define the extent of contamination and provide a basis for planning a successful remediation project.

If you require any additional information or clarification after review of our plan please contact myself or Matt Walker at (707) 451-1360. We look forward to County approval of the plan so as to facilitate initiation of remediation activities.

Yours truly,

Brian W. West

Brian W. West PE
President
West & Hansen Engineers, Inc.

BWW/lr

Enclosure:

cc: Paul Hypnarowski, OSA
Scott Hilyard, Military

never implemented

SITE ASSESSMENT WORKPLAN

UNDERGROUND GASOLINE STORAGE TANK

ORGANIZATIONAL MAINTENANCE SHOP #35
16501 Ashland Ave, San Lorenzo

Prepared for

The Office of the State Architect

&

The California State Department of the Military
Sacramento

Prepared by

West & Hansen Engineers, Inc.
Environmental Consultants
Vacaville, California

January 22, 1990

ACKNOWLEDGEMENTS

Numerous individuals at a variety of agencies participated in the preparation of this workplan. Mr. Paul Hypnarowski PE at the Office of the State Architect, served as Project Manager. Mr. Mike Golden PE and Mr. Stephen Medford at OSA also participated.

At the OMS #35, Warrant Officer Charles Kahoutek assisted in the field investigation portion of the project. Ms. Katherine Chesick, Senior Hazardous Materials Specialist at the Alameda County Department of Environmental Health, Hazardous Materials Program, also was helpful in supplying information related to the project.

This report was prepared under Contract TX 6746, Task Assignment No. 11. Principal authors are Mr. Brian W. West PE and Mr. Matthew J. Walker PE.

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1.0 Introduction

The Office of the State Architect (OSA) has been delegated responsibility by the Legislature for bringing most State owned underground storage tanks into compliance with prevailing environmental regulations. West & Hansen Engineers, Inc., a Consultant to OSA, has been assigned to manage site remediation at the Organizational Maintenance Shop No. 35 in San Lorenzo. Prior to initiating field investigations, Alameda County requires submittal of a Site Assessment Workplan outlining the current state of knowledge, goals and investigative methods to be employed. In this Section, the scope, objective and approach of the Site Assessment Workplan are presented, as well as selected background information.

1.1 Scope

The scope of this project includes preparing, submitting and obtaining approval of a Site Assessment Plan to investigate subsurface contamination at the OMS #35, 16501 Ashland Ave, San Lorenzo, California. Specifically, investigating soil and possibly groundwater contamination resulting from leaks in an underground gasoline storage tank in the vehicle parking area is the scope of this effort. The scope does not include investigating possible contamination in areas other than the gasoline tank site or any other underground tank compliance activities.

1.2 Objective

Generally, the objective of this project is to initiate action resulting eventually in the remediation of sub-surface contamination at the gasoline tank site. Specifically, the goal of this report is to obtain County approval to conduct site investigation activites. The plan contained in this report is intended to thoroughly describe proposed field procedures for accurately determining the extent of contamination.

1.3 Approach

A combination of site investigation, personal interview and records review was employed to compile this report. The OMS #35 was visited on December 15 and 21, 1989 and the gasoline tank site inspected. OMS personnel were interviewed and their files reviewed for information pertinent to the site assessment. Contractor and OSA inspection personnel with first hand knowledge of the site were interviewed. County Hazardous Material Division and Regional Water Quality Control Board personnel were also contacted regarding specific regulations applicable to the site.

1.4 Project Background

The OMS #35 is located at 16501 Ashland Ave, San Loenzo, CA. The site is in the East San Francisco Bay within Alameda County. Underground gasoline storage has been installed at the OMS since its founding. The existing tank has been in service intermittantly during the past 35 years. It is the only tank operated on site since 1955.

During site rehabilitation in December 1989 it was discovered that corrosion holes had been present in the vent and product lines for an undetermined period of time. Obvious gasoline contamination was present in the excavation.

On December 1, 1989 the Alameda County Department of Environmental Health, Hazardous Materials Program, ordered the State Department of the Military to prepare and submit a Site Assessment Workplan. The Military Department relies on OSA for technical assistance to comply with underground storage tank regulations. As a result, OSA assigned one of their retained consultants (West & Hansen Engineers, Incorporated) to prepare and follow through with a site assessment plan.

