SOIL AND GROUNDWATER SAMPLING WORK PLAN

COAST GUARD INTEGRATED SUPPORT COMMAND, ALAMEDA

COAST GUARD ISLAND
ALAMEDA, CALIFORNIA 94501-5100
CONTRACT NO. DTCG88-97-D-6AL186

U.S. COAST GUARD

Prepared for
Joe Sabel
Project Manager
United States Coast Guard
Civil Engineering Unit Oakland
2000 Embarcadero, Suite 200
Oakland, CA 94606-5337

March 16, 1998

Woodward-Clyde

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SK9746B.0000

U S Department
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United States
Coast Guard

Commanding Officer
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5090
March 19, 1998

Mr. Larry Seto
Alameda County Health Care Services
Environmental Health Services
Environmental Health Protection
1311 Harbor Bay Parkway, Suite 250
Alameda, CA 94502-6577

RE: Coast Guard Island, Alameda, CA

Dear Mr. Seto:

As we promised in our letter of 12 March, enclosure (1) is the final workplan for Coast Guard Island. The plan includes the revisions that you requested.

Utility clearance is scheduled for 31 March. Investigation activities are scheduled for 1 April. We hope the date has no significance.

For questions regarding this or other issues related to the site, please contact Mr. Joseph Sabel at 510-535-7239. Fax transmissions can be sent to 510-535-7288. An internet e-mail address can be provided on request.

Sincerely,

Dave Stalters

DAVE STALTERS
Chief, Environmental Division
U.S. Coast Guard
By direction of the Commanding Officer

Encl: (1) Final workplan
ala.cnty.finpln

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The project site is located on Coast Guard Island in Alameda, CA. The Coast Guard has occupied this location since the early 1930's. The original tenants included other federal agencies and a short rail spur. Older photographs appear to indicate that the southern portion of the island may have consisted of naturally occurring material.

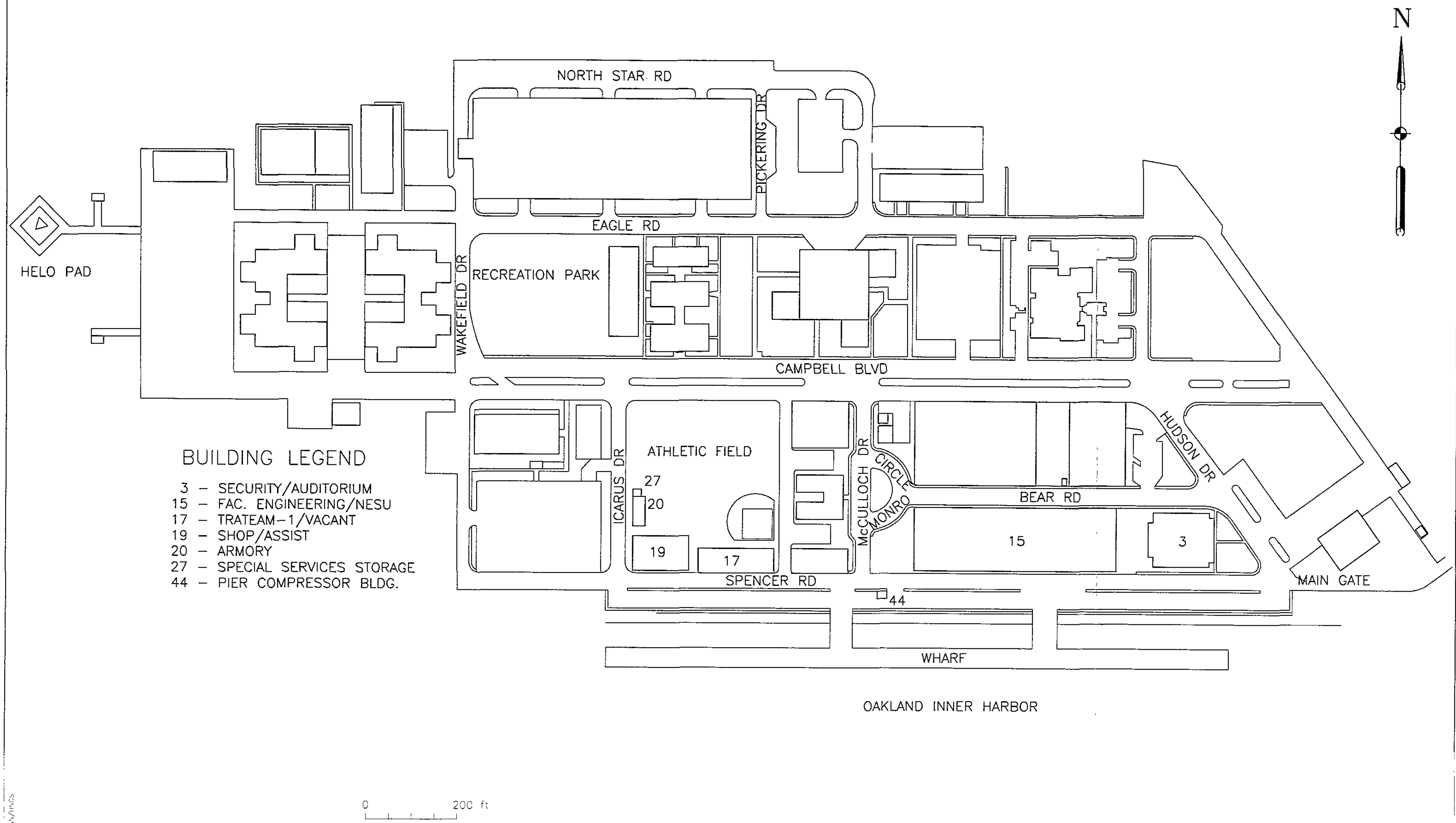
The Vehicle Maintenance Facilities (VMFs) for USCG Integrated Support Command in Alameda, CA were located in two areas, Buildings 15 and 19 (see Figure 1). Vehicle Maintenance activities were first conducted in Building 19. After several years of operation, automobile maintenance duties were moved from Building 19 to Building 15.

