aqua science engineers inc.

September 10, 1992

# WORKPLAN
for
GROUNDWATER CONTAMINATION
ASSESSMENT, NO. 2571
at
The Oliver Rubber Company
1200 65th Street
Emeryville, California

Provided for:
Alameda County Health Care Services Agency
80 Swan Way, Room 200
Oakland, California


Submitted by:
AQUA SCIENCE ENGINEERS, INC.
2411 Old Crow Canyon Road, #4
San Ramon, CA 94583
(510) 820-9391

## I. INTRODUCTION

A. Statement of Work Scope:

A preliminary site investigation is to be conducted for the Oliver Rubber Company at 1200 and 1259 65th Street, Emeryville, California ("the site") as follow up to underground storage tank removal activities conducted on November 1, 1991 and June 24, 1992 performed by Aqua Science Engineers, Inc. (ASE). The site had two separate and distinctly different phases of tank pulling activities as directed by both the client and the Alameda County Health Care Services Agency (ACHCSA):

*1200 65th Street - removal of (2) 8, 000 gallon, underground, non-halogenated solvent tanks on November 1, 1991 (the tank closure report detailing ASE activities is dated December 5, 1991, entitled "Project Report - Underground Storage Tank Closure" of which a copy was sent to ACHCSA).*

*1259 65th Street - removal of (1) 1,000 gallon underground, Bunker Oil tank on June 24, 1992 (the tank closure report detailing ASE activities is dated July 16, 1992, and is entitled "Project Report - Underground Storage Tank Closure" of which a copy was sent to ACHCSA).*

The proposed Phase II site assessment activities have been initiated by the property owner in accordance with Regional Water Quality Control Board requirements. This Phase II site assessment will fulfill several needs:

1. It will define the horizontal and vertical extent of the plume, confirming or denying the presence and distribution of petroleum-contaminated soil and groundwater, in reference to the Bunker Oil tank,

2. It will further investigate the possibility of soil and groundwater contamination by non-halogenated solvents in reference to the (2) former 8,000 gallon non-halogented solvent tanks,

3. It will supply the site with two soil borings and three 2" groundwater monitoring wells, which will establish a known groundwater gradient and direction.

**ASE proposes: the drilling of five soil borings, installation of three 2" groundwater monitoring wells, soil sampling and analysis, well development, and sampling and analysis of groundwater from the monitoring wells.**

Of the three wells, one well (MW-1) will be installed within 10 feet from the former Bunker Oil tank in a down-gradient location; one well (MW-2) will be installed within 10 feet of the former non-halogenated solvent tanks pit in an assumed down-gradient location; the last well (MW-3) will be in an up-gradient location near the former 8,000 gallon tank pit. The two soil borings (SB-1 and SB-2) will define the lateral extent of soil contamination to the north and south of the former Bunker Oil tank. (see Figure 2, Site Plan, for locations of monitoring wells and soil borings).

Prior to commencement of field activities, this work plan will be approved by the City of Emeryville Fire Department, and well permits will be obtained from the Alameda County Flood Control and Water Conservation District, Zone 7.

B. Site Location:

The site is located at the corner of 65th Street at Hollis Street. The site is approximately 1/16 mile west of Interstate 80, and 1/16 mile south of Highway 13, within the City limits of Emeryville, California. The site is currently used as a manufacturing setting for rubber products. The topography of the immediate area is generally even and located at approximately 10 feet above mean sea level. (see Figure 1: Site Location Map).

C, D. Background and Site History:

Information regarding the known historic use of this site is unattainable at this time. Between November 1, 1991 and June 24, 1992, (3) underground fuel storage tanks were removed from the property by ASE; two of the tanks had 8,000 gallon capacities and contained non-halogenated solvents; one of the tanks had a 1,000 gallon capacity, and contained "Bunker Oil". Underground tank removal activities were documented by ASE in a reports referenced in the previous sections.

In reference to the (2) 8,000 gallon tanks, a total of 8 soil and 2 pit-level groundwater samples were collected from the excavation pit on two separate occasions. The tanks, upon inspection, had no cracks, holes or pits. However, when groundwater sample analysis identified detectable levels of contaminants, overexcavation was determined as means for remediation. Due to obstructions (R/R tracks, road, building), overexcavation of the tank pit was limited; however, based on the next set of analytical results, it did reduce the levels of soil-contamination significantly. Groundwater analysis showed only little change in the second set of results.

In reference to the (1) 1,000 gallon tank, a total of 11 soil samples were collected from the excavation and the stockpile during the removal activities. Based on inspection of the removed underground tank (corrosion, holes, pitting) and levels of compounds detected in the soils, it was determined that an unauthorized release/leak had occurred. The appropriate paperwork was generated by ASE, and overexcavation activities of the tank pit began. Approximately 36 cubic yards of petroleum-contaminated soil was overexcavated and stockpiled on plastic on site. Analytical testing of the excavation and stockpiled soils revealed detectable levels of contaminants.

## II. SITE DESCRIPTION

A. Vicinity Description and Hydrogeologic Setting:

The site rests on unconsolidated sediments primarily composed of clay and silt with some sand. The eastern shoreline of the San Francisco Bay is located approximately 1/16 mile west of the site. Shallow groundwater in the area is located approximately 10-15 feet below grade at the site, and is assumed to flow in a westerly direction towards the San Francisco Bay.

B,C. Vicinity, Site Maps:

Figure 1: Site Location Map taken from U.S. Geological Survey shows topographic elevations and area landmarks.

Figure 2: Site Plan derived from site sketches.

D. Existing Soil Contamination and Excavation:

Native soil from below the removed tank was sampled at the time of UST closures. Chemical testing of soil samples indicate petroleum contamination in the immediate vicinity of the removed storage tank. Analytical results and testing methods can be found in the tank closure reports referred to previously.

