# SITE INVESTIGATION AND SOIL REMEDIATION

# AT

# 1600 63RD STREET
# PETERSON MANUFACTURING PARCEL
# EMERYVILLE, CALIFORNIA

# HEALTH AND SAFETY PLAN

PREPARED FOR

WAREHAM DEVELOPMENT COMPANY
SAN RAFAEL, CALIFORNIA

PREPARED BY

**ENGINEERING-SCIENCE**
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APRIL 1988

ES ENGINEERING-SCIENCE

NC065

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## HEALTH AND SAFETY PLAN

Prepared for

WAREHAM DEVELOPMENT COMPANY
San Rafael, California

April 1988

Prepared by

ENGINEERING-SCIENCE, INC.
600 Bancroft Way
Berkeley, California 94710

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EMERYVILLE, CALIFORNIA

# HEALTH AND SAFETY PLAN

Prepared by:

| | |
|---|---|
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Reviewed and Approved by:

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# CHAPTER 1

## PURPOSE AND POLICY

The purpose of this plan is to establish personnel protection standards and mandatory safety practices for remedial activities conducted on the Peterson Tallow Manufacturing Company site at 1600 63rd Street, Emeryville, California. The plan also provides for contingencies that may arise during field investigations and operations.

The provisions of this plan are mandatory for all remedial work. All Engineering-Science (ES) personnel who engage in on-site remedial work shall be familiar with this plan and comply with its requirements. Any supplemental plans used by subcontractors shall conform to this plan as a minimum.

A site description and scope of work summary for the project is provided in Chapter 2. Chapter 3 presents the project team organization, personnel responsibilities, and lines of authority. Training and medical monitoring requirements are contained in Chapter 4. Chapter 5 presents a safety and health risk analysis. Chapter 6 contains the emergency procedures and list of emergency contacts. Site-specific requirements for levels of protection are included in Chapter 7, and air monitoring procedures are provided in Chapter 8. Site control measures, including designation of site work zones, are contained in Chapter 9, while Chapter 10 provides detailed site-specific decontamination procedures. Chapter 11 contains the health and safety plan acceptance form. Site forms are provided in Appendix A and the ES annual medical monitoring program is described in Appendix B.

# CHAPTER 2

# SITE DESCRIPTION AND SCOPE OF WORK

## SITE DESCRIPTION

The Peterson Manufacturing Company property is located between 63rd and 64th Streets in western Emeryville, California. Figure 2-1 is a site location map. Mr. Adolf Peterson purchased the property in the early 1900's and by 1914 had constructed the Peterson Manufacturing Company, a tallow manufacturing plant. The plant operated for over 70 years and underwent many modifications. In 1987, the plant was shut down, and Wareham Development purchased the property. The site plan for the Peterson Manufacturing Company at the time of closure is presented in Figure 2-2.

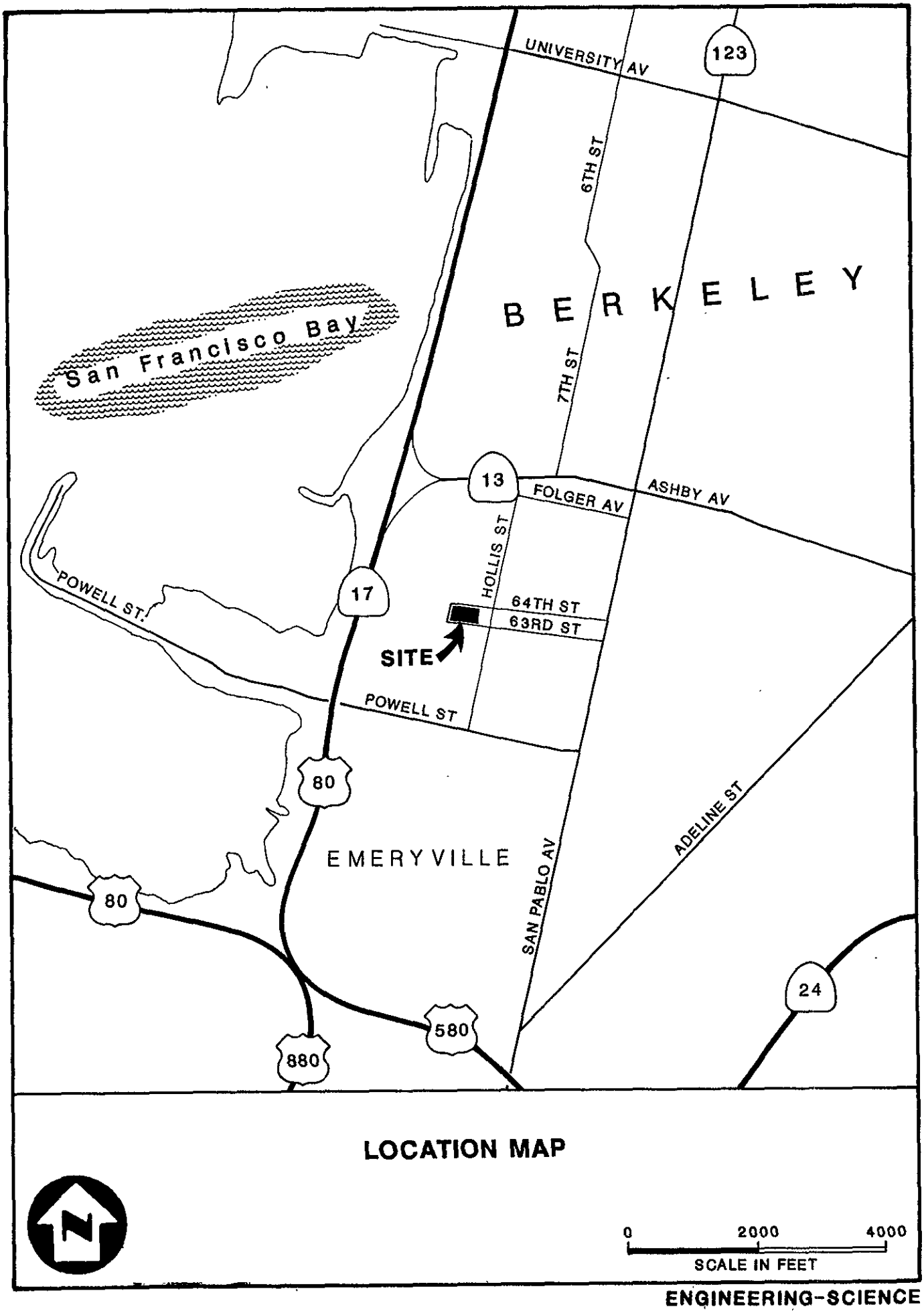
## SITE CONTAMINATION

Potential sources of contamination on the property include four in-place, underground storage tanks (USTs), two former UST sites, approximately ten aboveground storage tanks, four or more sumps, and two large in-ground containment areas, including a 20,000-gallon trough and a large rectangular concrete vat. Compounds stored in the tanks were used in tallow manufacturing processes and plant operations. The compounds include hexane, gasoline, diesel fuel, boiler fuel #2, and boiler fuel #6.

Site contaminant characterization work performed by Engineering-Science, Inc. (ES) to date has included the following:

- Ten soil boreholes logged and sampled;
- Sampling of four underground storage tanks;
- Sampling of seven aboveground storage tanks;

FIGURE 2-1




**LOCATION MAP**

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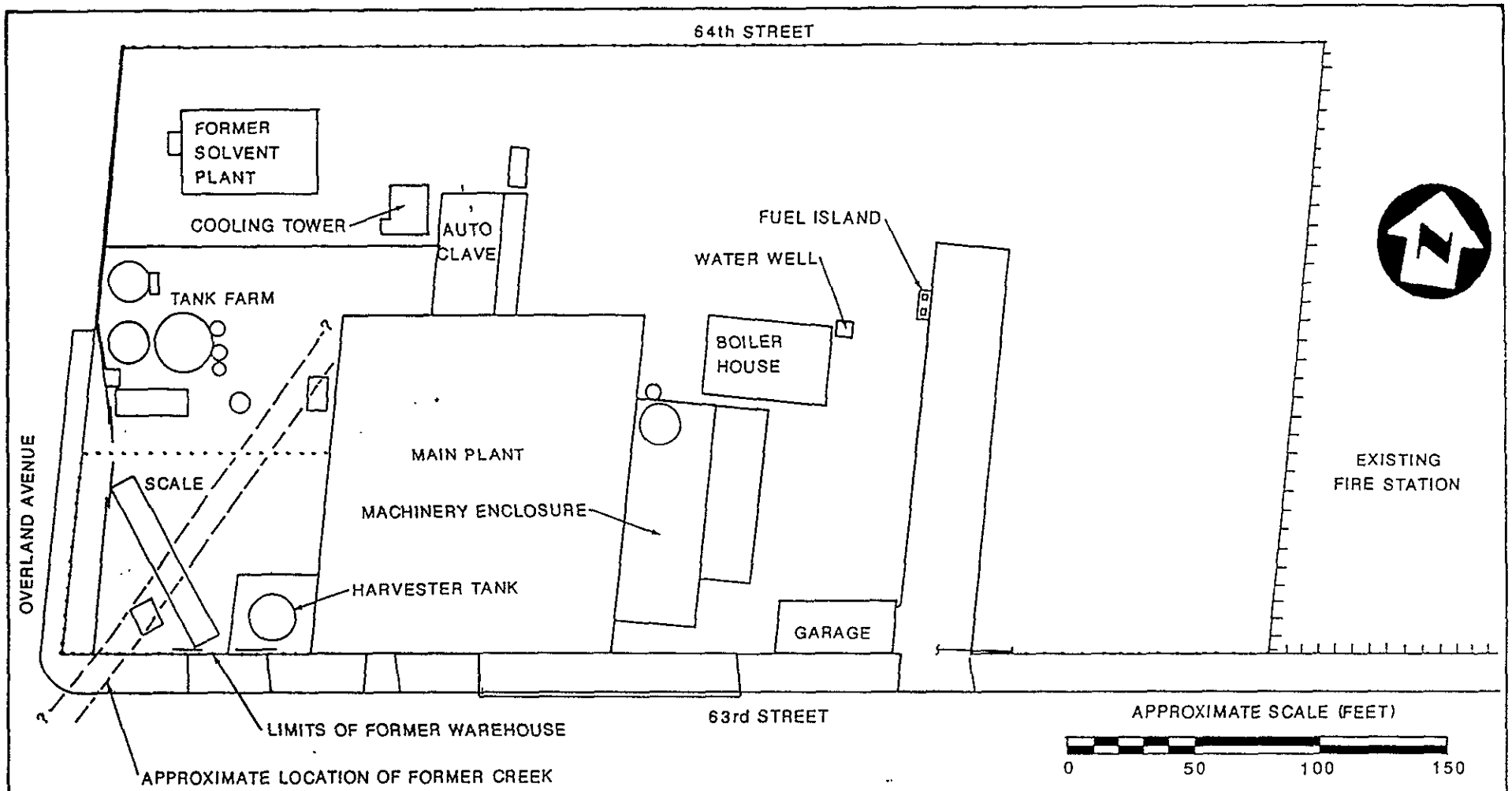