In August 1997, following the removal of a 1,000 gallon fuel oil underground storage tank (UST) in Building 19 at the U. S. Coast Guard (USCG) Integrated Support Command (ISC) in Alameda, CA, three soil samples were collected by a previous contractor from a tank excavation and a soil stockpile. Specifically, the first sample labeled "BLDG. 19 WEST" was collected from the base of the west end of the tank excavation. The second sample ("BLDG. 19 EAST") was taken from the base of the east end of the excavation. Finally, a four-point composite sample was collected from the excavated soil stockpile and labeled "BLDG. 19 PILE". During the same sampling event in August 1997, two samples were collected from the soil immediately adjacent to and below the 1,000 gallon fuel oil UST in Building 15. Specifically, one sample was collected from below the north end of the tank at a depth of 8.5 feet below ground surface (bgs) and labeled "BLDG. 15 NORTH". The other sample was collected from below the south end of the tank at a depth of 8.0 feet bgs and labeled "BLDG. 15 SOUTH". The samples from both Buildings 19 and 15 were analyzed for TPH as gas (TPHg), BTEX, and Total Lead, and the analytical results are presented in Table 1.

The results of the soil sampling indicated that the subsurface soil has been impacted by petroleum hydrocarbons from both tanks. Building 15 samples returned Method EPA 8020A TPHg values of 6,000 and 4,100 ppm for the north and south samples taken, respectively. Similarly, Building 19 samples had values of 730 and 3,000 ppm for the east and west piles, respectively. Based upon the analytical results for TPHg, BTEX, and Total Lead, the former contractor recommended additional environmental assessment activities due to the significant concentrations of petroleum hydrocarbons in the soil.

Based upon the results of the preliminary investigation, the USCG Civil Engineering Unit Oakland (CEU) contracted Woodward Clyde Federal Services (WCFS) to perform the following scope of work for this project:

- Advance 4 to 6 borings within the vicinity of Building 15, and 6 borings in the vicinity of Building 19. Depth to groundwater is anticipated to be approximately 10 feet bgs.
- Collect soil and groundwater samples from each boring using continuous, direct push technology for the soil samples and temporary casing to extract groundwater samples.
- Using either a PID or similar field screening methodology, collect the single most contaminated soil sample per hole.
- Analyze the most contaminated soil samples and groundwater samples for TPHg, TPH-diesel (TPHd), MTBE, BTEX, and Total Lead.



