

*See Alco's  
letter dated 6/20/97*



**DRAFT**  
**HAZARDOUS WASTE PRELIMINARY**  
**SITE INVESTIGATION WORKPLAN**  
**TASK ORDER NUMBER: 04-911175-47**

**ETTIE MAINTENANCE STATION**  
**OAKLAND, CALIFORNIA**

prepared for

**CALIFORNIA DEPARTMENT OF**  
**TRANSPORTATION**  
District 4  
111 Grand Avenue  
Oakland, California

prepared by

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June 12, 1997  
575-71022

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## STATEMENT OF LIMITATIONS AND PROFESSIONAL CERTIFICATION

Information provided in this Workplan, for Professional Service Industries, Inc. (PSI), is intended exclusively for the use of Caltrans for the evaluation of subsurface conditions as it pertains to the subject site. The professional services provided have been performed in accordance with practices generally accepted by other geologists, hydrologists, hydrogeologists, engineers, and environmental scientists practicing in this field. No other warranty, either expressed or implied, is made. As with all subsurface investigations, there is no guarantee that the work conducted will identify any or all sources or locations of contamination.

PSI reserves the right to deviate from the proposed scope of services outlined in this Workplan as needed to obtain the required information. If such deviation is necessary, PSI will make every attempt to seek prior approval from the client and the regulatory agency overseeing this project.

This Workplan is issued with the understanding that Caltrans is responsible for ensuring that the information contained herein is brought to the attention of the appropriate regulatory agency. This Workplan has been reviewed by a geologist who is registered in the State of California and whose signature and license number appear below.

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Frank R. Poss  
Associate Hydrogeologist

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John Whiting, RG #5951  
Senior Geologist

## 1.0 INTRODUCTION

Professional Service Industries, Inc. (PSI) has been retained by the California Department of Transportation (Caltrans), under Task Order Number 04-911175-47 and Contract Number 43Y097, to prepare a detailed Workplan to assess current soil and groundwater conditions at the Ettie Maintenance Station, Oakland, California (subject site; Figure 1). The scope of work for this investigation includes:

- Preparation of a Workplan and a Health and Safety Plan;
- Completion of soil and ground-water sampling at the above referenced properties;
- Preparation of a draft report for the project describing the methodology and results of the investigation and recommendations; and
- Preparation of a final report for the entire project.

### 1.1 SITE BACKGROUND

Information provided by Caltrans in the Task Order, dated May 28, 1997, indicates that two underground fuel tanks (UST) at the Ettie Maintenance Station were removed from the site on October 19 and 20, 1995. Laboratory analyses of soil and groundwater samples collected from the UST excavation indicated the presence of diesel and waste oil hydrocarbons.

On February 8, 1996, soil and groundwater samples were collected from two borings drilled down gradient from the former USTs and dispensers. The results of the soil analyses indicated that detectable concentrations of total petroleum hydrocarbons as oil (TPH-Oil) were as high as 1,200 milligrams per kilogram (mg/kg), while detectable concentrations of TPH-oil and TPH as diesel (TPH-D) were as high as 2,300 milligrams per liter (mg/l) and 62.5 mg/l, respectively.

### 1.2 PROJECT OBJECTIVE

The objective of the project is to determine the horizontal and vertical extent of petroleum hydrocarbon contamination in subsurface soil and groundwater as related to the two underground storage tanks (USTs) removed from the site. The concentrations of selected potentially hazardous constituents in soil and water will be determined, and will be evaluated for their potential impacts. The purpose of this Workplan is to delineate the scope of work for this project and to describe the methodology utilized to complete the scope of work.

## 2.0 PRE-FIELD ACTIVITIES

This section describes the tasks the contracted consultant (Contractor) will perform prior to initiating any field activities. These tasks include: 1) attending the Caltrans Task Order Meeting; 2) identifying borehole locations; 3) preparing the Pre-Work Site Visit Checklist; 4) locating any underground utility lines in conjunction with Underground Service Alert (USA); and 5) completing the Investigation Completion Schedule.