**SITE PLAN**
**PETERSON MANUFACTURING CO. PARCEL**
**EMERYVILLE, CALIFORNIA**

Base: "Plot Plan", by John F. Tulloch, Engineers, Contractors, dated January 24, 1968.

ENGINEERING-SCIENCE

FIGURE 2-2

- Sampling of two sumps;
- Sampling of trough and concrete vat; and
- Installation of three groundwater monitoring wells, including the sampling of soil and groundwater.

In addition, six soil boreholes were completed in a previous study (Reference 1). Locations of boreholes are shown in Figure 2-3. Table 2-1 presents analytical results of all soil samples collected in the area to date. Table 2-2 summarizes available information on former and existing USTs including tank content description, analyses performed, analytical results, and tank history. Table 2-3 contains analytical results of groundwater samples from three groundwater monitoring wells and one abandoned water well. Table 2-4 contains information on sumps, troughs, and aboveground storage tanks.

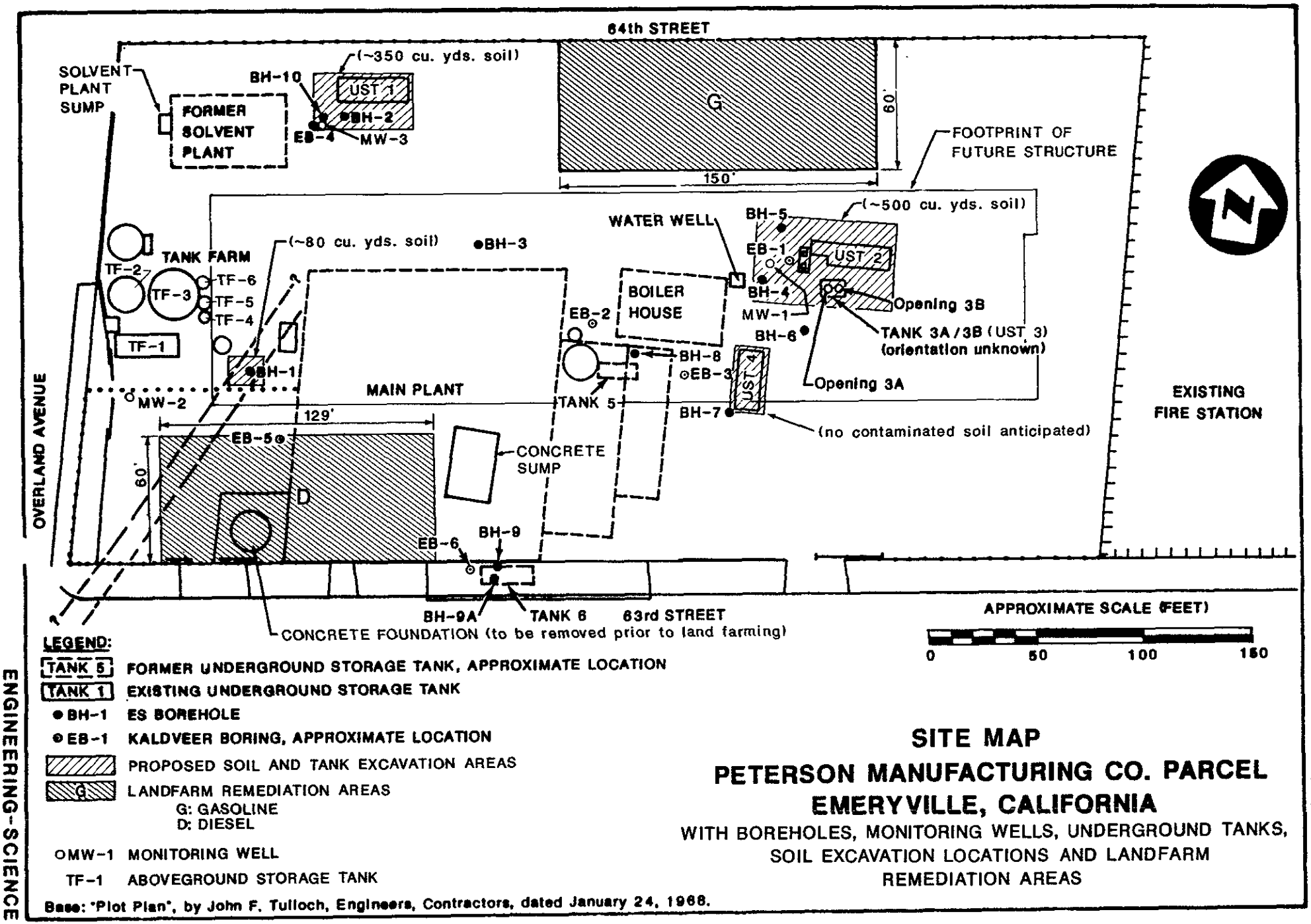
Analysis of Soil Samples

Of the 10 soil boreholes sampled by ES, only three contained levels of total petroleum hydrocarbons or total oil and grease greater than 1,000 mg/kg (Reference 2). These were: borehole sample BH-1 (ES) and samples EB-3 and EB-6 (Kaldveer and Associates). Borehole sample BH-1 contained 1,900 mg/kg total petroleum hydrocarbons and 2,900 mg/kg animal/vegetable oil and grease. This is presumed to be animal fat rather than petroleum oil because of the shallow sample origin and the location of the borehole near the grease heating area (autoclave). Borehole EB-3 contained 120 mg/kg waste oil west of Tank 4. Borehole EB-6 contained 190 mg/kg of waste oil west of Tank 6 (Reference 1).

PCBs were not detected in the three borehole samples collected near potential waste oil tank sources (BH-7, BH-8, and BH-9a).

Analysis of Samples from Tanks and Sumps

All underground and aboveground storage tank samples were analyzed by GC/FID for total petroleum hydrocarbons which includes gasoline, jet fuel, and diesel fuel (C5 through C22). Underground Storage Tank (UST) samples suspected of containing waste oil were also analyzed for Aroclor (polychlorinated biphenyls or PCBs) by EPA Method 8080. UST samples suspected of containing gasoline were also analyzed for tetraethyl lead.




Base: "Plot Plan", by John F. Tulloch, Engineers, Contractors, dated January 24, 1968.

# SITE MAP
## PETERSON MANUFACTURING CO. PARCEL
## EMERYVILLE, CALIFORNIA
WITH BOREHOLES, MONITORING WELLS, UNDERGROUND TANKS, SOIL EXCAVATION LOCATIONS AND LANDFARM REMEDIATION AREAS

FIGURE 2-3

ENGINEERING-SCIENCE

TABLE 2-1

SUMMARY OF SOIL SAMPLES
PETERSON MANUFACTURING COMPANY PROPERTY

| Sample Borehole | Sample Depth (in feet) | Sample Lithology | Analyses Performed | Analytical Results |
|---|---|---|---|---|
| BH[a]-1 (composite) | 2.5<br>6.5 | Green-black clay<br>Black and orange gravel; strong hydrocarbon odor | EPA Method 418.1<br>EPA Method 413.2 | 1,900 mg/kg<br>4,800 mg/kg |
| BH-2 | None | Drilling refusal at 2 feet | None | |
| BH-3 | 1.0 | Brown sandy silty clay | EPA Method 418.1<br>EPA Method 413.2 | <100 mg/kg<br>100 mg/kg |
| BH-4 (composite) | 2.5<br>4.5 | Green-black clay; strong hydrocarbon odor<br>Gray silty clay; strong gasoline smell | GC/FID, for TPH | 1,300 mg/kg (gasoline) |
| BH-5 (composite) | 2.5<br>6.0 | Black sandy clay; strong hydrocarbon odor<br>Green clay; strong odor | GC/FID for TPH | 1,300 mg/kg (gasoline and <5% #2 Diesel) |
| BH-6 (composite) | 1.0<br>3.5 | Black-brown gravelly clay; hydrocarbon smell<br>Black clay; strong hydrocarbon smell | GC/FID for TPH | 17 mg/kg (gasoline) |
| BH-7 (composite) | 3.5<br>9.5 | Black organic clayey silt; strong hydrocarbon odor<br>Orange-brown clay | GC/FID for TPH<br>EPA 8080 (PCBs) | 20 mg/kg (#2 Diesel)<br>ND |