Project No SK97463	USCG ISC SUBSURFACE INVESTIGATION, ALAMEDA	SITE MAP	Figure 1
Federal Services			

- Characterize the nature, concentration, and horizontal and vertical extent of petroleum contamination discovered at or near Tanks K05 and K06.

The remainder of this work plan outlines WCFS's approach for the additional investigation. Approval of this work plan is required by the Alameda County Deparment of Environmental Health and Regional Water Quality Control Board (RWQCB) prior to the commencement of work at the site.

All work will be conducted in accordance with the RWQCB publication: *Tri-Regional Board Staff Recommendations For Preliminary Investigation and Evaluation Of Underground Storage Tank Site* (1990). WCFS will advance five borings in the vicinity of Building 15 shown in Figure 2 and six borings in the vicinity of Building 19 shown in Figure 3 in order to collect soil and groundwater samples. Based upon available data, groundwater flow is expected to be westerly across the site toward the Brooklyn Basin South Channel.

Borings

The boring location rationale are provided below:

Building 15 Locations

Boring 15-1 The proposed location for 15-1 is located immediately project north of Tank K-05 near the northeast corner of Building 15. Boring 15-1 will serve as the upgradient sampling location for this investigation and will be used to assess potential hydrocarbons in proximity to former samples BLDG. 15 NORTH and BLDG. 15 SOUTH.

Boring 15-2 The proposed location for 15-2 is located immediately project west of Tank K05. Boring 15-2 will serve as a cross-gradient sampling location for this investigation.

Boring 15-3 The proposed location for 15-3 is located immediately project east of Tank K05 in the southeast corner of Building 15. Boring 15-2 will serve as a cross-gradient sampling location for this investigation.

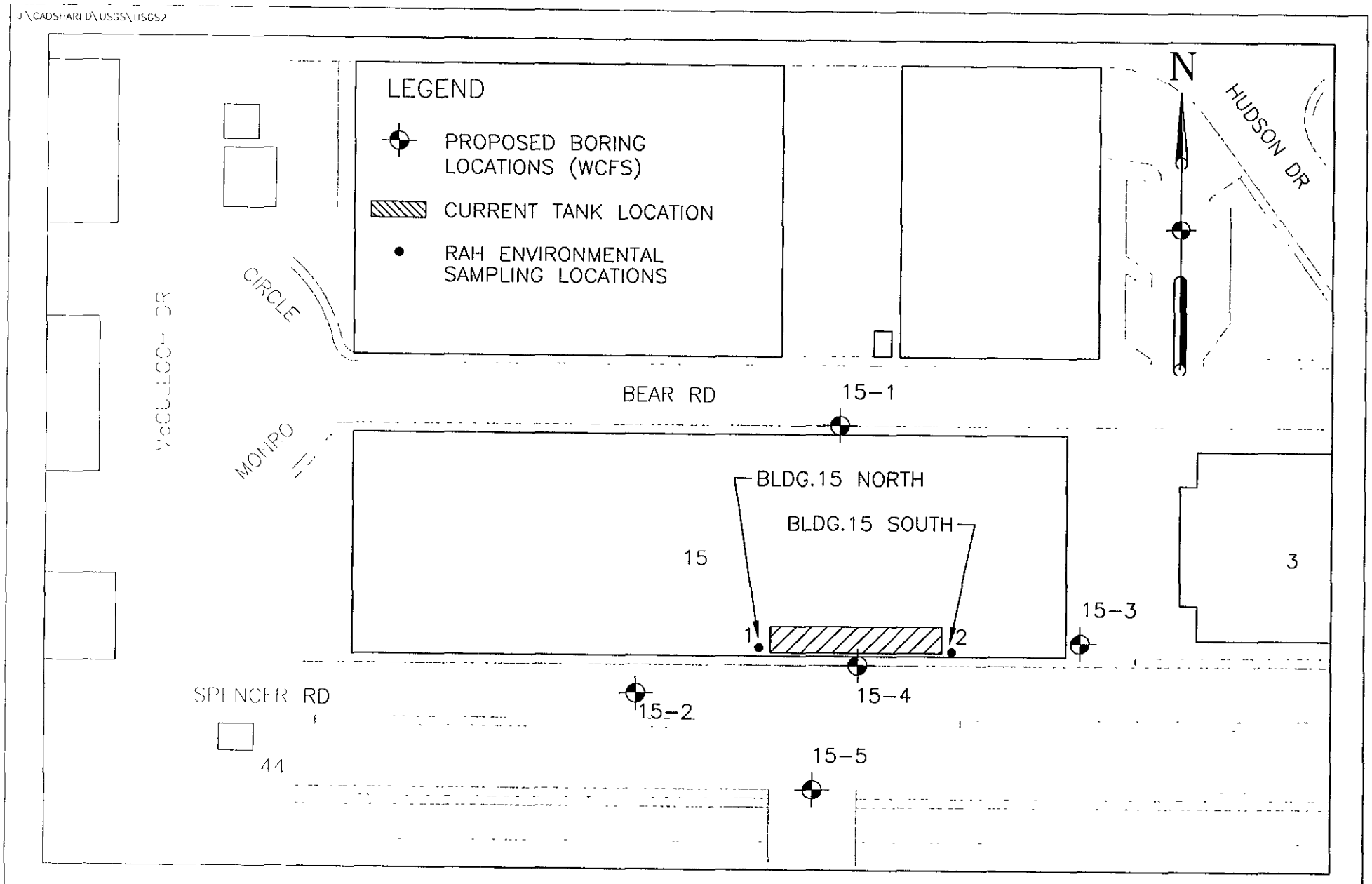
Boring 15-4 The proposed location for 15-4 is in between BLDG. 15 NORTH and BLDG. 15 SOUTH on the outside of Building 15. These two locations reported the highest values for TPHg (6,000 ppm) and benzene (7 ppm) during the 1997 investigation.