This section describes the activities PSI has performed or will perform prior to initiating the soil and groundwater investigation. These activities include: attendance at the Task Order meeting, identification of borehole locations, preparation of a Pre-Work Site Visit Checklist, utility clearance, and preparation of an Investigation Completion Schedule.

### 2.1 TASK ORDER MEETING

A Task Order Meeting was conducted on June 6, 1997, with Mr. Frank Poss of PSI and Ms. Chris Zdunkiewicz and Mr. Howell Chan of Caltrans in attendance. The primary purpose of the meeting was to familiarize PSI with site conditions that may impact field operations.

A secondary purpose of the Task Order Meeting was to identify the boring locations and to prepare a Pre-Work Site Visit Checklist (Appendix A). Topics specified in the Checklist include identification of borehole location, confirmation of underground utility clearance, location of water/power supply sources, and storage areas for drill cuttings.

### 2.2 HEALTH AND SAFETY PLAN

Prior to the commencement of field activities at the site, a site specific Health and Safety Plan (HSP) will be developed in compliance with 29 CFR 1910.120, and reviewed and signed by a Certified Industrial Hygienist. The HSP is designed to address the potential hazardous materials that may be encountered during field activities at the site. Further, the HSP will be designed to minimize the exposure to potentially hazardous materials and unsafe working conditions to on-site personnel.

### 2.3 UTILITY CLEARANCE

At least 48 hours prior to drilling activities, PSI will contact Underground Service Alert (USA) to identify utility lines that may underlie the areas of investigation.

### 2.4 INVESTIGATION COMPLETION SCHEDULE

At the Task Order Meeting, Mr. Poss and Ms. Zdunkiewicz agreed that the Investigation Completion Schedule, prepared by Caltrans, appears to be feasible under the observed site conditions (Appendix A). In the event that field conditions encountered during the investigation are judged to impact the Schedule, PSI may request that the Schedule be revised.

## 3.0 SUBSURFACE INVESTIGATION

This section describes the methodology implemented to conduct a soil and groundwater investigation at the site. The objectives of these sampling procedures are to establish protocols for conducting an investigation that will provide an accurate assessment of the current soil and groundwater conditions and to minimize the potential for cross-contamination during sampling operations.

### 3.1 SOIL BORINGS

Six soil borings have been identified at the site to investigate the soil and groundwater concentrations across the site (Figure 2). PSI will use V&W Drilling of Rio Vista, California, to complete the borings at this site. Borings B1 through B6 will be advanced by simultaneously pushing or driving a small-diameter drive casing and an inner sample barrel. The borings will be sampled at 1.5 and 3 meters (5 and 10 feet) below ground surface (bgs). The field work for drilling and soil sampling activities will be conducted in accordance with the field procedures outlined in Appendix B. If obstructions are encountered during drilling, the borehole location will be relocated several feet from the obstruction. Upon completion of drilling, borings not scheduled to be utilized for the installation of monitoring wells will be backfilled with concrete/bentonite slurry, in accordance with Caltrans and local requirements.

### 3.2 SOIL SAMPLING PROTOCOL

Soil samples will be collected by a PSI geologist working under the supervision of a State of California registered geologist. The samples will be collected in clean, 6-inch-long stainless-steel tubes. Upon retrieval of the sampler, a minimum of one stainless steel tube will be preserved for chemical analyses. Soil samples will be collected according to PSI procedures as outlined in Appendix B. The soil samples will be logged on chain-of-custody records and transported to GEOTEST of Long Beach, California, a California Department of Health Services certified hazardous materials testing laboratory, following chain-of-custody protocol.

### 3.3 SOIL CLASSIFICATION

Soil will be described by a PSI Geologist and recorded on a field boring log for each boring drilled. The data recorded on the logs will be based on examination of soil samples retrieved in the stainless-steel tubes, cuttings obtained from the auger, and drilling conditions observed in the field. Boring logs will include information regarding the location of the boring, type of sampler used, and geologic descriptions of materials encountered. Special attention will be paid to the contact between the fill and native soil.

Soils will be classified according to the Unified Soil Classification System (USCS). Other information to be recorded on the logs includes indications of potential contaminants and the occurrence of and depth-to-water. Organic vapor analyzer (OVA) measurements for soil samples and/or auger cuttings will be recorded on the field boring logs.