2.0 Site Assessment Plan

The site assessment plan presented in this Section is patterned after guidelines presented in San Francisco Bay Regional Water Quality Control Board Staff Recommendations for Initial Evaluation and Investigation of Underground Tanks (Revised November 9, 1989). As stated in the RWQCB guidelines, the goal of the site investigation is to determine the nature, horizontal and vertical extent, geologic and hydrogeologic controls and potential groundwater impact of the unauthorized release. In the following Sections of this report each element of the proposed site investigation is described in detail.

2.1 Site History

The site has been a military staging depot since the Korean War era. The underground tank was installed approximately 1955. The area immediately surrounding the tank site has been used for Military vehicle parking for the entire lifetime of the tank and will continue to be used for that purpose indefintely.

Other potentially hazardous materials used on site are lube oils, solvents, brake fluid and paint. These materials are stored and used in small quanitities. There have been no recorded spills.

The existing gasoline tank at the site has been intermittantly used. At one point it was dormant for 6 years (1981-1986). In an attempt to upgrade fueling capability at the OMS a project to rehabilitate the gasoline tank and add a diesel tank was undertaken. It was during excavation for the tank upgrade project that contamination was discovered.

The gasoline tank has undergone precision testing yearly since November 1986. The most recent test was in March 1989. The system has passed on all test dates. Both the tank and piping were tested. OMS personnel reported no noticable problems dispensing fuel with the suction type pump. There was also no significant loss of product noted based on inventory records.

It was obvious from the condition of the product piping upon removal that gasoline had leaked through large corrosion holes. Although surface spillage undoubtedly occurred both from filling and dispensing, it is believed the majority of contamination resulted from product line leaks.

The gasoline tank is single wall steel rated at 2,000 gallon capacity. Piping was single wall steel but has been replaced with new double wall fiberglass piping. The tank was used to store regular, leaded gas throughout its entire lifetime. There was no other known product stored. There is no accurate estimate of the quantity product released.

To date, no soil or groundwater samples for laboratory analysis have been taken.

2.2 Site Charactaristics

Figure 1 presents a location map depicting the site vicinity and pertinent features.

Figure 2 - Site Plan presents a plot plan of the tank site. All known applicable surface and sub-surface features are included on the plot.

The site is located in a fully developed suburban area. The surrounding area is a mix of light industrial, commercial and residential development. San Lorenzo High School is immediately north of the site. The high school property is within 50 feet of the gasoline tank.

The topography of the site is flat. Drainage in the immediate area of the tank site has been modified to promote flow to storm sewer catch basins eventually discharging towards Ashland Ave (south). Subsurface gradient in the area is presumed to be to the south towards San Lorenzo Creek.

Hydrogaphically, the site is located in the Alameda Bay Plain Basin. Strata is generally alluviated, interfingered lenses of clayey gravel. Exposed native soil at the site contains dense adobe clay. Depth to first groundwater varies from 12-17 feet.

It is reported (IT Corp., "Leak Detection Plan for the OMS #35) that there are no water wells within 0.5 miles of the site.

3.0 Site Assessment Plan

The following site plan has been assembled in acccordance with all applicable guidelines and regulations. In the following sub-sections methods, procedures and equipment for conducting soil and groundwater investigations are presented. Technical details are contained in the Appendices.

3.1 Soils Borings

It is proposed to conduct sub-surface investigation via borings made with a powered, continuous flight, hollow stem auger. All drilling will be performed by a sub-contractor with a valid California C-57 license. All borings will be supervised by a civil engineer with a current Professional Civil Engineers registration in the State of California. Soil borings will be permitted as necessary.

Equipment, techniques and procedures used to complete soil borings will conform with San Francisco RWQCB specifications. All soil samples taken will similarly conform with WQCB requirements. Soil boring and sampling specifications are presented in Appendix 1.

At a minimum, six borings are proposed as indicated on Figure 2. All borings will be drilled using an 8 inch OD hollow stem auger. All borings will be completed at least to first groundwater. Soil samples will be taken at 5 foot intervals within the vadose zone and at the capillary fringe. Based on field screening samples will be composited as appropriate.