Boring 15-5 The proposed location for 15-5 is located 100 feet immediately project south of Tank K05. Boring 15-5 will serve as the downgradient sampling location for this investigation and will be used to assess potential downgradient migration of petroleum hydrocarbons.

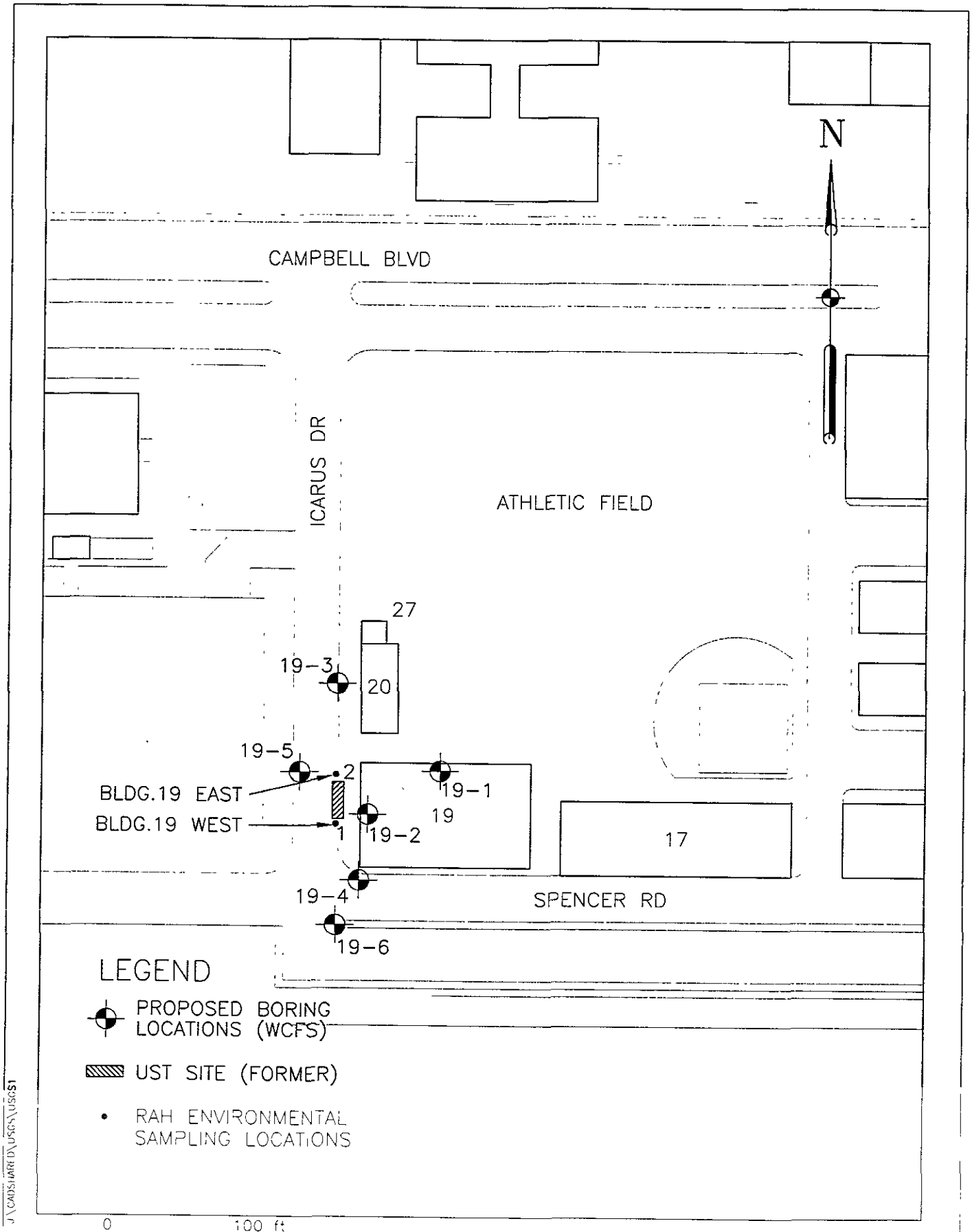
Building 19 Locations

Boring 19-1 The proposed location for 19-1 is located within Building 19, 80 feet immediately project east of Tank K06. Boring 19-1 was chosen as the cross-gradient sampling location for this investigation to assess the migration of the contamination within Building 19.

Boring 19-2 The proposed location for 19-2 is located within Building 19-2 in the vicinity of samples BLDG. 19 EAST and BLDG. 19 WEST. Due to the large variation between BLDG. 19 EAST (TPHg = 3,000 ppm) and BLDG. 19 WEST (TPHg = 730 ppm), this location was chosen to assess the contamination immediately adjacent to the tank.



Project No. SK9746B	USCG ISC SUBSURFACE INVESTIGATION, ALAMEDA	FORMER AND PROPOSED BORING LOCATIONS IN VICINITY OF BUILDING 15	Figure 2
	Federal Services		



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Project No. SK97468

USCG SC SUBSURFACE INVESTIGATION, ALAMEDA

Federal Services

FORMER AND PROPOSED BORING LOCATIONS IN THE VICINITY OF BUILDING 19

Figure 3

Boring 19-3 The proposed location for 19-3 is located immediately project north of Tank K06 adjacent to the southwest corner of Building 20. Boring 19-3 will serve as the upgradient sampling location for this investigation.

Boring 19-4 The proposed location for 19-4 is located immediately project south of Tank K06 adjacent to the southwest corner of Building 19. Boring 19-4 will be used to assess the potential downgradient migration of the petroleum contamination.

Boring 19-5 The proposed location for 19-5 is located immediately project west of Tank K06 on Icarus Drive. Boring 19-5 will be used to assess the potential western cross-gradient migration of the petroleum contamination.