TABLE 2-1 (continued)

| Sample Borehole | Sample Depth (in feet) | Sample Lithology | Analyses Performed | Analytical Results |
|---|---|---|---|---|
| BH-8 (composite) | 2.5 | Dark gray sandy clay; hydrocarbon odor | EPA Method 418.1<br>EPA Method 413.2 | <100 mg/kg<br><100 mg/kg |
| | 6.0 | Orange-light brown sandy clay; hydrocarbon/gasoline odor | EPA Method 8080 (PCBs) | ND |
| | 9.0 | Dark brown clayey sandy silt; hydrocarbon odor | | |
| BH-9 | None | Drilling refusal at 3 feet | None | |
| BH-9A (composite) | 5.5 | Green-gray sandy gravelly clay; faint hydrocarbon/gas and tallow factory odor | GC/FID for TPH<br>EPA Method 8080 (PCBs) | 16 mg/kg (#2 Diesel)<br>ND |
| | 10.0 | Orange-brown clay; tallow factory odor | | |
| BH-10 | 2.5 | Black and green clay; tallow factory odor | EPA Method 418.1<br>EPA Method 413.2 | <100 mg/kg<br><100 mg/kg |
| EB[b]-1 | 3.0 | Dark gray silty clay; fairly strong odor | GC/FID Gasoline Standard<br>GC/FID Diesel Standard | 1,600 mg/kg (gasoline)<br>380 mg/kg (diesel fuel) |
| EB-2 | 2.5 | Gray-green silty clay; slight odor | GD/FID Waste Oil Standard | ND |
| EB-3 | 3.0 | Gray silty clay | GC/FID Waste Oil Standard | 120 |
| EB-4 | 4.5 | Olive-gray silty clay; odor | Mod. EPA 8015 Total Hydro.<br>EPA 8240 | ND<br>6 ppb Benzene<br>11 ppb Toluene |

TABLE 2-1 (continued)

| Sample Borehole | Sample Depth (in feet) | Sample Lithology | Analyses Performed | Analytical Results |
|---|---|---|---|---|
| EB-5 | 6.0 | Black silty clay; some odor | Mod. EPA 8015 Total Hydro.<br>Standard Method 503D (equivalent to 413.2 if no low boiling point compounds present) | ND<br>1,300 mg/kg |
| EB-6 | 7.5 | Light gray silty clay; strong odor | GC/FID Waste Oil Standard<br>GC/FID Gasoline Standard | 190 mg/kg<br>ND |
| MW[c]-1 | 5.0 | | Lead<br>Ethylene Dibromide<br>Benzene<br>Toluene<br>Total Xylene Isomers<br>GC/FID for TFH | 4.9 mg/kg<br>ND<br>0.7 mg/kg<br>0.8 mg/kg<br>1.2 mg/kg<br>360 mg/kg (gasoline and diesel) |
| MW-2 | 5.0 | | EPA Method 418.1<br>EPA Method 413.2<br>GC/FID for TFH | < 250 mg/kg<br>< 250 mg/kg<br>< 10 mg/kg |
| MW-3 | 4.5 | | EPA Method 8080 (PCBs)<br>GC/FID for TFH<br>EPA Method 8240 | < 0.3 mg/kg<br>1,100 mg/kg<br>Toluene 0.6 mg/kg |

[a]All boreholes labeled BH were sampled by Engineering-Science, September 1987.
[b]All boreholes labeled EB were sampled by other consultants (Reference 2).
[c]All boreholes labeled MW were sampled by Engineering-Science, November 1987 and January 1988.

TFH = Total Fuel Hydrocarbons
TPH = Total Petroleum Hydrocarbons
ND = not detected.

TABLE 2-2

SUMMARY OF UNDERGROUND STORAGE TANKS
PETERSON MANUFACTURING COMPANY PROPERTY

| Tank ID | Status | Tank Size (gallons) | Depth of Tank Bottom (in feet) | Thickness of Tank Contents (in feet) | Description of Tank Contents | Analysis Performed | Analytical Results | Tank History[a] |
|---|---|---|---|---|---|---|---|---|
| #1 | Existing | 10,000 | 10.92 | 0.75 | Amber water-like liquid with gray-brown sludge (separated) with diesel odor | GC/FID Total Hydrocarbon Scan | 46 mg/l C5-C12[b] | Stored hexane from 1965 to 1978. Reportedly presently stores water and small quantity of #6 boiler fuel. Tank recently passed leak test. |
| | | | | | | Arochlor | 85 mg/kg Arochlor 1221 in oil | |
| #2 | Existing | 10,000 | 10.58 | 0.42 | Oily amber liquid with slight gas or solvent odor with surface beads of oil or water | GC/FID Total Hydrocarbon Scan | 750 mg/l C9-C22[c] | Tank in place at least since 1957. Reportedly stores gasoline but tank labeled "Diesel #2" and contents resemble diesel fuel. |
| | | | | | | Tetraethyl Lead | 0.3 mg/l tetraethyl lead | |
| #3B | Existing | 10,000 | 10.75 | 0.38 | Amber liquid with faint turpentine odor | GC/FID Total Hydrocarbon Scan | 100% C9-C22[d] (mostly C10-C16) | Tank is 20 to 30 years old. Stored gasoline until 1981. Currently stores diesel fuel. |
| | | | | | | Tetraethyl Lead | <0.2 mg/l tetra-ethyl lead | |
| #4 | Existing | 10,000 | 10.79 | 0.38 | Dark brown oil may contain animal fat | GC/FID Total Hydrocarbon Scan | 21% C9-C22 (mostly higher end) | Tank is roughly 20 years' old. Initially contained #2 boiler fuel. Reportedly stores #6 boiler fuel at present time. |
| | | | | | | Arochlor | <1 mg/kg Arochlor in oil | |
| #5 | Excavated | Unknown | | | | | | Excavated in 1963. Tank formerly contained #2 boiler fuel and possibly gasoline. |
| #6 | Excavated | 8,000 | | | | | | Tank, present in 1957, was removed in the mid-1970's. Probably contained gasoline. |

[a] Information from Reference 1.

[b] $C_5$-$C_{12}$ corresponds to gasoline.

[c] $C_9$-$C_{22}$ corresponds to diesel fuel.

[d] $C_{10}$-$C_{16}$ corresponds to jet fuel.

TABLE 2-3

GROUNDWATER SAMPLING RESULTS
PETERSON MANUFACTURING COMPANY PROPERTY

| Sample | Description | Analytical Method | Compound | Analytical Results |
|---|---|---|---|---|
| MW-1 | Groundwater sample from monitoring well number 1, 11/12/87 | EPA Method 7420 | Lead | 0.031 mg/l |
| | | EDB | Ethylene Dibromide | <0.02 ug/l |
| | | EPA Method 602 | Benzene | 1.7 mg/l |
| | | | Toluene | 2.6 mg/l |
| | | | Total Xyelene Isomers | 4.2 mg/l |
| | | EPA Method 8015 | Total Fuel Hydrocarbons | 21 mg/l |
| MW-2 | Groundwater sample from monitoring well number 2, 11/12/87 | EPA Method 413.2 | Oil and Grease | 200 mg/l |
| | | EPA Method 418.1 | Oil and Grease, Hydrocarbons | <5 mg/l |
| | | EPA Method 8015 | Total Fuel Hydrocarbons | <1.0 mg/l |
| MW-3 | Groundwater sample from monitoring well number 3, 1/13/88 | EPA Method 8080 | Polychlorinated Biphenyls | <0.3 ug/l |
| | | EPA Method 8015 | Total Fuel Hydrocarbons | 2.7 mg/kg |
| | | EPA Method 8240 | Volatile Organics (Tetrachloroethylene) | 2 ug/l |
| Water Well 1 | Grab sample from liquid surface in well, 2/26/88 | EPA Method 8015 | Hydrocarbons | 17,000 mg/l |

TABLE 2-4

SUMMARY OF SUMPS, TROUGHS, AND ABOVEGROUND STORAGE TANKS
PETERSON MANUFACTURING COMPANY PROPERTY

| Sample | Sample Description | Sample Origin | Analyses | Results |
|---|---|---|---|---|
| TF-1 | White to grey solid (congealed fat) | Aboveground Tank 1 | EPA Method 413.2 (Oil and Grease) | 330,000 mg/kg |
| | | | EPA Method 418.1 (Total Petroleum Hydrocarbons) | 12,000 mg/kg |
| | | | EPA Method 8240 | 3,600 ug/kg Chloroform<br>5,990 ug/kg C6 and C7 hydrocarbons |
| | | | Percent Moisture | 14.6% |
| TF-4 | | Aboveground Tank 4 | EPA Method 413.2 (Oil and Grease) | 38 mg/l |
| | | | EPA Method 418.1 (Total Petroleum Hydrocarbons) | 12 mg/l |
| | | | EPA Method 824 | ND |
| TF-6 | Iron oxide flakes | Aboveground Tank 6 | Not Analyzed | |
| TF-7 | Gray-black sludge with brown crusty surface | Aboveground Tank 7 | EPA Method 413.2 (Oil and Grease) | 43,000 mg/kg |
| | | | EPA Method 418.1 (Total Petroleum Hydrocarbons) | 1,900 mg/kg |
| | | | EPA Method 8240 | 2,600 ug/kg Toluene |
| | | | Percent Moisture | 78% |
| TF-W | Water with brown-red oily phase (only water component analyzed) | Standing water northwest of Aboveground Tank 1 | EPA Method 413.2 (Oil and Grease) | 14 mg/l |
| | | | EPA Method 418.1 (Total Petroleum Hydrocarbons) | 4.8 mg/l |
| | | | EPA Method 8240 | 83 ug/l C6 hydrocarbon |