### 3.4 GRAB WATER SAMPLING

Following the drilling of the borings, disposable polyethylene tubing will be lowered through the drill stem with a groundwater sample collected using a peristaltic pump. Field work for groundwater sampling will be conducted in accordance with the procedures outlined in Appendix B..

### 3.5 WELL INSTALLATION

Following grab groundwater sampling, borings B1, B3, B4, and B6 will be converted to 2.5 centimeter (cm) (1-inch) groundwater monitoring wells. The wells will be constructed with schedule 40 PVC casing with 0.0508 cm (0.020-inch) machine-slotted and will be screened from 1.5 to 4.5 meters (5 to 15 feet) bgs. The filter pack will be #3 Monterey sand and will be pre-packed to insure the installation of a good sand pack. The annulus



grout will be Portland cement mixed at a ratio of 5 gallons of water per 94-pound sack of cement and emplaced using a tremie pipe. The well will be completed to surface with a 45.72 cm (18-inch) outside diameter well box. Subsequent to completion, the well will be developed by surging the well with a surge block and purging the well of approximately 3 to 5 well volumes with a bailer, or until water clarity indicates that development is complete. Following completion of the well installation, the newly installed well will be surveyed by correlating its elevation and location to two other existing wells at the site. Accuracy will be to 0.003 m (0.01 foot) vertically and to 0.003 m (0.1 foot) horizontally. Surveying will be conducted by a State of California certified surveyor.

### 3.6 MONITORING WELL SAMPLING

The four newly installed monitoring wells will be sampled a minimum of 72 hours after their installation. Prior to groundwater sampling, groundwater elevations will be measured using the surveyed mark at the top of the well head for reference in each of the monitoring wells at the site. The monitoring wells will then will be purged of a minimum of three well volumes, and until pH, conductivity, and temperature stabilizes. The purging will be completed by hand bailing or submersible pump. Groundwater samples will be collected with a disposable polyethylene bailer with volatile organic samples collected first. The groundwater samples will be collected according to PSI's standard protocol, which can be found in Appendix B.

Following groundwater sample collection, the samples will be logged on a Chain-of-Custody Record and stored in an ice chest at 4 degrees Celsius. The samples will be stored so as not to allow cross contamination. Sampling bottles with preservative will be utilized as instructed by the analytical laboratory. All transportation and handling of the groundwater samples will follow Chain-of-Custody protocol.

### 3.7 STORAGE AND DISPOSAL OF GENERATED WASTES

All soil cuttings will be temporarily placed on an 2.44 m by 2.44 m (8-foot by 8-foot) plastic sheet, 4 mil or thicker, prior to being stored in 55-gallon drums. No cuttings will be directly deposited onto the ground surface. The disposition of the cuttings will be determined upon receipt of laboratory analytical results.

Water from equipment cleaning will be stored in individually labeled United States Department of Transportation (DOT) approved (17H) 55-gallon drums. Disposition of the water will be determined upon receipt of laboratory analytical results of the soil and water samples. PSI will arrange for the management and appropriate disposal of soil and water generated during the field activities under Special Provision SP-2 of Contract 43Y097.

### 3.8 DECONTAMINATION PROCEDURES

The following decontamination procedures will be followed to maintain sample integrity and to prevent cross-contamination between sampling locations:

- All soil and surface-water sampling equipment will be cleaned with a non-phosphate detergent and rinsed twice with deionized water prior to use at a new sampling location. Sampling equipment includes:
  - Stainless-steel sample barrel and tubes,
  - Drilling equipment,
  - Groundwater sampling equipment
  - Sounders, and
  - Development equipment.
- The rinsate will be retained and stored in labeled DOT-approved (17H) 55-gallon drums until laboratory results for associated soils and/or water are received and disposition of the stored water may be determined.
- Drilling equipment will be pressure washed between drilling locations.

### 4.0 LABORATORY ANALYSIS PROGRAM

The soil and groundwater samples collected during this investigation will be submitted to GEOTEST, a State of California EPA-certified hazardous waste laboratory (Environmental Laboratory Accreditation Program [ELAP] #1225) for analysis.