## III. PLAN FOR DETERMINING THE EXTENT OF SOIL CONTAMINATION ON SITE:

The soil investigation phase of this project will perform several duties. First, it will define the horizontal and vertical extent of the Bunker Oil plume, and will confirm or deny the presence of petroleum-contaminated soil by installing three soil borings surrounding the former tank (one of which will be modified to act as as 2' groundwater monitoring well in a down-gradient direction). Secondly, this plan will investigate the possibility of soil contamination at the former non-halogenated solvent tank area. Soil borings (which will later be modified to act as 2" monitoring wells), will be installed, and samples will be extracted and tested as described in a following section. This investigation includes hollow stem auger drilling, soil sampling and analysis, monitoring well construction, development, and groundwater sampling and analysis.

A. Describe Method/Technique For Determining Extent of Contamination Within the Excavations:

Contaminated soils were identified in the former underground storage tank excavations. The lateral extent of soil contamination was not determined at the time of tank removals. The focus of this investigation is to determine the possible presence of contamination in soils and groundwater with variation of five select locations. The five soil borings will be drilled to a depth of 10-12 feet below grade. One sample from each hole will be sent to the laboratory for analytical testing. Of the five soil borings, three will be drilled to a depth of groundwater plus 5-10 feet (approximately 25 feet deep), and will be fitted with a 2" groundwater monitoring well; two will be installed at a down-gradient location, and one in an up-gradient location. See Figure 2, Site Plan for locations of the soil borings (SB-1 and SB-2) and the monitoring wells (MW-1, MW-2, and MW-3).

B. Describe Sampling Methods and Procedures:
Boring Methods, Numbers, Locations, Abandonment:

To determine if site soils have been impacted by contaminates, five soil borings are proposed at the site (three of which will be finished as 2-inch diameter groundwater monitoring wells). Soil boring SB-1 and SB-2 will not be modified as wells; they will be backfilled with a cement slurry.

A Mobile Drill B-57 or CME 75 hydraulic rotary drill with 6.25" I.D. by 10.5" O.D. hollow stem augers will be used. Drilling will proceed to first encountered groundwater plus 5 to 10 feet, with an expected maximum of 25 feet depth below grade. Soil samples will be obtained on 5 foot intervals using a 2.5 inch dia. hammer driven California Modified split spoon sampler with brass sample sleeves.

Soil Classification and Sampling Methods:

Soil borings will be continuously logged on site by an ASE personnel geologist using the Unified Soil Classification System. Undisturbed soil samples will be taken at 5 foot intervals, starting at 5 foot depth, with a hammer driven California Modified split spoon sampler. The sampler will be advanced ahead of the auger tip by successive hammer blows. The samples will be collected for visual classification and chemical analysis. A total of three soil samples from each boring will be subject to the analytical test methods described above. The soil samples selected for chemical testing will be determined by the ASE geologist on-site at the time of sampling. Field screening with a portable OVM, color, odor, sheen, and physical characteristics will be used in the selection.

Samples designated for laboratory analysis will be sealed on the ends with aluminum foil, plastic caps and tape. The samples will be placed in an ice chest with dry ice and delivered to a State certified laboratory with chain of custody documents. A detailed description of sample collection and handling procedures is appended to this work plan (Appendix B: Quality Assurance and Quality Control Plan).

All sampling equipment will be cleaned in buckets with brushes and a TSP or Alconox solution, then rinsed twice with tap water. The drill rig and augers will be steam cleaned between wells and on site before departure. Rinsates will be contained on site in sealed, labeled drums.

Sampling and Analysis for Soils

| EPA METHOD | TANK SITE | NO. OF SAMPLES |
|---|---|---|
| 3510/8015 | Bunker Oil and N-H Solvent | 5 |
| 8020 | Bunker Oil | 3 |
| 5520 D&F | Bunker Oil | 3 |
| 5030/8015 | N-H Solvent | 2 |
| 7420 | N-H Solvent | 2 |
| 8240 | N-H Solvent | 2 |

C. Describe Methods/Criteria for Screening Soil and Storing Soil:

Soil samples obtained during drilling will be screened in the field via sensory perceptions and portable organic volatile meter. Cuttings generated during drilling will be stored on site, on plastic sheeting, and covered with plastic sheeting. On site treatment or off site disposal of contaminated drill cuttings is not a part of this work scope. The PRP will be advised of the soil sample results and soil treatment/disposal options. It is likely that a licensed hauler will be contracted to transport the soils as non-hazardous waste, under appropriate manifests, to a local landfill facility.

D. Security Measures:

The site is currently fenced around the entire perimeter. A working area will be established with barricades and warning tape around the drill rig and well location. Within the working area only authorized personnel will be allowed.

## IV. PLAN FOR DETERMINING GROUNDWATER CONTAMINATION:

A. Placement and Rational for Monitoring Well Placement

Based on reports of Regional Groundwater Flow, ASE assumes a groundwater gradient direction of west, towards the San Francisco Bay. As shown on Figure 2, Site Plan, MW-1 is positioned in an assumed down-gradient location, and will be used to investigate the petroleum contamination in respect to the former Bunker Oil tank. MW-2 is positioned in an assumed down-gradient location in respect to the former non-halogenated solvent tanks. This well will be used to define groundwater contamination (if any) by these former tanks. The final well, MW-3, will be positioned in an assumed up-gradient location and will be used solely to define the groundwater gradient of the site. Groundwater samples will be submitted for chemical analysis as described in a following section.

B. Monitoring Well Drilling and Installation Specifications:

The monitoring wells will be modified from the soil borings discussed in a previous section, and will be drilled and installed using equipment described above. The wells will be constructed of 2 inch flush threaded schedule 40 PVC casing, with up to 20 feet of .01" or .02" factory slotted well screen. The top of the well screen will extend up to 3 feet above encountered water level to account for seasonal fluctuations (see Figure 3, Typical Well Construction Diagram). The well casing will be inserted through the augers to a point a few inches above hole bottom where it will be suspended until the well is secured within the sand pack. Sand (#2 or #3) will be poured through the augers in one to two foot lifts up to about two feet above the top of the perforated casing. One to two feet of bentonite pellets will be placed above the sand, and activated with tap water. The seal will be finished up to the surface with tremmied cement/bentonite grout. The well heads will be secured with locking caps and concrete-vaulted, flush-mounted, water-tight well covers.