TABLE 2-4 (Continued)

SUMMARY OF SUMPS, TROUGHS, AND ABOVEGROUND STORAGE TANKS
PETERSON MANUFACTURING COMPANY PROPERTY

| Sample | Sample Description | Sample Origin | Analyses | Results |
|---|---|---|---|---|
| TF-S | Grey liquid with particulates and lumpy floating component | Sump 10' east of Aboveground Tank 1 | EPA Method 413.2 (Oil and Grease) | 4,200 mg/l |
| | | | EPA Method 418.1 (Total Petroleum Hydrocarbons) | 86 mg/l |
| | | | EPA Method 8240 (3/1/88) | 1,400 ug/l Toluene |
| | | | EPA Method 8240 (3/24/88) | 1,100 ug/l Toluene |
| IV Vat | Light-colored, oily film on surface | Concrete sump inside main building | EPA Method 413.2 (Oil and Grease) | 9 mg/l |
| OV Trough | Grayish-colored liquid, no film on surface, strong fat odor | Surface sample from trough west of main building | EPA Method 413.2 (Oil and Grease) | 570 mg/l |
| OV Trough 3.5' | | Sample collected at a depth of 3.5' | EPA Method 413.2 (Oil and Grease) | <5 mg/l |
| OV Trough Bottom | Minor black sediments | Sample collected at bottom of trough | EPA Method 413.2 (Oil and Grease) | <5 mg/l |

Only the sample collected from Tank 3 was a pure product (diesel). The remaining tanks all contained impure hydrocarbons, presumably mixed with water or other unknown compounds. Aroclor 1221, a PCB, was detected in the oil fraction in Tank 1 at 85 mg/kg. Tetraethyl lead was found in Tank 2 at 0.3 mg/l. These analyses indicate that the contents of tanks 1 and 2 are classified as hazardous wastes.

Analysis of Monitoring Well Soil and Groundwater Samples

Soil samples were taken from the five-foot level of monitoring wells MW-1, MW-2, and MW-3 during their installation. The soil sample from MW-1 contained 360 mg/kg total fuel hydrocarbons and trace amounts of BTX. The sample from MW-3 contained 1,100 mg/kg total fuel hydrocarbons. The soil sample from MW-2 contained 200 mg/kg oil and grease and 100 mg/kg hydrocarbons (by gravimetric analysis).

A ground water sample collected from MW-1 contained total fuel hydrocarbons (21 mg/l), benzene (1.7 mg/l) toluene (2.6 mg/l) and total xylene (4.2 mg/l).

SCOPE OF WORK

Remaining characterization work at the Peterson site includes sampling of aboveground tanks and sumps. The monitoring wells will be periodically sampled. Other soil sampling may be required.

Remediation work that remains includes excavation of four underground storage tanks and the on-site biodegradation remediation of the contaminated soils.

# CHAPTER 3

## PROJECT TEAM ORGANIZATION

The following personnel are designated to carry out the stated job function on-site.

| | |
|---|---|
| Project Manager: | Dan McCullar |
| Field Team Leaders: | Eric Storrs |
| | Ajay Singh |
| Project Health and Safety Officers: | Eric Storrs |
| | Wayne Hauck |
| Field Team Members: | Dan McCullar |
| | Eric Storrs |
| | Ajay Singh |
| | Wayne Hauck |
| | Marc Pierce |
| | Riedel Environmental Services personnel |
| | Drilling personnel (unnamed) |

Table 3-1 describes the responsibilities of all on-site personnel.

TABLE 3-1

ON-SITE PERSONNEL

| Title | General Description | Responsibilities |
|---|---|---|
| Project Team Leader (Manager) | Reports to upper-level management. Has authority to direct response operations. Assumes total control over site activities. | o Prepares and organizes the background review of the situation, the Work Plan, the Project Health and Safety Plan, and the field team.<br>o Obtains permission for site access and coordinates activities with appropriate officials.<br>o Ensures that the Work Plan is completed and on schedule.<br>o Briefs the field teams on their specific assignments.<br>o Uses the Project Health and Safety Officer to ensure that safety and health requirements are met.<br>o Prepares the final report and support files on the response activities.<br>o Serves as the liaison with public officials. |
| Project Health and Safety Officer | Advises the Project Manager on all aspects of health and safety on site. Stops work if any operation threatens worker or public health or safety. | o Periodically inspects protective clothing and equipment.<br>o Ensures that protective clothing and equipment are properly stored and maintained.<br>o Controls entry and exit at the Access Control Points.<br>o Confirms each team member's suitability for work based on a physician's recommendation.<br>o Monitors the work parties for signs of stress, such as cold exposure, heat stress, and fatigue.<br>o Implements the health and safety plan.<br>o Conducts periodic inspections to determine if the Project Health and Safety Plan is being followed.<br>o Enforces the "buddy" system.<br>o Knows emergency procedures, evacuation routes, and the telephone numbers of the ambulance, local hospital, poison control center, fire department, and police department.<br>o Notifies, when necessary, local public emergency officials.<br>o Coordinates emergency medical care.<br>o Sets up decontamination lines and the decontamination solutions appropriate for the type of chemical contamination on site.<br>o Controls the decontamination of all equipment, personnel, and samples from the contaminated areas.<br>o Assures proper disposal of contaminated clothing and materials.<br>o Ensures that all required equipment is available.<br>o Advises medical personnel of potential exposures and consequences.<br>o Notifies emergency response personnel by telephone or radio in the event of an emergency. |
| Field Team Leader | Responsible for field team operations and safety. | o Manages field operations.<br>o Executes the work plan and schedule.<br>o Enforces safety procedures.<br>o Coordinates with the Project Health and Safety Officer in determining protection level.<br>o Enforces site control.<br>o Documents field activities and sample collection.<br>o Serves as a liaison with public officials. |
| Work Team | Drillers, samplers. The work party must consist of at least two people. | o Safely completes the on-site tasks required to fulfill the work plan.<br>o Complies with project health and safety plan.<br>o Notifies Project Health and Safety Officer or supervisor of suspected unsafe conditions. |

CHAPTER 4

TRAINING AND MEDICAL MONITORING

The ES employees that will be involved in site remediation activities are enrolled in a medical surveillance program. This program requires the employees to receive a baseline physical and yearly check-up exams. The tests performed during the annual exam are listed in Appendix B. No additional medical monitoring is deemed necessary for performance of remediation activities described in this plan. In the event that an employee is exposed to adverse levels of contaminants during site work, the employee will be examined to evaluate and treat potential health problems resulting from the exposure.

ES employees involved in remediation work have received 40 hours of health and safety training meeting the requirements of 29 CFR 1910.120 paragraph (e). ES employees who may need to wear respirators during site activities will receive instructions, demonstration and practice on how the respirator should be worn, how to adjust it, and how to determine if the respirator fits properly (29 CFR 1910.134). Health and safety personnel working at the site will be familiar with the operation, calibration, and limitations of all field monitoring equipment.

The on-site field team will have the following health and safety equipment readily available and will be trained in their proper use:

Copy of the Health and Safety Plan
First aid kit
Eye wash bottle
Duct tape
Paper towels
Fire blanket
Plastic garbage bags

A list of emergency contacts

Combustible gas indicator

Photovac Tip 1

Sensidyne gas pump with Benzene and Hexane colorimetric tubes

# CHAPTER 5

# HEALTH AND SAFETY RISK ANALYSIS

Chemical and construction related hazards will exist at the 1600 63rd Street property at various times during remediation activity.

## CHEMICAL HAZARDS

The chemical compounds encountered on site to date are: hexane, gasoline, gasoline related compounds such as benzene, toluene and xylene, lead and minor amounts of diesel and waste oil, and PCBs, tetrachloroethylene, and oil and grease. Ethylene dibromide, a leaded gasoline additive, has not been detected on site but may be encountered during site work. Hazards associated with presence of these substances in the soil or groundwater consist of inhalation of vapors, skin contact, fires and explosions.

The potential for vapor inhalation or skin contact with the anticipated chemical substances will be present during tank sampling, soil excavation, soil sampling, drilling and groundwater sampling. These substances can have severe health effects. Gasoline constituents including benzene and EDB have demonstrated carcinogenic activity in certain animal species as have PCBs and tetrachlorethylene. Acute levels of gasoline can cause symptoms of headaches, nausea, and dizziness while inhalation of acute concentrations of gasoline fumes can cause central nervous system depression. Gasoline is also a defatting agent such that repeated or prolonged exposure can cause dermatitis; gasoline can also be absorbed into the body through the skin.