All soil and groundwater samples collected from at the site will be analyzed for the following constituents according to the indicated methods:

- Total Petroleum Hydrocarbons as Gasoline (TPH-G) in accordance with a modified Environmental Protection Agency (EPA) Method 8015
- TPH-D in accordance with a modified EPA Method 8015
- Oil and Grease (TOG) in accordance with EPA Method 5520 F

Soil and groundwater samples collected from borings B2, B3, and B4 will be analyzed for the following constituents according to the indicated methods:

- Volatile Organic Compounds (VOCs) in accordance with EPA Method 8260

Soil samples collected at 3 meters (10 feet) bgs and groundwater samples collected from borings B4, B5, and B6 will be analyzed for the following constituents according to the indicated methods:

- Semi-volatile organic compounds (SVOCs) using EPA Method 8270

Soil samples collected at 1.5 meters (5 feet) bgs and groundwater samples collected from borings B1, B2, and B3 will be analyzed for the following constituents according to the indicated methods:

- Polynuclear Aromatics (PNAs) using EPA Method 8100

Soil samples collected from boring B4 will be analyzed for the following constituents according to the indicated methods:

- Moisture Content in accordance with ASTM-2216
- Total Organic Carbon in accordance with EPA Method 9060; and
- Soil Porosity

All Quality Assurance/Quality Control (QA/QC) procedures outlined on page 31 in Contract Number 43Y097 will be strictly adhered to during the performance of the work at the site.

## **5.0 FIELD QUALITY ASSURANCE/QUALITY CONTROL**

The following equipment calibration procedure and field documentation procedures will be implemented by PSI field personnel.

### 5.1 SAMPLE IDENTIFICATION

Soil samples collected in the field will be labeled according to standard protocol, as outlined in Appendix C.

### 5.2 CHAIN-OF-CUSTODY PROCEDURES

Chain-of-Custody records will be used to document sample handling and shipping procedures. Chain-of-Custody records will trace the sample(s) from collection, through any custody transfers to the analytical laboratory. Information recorded on the Chain-of-Custody records will include location of sample collection, sample identification (I.D.) number, date and time of collection, number and type of sample containers and analyses requested. The shipping conditions will also be described on the Chain-of-Custody records. The name of the sampler(s) as well as the name of the person relinquishing the samples will be documented. Chain-of-custody procedures are outlined in Appendix C.

### 5.3 FIELD INSTRUMENTS

The following instruments will be used in the field for health and safety, as well as, site assessment purposes.

#### Organic Vapor Analyzer (OVA)

An organic vapor analyzer with a flame ionization detector (FID) will be calibrated daily using a reference calibration gas. Calibration gas is pre-bottled by a laboratory supply house and has a listed calibration value in parts per million for each specific gas. The field OVA will be used as an indicator of total petroleum hydrocarbons in soil samples and for health and safety purposes.

*2 - 100 and spiked blanks - (control)*

### Temperature, pH, and Conductivity Meter

This meter will be calibrated prior to sampling each day. The meter will be used at every water sample during purging to collect temperature, pH, and conductivity data. Laboratory supplied buffer and standard solutions will be used to calibrate the instrument.

## **6.0 DATA MANAGEMENT**

In accordance with Provision SP12 of Contract 43Y097, a Daily Work Force Log will be completed by on-site personnel for each day in the field. The log will include the following items listed below:

- Task order number and contract number;
- Project name and location;
- Name, Title and Company of person performing the work;
- Date work is being performed;
- Actual begin and end times of work;
- Description of work being performed;
- Additional notations, observations or remarks to further characterize or clarify work being performed;
- Equipment utilized on site; and
- Change orders issued during site activities.