The soil stockpiled east of the tank excavation will be sampled to determine proper disposal. Using an earthmover, the pile will be leveled to an approximate depth of three feet. Soil samples will be taken from the center of 3x3 foot squares and field analyzed. Soil samples testing clean in the field will be composited for laboratory confirmation. Samples testing contaminated (>100 PPM TPH) will be similarly composited and laboratory analyzed.

West & Hansen Engineers, Inc.

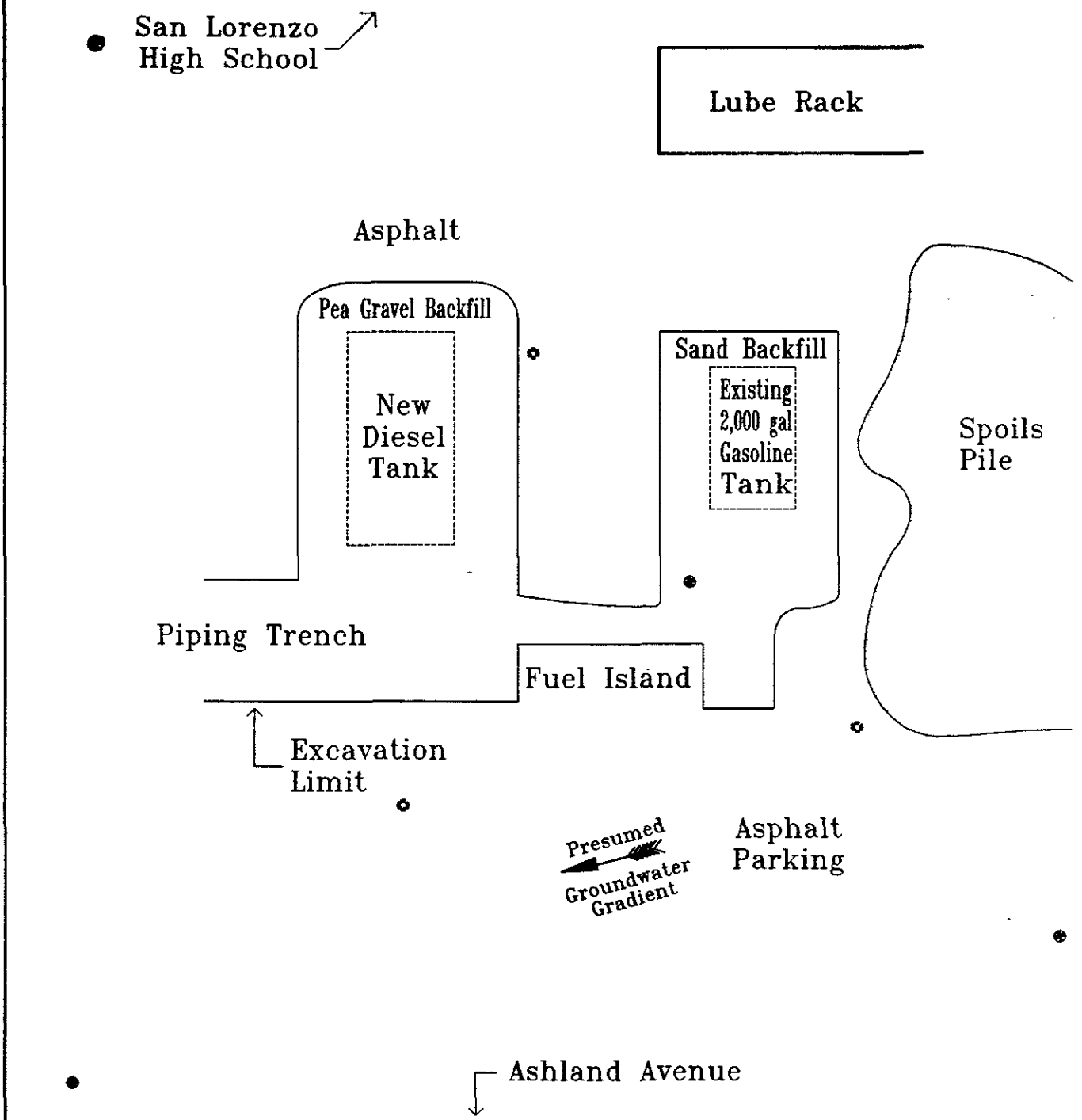
Project Name: OMS #35 23190

Location: 16501 Ashland Ave., San Lorenzo

Map Source: Thomas Brothers Maps – California, Page 146

Figure 1 – Area Map

Project Name: OMS #35	23190
Location: 16501 Ashland Ave., San Lorenzo	
Drawing By: West & Hansen Engineers, Inc.	Date: January 12, 1990



LEGEND

- Groundwater Monitoring Well Location
- Soils Boring Location

Each 3x3 square will be marked for future identification. Upon completion of sampling activities the pile will be covered with plastic sheeting. Within one week of receipt of lab results, contaminated soil will be loaded, manifested and transported to proper disposal.