Safe working habits and adherence to the use of proper protective clothing and respiratory protection will minimize the chances of exposure to site chemicals. A Photovac Tip 1 and a Sensidyne gas pump

equipped with benzene colorimetric tubes will be used to monitor organic vapors and to determine the proper level of respiratory protection. Protective clothing which has low permeability to gasoline will be used, such as saranex or viton rather than tyvek for chemically resistant suits, and neoprene or polyvinyl chloride rather than butyl rubber or latex for boots and gloves.

Because gasoline is an extremely flammable compound having a flash point of -50° F, the potential for an explosion or fire will be greatest whenever heat or sparks are generated during work activities. Activities having the greatest fire and explosion hazard are excavation, drilling or split-spoon soil sampling. Excavation and drilling may release explosive levels of gasoline vapors which could be ignited by sparks and heat generated from drilling and excavation equipment. Hammering required in split spoon sampling could generate sparks. Monitoring of gases on-site with a combustible gas meter will identify potential explosive conditions and permit corrective actions to be taken. Non-sparking tools should be used when possible, for example, a brass split-spoon can be substituted for a stainless steel split-spoon whenever fumes of combustible nature are present. The local fire department may be able to offer alternative methods for safely performing tasks. No smoking will be allowed on site.

Table 5-1 lists the substances known and suspected to be on site along with their known concentrations, hazards, and characteristics.

CONSTRUCTION RELATED HAZARDS

Construction related hazards consist of accidents that can occur during operation of excavation and drilling equipment, open excavations, and underground power lines. Potential for equipment and excavation related accidents will be reduced by observing standard safety procedures for construction, by wearing hard hats and steel toed boots, and by barricading the excavation perimeter. No one will enter excavations deeper than five feet unless they have been shored. The Underground Service Alert will be notified prior to onset of excavations to identify any underground lines. Careful attention will be paid to the electrical line bounding the southern end of the proposed excavation area.

| Chemical | Maxim Conce On Si | Symptoms of Exposure [b] |
|---|---|---|
| Benzene | 0.7 m<br>1.7 m | Eye, nose, respiratory irritation; giddiness; nausea; headache; staggered gait; fatigue; dermatitis; abdominal pain |
| Toluene | 2.6 m<br>2.6 m | Dizziness; headache; fatigue and weakness; confusion; tearing; nervousness; dermatitis |
| Xylene | 1.2 m<br>4.2 m | Dizziness; drowsiness; excitement; incoordination; staggering gait; eye, nose, throat irritation; nausea; vomiting; abdominal pain; dermatitis |
| Ethylene Dibromide | <1 ug/ | Eye, respiratory irritant; dermatitis |
| Lead | 0.031 water<br>4.9 m | |
| Tetra ethyl Lead as Lead | 0.3 m<br>(AST 2 | Anxiety tremor; hyperreflexia; spastic; bradycard; hypotension; hypotherm; nausea; hallucinations; convulsions; eye irritation |
| Gasoline | 1600 m soil<br>21 mg/ | Dermatitis; pulmonary edema; hyperemia of eye conjunctiva |
| Diesel | 1100 m soil | |

[a] Information summari
[b] "Threshold Limit Va
[c] Information from "N
[d] PEL: Permissible Ex
[e] TLV: Threshold Limi
[f] IDLH: Immediately D

| Chemical | Maximum R Concentra On Site | Symptoms of Exposure[b] |
|---|---|---|
| PCBs | 85 mg/kg (AST 1) | Eye, skin irritation; acne-form dermatitis; jaundice; dark urine; (carcinogen) |
| Tetrachloro-ethylene | 2 ug/1, w | Eye, nose, throat irritantion nausea; flushed face and neck; vertigo, dizziness,incoordination; headache; somnolence; erythma (carcinogen) |
| Hexane | 46 mg/1 (AST 1) | Acneform dermatitis; nausea confusion; jaundice; coma |
| Fuel oil | 210,000 m (AST 4) | |
| Chloroform | 3,600 ug/l (AST 1) | Dizziness, mental dullness; nausea; headache; fatigue; anesthesia; hepatomegaly; eye, skin irritation (carcinogen) |

[a] Information summarized
[b] "Threshold Limit Value
[c] Information from "NIOS
[d] PEL: Permissible Expos
[e] TLV: Threshold Limit Va
[f] IDLH: Immediately Dange
[g] For PCBs, 1 mg/m3 range (Draft Toxicological Pr
[h] Ca: Potential human car

# CHAPTER 6

# EMERGENCY PROCEDURES AND CONTACTS

## EMERGENCY PROCEDURES

In the event that an emergency develops on-site, the procedures delineated herein are to be immediately followed. Emergency conditions are considered to exist if:

- Any member of the field crew is involved in an accident or experiences any adverse effects or symptoms of exposures while on site.
- A condition is discovered that suggests the existence of a situation more hazardous than anticipated.

### Chemical Exposure

If a member of the field crew demonstrates symptoms of chemical exposure the procedures outlined below must be followed:

- Another team member (buddy) should remove the individual from the immediate area of contamination.
- Precautions should be taken to avoid exposure of other individuals to the chemical.
- If the chemical is on the individual's clothing, the clothing should be removed if it is safe to do so.
- If the chemical has contacted the skin, the skin should be washed with copious amounts of water, preferably under a shower.
- In case of eye contact, an emergency eye wash should be used. Eyes should be washed for at least 15 minutes.

- If necessary, the victim should be transported to the nearest hospital or medical center. An ambulance should be called to transport the victim, if necessary.
- All chemical exposure incidents must be reported in writing.

Personal Injury

In case of personal injury at the site, the following procedures are to be followed:

- Field team members trained in first aid should administer treatment to an injured worker.
- The victim should then be transported to the nearest hospital or medical center. If necessary, an ambulance should be called to transport the victim.
- The site manager is responsible for making certain that an accident report form is completed. This form is to be submitted to the health and safety coordinator. Follow-up action should be taken to correct the situation that caused the accident.

Fire or Explosion

A fire or explosion hazard exists when a combustible atmosphere may be generated by operations such as excavation and drilling in areas contaminated with combustible materials. Hazard conditions shall be identified by the project manager. Under these conditions, the following precautions must be taken:

- Continuous monitoring of work areas with a combustible gas detector will be conducted if the potential for fire or explosion exists, as during welding operations, or when ignition sources (vehicles, motors, etc.) are present in the contaminated area.
- If monitoring indicates the existence of a combustible atmosphere (20 % LEL), the area will be immediately evacuated and emergency personnel will be contacted. Re-entry will not take place until it can be done safely.

- During operations involving a high hazard of fire or explosion, fire fighting and other emergency personnel will be on hand while the operation is taking place. The site safety officer shall establish liaison and coverage with fire-fighting and emergency facilities, and contact these facilities in case of emergency.
- Emergency personnel should be aware of potential emergencies involving fire and explosion.
- Smoking will not be allowed by any person on site during the remediation activity.