### 6.1 DATA STORAGE

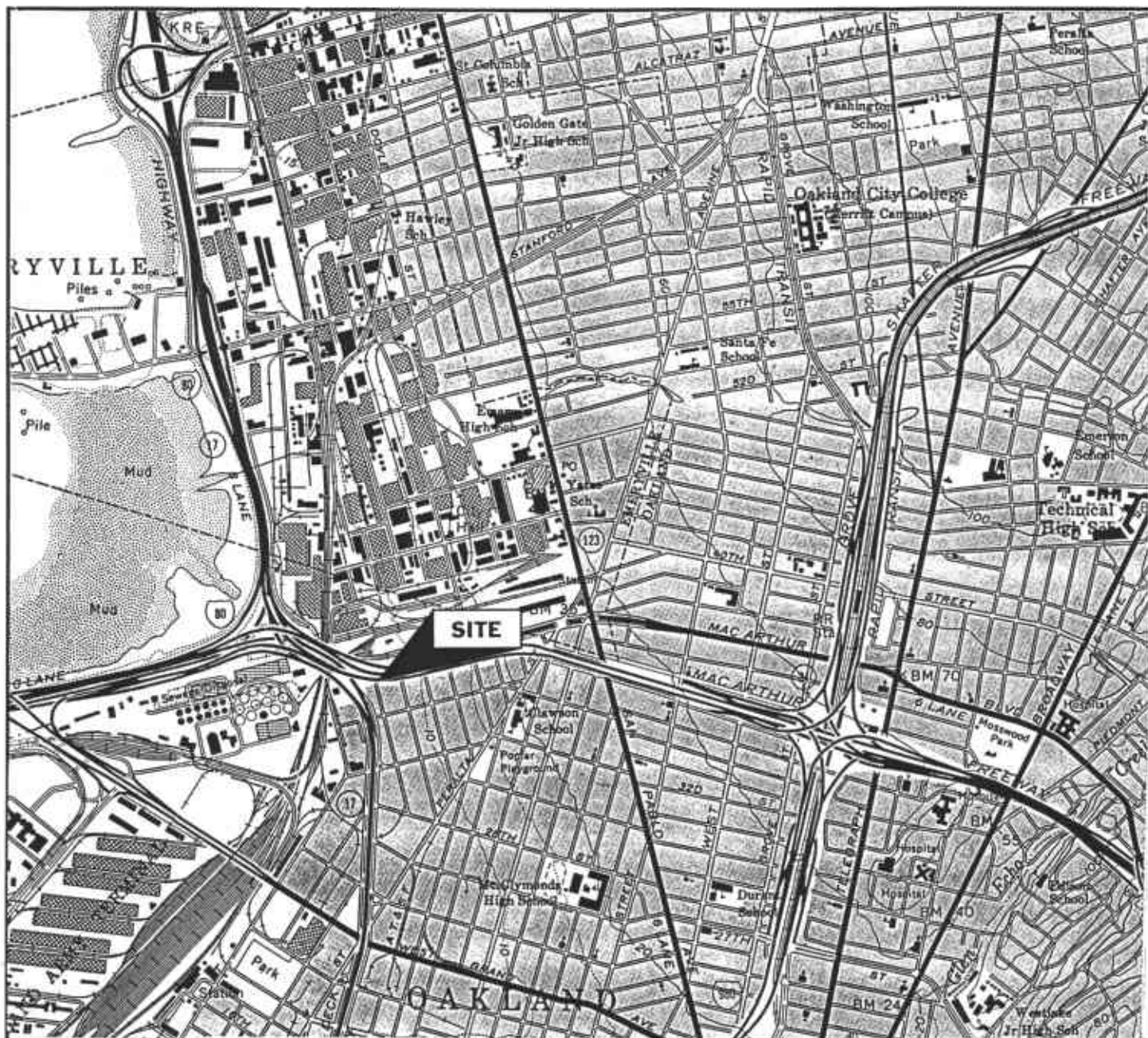
Project correspondence, field notes, maps, and data will be filed within the main Project File at PSI's Hayward office. Chemical data will be entered onto a spreadsheet program for ease of organization, review, and presentation of data in the report. Hard copy files within the main Project File may include, but not be limited to:

- Basic Data: Soil boring logs, field procedures, forms, maps, analytical data.
- Project Field Logs: The project notebook and all field memorandums.
- Correspondence: All written correspondence and telephone conversation records.
- Data Presentation: All maps and tables generated from basic data analyses.
- Data Verification: Documentation that all tables, maps and texts using basic information have been reviewed.