3.2 Monitoring Wells

Four borings will be completed at least 15 feet into the saturated zone and converted into groundwater monitoring wells. The anticipated well locations are indicated on Figure 2.

The groundwater gradient at the site is not definitely known. Due to the flatness of local topography, the groundwater gradient in all likelihood is of small magnitude. Consequently, product may potentially be both up and downgradient from the tank site.

The proposed locations of groundwater wells were selected based on three considerations. 1. To detect groundwater contamination both up and down gradient from the tank site (two wells are proposed in the presumed downgradient direction). 2. To definitely determine the groundwater gradient direction and magnitude. 3. To serve as potential extraction wells for any existing contaminated groundwater or floating product. All proposed groundwater monitoring wells are to be of 4 inch diameter construction to facilitate conversion to extraction wells if necessary.

Upon stabilization of groundwater well levels the local gradient will be determined. Both direction and magnitude will be established. Proposed well locations have been selected considering intervisibility. All three wells can be sounded and sighted simultaneously. Well depths will be measured utilizing surveying equipment and techniques accurate to 0.01 feet.

All groundwater wells installed will conform to specifications as presented in Department of Water Resources Bulletin 74. All applicable permits will be obtained prior to well construction and operation. Drillers and supervisors will be properly licensed as required by State law.

Monitoring wells will be installed, developed and sampled as specified in Appendix 2; Monitoring Wells. All drill cuttings and pumped fluids will be drummed and retained on site pending laboratory analysis to determine proper disposal.

3.3 Quality Assurance/Quality Control

The site investigation will be conducted by West & Hansen Engineers, Inc. under Contract TX 6476 with the Office of the State Architect. West & Hansen Engineers was selected based on technical qualifications and has successfully performed many past underground tank related projects for OSA. They have also performed underground tank related projects in Alameda County, specifically at UC Berkeley.

All site work will be performed under direct supervision of a West & Hansen Engineers, Inc. Project Manager holding a current California registration in civil engineering. The Project Manager shall have direct responsibility for all aspects of the site investigation.

All equipment, materials and supplies used at the site will be new or have been de-contaminated in accordance with US EPA specifications as described in Appendix 4. On-site steam cleaning capabilities will be established for use during all sub-surface exploration.

Soil and groundwater samples will be analyzed in a California DHS certified laboratory utilizing EPA approved analytical procedures. Laboratory certification will be documented in the Site Investigation Report.

Background samples and sample blanks will be will be utilized in accordance with Appendix 3. Chain of custody will be maintained by use of forms as illustrated in the Appendix. Detection limits will be at least those specified in Appendix 3 and will be listed on each sample report form.

3.4 Health & Safety Plan

All activities at the site shall be conducted to maintain the safety of workers, OMS employees and the public. All residues generated during the site investigation will be handled as hazardous so as to protect the environment. Specific health and safety measures to be implemented include:

Site Manager - The West & Hansen Engineers Project Manager shall be designated as Site Manager. He will be responsible for erecting and maintaining barriers around the site to prevent unauthorized entry. He shall ensure that all personnel granted access to the work site are aware of safety procedures and shall be authorized to remove any individual not adhering to established rules.

The Project Manager shall maintain a permanent, bound record of all work activities. The site record shall be kept on site during all work hours and be made available to County inspection personnel on request.

Each individual allowed access to the work site shall have available:

- hard hat
- safety glasses
- appropriate gloves
- respirator with organic filter cartridges

Use of each safety item shall be dependent upon work activities currently underway.

The site manager shall ensure that a first aid kit and fire extinguisher are available during all work hours. All site personnel shall be briefed on the procedure for summoning emergency response and made aware of the closest location for medical aid.