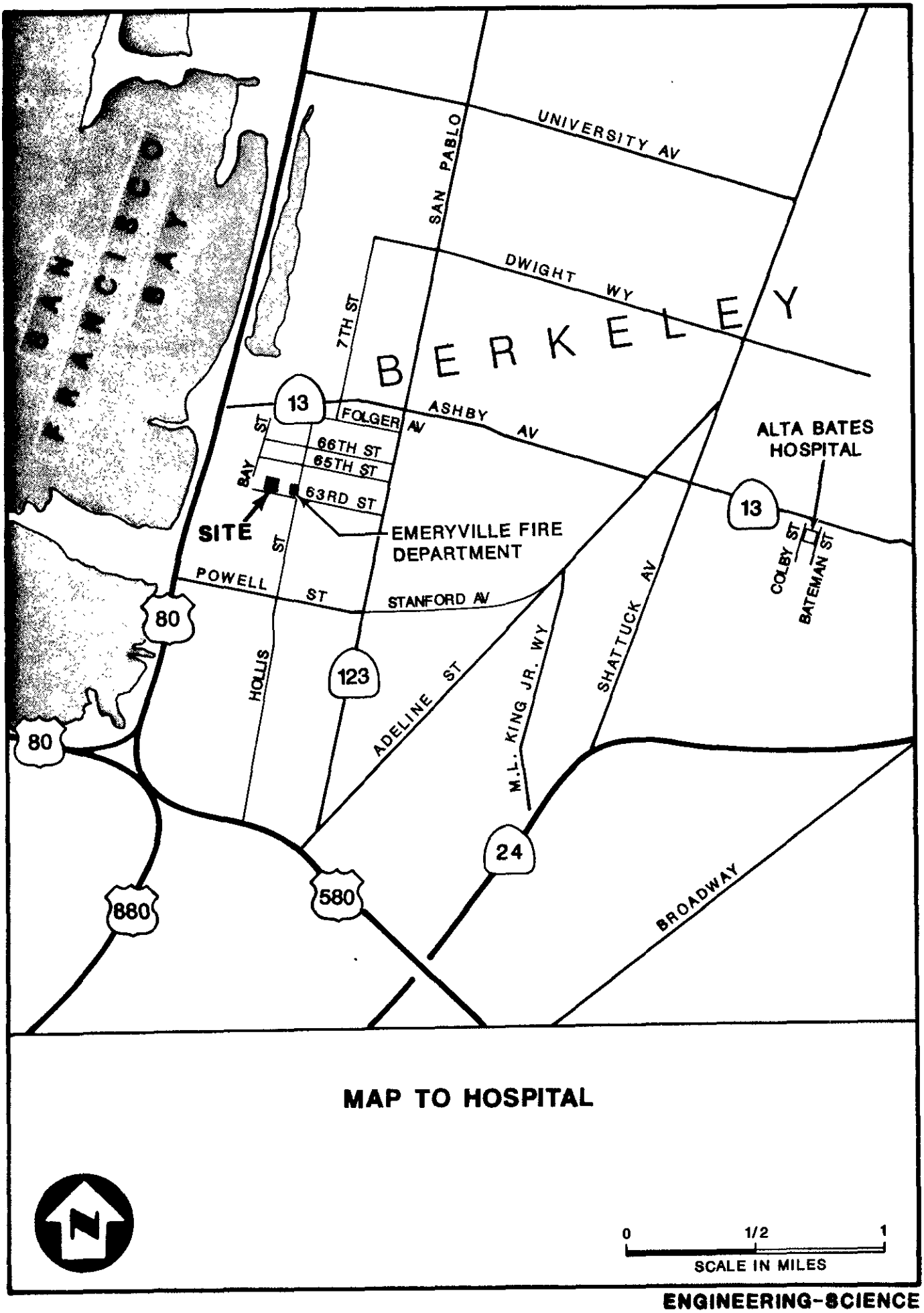
EMERGENCY CONTACTS

In the event of any emergency requiring outside assistance or support services, the appropriate contact(s) should be made from the list below. An Emeryville Fire Department station is located one block from the site on the corner of 63rd Street and Hollis Avenue. The closest public telephones to the site are at the Union 76 gas station on the corner of Powell Street and Hollis Avenue. Figure 6-1 is a map showing the site area and the route to Alta Bates Hospital, the nearest emergency room facility. In the case of severe trauma, as defined by paramedics, an injured person may be transported to the Highland General Hospital Emergency Room.

Emergency Assistance

| | |
|---|---|
| For all fire, police and medical emergencies: | 911 |
| Emeryville Fire Department (non-emergency): | (415) 652-4575 |
| Emeryville Police Department (non-emergency): | (415) 653-5455 |
| Poison Control Center | (415) 428-3248 |
| or | |
| San Francisco Poison Control Center at the San Francisco General Hospital | (415) 476-6600 |
| Chem-trec | (800) 424-9300 |

FIGURE 6-1




**MAP TO HOSPITAL**

ENGINEERING-SCIENCE

Emergency Room

Alta Bates Hospital Emergency Room (closest to site)
3001 Colby
Berkeley, California 94705 (415) 540-1303

Route: 65th Street to Hollis; left on Hollis; right on Folger; left on 7th; right on Ashby (Rt 13); right on Colby. SEE MAP PREVIOUS PAGE.

Highland General Hospital Emergency Room (for major trauma)
1411 E 31st Street
Oakland, California 94602 (415) 534-0967

ES Medical Monitoring Facility

Merritt Peralta Occupational Health Service
384 34th Street
Oakland, California (415) 652-3992

ES Contacts

Project Manager: Dan McCullar (415) 548-7970
ES Berkeley, California

Office Health and Safety Representative: (415) 548-7970
Eric Storrs, ES Berkeley, California

Deputy Corporate Health and Safety Manager: (404) 325-0770
Edward Grunwald, ES Atlanta, Georgia

Corporate Health and Safety Manager: (818) 440-6000
Phil Storrs, ES Pasadena, California

Client Contact

Mark Scher (415) 457-4964

Site Contact

Fred Glueck (415) 233-6552

# CHAPTER 7

# LEVELS OF PERSONAL PROTECTION REQUIRED FOR SITE ACTIVITIES

Personal protective equipment, divided into respiratory and dermal protection categories, is described below. All remediation activities will initially require use of respiratory and dermal protection level D. However, the actual protection levels appropriate for the activity will depend on air monitoring measurements and field conditions. Contingencies for use of dermal protection level C and respiratory protection levels B and C will be provided for excavation, drilling and soil sampling activities. For groundwater sampling activities contingencies requiring use of dermal protection levels B or C and respiratory protection level C are planned.

## RESPIRATORY PROTECTION

The appropriate level of respiratory protection for site activities will depend upon air monitoring measurements. Respiratory protection air monitoring will be done for benzene, hexane, ethylene dibromide, and organic vapors. Selection of respiratory protection will be based on the following tables. In the event that the three monitoring systems indicate the need for different levels of respiratory protection, the most conservative protection level will be used.

BENZENE

| Airborne Concentration of Benzene | Respiratory Protection |
|---|---|
| ≤1 ppm | No protection needed |
| >1 ppm to ≤50 ppm | Full facepiece respirator with organic vapor cartridges |
| | Full facepiece gas mask with chin style canister |
| >50 ppm to ≤100 ppm | Full facepiece powered air purifying respirator with organic vapor canister |
| >100 ppm to ≤1,000 ppm | Supplied air respirator with full facepiece in positive pressure mode |
| >1,000 ppm or unknown concentration | Self-contained breathing apparatus with full face piece in positive pressure mode |
| | Full facepiece positive pressure supplied-air respirator with auxiliary self-contained air supply |
| Escape | Any organic vapor gas mask |
| | Any self-contained breathing apparatus with full facepiece |

ETHYLENE DIBROMIDE

| Airborne Concentration of Ethylene Dibromide | Respiratory Protection |
|---|---|
| Background levels | Level D |
| 0 ppm to 20 ppm | Level D |
| 20 ppm to 160 ppm | Level C |
| 160 ppm and above | Level B |

HEXANE

| Airborne Concentration of Hexane | Respiratory Protection |
|---|---|
| Background levels | Level D |
| 0 to 50 ppm (lowest TLV listed in Table 5-1) | Level D |
| 50 to 2,000 ppm (40 percent of the lowest IDLH listed in Table 5-1) | Level C |
| 2,000 ppm and above | Level B |

TOTAL ORGANIC VAPORS

| Airborne Concentration of Total Organic Vapors | Respiratory Protection |
|---|---|
| Background levels | Level D |
| 0 ppm to 100 ppm (lowest TLV listed in Table 5-1, excluding benzene and ethylene dibromide) | Level D |
| 100 ppm to 800 ppm (40 percent of the lowest IDLH listed in Table 5-1, excluding benzene and ethylene dibromide) | Level C |
| 800 ppm and above | Level B |

| Airborne Concentration of PCBs | Respiratory Protection |
|---|---|
| $< 0.001\ mg/m^3$ | Level D |
| $> 0.001\ mg/m^3$ to $\leq 0.05\ mg/m^3$ | Level C |
| $> 0.05\ mg/m^3$ to $\leq 0.1\ mg/m^3$ | Level B (PAPR) |
| $> 0.1\ mg/m^3$ to $\leq 1\ mg/m^3$ | Level B (SCBA) |
| $> 1\ mg/m^3$ | Level A |

PCBs will not be measured because they are not detected by the Photovac TIP and because no environmental samples have contained PCBs. PCBs were only detected in Tank 1 at levels of 85 mg/kg, and they have a very low vapor pressure. During work with this tank, respiratory protection should be worn.

Airborne tetraethyl lead is not being considered a health hazard. This is because tetraethyl lead has a very low vapor pressure, and it is unlikely that concentrations found in gasoline could result in airborne concentrations approaching the TLV at $7.5 \times 1^{0-3}$ ppm.

Respiratory Protection Levels

Level D Operations

- No respiratory protection

Level C Operations

- Full-face air purifying respirator equipped with organic vapor canister or cartridges (NIOSH approved)

Level B Operations

This level of respiratory protection is required for atmospheres with concentrations of known substances greater than protective factors associated with full-face air purifying respirators, concentrations of known substances exceeding 40 percent of the substance IDLH level, or for atmospheres containing less than 19.5 percent oxygen.

- Pressure-demand full-face piece, self contained breathing apparatus (SCBA) or pressure-demand supplied air respirator with escape SCBA (NIOSH approved)

DERMAL PROTECTION

The level of dermal protection required depends upon the nature of the site activities. Selection of dermal protection shall be made according to need, based on the following information:

Dermal Protection Levels

Level D Operations

This level of protective clothing will be worn where work functions preclude potential for splashes or immersion.

Excavation and Drilling Activities; Soil Sampling

- Hard Hat
- Safety glasses or goggles
- Neoprene Rubber Boots, steel toe and shank
- Coveralls
- Neoprene work gloves

Ground-water Sampling

- Safety glasses or goggles
- Neoprene Rubber Boots
- Coveralls
- Neoprene work gloves

Level C Operations

This level of protective clothing will be worn where liquid splashes or other direct contact will not adversely affect or be absorbed through any exposed skin.

Excavation and Drilling Activities; Soil Sampling

- Hard Hat
- Safety glasses or goggles if a full face respirator is not required.
- Neoprene Rubber Boots, steel toe and shank
- Coveralls

- Saranex or tyvex coated with saranex suit (over coveralls)
- Neoprene gloves
- Inner gloves

Groundwater Sampling

- Safety glasses or goggles if a full face respirator is not required
- Neoprene Rubber Boots
- Coveralls
- Saranex or tyvex coated with saranex suit (over coveralls)
- Neoprene Gloves
- Inner gloves

Level B Operations

This level of protective clothing will be worn when liquid splashes or other direct contact will adversely affect or be absorbed through exposed skin; when it is highly unlikely that small areas of the head or neck left exposed by this level of clothing will be contacted by splashes of extremely hazardous substances; and when types and concentrations of vapors in air do not present a cutaneous or percutaneous hazard to the small, unprotected areas of the body.