## **7.0 INVESTIGATIVE REPORT PREPARATION**

Upon completion of the pre-field and field activities described in this Workplan, a Draft Investigation Report will be prepared presenting the investigative methodology implemented, findings, and conclusions for the subject site. The report will include the following elements:

- Title sheet,
- Signature page,
- Table of contents,
- Investigative summary,
- Introductory narrative of the project,
- File review Information,
- Investigative methods,
- Investigative results and field observations,
- Data evaluation and discussion,
- Graphs, Tables and Figures,
- Summary table (s) indicating laboratory results,
- Contaminant concentrations, analytical methods, and detection limits,
- Copies of original laboratory documentation,
- Field procedure forms, and chain-of-custody records,
- Conclusions, and
- Recommendations.



NORTH

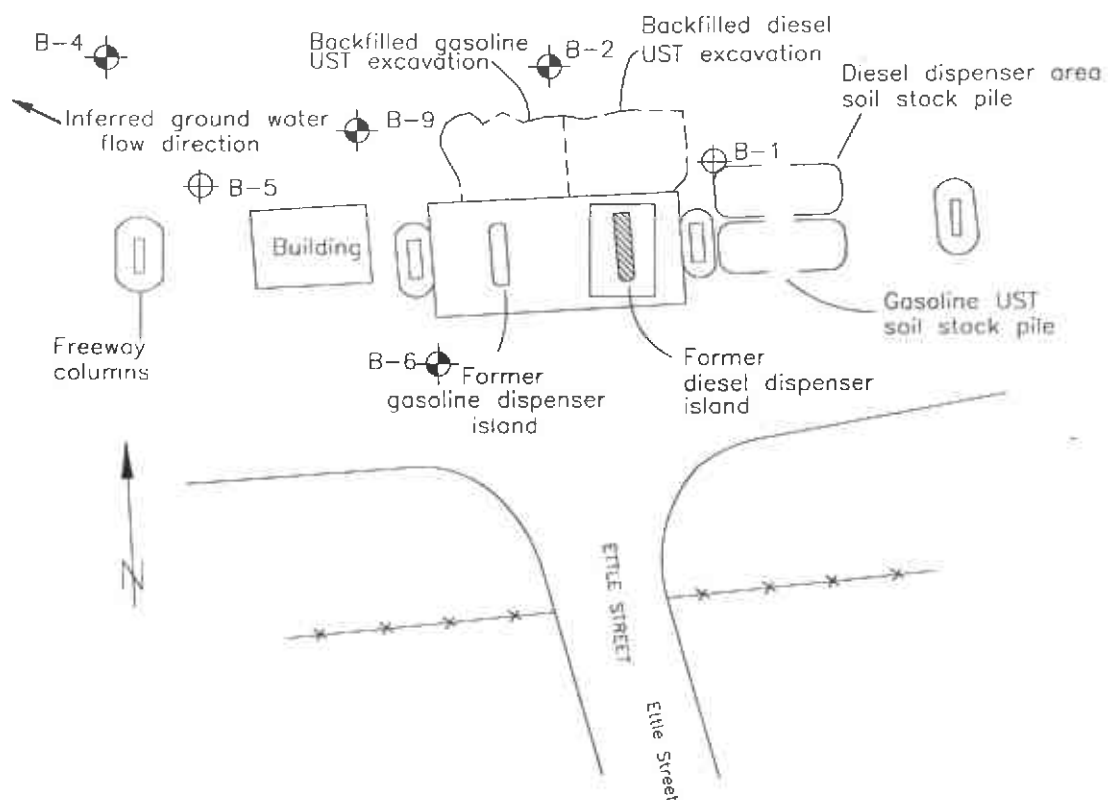


REFERENCE:  
U.S.G.S. OAKLAND, CALIFORNIA, 1959  
PHOTOREVISED, \*980

**psi** ENVIRONMENTAL  
GEOTECHNICAL  
CONSTRUCTION  
CONSULTING • ENGINEERING • TESTING

SITE LOCATION  
FORMER CALTRANS MAINTENANCE FACILITY  
3456 ETTIE STREET  
OAKLAND, CALIFORNIA  
PROJECT NUMBER: 575-71022