All residues shall be containerized in DOT approved series 17 drums. Liquids and soilds shall be segregated. Similarly, obviously contaminated residue shall not be intermixed with apparently clean material. Representative samples of the contents in each drum shall be taken for laboratory analysis.
All residue containers shall be stored at the work site and clearly labelled as hazardous both in English and Spanish.

3.5 Report of Findings

Following conclusion of field investigation activities and receipt of analytical results a site assessment report will be prepared and submitted to the County Environmental Health Department. Included in the report shall be:

- Site History
- Location Maps
- Site Plans
- Description of Soils Borings and Boring Logs
- Description of Monitoring Wells and Well Logs
- Analytical Data Including Original Lab Reports
- Groundwater Measurements
- Quality Assurance/Quality Control Methods
- Health & Safety Plan
- Monitoring Well permits
- Geologic/Hydrogeologic Illustrations
- Findings

In addition to a description of the site investigation, the site assessment report shall include proposals for site mitigation and remedial action. All proposals for removal of product from groundwater, treatment, excavation or justification for retention in place, shall be described.

4.0 Schedule

Within seven days of Site Assessment Plan approval, West & Hansen Engineers, Inc. will submit a written request to the Office of the State Architect for authorization to commence site assessment activities. Within 14 days of receipt of Notice to Proceed, West & Hansen will prepare and submit a preliminary schedule of field activities to the designated County Representative. Within 14 days of start of field work the County will be supplied with a final schedule indicating occurance of all anticipated sampling activities.

Within 21 days of receipt of analytical data the Site Assessment report shall be submitted to the County.

5.0 Summary

All proposed methods, equipment and procedures proposed in this Site Assessment Workplan are in conformance with State and Regional Water Quality Control Board specifications. The actions, methods and techniques proposed in this plan are sufficent to adequately aproximate the magnitude and extent of sub-surface contamination at the site.

APPENDIX 1

SOIL BORINGS

Definition of the vertical and horizontal limits of contamination as well as site geology will be accomplished by means of subsurface investigation. The principal method of defining subsurface conditions at the site will be through the use of soil borings and soil sampling. Soil borings will be drilled with the use of a continuous flight hollow stem auger unless specific site conditions preclude its use.

In-place soil samples at the base of the boring will be obtained through the augers hollow center. Liners in the sampling device allow a sealed, undisturbed sample to be retrieved.

Soil borings will be completed by a drilling subcontractor licensed in the State of California. The borings will be supervised and logged by a qualified civil engineer holding a current California registration as a registered civil engineer.

Materials encountered during drilling will be described and classified by the Uniform Soil Classification System. Soil sampling will be conducted by the use of a California split spoon or equivalent tube type sampler equipped with a brass or stainless steel sleeve. Soil samples will be taken at 5 foot intervals, at marked changes of lithography for geologic control and at the capillary fringe, if encountered.

Borings will be advanced until the saturated zone is reached or until an absence of contamination is recognized in the opinion of the responsible professional. The supervising civil engineer will determine the advisability of drilling into or through confining layers below contaminated zones.

The number and stratigraphic position of laboratory samples will be selected to adequately define the nature and distribution of soil contamination present. A bottom hole sample will be taken from each boring.

All borings will be abandoned by placing a bentonite basal plug and backfilling with grout. A cement surface plug shall be placed at the surface of the boring. Boring identification numbers shall be placed at each boring location. All boring locations will be accurately plotted on the site plan.

APPENDIX 2

SAMPLE QUALITY ASSURANCE/QUALITY CONTROL

Sample quality will be checked by the use of proper sampling, handling and testing methods. Examples of quality control methods are use of background samples, equipment rinse samples, and trip and field blanks. Chain of custody forms, use of a DHS certified laboratory, acceptable detection limits and proper sample preservation and holding times also provide assurance of accurate analytical data.

Background Samples

Procedures and methods used to obtain, handle, prepare, transport and analyze background samples will be identical to those used for site samples. Background samples will be used to define conditions at the site before the unauthorized release.

An equipment rinse sample will be utilized to detect residual contamination on sampling apparatus. Sampling equipment will be filled with distilled water which will then be transferred to a sample container.

Sample blanks will be used to check for cross-contamination during sample collection, transport and in the laboratory. Two types of sample blanks will be utilized; trip blanks will be used to verify handling, storage and shipment conditions, field blanks will be used to confirm site conditions.