C. Groundwater Sampling Plans:

The wells will be developed by surging and bailing the groundwater into a DOT 17H drum until the water appears to be reasonably clear with a minimum of 5 well volumes removed. Groundwater will be checked for sheen and free product prior to purging and sampling. Free product and sheen will be measured with an acrylic bailer which will be

lowered slowly to the groundwater surface and filled about half full for direct observation. Water level measurements will be conducted and a survey of top of well casing elevations will be made.

Prior to obtaining water samples from the monitoring wells, not less than 5 well volumes of water will be bailed from the well. Samples will be obtained in a precleaned bailer and secured in 40 ml volatile organic analysis vials, placed in a cooler with wet ice and delivered to a State certified lab with Chain of Custody documents. A detailed description of sample collection and preservation procedures is appended to this document (Appendix B: Quality Assurance and Quality Control Plan).

samples of the groundwater well MW-1, MW-2, and MW-3 will be collected as described above and transported to a State of California Certified Laboratory for analysis by the following methods:

Sampling and Analysis for Groundwater

| EPA METHOD | MONITORING WELL | NO. OF SAMPLES |
|---|---|---|
| 3510/8015 | MW-1 | 1 |
| 8020 | MW-1 | 1 |
| 5520 D&F | MW-1 | 1 |
| 5030/8015 | MW-2, MW-3 | 2 |
| 7420 | MW-2, MW-3 | 2 |
| 8240 | MW-2, MW-3 | 2 |

## V. SITE SAFETY:

Prior to commencement of field activities, a site safety meeting will be held at a designated command post near the working area. Emergency procedures will be outlined at this meeting. The hazards of the known or suspected chemicals of interest will be explained. Level D personal protection is the anticipated maximum amount of protection needed. A site safety plan which conforms to Part 1910.120 (i) (2) of 29 CFR will be on site at all times during performance of this project. A working area will be established with barricades and warning tape to delineate the zone where hard hats and steel toed shoes must be worn, and where unauthorized personnel will not be allowed. If, during drilling, fuel product odors are deemed to be substantial, half face respirators with organic vapor cartridges will be worn.

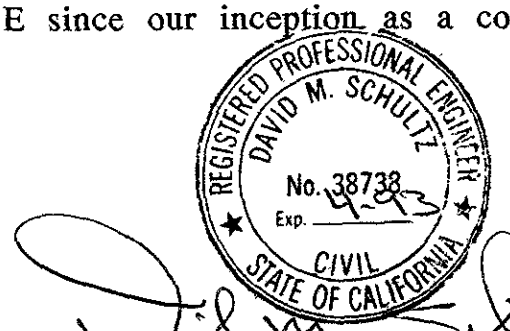
A nearby hospital will be designated in the site safety plan as the emergency medical facility of first choice. A map with a course plotted to the hospital will be on site. A copy of the site specific Health and Safety Plan is appended to this report (Appendix A: Health and Safety Plan).

Reporting

A complete and final report of methods, findings, and conclusions from work proposed herein will be submitted to the client for forwarding to the appropriate agencies. The report will be submitted under the seal of a State Registered Civil Engineer, Mr. David Schultz (#38738). Mr. Schultz has implemented hundreds of tank removal, site investigation, and remediation projects for ASE since our inception as a company in 1983.

Respectfully submitted,

AQUA SCIENCE ENGINEERS, INC.