Excavation and Drilling Activities; Soil Sampling

- Hard hat
- Safety glasses or goggles if a full face respirator is not required
- Neoprene Rubber Boots, steel toe and shank
- Coveralls
- Hooded Saranex or tyvek coated with saranex suit (over coverall)
- Neoprene Gloves
- Inner gloves

Groundwater Sampling

- Safety glasses or goggles if a full face respirator is not required
- Neoprene Rubber Boots
- Coveralls

- Hooded Saranex or tyvek coated with saranex suit (over coveralls)
- Neoprene Gloves
- Inner gloves

All hard hats, safety eye wear, and foot wear must meet applicable OSHA standards. These requirements can be found in OSHA General Industry Standards, 24 CFR 1910. The manufacturer should specify if their product meets this criteria.

Note: Latex gloves are relatively permeable to leaded and unleaded gasolines. These gloves can only be used as inner gloves and not the sole source of hand protection.

CHAPTER 8

# AIR MONITORING PROCEDURES

Air monitoring will be used to identify and quantify airborne levels of hazardous substances.

## ORGANIC VAPORS

General monitoring for organic vapors will be conducted using Photovac TIP 1 with a 10.6 ev lamp. The photovac should be calibrated for ethylene dibromide or toluene prior to use according to the manufacturers specifications. Specific air monitoring will be done for benzene and ethylene dibromide (EDB) because of their high health hazards and low PEL compared to other chemicals likely to be present on site. Benzene and EDB monitoring will be performed using a sensidyne colorimetric gas detector pump with benzene and EDB tubes. All respiratory protection air monitoring will be done in the breathing zone during excavation, drilling and sampling activities.

## EXPLOSIVE/COMBUSTIBLE GASES

Air monitoring for combustible gases/vapors will be conducted during excavation, drilling and split spoon sampling with a combustible gas meter. Guidelines have been established by the National Institute for Occupational Safety and Health (NIOSH) concerning the action levels to be utilized when working in a potentially explosive environment. Action levels are based on vapor explosive and flammability limits.

Lower Explosive Limit (LEL) - The LEL is the lowest concentration of a gas or vapor in air by volume that will explode when there is an ignition source. Lower Flammability Limit (LFL) - The LFL is the lowest

concentration in a gas, vapor or air by volume that will burn when there is an ignition source.

NIOSH guidelines on the use of the combustible gas indicator:

1. 10 percent LEL - limit all activities in area to those that do not generate sparks.

2. 20 percent LEL - limit all activities in area.

When readings exceed 20 percent LEL on the indicator all activities must cease to allow time for the combustible gases to vent.

Limitations: When a hot-wire type combustible gas indicator is used to test vapors of leaded gasoline, a combustion product of tetra-ethyl lead is deposited of the filament unit, reducing the catalytic activity of the filament. To circumvent this effect a special version of the standard instrument is available for gasoline testing. In these instruments, the voltage is boosted across the detector to maintain a sufficiently high filament temperature to prevent contamination.

In any atmosphere where there is a likelihood of a chemical fire, there is the risk of creating toxic vapors in the fire or of asphyxiation caused by reduction of the oxygen content.

Contaminant concentrations in the ambient air, in excess of the Lower Flammability Limit are considered to be Immediately Dangerous to Life and Health (IDLH). At or above the LFL, the use of respirators is limited to those devices that provide the maximum protection, such as a positive pressure self-contained breathing apparatus (SCBA).

Work on these sites will be restricted to vapor concentrations below the Lower Flammability Limit.

Displacement of Combustible Gases

If explosive/combustible concentrations of gases are encountered during any activity, work shall cease to allow time for vapors to disperse. If concentrations of gases in a well/bore-hole are not diminshed after allowing adequate time to vent, then the following steps should be taken.

1. Obtain an air compressor (minimum 1.5 horsepower). The hose on the pressure side of the compressor should have a length equivalent to the depth of the well/bore-hole.

2. Place hose into the well/bore-hole until it reaches bottom.

3. Start air compressor and "run" it for 15 minutes. (The air compressor should be placed a safe distance from the well/bore-hole, or should be non-sparking).

4. Measure the percent LEL in the well/bore-hole. If explosive reading continues above 20% LEL repeat step 3. If level of combustible gases/vapor in the well are now below 20% LEL proceed with Step 5.

5. Monitor well/bore-hole for five minutes with combustible gas indicator; if readings remain below 20% LEL continue with drilling or split-spoon sampling activities.

6. Continue monitoring explosive gas concentrate placed a safe distance from the well/bore-hole, or should be non-sparking).

OXYGEN MONITORING

NIOSH requires the use of self-contained breathing apparatus when oxygen concentrations fall below 19.5%. An oxygen indicator should be used to monitor the atmospheric oxygen concentration during excavation or activities in which our circulation is poor.

Note: The combustible gas indicator is intended for use only in normal atmospheres, not ones that are oxygen enriched or deficient. Oxygen concentrations that are less than or greater than normal may cause erroneous readings.

All monitoring equipment used during these studies must be certified for operation in a Class I atmosphere. A Class I atmosphere consists of flammable vapors and gases, such as gasoline and hydrogen. The instrument's instruction manual contains information on the use of the instrument in an explosive atmosphere.

# CHAPTER 9

## SITE CONTROL MEASURES

A chain link fence surrounds the Peterson Manufacturing Parcel. The access gates are locked whenever authorized workers are not present.

Barricades will be set up during soil excavation to maintain a safe distance between the excavation and any workers on the site.

During soil excavation, control boundaries delineating the exclusion zone (contaminated area), contamination reduction zone, and the support zone (clean area) will be established if needed. Control boundaries will be identified by boundary tape. The location of the boundaries will be determined daily at the site dependent upon actual wind direction.

CHAPTER 10

DECONTAMINATION PROCEDURES

Activities at this site will be of short to moderate duration and exposure to these petro-chemicals should be minimal if proper precautions are followed. Simple and expedient decontamination procedures, appropriate to the site and work conditions will be followed.

Based on the work to be performed at the Peterson Manufacturing Parcel, it may be necessary to establish a zone of exclusion. If this occurs, a decontamination pad will be established at the entrance/exit point to the exclusion zone. Workers entering this area must be equipped in the proper level of protection. Workers leaving the exclusion zone shall follow the appropriate decontamination procedures described below.

PERSONNEL DECONTAMINATION

Level D Operations

Station 1: Segregated Equipment Drop

Deposit equipment used on-site (tools, sampling devices and containers, monitoring instruments, radios, clipboards, etc.) on plastic drop cloths or in different containers with plastic liners. Each will be contaminated to a different degree. Segregation of the drop reduces the probability of cross-contamination.

Equipment: various size containers
plastic liners
plastic drop cloths

Station 2: Safety Boot Wash

Thoroughly wash safety boots. Scrub with long-handle, soft-bristle scrub brush and copious amounts of detergent solution. Repeat as many times as necessary.

Equipment: container (30 gallons)
detergent solution
2 to 3 long-handle, soft-bristle scrub brushes

Station 3: Safety Boot Rinse

Rinse off detergent solution using copious amounts of water. Repeat as many times as needed.

Equipment: container (30 gallon), or
spray unit
water
2 to 3 long-handle, soft-bristle brushes

Station 4: Glove Wash

Scrub gloves with detergent solution.

Equipment: container (20 gallon)
detergent solution
2 to 3 long-handle, soft-bristle scrub brushes

Station 5: Glove Rinse

Rinse off detergent solution.

Equipment: container (30 gallons), or
spray unit
water
2 to 3 long-handle, soft-bristle scrub brushes

Station 6: Boot and Glove Removal

Remove boots and gloves; and place in segregated plastic bags.

Equipment: plastic bags

Level C Operations

Station 1: Segregated Equipment Drop

Deposit equipment used on-site (tools, sampling devices and containers, monitoring instruments, radios, clipboards, etc.) on plastic drop cloths or in different containers with plastic liners. Each item will be contaminated to a different degree. Segregation at the drop reduces the probability of cross-contamination.

Equipment: various size containers
plastic liners
plastic drop cloths

Station 2: Glove Wash

Scrub outer gloves with decontaminant solution or detergent/water.

Equipment: container (20 gallons)
decontaminant solution, or
detergent water
2 to 3 long-handle, soft-bristle scrub brushes

Station 3: Glove Rinse

Rinse off decontaminant solution from Station 2 using copious amounts of water. Repeat as many times as necessary.

Equipment: container (30 gallons), or
spray unit
water
2 to 3 long-handle, soft-bristle scrub brushes

Station 4: Outer Glove Removal

Remove outer gloves and deposit in container with plastic liner.

Equipment: container (20 gallons)
plastic liners

Station 5: Suit/Safety Boot Wash

Thoroughly wash saranex suit and safety boots. Scrub with long-handle, soft-bristle scrub brush and copious amounts of decontaminant solution or detergent/water. Repeat as many times as necessary.

Equipment: container (30 gallons)
decontaminant solution, or
detergent/water
2 to 3 long-handle, soft-bristle scrub brushes

Station 6: Suit/Safety Boot Rinse

Rinse off decontaminant solution or detergent/water using copious amounts of water. Repeat as many times as necessary.

Equipment: container (30 gallons), or
spray unit
water
2 to 3 long-handle, soft-bristle scrub brushes

Station 7: Canister or Mask Change

If worker leaves Exclusion Zone to change canister (or mask), this is the last step in the decontamination procedure. Worker's canister is exchanged, new outer gloves donned, and joints taped. Worker returns to duty.

Equipment: canister (or mask)
tape
boot covers
gloves

Station 8: Safety Boot Removal

Remove safety boots and deposit in container with plastic liner.