Trip blanks will either be prepared by the analytical laboratory or the responsible professional before traveling to the work site.

One trip blank will be used for each sample set of 20 samples. At least 5% trip blanks will be used for sets greater than 20 samples. Trip blanks will remain with the collected samples during transportation and will be analyzed with the field samples to check for any introduced contamination. Trip blanks will not be opened by either the sample collectors or handlers.

Field blank water samples will be opened and exposed at the sampling site to detect contamination from air exposure. The sample will be poured into the sample container to simulate actual sampling conditions.

Chain of Custody Forms

A chain of custody form will be generated for all site samples. The form will accompany the samples from the time of generation to time of analysis. Originals will be retained even if illegibility or inaccuracies require preparation of a replacement. Any corrections will be initialed and dated. Copies will be retained by the supervising professional.

A sample chain of custody form is depicted in Figure A-1. The site name, collector signature, date and time of collection will always appear. The number and condition of containers, description of samples and sample identification numbers will also be included. The name and signature of all individuals, with inclusive dates of possession, will be recorded.

State Certified Laboratories

All soil and water samples will be analyzed by a commercial laboratory certified by the California Department of Health Services for the intended analysis. Documentation of certification will be presented in all reports containing analytical results.

Detection Limits

Minimum detection limits for analytical procedures are:

COMPOUND	WATER (ppb)	SOIL (ppb)	METHOD
Benzene	0.3	5.0	EPA 602/8020
Toluene	0.3	5.0	EPA 602/8020
Xylenes (Total)	0.6	15.0	EPA 602/8020
Total Petroleum Hydrocarbons	500.0	10,000.0	DHS mod. 8015 (GC-FID)

CALSCIENCE ENVIRONMENTAL LABORATORIES, INC.
11631 SEABOARD CIRCLE
STANTON, CA 90680
TEL: (714) 895-5494 • FAX: (714) 894-7501

Figure A-1

CHAIN OF CUSTODY RECORD

Date _____

Page _____ of _____

LABORATORY CLIENT:*			CLIENT PROJECT NAME / NUMBER:
ADDRESS:			PROJECT CONTACT:
CITY	STATE	ZIP	
TEL:	FAX:		SAMPLER(S): (SIGNATURE)

TURN AROUND TIME DESIRED ☐ SAME DAY (100 %) ☐ 24 HOURS (50%) ☐ 48 HOURS (25%) ☐ 10 DAYS
Prior confirmation with CEL is recommended for rush samples

LABORATORY WORK ORDER NUMBER : _____

SHIPMENT METHOD:

AFTER ANALYSES, SAMPLES ARE TO BE: ☐ DISPOSED OF ☐ RETURNED TO CLIENT ☐ STORED (30 DAYS MAX.) ☐ OTHER _____

SPECIAL INSTRUCTIONS:

SAMPLE ID	LOCATION DESCRIPTION	SAMPLING		SAMPLE TYPE				SOLID / SOIL	NO. OF CONTAINERS	TESTS REQUIRED
				WATER		AIR				
		DATE	TIME	Comp.	Grab.	Integ.	Grab.			

Relinquished by: (Signature)	Received by: (Signature)	Date:	Time:
Relinquished by: (Signature)	Received by: (Signature)	Date:	Time:
Relinquished by: (Signature)	Received for Laboratory by: (Signature)	Date:	Time:

Sample Preservation and Holding Times

PARAMETER	MATRIX	CONTAINER	HOLDING TIME	PRESERVATION
TPH	Soil	3" stainless or brass cylinder	14 days	Frozen
	Water		40 days	4°C
BTXE	Soil	40ml glass vial teflon faced silicon septum	14 days	4°C
	Water		40 days	4°C
Organic Lead	Soil	3" SS or brass cylinder	14 days	Frozen
	Water	40ml glass vial	4 days	4°C

APPENDIX 3

MONITORING WELLS

Monitoring wells are intended to obtain specific water elevation and quality data. The well is designed to sample a specific aquifer or portion of an aquifer. The design, construction and field oversight of well construction shall be supervised by a civil engineer with current California registration.