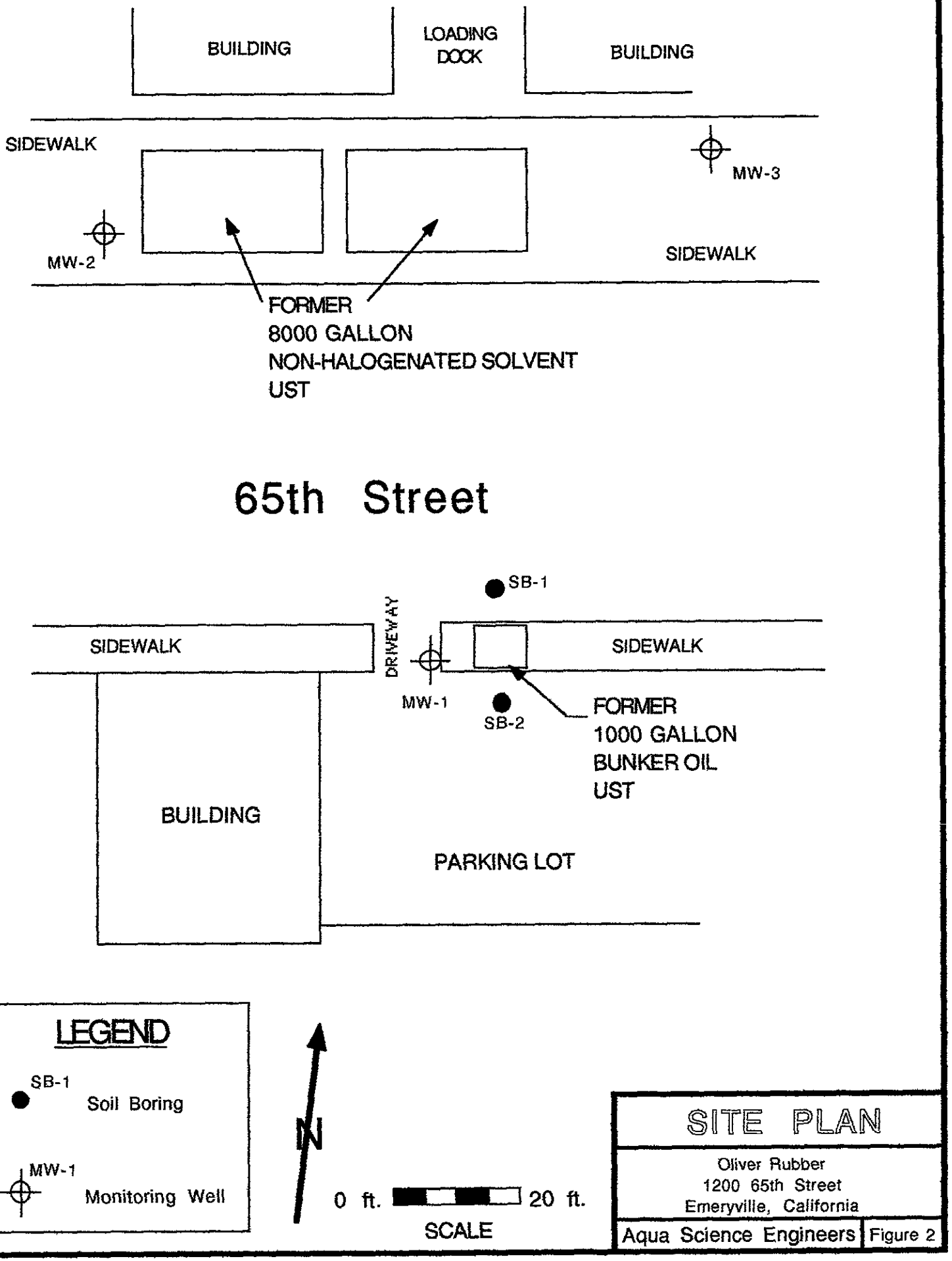

David Allen
Project Manager

David M. Schultz
Principal Engineer
P.E. No. 38738


# SITE LOCATION MAP

Oliver Rubber
1200 65th Street
Emeryville, California

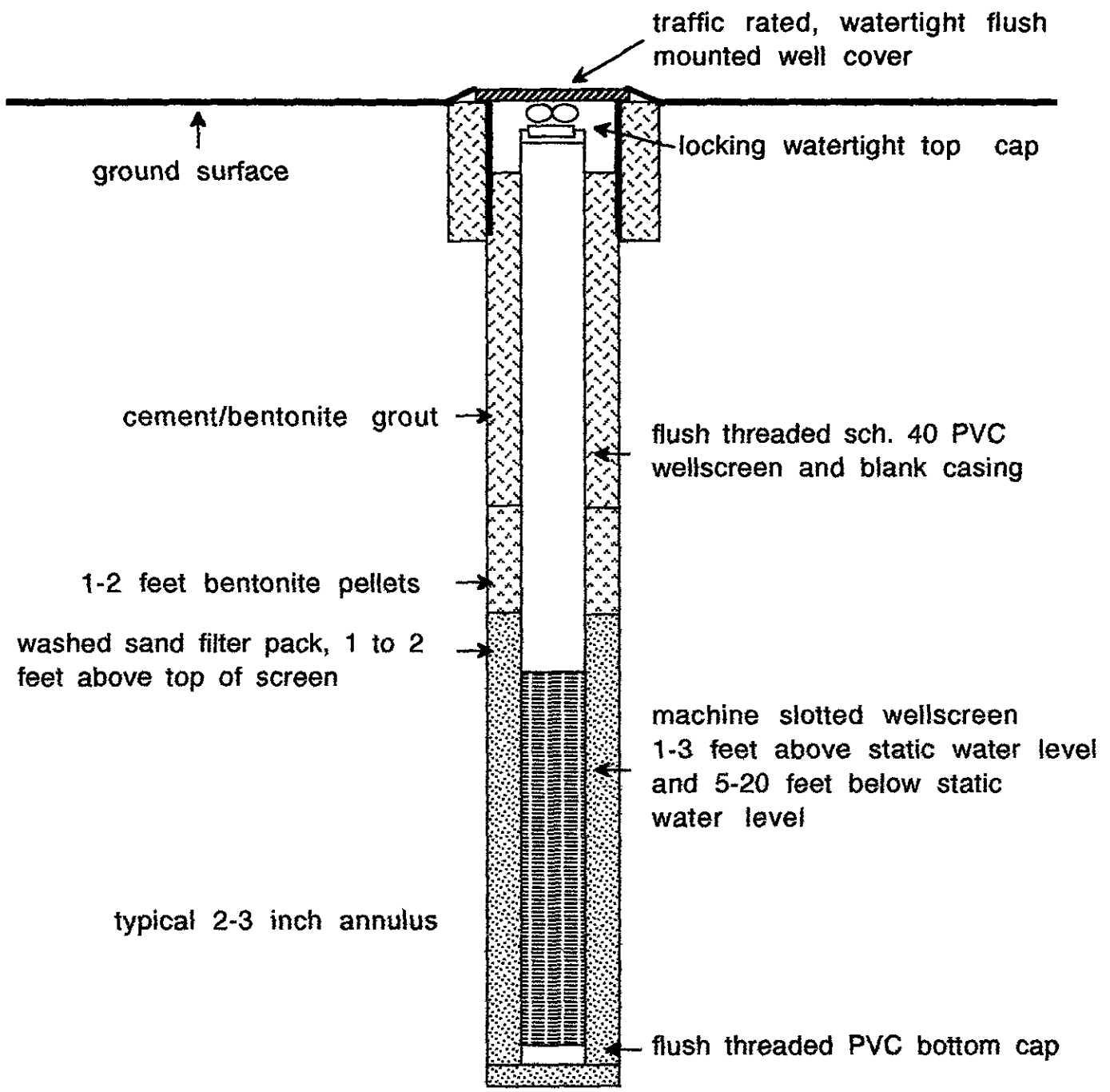
Aqua Science Engineers | Figure 1




# SITE PLAN

Oliver Rubber
1200 65th Street
Emeryville, California

Aqua Science Engineers | Figure 2




TYPICAL
MONITORING WELL CONSTRUCTION
IN CROSS SECTION

Aqua Science Engineers | Figure 3

# APPENDIX A

Health and Safety Plan

# HEALTH AND SAFETY PLAN

*for:*

Oliver Rubber Company
1200 65th Street
Emeryville, California 94607

*prepared by:*

Aqua Science Engineers, Inc.
2411 Old Crow Canyon Road, #4
San Ramon, California 94583
(510) 820-9391

AQUA SCIENCE ENGINEERS, INC.
HEALTH & SAFETY PLAN
for the
OLIVER RUBBER JOBSITE

A. GENERAL DESCRIPTION

Site: 1200 65th Street, Emeryville, California

Work Scope: AQUA SCIENCE ENGINEERS WILL INSTALL A TOTAL OF TWO SOIL BORINGS AND THREE GROUNDWATER MONITORING WELLS AT THE ABOVE REFERENCED SITE.