Equipment: container (30 gallons)
plastic liners
bench or stool

Station 9: Suit Removal

With assistance of helper, remove Saranex suit. Deposit in container with plastic liner.

Equipment: container (30 gallons)
bench or stool
plastic liner

Station 10: Inner Glove Wash

Wash inner gloves with decontaminant solution of detergent/wash that will not harm skin. Repeat as many times as necessary.

Equipment: decontaminant solution or detergent/water
basin or bucket

Station 11: Inner Glove Rinse

Rinse inner gloves with water. Repeat as many times as necessary.

Equipment: water basin or bucket
small table

Station 12: Facepiece Removal

Remove facepiece. Avoid touching face with gloves. Deposit facepiece in a clean plastic bag.

Equipment: plastic bags

Station 13: Inner Glove Removal

Remove inner gloves and deposit in container wit;h plastic liner.

Equipment: container (20 gallons)
plastic liners

Station 14: Field Wash

Wash hands and face.

Equipment: water
soap
tables
wash basins/buckets

Station 15: Redress

Put on clean clothes.

Equipment: tables
chairs
clothes

EQUIPMENT DECONTAMINATION

Excavation and drilling equipment will be steam cleaned before excavation or drilling work is begun. Excavation equipment will also be decontaminated between use in different excavations. Downhole drilling equipment will be decontaminated prior to each boring. The decontamination procedure of choice is as follows:

1. Steam clean all down-hole or in-pit equipment to remove gross contamination.

2. Wash equipment contacting undisturbed soils in a detergent (Alcanox) water solution.

3. Rinse the equipment with tap water followed by acetone and distilled water rinses.

The equipment should then be air-dried in a clean section of the decontamination area.

Excavation equipment and drill rigs will be steam cleaned upon the completion of the final excavation or boring. A work sequence hierarchy (from less likely to more likely contaminated locations) will be imposed to reduce the potential of cross-contamination.

All soil and ground-water sampling equipment will be decontaminated in compliance with the methodology established above for in-pit or down-hole excavation and drilling equipment. All wash solutions will be directed into the sanitary sewer as allowed by the City of Emeryville Public Works Department.

Excavation spoils will be hauled off site by a qualified excavation and disposal contractor. Contaminated drill cuttings will be drummed until appropriate removal based on soil cutting analysis can be arranged. The level of respiratory protection needed to carry out this task shall be determined by air monitoring of the soils and cuttings. Dermal protection shall consist of neoprene outer gloves, inner gloves, neoprene rubber boots, and a saranex suit.

CHAPTER 11

# PROJECT HEALTH AND SAFTEY PLAN ACCEPTANCE FORM

I have read and agree to abide by the contents of the

Health and Safety Plan
for
Site Investigation and Soil Remediation
of the
Peterson Manufacturing Parcel
1600 63rd Street
Emeryville, California

_____
Signed

_____
Dated

Return to: Eric Storrs
Engineering-Science, Berkeley
Office Health and Safety Representative

## REFERENCES


1. Peter Kaldveer and Associates, Inc., February 1987, Soil Testing, Proposed Office Building at the Peterson Manufacturing Property, Emeryville, California.

2. Engineering-Science, Inc., October 1987, Letter Report to Messrs. Mark Scher and Dan Nourse, Wareham Development.

# APPENDIX A

# SITE FORMS

ES ENGINEERING-SCIENCE COMPANIES

# ACCIDENT REPORT FORM



Project: _____

EMPLOYER

1. Name: _____

2. Mail Address: _____
(No. and Street) (City or Town) (State)

3. Location, if different from mail address: _____

_____

INJURED OR ILL EMPLOYEE

4. Name: _____ Social Security Number: _____
(First) (Middle) (Last)

5. Home Address: _____
(No. and Street) (City or Town) (State)

6. Age: _____ 7. Sex: Male ( ) Female ( )

8. Occupation: _____
(Specific job title, not the specific activity employee was performing at time of injury)

9. Department: _____
(Enter name of department in which injured persons is employed, even though they may have been temporarily working in another department at the time of injury)

THE ACCIDENT OR EXPOSURE TO OCCUPATIONAL ILLNESS

10. Place of accident of exposure: _____
(No. and Street) (City or Town) (State)

11. Was place of accident or exposure on employer's premises? Yes ( ) No ( )

12. What was the employee doing when injured? _____
(Be specific - Was employee

_____
using tools or equipment or handling material?)

_____

13. How did the accident occur? _____
(Describe fully the events that resulted in the

_____
injury or occupational illness. Tell what happened and how. Name objects

_____
and substances involved. Give details on all factors that led to accident.

_____
Use separate sheet for additional space.)

14. Time of accident: _____

15. ES WITNESS TO _____
ACCIDENT (Name) (Affiliation) (Phone No.)

_____
(Name) (Affiliation) (Phone No.)

_____
(Name) (Affiliation) (Phone No.)

OCCUPATIONAL INJURY OR OCCUPATIONAL ILLNESS

16. Describe injury or illness in detail; indicate part of body affected:

_____

_____

17. Name the object or substance that directly injured the employee. (For example, object that struck employee; the vapor or poison inhaled or swallowed; the chemical or radiation that irritated the skin; or in cases of strains, hernias, etc., the object the employee was lifting, pulling, etc.).

_____

_____

18. Date of injury or initial diagnosis of occupational illness _____
(Date)

19. Did the accident result in employee fatality? Yes ( ) No ( )

OTHER

20. Name and address of physician _____

_____

21. If hospitalized, name and address of hospital _____

_____

Date of report _____ Prepared by _____

Official position _____

ES ENGINEERING-SCIENCE COMPANIES

# AIR PURIFYING RESPIRATOR LOG

SITE: _____

LOCATION: _____

DATES OF INVESTIGATION: _____

| User | Date of Use | Cleaned and Inspected Before Use (Initials) | Cartridges Changed Before Use (Yes, No, N/A) | Total Hours on Cartridge |
|---|---|---|---|---|
| | | | | |
| | | | | |
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| | | | | |

_____

Project Health and Safety Officer or ES Project Manager — Date

Return to Office Health and Safety Representative at the completion of field activities.

ENGINEERING-SCIENCE COMPANIES

# SCBA RESPIRATOR LOG

SITE: _____

LOCATION: _____

DATES OF INVESTIGATION: _____

| User | Date of Use | SCBA # | Satisfactory Checkout (Yes/No - Initials) | Date Cleaned |
|---|---|---|---|---|
| | | | | |
| | | | | |
| | | | | |
| | | | | |
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| | | | | |
| | | | | |

SCBA Performance Comments:

_____

Project Health and Safety Officer or ES Project Manager — Date

Return to Office Health and Safety Representative at the completion of field activities.

# APPENDIX B

# ANNUAL MEDICAL EXAMINATION

APPENDIX B

ANNUAL MEDICAL EXAMINATION

Each ES employee's annual medical examination will involve compiling an interval medical history and undergoing a thorough medical examination as outlined below.

INTERVAL MEDICAL HISTORY

Interval medical history will be performed focusing on changes in health status, illnesses, and possible work-related symptoms. The worker will provide the examining physician with information about the worker's interval exposure history, including exposure monitoring results (if performed).

PHYSICAL EXAMINATION

- Height, weight, temperature, pulse, respiration, and blood pressure.
- Head, nose, throat.
- Vision tests that measure refraction, depth perception, and color vision.
- Chest (heart and lungs).
- Peripheral vascular system.
- Abdomen and rectum (including hernia exam).
- Spine and other components of the musculoskeletal system.
- Genitourinary system.
- Skin.
- Nervous system.
- Blood test.
- Urine test.

ADDITIONAL TESTS

Additional medical testing may be performed, depending on available exposure information, medical history, and examination results. Testing should be specific for the possible medical effects of the worker's exposure. Multiple testing for a large range of potential exposures is

not always useful; it may involve invasive procedures (e.g., tissue biopsy), be expensive, and may produce false-positive results.

Pulmonary Function

Pulmonary function test should be administered if the individual uses a respirator, has been or may be exposed to irritating or toxic substances, or if the individual has breathing difficulties, especially when wearing a respirator.

Audiometric Tests

Annual retest are required for personnel subject to high noise exposures (an 8-hour, time-weighted average of 85 dBA or more), those required to wear hearing protection, or as otherwise indicated.

Electrocardiogram

An electrocardiogram (EKG) will be performed annually for those over 40 and every three years for all others. The EKG will be the standard 12- lead resting type.

Chest X-Rays

Chest x-rays will be performed when clinically indicated or every three years. The x-ray should be at least 14 by 17-inch P-A (posterior/anterior).

Blood and Urine Test

Blood and urine test frequently performed by occupational physicians include:

Blood Test

- Complete blood count with differential and platelet evaluation
- White cell count
- Red blood cell count
- Hemoglobin
- Hematocrit
- Reticulocyte count
- Total protein
- Albumin
- Globulin

- Total bilirubin
- Alkaline phosphatase
- Gamma glutamyl transpeptidase (GGTP)
- Lactic dehydrogenase (LDH)
- Serum glutumigoxaloacetic transaminase (SGOT)
- Serum glutamic-pyruvic transaminase (SGPT)
- Blood urea nitrogen (BUN)
- Creatinine
- Uric Acid

Urinalysis

- Color
- Specific gravity
- pH
- Qualitative glucose
- Protein
- Bile
- Acetone
- Microscopic examination of centrifuged sediments