Monitoring Well Installation

Monitoring wells will be drilled by a contractor licensed in the State of California. Wells will be drilled with a continuous flight hollow stem auger unless site specific conditions preclude its use. An application to install a monitoring well will be filed in all jurisdictions were required.

Specifications for drilling within the vadose zone are described in the Soil Borings Appendix, and will be observed during monitoring well construction. A sample will be taken at the top of the capillary fringe.

The monitoring well boring will extend at least 15 feet into the saturated zone. Drilling through confining layers under contaminated zones will be avoided. If necessary, a large diameter surface casing will be installed through the contaminated zone to prevent the introduction of contaminants into the aquifer.

The monitoring well will be screened at least 15 feet into the aquifer and at least 5 feet above the water table, if possible. A filter pack of chemically inert sand with a grain size and grain size distribution appropriate for the aquifer will be installed from the base of the screened section to 2 feet above the top of the well screen. Well screens and filter backs will not be constructed through impermeable layers.

A three to five foot bentonite annular seal will be placed above the filter pack. The annular space above the seal will be backfilled with grout. A five foot cement surface seal will be placed. A water tight casing top and locking well cover cap will be provided. The well top or cover will be clearly labeled "MONITORING WELL". A traffic rated well cover will be installed if appropriate.

Monitoring Well Development

Upon well completion the natural hydraulic conductivity of the formation will be restored and all foreign sediment removed to ensure turbid free, representative, groundwater samples.

Wells will be developed utilizing surge bailing unless site specific conditions preclude its use. Any outside water introduced for development will be verified uncontaminated and chemically inert. All down hole bailer equipment will be de-contaminated prior to use. The well will be developed until within acceptable turbidity limits based on Imhoff cone measurement. All extracted fluids will be containerized until sampling for proper disposal.

Groundwater Sampling

Upon completion of development, the well will be allowed to stabilize for a period of time to be determined by the supervising professional. Before collecting a sample for analysis of dissolved constituents, the well will be purged until temperature, conductivity and ph stabilize.

Alternatively, at least three well volumes will be pumped or bailed from the well prior to sampling. If this technique is used, the well will be allowed to recharge to 80% of its original level prior to extracting a sample.

Groundwater samples will be collected using a teflon bailer. Sample containers will be supplied by the analytical laboratory and designed to prevent any loss of volatile constituents. Sample containers will be completely filled so there is no headspace present. Sample containers will be immediately transferred to a chilled storage container and maintained at 4 degrees Centigrade until delivery to the analytical laboratory.

After well purging or bailing at least 24 hours will allowed for stabilization prior to sampling for floating product. A transparent bailer will be used to extract a representative groundwater column from the top of the aquifer. The visible layer of floating product will be measured by gradations on the bailer or some other appropriate method.

Depth to Groundwater Measurement

At least 24 hours shall elapse between well bailing or purging and depth to groundwater measurement. Before commencing depth to groundwater measurement, the well will be checked for floating product. If significant floating product is present the depth measurement will be corrected by use of an appropriate mathematical calculation.

A datum will be established on or near the top of the well casing utilizing surveying equipment accurate to within 0.01 feet. All well datums will be established from a common point if possible. The depth to groundwater will be measured by use of an electronic sounding tape utilizing an audible alarm and marked in 0.1 foot increments.

APPENDIX 4

EQUIPMENT DECONTAMINATION AND DISPOSAL OF CONTAMINATED MATERIAL

Decontamination

All downhole tools and equipment will be decontaminated prior to use at each sample location. Most site equipment will be decontaminated using a portable steam cleaner. Equipment or materials not suitable for high temperature cleaning will be decontaminated utilizing a USEPA Region IX recommended method.

All downhole equipment or other tools, supplies and apparatus coming into contact with potentially contaminated material shall be decontaminated prior to transport off site.

Categorization and Disposal

All excavated soil, drill cuttings, generated fluids, equipment rinsate and contaminated disposable supplies will be containerized onsite until demonstrated to be nonhazardous or designated for proper treatment or disposal. Obviously contaminated material will be segregated from apparently clean material to avoid cross contamination.

Material in each container will be logged as to type and point of origin to facilitate proper categorization. Additional sampling will be performed as necessary to classify each lot.

All regulated material will be manifested and transported to proper disposal as required by law. Material verified non-hazardous will be dispensed with in an appropriate manner.