SAFETY POLICY:

This Health and Safety Plan is written specifically for the Oliver Rubber jobsite. All persons on site will follow OSHA safe operating practices as outlined in 29 CFR 1910 and 1926, as well as established guidelines from their respective companies or organizations.

Plan Prepared by: David Allen Date: 9/4/92
Plan Approved by: David Schultz Date: 9/10/92

Proposed Start Date: September 14, 1992

Overall Hazard Level: Serious: Low: XXX
Moderate: XXX Unknown:

Project Organization:
Site Manager for A.S.E.: David Allen
A.S.E. Safety Officer: Steve DeHope
Other Potential A.S.E Personnel: Bill Lachmar

B. SITE/WASTE CHARACTERISTICS

Waste Type(s): Solid: XXX Sludge: Liquid: XXX Gas:

Characteristics: PETROLEUM RESIDUALS, TOXIC

Site Parameter: THE SOIL BORING LOCATIONS AND ANY STOCKPILED MATERIAL ARE IDENTIFIED AS EXCLUSION ZONES. A MINIMUM BOUNDARY OF THREE FEET SURROUNDING BOTH IS TO BE MAINTAINED IN AS MUCH AS IS POSSIBLE.

C. HAZARD EVALUATION

CHEMICAL HAZARDS

Potential chemical hazards include skin and eye contact or inhalation exposure to potentially toxic concentrations of hydrocarbon vapors. The potential toxic compounds that may exist at the site are listed below, with descriptions of specific health effects of each. The list includes the primary potential toxic constituents of gasoline and waste oil known to be on site. Exposure levels and symptoms are taken from the NIOSH Pocket Guide to Chemical Hazards.

1. BENZENE

a. Colorless, clear, highly flammable liquid with characteristic odor.
b. High exposure levels may cause acute restlessness, convulsions, depression, respiratory failure. BENZENE IS A SUSPECTED CARCINOGEN.
c. Permissible exposure level (PEL) for a time weighted average (TWA) over an eight hour period is 1.0 ppm.

2. TOLUENE

a. Colorless liquid with a benzene-like odor.
b. High exposure levels may cause fatigue, euphoria, confusion, dizziness. TOLUENE IS LESS TOXIC THEN BENZENE.
c. PEL for a ten hour TWA is 100 ppm.

3. XYLENE

a. Colorless, flammable liquid with aromatic odors.
b. high exposure levels may case dizziness, drowsiness, narcosis.
c. PEL for a ten hour TWA is 100 ppm.

4. ETHYLBENZENE

a. Clear, colorless, highly flammable liquid with characteristic odor.
b. High exposure levels may cause irritation to skin, nose and throat, dizziness, constriction in chest, loss of consciousness, respiratory failure.
c. PEL for an eight hour TWA is 100 ppm.

5. LEAD
(Lead Arsenate)

a. Odorless, colorless solid with properties that vary depending upon specific compounds.
b. High exposure levels may cause nausea, diarrhea, inflamed mucous membranes, abdominal pains, weakness. LEAD IS A SUSPECTED CARCINOGEN.

c. PEL for an eight hour TWA is .05 milligrams per cubic meter (airborne).

ALL SUBSTANCES AS THEY EXIST ON SITE ARE EXPECTED TO BE STABLE.

PHYSICAL HAZARDS

Under no circumstances will anyone climb on any drill cutting material piles. Personnel shall maintain the maximum distance possible from the borings while performing their activities. Other on-site hazards include physical injuries due to the proximity of workers to engine-driven heavy equipment and tools. Heavy equipment used during drilling may include the drill rig or other equipment as part of soil sampling and subsequent well installation operations. Only trained personnel will operate machines, tools and equipment; all will be kept clean and in good repair. Minimum safety apparel required around heavy equipment will include a hardhat, steel-toed boots and hearing conservation devices. ALL WORK WILL BE PERFORMED IN ACCORDANCE WITH OSHA GUIDELINES.

Inspections of the well locations, the adjacent areas, and protective systems are to be made by a qualified person while personnel are on site. Attention will be made to note if any evidence of potential cave-in exists.

1. USE SAFETY EQUIPMENT, MASK RESPIRATORS WITH NIOSH APPROVED C-21 CARTRIDGES FOR ORGANIC VAPORS, AS NECESSARY.

2. HAVE AT LEAST ONE DRY CHEMICAL MODEL PA-200 A-B-C FIRE EXTINGUISHER PRESENT.

LEVEL OF PROTECTION

A contamination Reduction Zone (CRZ) will be maintained and adjusted as work proceeds and moves around the site. The workers on site will wear level 'D' protective clothing. (This protection level may be upgraded after on-site conclusions of data are completed). THE LEVEL OF PROTECTION FOR PERSONNEL WORKING IN THE AREA WILL BE UPGRADED IF; the organic vapor levels in the operator's breathing zone exceeds 5 ppm above background levels continuously for more then five minutes. In this event, personnel protective equipment will include full face respirators with double-cartridge filters for organic vapors and particulates, in addition to hardhat, steel-toed boots and coveralls. If work proceeds in an environment where vapor concentrations exceed 200 ppm, a self contained breathing apparatus or airline respirator will

be utilized by the personnel. Levels of Protective Clothing are defined on the following pages as described in the "EPA Standard Operating Safety Guidelines":

LEVEL A PROTECTION

Components:

1.) Pressure-demand, supplied air respirator that is MSHA and NIOSH approved. Respirators may be pressure demand, self contained breathing apparatus (SCBA), or pressure demand, airline respirator with an escape bottle for atmospheres with an extreme IDLH.