Boring 19-6 The proposed location for 19-6 is located on Spencer Road southwest of Tank K06. Boring 19-6 will be used to assess the potential downgradient migration of the petroleum contamination.

Woodward-Clyde Federal Services will subcontract Gregg Drilling of Martinez, California to provide drilling services. Gregg Drilling will advance borings using a GEOPROBE Model 5400 Sampling Rig under the supervision of WCFS. Prior to the commencement of drilling, each boring hole will be cleared for utilities by NORCAL Locating Service. In addition, the drilling and utility contractors will meet with Tim Madden of the USCG to review a contingency plan to prepare for ruptured utility lines. Once each of the sites identified for boring have been cleared by the utility contractor, Gregg Drilling will begin drilling operations. If necessary, Gregg Drilling will core through concrete or hand auger prior to using the GEOPROBE Rig. Each soil boring will be advanced to collect soil samples at intervals of approximately 2 feet bgs down to an anticipated groundwater depth of 10 feet. Once groundwater has been contacted, the temporary casing will be advanced an additional 2 to 3 feet to obtain a final groundwater sample at approximately 12.5 feet bgs. Based upon PID field screening results for soil samples, the sample registering the highest VOC value will be analyzed at the laboratory for TPHg, TPHd, MTBE, BTEX, and Total Lead. In addition, all samples collected from the boring will be sent to the laboratory to be held in the event that additional analytical results are necessary. The holding time for soil samples is approximately 5 days. WCFS will catalogue the results of the PID analysis after sampling is completed and make recommendations for further analysis of soil samples to the USCG if these analyses are warranted.