DATE: 6/13/97	CKD BY:	FIGURE NO: 1
FILE NO: 71022-1		DRAWN BY: S.BOWERS



0 20 40  
Approximate Scale in Feet

## LEGEND

B-4 BORING LOCATION AND DESIGNATION

B-6 BORING TO BE CONVERTED TO GROUNDWATER MONITORING WELL

**psi** ENVIRONMENTAL  
GEOTECHNICAL  
CONSTRUCTION  
CONSULTING • ENGINEERING • TESTING

SITE PLAN  
CALTRANS MAINTENANCE STATION  
3456 ETTIE STREET  
OAKLAND, CALIFORNIA  
PROJECT NUMBER: 575-71022

DATE: 06/13/97	CKD BY:	FIGURE NO.: 2
FILE NO: 71022-2		DRAWN BY: S.BOWERS



**APPENDIX A**

**PROJECT INFORMATION**

Date \_\_\_\_\_

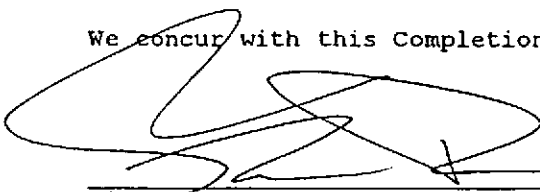
ATTACHMENT C  
SITE INVESTIGATION COMPLETION SCHEDULE  
Contract No. 43Y097  
Task Order No. 04-911175-47

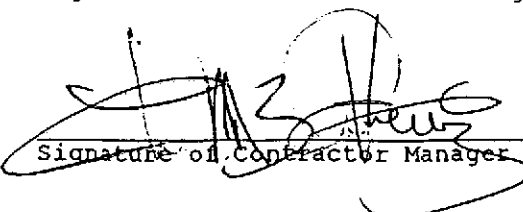
	Delivery Day*	Delivery Date
A. Receive Task Order (by Contractor)		5/23/97
B. Return of ARD		5/28/97
C. Do pre-work site visit	day 1	<del>5/30/97</del> 6/6/97
D. Return pre-work site visit check list to Contract Manager	day 1	<del>5/30/97</del> 6/6/97
F. Return Completion Schedule	day 1	<del>6/06/97</del> 6/6/97
G. Provide draft of H&S and work plan	day 3	<del>6/06/97</del> 6/13/97
H. Provide final H&S and work plan*	day 5	<del>6/13/97</del> 6/20/97
I. Begin field work	day 7	<del>6/18/97</del> 6/24/97
L. Complete field work**	day 10	<del>6/24/97</del> 6/30/97 <sup>Cont</sup>
N. Provide draft final report**	day 16	<del>7/03/97</del> 7/11/97
O. Provide final report**	day 22	<del>7/10/97</del> 7/18/97

Notes: \* working days (a working day is defined as any day except, Saturdays, Sundays, and national holidays--Veteran's Day, Thanksgiving; declination that a day is a non-working day for field work due to inclement weather or conditions resulting therefrom will be made by the Contract Manager)

\*\* Penalty of \$50/day for each workday these elements are overdue. The contractor agrees to pay said liquidated damages herein provided for and further agrees that Caltrans may deduct the amount from any moneys due or that may become due the Contractor under the task order.

We concur with this Completion Schedule on this date 6/6/97

  
\_\_\_\_\_  
Signature of Contractor or Designee

  
\_\_\_\_\_  
Signature of Contractor Manager or Designee

APPENDIX B  
FIELD PROCEDURES

## **APPENDIX B**

### **FIELD PROCEDURES**

#### **I. DRILLING OF SOIL BORINGS AND COLLECTION OF SOIL SAMPLES**

The following procedures will be used for the drilling and sampling of the soil borings drilled at the site:

1. Drilling will be conducted by V&W Drilling under the supervision of PSI. Drilling equipment will be pressure washed at the beginning of the day and between soil borings.
2. Prior to the commencement of drilling activities at the site, Underground Service Alert (USA) will be contacted to identify underground utilities in the areas that the borings will be located.
3. Boring logs for the soil borings drilled at the site will be prepared under the supervision of a State of California-registered geologist. The soil cuttings observed during drilling will be described in accordance with the Unified Soil Classification System.
4. A split-sample barrel will be used for the collection of soil samples. Soil samples will be collected by driving the sampler approximately 0.3 meters (1.5-feet) into the bottom of the soil boring through the center of the drilling bit. Three stainless steel rings will be placed in the split-sample barrel prior to sample collection.
5. The ends of the sample tubes will be covered with Teflon sheets and capped with polyvinyl chloride (PVC) end caps. The sample will be labeled and placed in a zip-lock bag in a chilled cooler pending delivery to the laboratory for analysis.
6. Soil samples will be assigned identification numbers such as B1-0.9, where B1 indicates boring 1 and -0.9 indicates that the sample was collected at 0.9 meters bgs. The samples will be labeled with the sampling designation, depth, date, client name, and project number.
7. Soil samplers will be washed between sampling intervals with Alconox soap followed by two deionized-water rinses.
8. Chain-of-custody procedures using chain-of-custody forms will be used to document sample handling and transportation.

9. A Century 128 organic vapor analyzer (OVA) will be used to monitor volatile organic compounds (VOCs) in the ambient air during drilling at the site in accordance with the site health and safety plan. VOC concentrations in the soil will be measured and recorded on the borings logs for depths that soil samples were collected. VOCs in the soil will be measured at the sampling depths by partially filling a zip-loc bag with soil. The components of the soil are allowed to volatilize and fill the head space in the tube for approximately 30 minutes prior to inserting the OVA probe through one of the end caps and recording the measurements.
10. Soil cuttings and steam wash water generated during drilling activities at the site will be contained in Department of Transportation (DOT) approved 55-gallon drums. The drums will be labeled with the contents, date, well or boring number, client name, and project number.

## **II FIELD DOCUMENTATION OF SAMPLING PROCEDURES**

The following outline describes the procedures adhered by PSI for proper sampling documentation.

1. Sampling procedures will be documented in a field notebook that will contain:
  1. Sample collection procedures
  2. Date and time of collection
  3. Date of shipping
  4. Sample collection location
  5. Sample identification number(s)
  6. Intended analysis
  7. Quality control samples
  8. Sample preservation
  9. Name of sampler
  10. Any pertinent observations
2. Samples will be labeled with the following information:
  1. Sample number
  2. Well number
  3. Date and time sample was collected
  4. Sampler's name

5. Sample preservatives (if required)

3. The following is the sample designation system for the site:

For Borings and Hand-Auger Borings the samples will be labeled B-(Boring Number)-(Depth) (ie. sample collected from boring 4 at 0.9 meters would be B4-0.9)

For groundwater samples (W) (Boring Number) (ie. WB4)

3. Handling of the samples will be recorded on a chain of custody form which shall include:

1. Site name
2. Signature of Collector
3. Date and time of collection
4. Sample identification number
5. Number of containers in sample set
6. Description of sample and container
7. Name and signature of persons, and the companies or agencies they represent, who are involved in the chain of possession
8. Inclusive dates and times of possession
9. Analyses to be completed

### **III. GROUND-WATER SAMPLING**

The following procedures will be used for ground water sampling:

1. All equipment shall be washed prior to entering the well with an Alconox solution, followed by two tap water rinses and a deionized water rinse.
2. Prior to purging wells, depth-to-water will be measured using an Solinst water-interface probe to an accuracy of approximately 0.01 foot. The measurements will be made to the top of the well casing on the north side.
4. Free floating product thickness and depth-to-ground water will be measured in wells containing free floating product using a Solinst oil-water interface probe to an accuracy of approximately 0.003 meters (0.01 foot). The measurements will be made to the top of the well casing on the north side.

5. Water samples will be collected with a polyethylene disposable bailer. The water collected will be immediately decanted into laboratory-supplied vials and bottles. The containers will be overfilled, capped, labeled, and placed in a chilled cooler, prior to delivery to the laboratory for analysis.
6. Chain-of-custody procedures, including chain-of-custody forms, will be used to document water sample handling and transport from collection to delivery to the laboratory for analysis.
7. Ground-water samples will be delivered to a State-certified hazardous waste laboratory within approximately 24 hours of collection.