2.) Fully encapsulating chemical resistant suit.

3.) Inner, chemical resistant gloves.

4.) Disposable gloves and boot covers, worn over the fully encapsulating suit.

5.) 2-way radio communications is highly recommended.

LEVEL B PROTECTION

Components:

1.) Pressure-demand, supplied air respirator that is MSHA and NIOSH approved. Respirators may be pressure demand, self contained breathing apparatus (SCBA), or pressure demand, airline respirator with an escape bottle for atmospheres with an extreme IDLH.

2.) Chemical resistant clothing which includes overalls and long sleeved jacket or, hooded one or two piece chemical splash suit or disposable chemical resistant one piece suit..

3.) Outer chemical resistant gloves.

4.) Inner chemical resistant gloves.

5.) Chemical resistant, steel toed and shank boots.

6.) Disposable chemical resistant boot covers.

7.) Hardhat.

8.) 2-way radio communications is highly recommended.

LEVEL C PROTECTION

Components:

1.) Air purifying respirator, full face, with twin cartridge or cannister equipped filters, that are MSHA and NIOSH approved.

2.) Chemical resistant clothing which includes coveralls or, hooded one-piece or two-piece chemical splash suit or chemical resistant hood and apron; disposable chemical resistant coveralls.

3.) Outer chemical resistant gloves.

4.) Inner chemical resistant gloves.

5.) Chemical resistant, steel toed and shank boots.

6.) Disposable chemical resistant boot covers.

7.) Hardhat.

8.) 2-way radio communications is recommended.

LEVEL D PROTECTION

Components:

1.) Coveralls.

2.) Gloves.

3.) Leather boots, shoes or chemical resistant, with steel toe and shank.

4.) Safety glasses or chemical splash goggles.

5.) Hardhat or face shield.

SITE ENTRY PROCEDURES

Any personnel entering the site will observe all conditions set forth by the owners/operators of the property, including vehicle travel speeds, restricted areas and conduct. Eating, drinking, smoking and other practices which increase the probability of hand-to-mouth transfer of contamination is prohibited in the work zone. All field personnel will be instructed to thoroughly wash their hands and face upon leaving the work area for breaks or cessation of day's activities.

DECONTAMINATION PROCEDURES

If required, equipment and personnel decontamination areas will be designated by the Project Manager at the start of the project. To prevent the transfer of contamination from the work site into clean areas, all tools will be cleaned adequately prior to final removal from the work zone. Disposable protective clothing such as Tyvek coveralls, latex gloves, boot covers, etc. will be changed on a daily basis or at the discretion of the Project Manager on site. All disposable protective clothing will be put into plastic bags and disposed of in a proper manner. All respirator cartridges will be discarded and replaced with fresh units on a daily basis, disposal will be in the same manner as the protective clothing. Drill cuttings soil will be stockpiled in an area designated by the Project Manager, to be handled as agreed upon in the scope of work contract with the client.

In the event of a medical emergency, the injured party will be taken through decontamination procedures, if possible. However, the procedures may be omitted when it may aggravate or cause further harm to the injured party. member of the work team will accompany the injured party to the medical facility to advise on matters concerning chemical exposure. The injured person will not transport themselves to the medical facility!

Personnel Protection Level will be Level 'D'. Protective clothing levels may be upgraded in the event that on site conclusions determine a greater then anticipated danger to personnel.

Site Entry: BARRICADES, CONES, OR BANNER GUARD MAY BE ERECTED TO CONTROL FOOT TRAFFIC AWAY FROM THE WORK ACTIVITY.

Decontamination-

Personnel and Equipment: IF REQUIRED, PERSONNEL AND EQUIPMENT WILL BE DECONTAMINATED A PER USEPA STANDARD OPERATING SAFETY GUIDELINES. A SMALLER MODIFIED DECONTAMINATION LINE MAY BE USED DUE TO SPACE RESTRICTIONS.
Work Limitations (time, weather):

NONE ARE ANTICIPATED, HOWEVER, PERSONNEL WORKING ON SITE MAY EXPERIENCE ELEVATED TEMPERATURES DURING THE WORK DAY. IN THE EVENT THAT AMBIENT TEMPERATURES REACH OR EXCEED 80 DEGREES FAHRENHEIT, THE FOLLOWING GUIDELINES ARE RECOMMENDED.

1. Periods of work should be reduced to no less then one hour time frames and separated by breaks intended to reduce personnel stress due to reduced natural ventilation from wearing protective clothing.

2. All personnel wearing level C protective clothing or greater, will be subject to medical monitoring of body temperature after work periods, by the following guidelines;

a. Heart Rate (HR) should be measured by counting the radial pulse rate for 30 seconds and doubling count for the correct pulse rate. This should be done as early as possible in the resting period. The HR at the beginning of the rest period should not exceed 110 beats per minute.
If the HR is higher, the next work period should be shortened by 10 minutes, while the length of the rest period remains the same. If the HR is 100 beats per minute at the beginning of the next rest period, the following work period should be shortened by an additional 10 minutes.

b. Body temperatures should be measured orally with a clinical thermometer as soon as possible in each resting period. Oral Temperatures (OT) should not exceed 99 degrees Fahrenheit. If it does, the next work period should be reduced by 10 minutes while the length of the resting period remains the same. If the OT exceeds 99 degrees Fahrenheit at the beginning of the next work period, the following work period should be reduced by an additional 10 minutes. OT should be measured at the end of each rest period to ensure that the body's temperature has dropped below 99 degrees Fahrenheit.
Body Water Loss (BWL) from sweating, could result in dehydration and further complications and stress on personnel working in protective clothing under adverse weather conditions. It is strongly recommended that plenty of stress relief beverages be available on site to replace body fluids. Commercial drink mixes that provide electrolyte balancing solutions or water are adequate for replacing body fluids.

Alternate methods of heat stress reduction can be made available such as,

Portable showers or hose-down facilities,
Shelter cover to protect against direct sunlight,
Rotating teams of personnel wearing protective clothing,
Performing extremely arduous tasks early in the workday.

EMERGENCY INFORMATION

In the event of an injury or suspected chemical exposure, the first responsibility of the project Manager will be to prevent any further injury. This objective will normally require an immediate stop to work until the situation is remedied. The Project Manager may order the evacuation of the work party. Other primary responsibilities in the event of an accident will be the first aid and decontamination of the injured team member(s). The injured party will be moved to a designated safe area and initial first aid will be rendered.

Employees are asked to make every effort and take personnel responsibility to prevent accidents involving machinery or any other aspect of the job, either by individual action or by notifying the Project Manager immediately of any unsafe condition that may exist.

In the event of an unexpected hazardous material discovery on site, the following actions will be taken by any employee involved;

1. The person having uncovered the unexpected material will notify the Project Manager and other workers of the danger. The site will be cleared of personnel if deemed necessary by the Project Manager. If site evacuation is required, appropriate local agencies such as the Fire Department or Health Department will be notified as well.

2. Immediate action will be taken to contain the hazardous material, provided the workers involved are properly attired with adequate protective clothing to avoid exposure.

3. Proper containment procedures will be determined for the hazardous material encountered prior to cleanup commencing. All personnel involved in the containment effort will be properly protected to prevent exposure. Backup personnel will be similarly protected while monitoring the work being done for any additional dangers.

4. The container(s) will be staged on site, away from the major activity areas and in such a way that if loss of containment occurs, the material will be withheld from further spread by a secondary containment berm or vessel.

5. The owner or agent controller of the property will be notified promptly of the incident and will be apprised as to the options available for proper disposal.

EXPOSURE SYMPTOMS AND FIRST AID

| EXPOSURE ROUTE | SYMPTOMS | FIRST AID |
|---|---|---|
| **Skin** | Dermatitis, itching redness, swelling | Wash immediately with soap and water contact ambulance if evacuation is needed. |
| **Eyes** | Irritation, watering | Flush with water, transport directly to emergency room, if necessary. |
| **Inhalation** | Vertigo, tremors | Move person to fresh air, cover source of exposure. |
| **Ingestion** | Nausea, vomiting | Call Poison Control Center, DO NOT INDUCE VOMITING, transport to medical facility. |

Local Resources:
HEALTH AND SAFETY CONTACT FOR ASE:

David Allen
Office: (510) 820-9391

Police : **911**
Fire

POISON CONTROL: SF (415) 476-6600
SJ (800) 798-0720

ROUTE TO NEAREST HOSPITAL
Go East on 65th Street
Turn Left on San Pablo Avenue
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Continue on Ashby Avenue to Colby Street (1 mile)

## ALTA BATES-HERRICK HOSPITAL (510) 540-1303

**3001 Colby Street, Berkeley, CA**

AQUA SCIENCE ENGINEERS INC.

HAZARDOUS MATERIALS SITE SAFETY PLAN

The below signed personnel have read this plan, understand it's contents and agree to follow the guidelines set forth;

| EMPLOYEE NAME (print) | SIGNATURE | DATE |
|---|---|---|

# APPENDIX B

Quality Assurance and Quality Control Plan

# Quality Assurance and Quality Control Plan

General Guidelines -

The remedial Investigation (RI) Quality Assurance/Quality Control (QA/QC) program is intended to facilitate the acquisition of accurate and reliable data. Environmental data gathered during the RI will be collected and analyzed following procedures described in the QA/QC Program.

The following general field and laboratory procedures will be implemented to ensure that QA/QC objectives are met:

1.0 Field QA/QC Plan

The Field QA/QC Plan includes protocols for:

- √ Data Collection
- √ Equipment Decontamination
- √ Soil Sampling
- √ Groundwater Sampling
- √ Groundwater Monitoring
- √ Well Development

The following descriptions are general summaries of the QA/QC procedures for field activities. Detailed sampling procedures are described in the attached protocols. This section relates to sampling procedure QA/QC.

All information pertinent to the field investigations will be kept in a field log book or sheets. Information to be documented includes at least the following:

- √ Sample numbers
- √ Locations of sample collection
- √ Soil boring and well numbers as applicable
- √ Depths at which samples were taken
- √ Names of the sampling personnel
- √ Dates and times of collection
- √ Purpose of sample
- √ Sample distribution (e.g., laboratory, archive, etc.)
- √ Field observations

Other pertinent filed measurements such as PID readings, pH, weather, and any other conditions that may effect the sample should be included.

Samples will be placed in laboratory prepared containers, appropriate for the analysis required.

## 2.0 Sample Preservation

Sample containers will be stored in a cool place for transportation to the site. All samples will be taken in a manner as to completely fill the container provided. Soil samples placed in stainless steel or brass tubes will have the ends covered with aluminum foil and closed with a plastic airtight cap. Water samples will be sealed with a teflon lined screw-on type top, in such a way, that no air is trapped within the sample container. All samples will be placed immediately into a cooler and kept chilled with chemical ice sealed in plastic, until delivered to the laboratory.

## 3.0 Chain-Of-Custody Procedures

### 3.1 Sample Labels

Each sample container will be labeled prior to filling to prevent misidentification. The label will contain at least the following information:

- √ Sample number which uniquely identifies the sample
- √ Project Title or Number
- √ Location of sample collection
- √ Soil boring or well number if applicable
- √ Name of collector
- √ Date and time of collection
- √ Type of analysis requested

### 3.2 Chain-of-Custody Record and Sample Analysis Request Form

A Chain-of-Custody record for each container or sample will be used to track possession of the samples from the time they were collected until the time they were released to the Laboratory for analysis.

The Chain-of-Custody record will contain the following information:

- √ Site Name
- √ Signature of collector
- √ Date and time of collection
- √ Sample Identification number(s)
- √ Number of containers in sample set
- √ Name and signature of persons, and the companies or agencies they represent, who are involved in the chain of possession
- √ Inclusive dates and times of possession
- √ Requested analysis for each sample
- √ Type of material found in each sample container

## 3.3 Delivery of Samples to the Laboratory

Samples will be delivered to the laboratory on a daily basis or as described in the scope of work for each specific project. All samples will be chilled as described in Section 2.0. The laboratory shall note on the Chain-of-Custody form the date and time of receipt.

## 4.0 Laboratory QA/QC Plan

Soil or groundwater samples will be submitted to a State Certified Hazardous Waste Laboratory for chemical analysis of hazardous constituents. Established QA/QC procedures for analytical operations will include sample custody procedures, standards of analytical accuracy, analysis of matrix spikes and method blanks, data reduction, verification of raw analytical data, and maintenance of control charts to monitor analytical performance. These QA/QC procedures are outlined in the laboratory QA/QC plan which is available upon request. Organic chemical analysis will be performed in accordance with standard procedures established by the USEPA under 40 CFR Part 136, October 1984. The laboratory is periodically evaluated through external performance audits conducted by the EPA and DHS using QC labs.

Provided the data base for a particular site is of sufficient size, statistical techniques may be employed for data verification.

# SOIL SAMPLING PROTOCOL

1. Sample Collection During Drilling Activities

A proposal will be submitted to the lead Regulatory Authority with proposed boring/sampling locations. The exact location and number of borings at each site will be determined in the field by the Project Manager/Geologist/Engineer.

Prior to arriving at the sample site, the drill augers and sampling equipment will be steam cleaned. The cleaning will be conducted on-site on all sampling equipment between each sample interval.

Soil samples will be obtained using a California Split-spoon sampler containing three or four six inch long, two inch diameter brass tubes. The sampler will be driven 18 inches ahead of the hollow stem auger by a 140 pound hammer with a 30 inch drop in accordance with American Society for Testing and Materials (ASTM) Methods D 1586-84 for split barrel sampling of soil and D 1587-83 for thin walled tube sampling of soils. The blows required to drive the sampler each six inch interval will be recorded on the boring log. The sampler will be removed from the boring and opened to reveal the brass tubes. The bottom tube or middle tube will be capped with aluminum foil and plastic end caps, taped and labeled with the following information; date, time, project ID, sample ID, name of sampler and type of analysis. This sample will be immediately placed into a cooler containing chemical "blue" ice sealed in plastic bags, or dry ice. The samples will be delivered to a state certified laboratory under chain-of-custody procedures as soon as possible.

Soil samples will be collected in 5 foot intervals, at significant changes in lithology, and at intervals of obvious contamination in order to develop a complete profile of soil contamination. The soil samples shall not be composited. Soil borings will extend through the entire interval of contaminated soil and will terminate if saturated soil is encountered.

2. Sample Collection During Tank Removal

Soil samples will be collected as soon as possible after removal of the tank. Where feasible, all preparations for soil sampling will be made prior to tank removal. Soil samples collected fro a backhoe bucket or directly from the excavation floor will be collected in a thin-walled stainless steel or brass cylinder at least three inches long by one inch in diameter. From 3 to 24 inches of soil will be removed from the immediate surface area where the sample is to be taken and the cylinder then pounded into the soil with a wooden mallet, bulk density driver, or other decontaminated driving device. No head space will be present in the cylinder once the sample is collected. Care will be taken to avoid contamination of both the inside and outside of the cylinder as well as it's contents.

Once the sample is collected, each end of the cylinder will be covered with aluminum foil or teflon tape and then capped with a polyethylene lid, and labeled. The sample will then be placed in an ice chest containing frozen chemical "blue" ice or dry ice for delivery to a state certified laboratory. Sample identification, storage, and transportation will be conducted as outlined in the previous section.

3. Sampling from Soil Piles or Shallow Soil Pits

Soil samples will be collected and transported from excavated material in the manner described in the previous section, however, a backhoe will not be utilized. If composite samples are to be collected, four brass cylinders will be collected for every 50 cubic yards of material to be sampled unless otherwise specified by the lead regulatory agency. The samples will be composited by the state certified analytical laboratory personnel prior to testing.

# GROUNDWATER SAMPLING PROTOCOL

Prior to arriving at the sampling site, all sampling equipment will be washed with laboratory grade detergent or equivalent, and rinsed twice with tap water and once with deionized water. The sample washing procedure will be carried out on site before sampling of other monitoring wells, in such cases where more than one monitoring well is being sampled, with the sampling device.

Immediately prior to sampling, the depth to water (DTW) level in the well will be recorded. The thickness of product on top of the groundwater, if present, will be measured using an interface probe or clear graduated bailer.

If free product is detected, analysis of groundwater for dissolved product will not be conducted. The product will be sampled for content, if the collection of a sample is possible. Before collecting at least two groundwater samples from each well, the well will be purged until indicator perimeters (temperature, pH, or conductivity) stabilize. This will entail the removal of at least four or five well casing volumes by bailing or pumping. The indicator perimeter will be taken both before and after purging of each well casing volume. Once the well is purged and well water chemistry has stabilized, a sample will be collected after the water level approaches 80 percent of it's initial elevation. Where water level recovery is slow, the sample will be collected after stabilization is achieved and enough water is present to fill sample containers.

Cross contamination from transferring pumps from well to well will be avoided by utilizing dedicated equipment. Where this is not feasible, thorough cleaning of equipment will be performed between sampling rounds. Sampling will proceed from the least contaminated to the most contaminated well, if information is available before sample collection, or if it is indicated by field evidence.

Groundwater samples will be collected with a teflon bailer equipped with a bottom emptying device. Duplicate samples will be transferred to vials or containers that meet Regional Board Specifications. Groundwater from the bailer will be transferred to the sample container by allowing the fluid to flow slowly along the sides of the vessel. All containers will be filled above the top of the opening to form a positive meniscus.

No head space should be present in the sample container once it is sealed. If it is not possible to collect a sample without head space, the problem will be noted in the field technician's sampling log.

Immediately following sample collection, samples will be labeled and stored in an ice chest containing frozen chemical "blue" ice sealed in plastic bags. Sample labels will contain the following information; date, time, project ID, sample ID, name of sampler, and type of analysis. All samples will be transported to a state certified laboratory under chain-of-custody procedures, as soon as possible.