A temporary casing will be used to facilitate collecting a groundwater sample at the first encounter of groundwater. The depth to groundwater is anticipated to be approximately 10 feet bgs.

Sample Collection

Sample collection will proceed in accordance with U.S. Environmental Protection Agency (EPA) document, Test Methods for Evaluating Solid Waste - Physical/Chemical Methods (EPA Reference SW-846). Soil samples will be collected in brass sleeves, and the ends sealed with teflon tape and plastic caps. Groundwater samples will be collected using temporary casing and a bailer to fill 40 milliliter (mL) VOA bottles for TPHg analysis. A peristaltic pump will be used to fill 1 L amber glass bottles for TPHd and half-pint bottles for Total Lead. Groundwater

samples will be filtered with a .45 Micron filter to assure no sediment contamination of the water samples. The samples will be labeled with the sample number, and chain-of-custody seals will be placed on each container. Each sample will then be put in a plastic bag, placed in a cooler with ice, and maintained at 4° C to preserve sample integrity for delivery to the laboratory. Gregg Drilling will steam clean the GEOPROBE Rig and temporary casing between borings to eliminate cross-contamination.

Sample Analyses

The soil and groundwater samples will be submitted to Caltest Analytical Laboratory of Napa, a State of California certified laboratory, for the analyses detailed in the table below:

Analytical Method	Parameter
EPA 8015 (modified)	TPH-Gasoline
EPA 8015 (modified)	TPH-Diesel
EPA 6010 ICP	Total Lead (digestion and analyses)
EPA 8020	MTBE and BTEX

Specifically, Caltest will first perform a methlene chloride extraction for the sample, and then utilize a gas chromatograph (GC) coupled with a flame ionization detector (FID) to determine hydrocarbon concentrations. The total lead analyses will first be digested using concentrated HNO_3. Once the digestion process is complete, each sample, blank, and QC sample are spiked with the laboratory standard prior to filtration. After quality control preparation, the samples are filtered through a 41 Whatman filter into a 50 mL graduated cylinder. After analysis, the results are entered into the laboratory information mgt. system (LIMS).

Samples which are positive for TPHg will be tested for MTBE and BTEX.

Caltest will submit preliminary results to WCFS within two weeks.

A draft final report will be submitted to the USCG within one month of the receipt of the written analytical data package. This report will include:

- Photodocumentation of the sampling event;
- Laboratory analytical data reports;
- Chain-of-Custody documentation;
- Detailed narrative of sample collection;
- Estimated direction of groundwater gradient; how determined?
- Any deviations from the work plan, with justification;
- Data interpretation; and
- Recommendations for case closure or further work, as required.

A final report will be submitted to the USCG within two weeks of receipt of comments on the draft report.

Subject to Alameda County of Environmental Health approval of this workplan, WCFS proposes the following schedule:

Activity	Date
Submit Draft Work Plan to USCG	January 16, 1998
USCG submits Work Plan to ACDEH	February 20, 1998
Receive Verbal ACDEH Approval	March 6, 1998
Submit Final Approved Workplan	March 20, 1998
Complete Field Activities	March 24, 1998
Submit Data to USCG for Review	May 8, 1998
ACDEH Verbal Recommendations	May 22, 1998
Submit Draft Report to USCG	June 5, 1998
Submit Final Report to USCG	June 26, 1998

Prepared by:

Mike deBettencourt
Senior Project Scientist

Date: _____

Reviewed by:

Chris Vais, Vice President
Hazardous Waste Operations

Date: _____

Appendix A
Contingency Plan

Point of Contact on Site: Tim Madden, USCG

In order to minimize the risk of puncturing utility lines, only three boring locations have been selected in utility laden areas. As a further precautionary measure, Gregg Drilling will hand auger 5 feet prior to insertion of the GEOPROBE.

1. **Water Main Break (High Probability)**

   The water lines are made of a brittle clay/asbestos composition which is difficult to locate with electronic equipment. Once the USCG and NORCAL have identified the water lines with paint, Woodward-Clyde will commence drilling.

   In the event of a water main break:

   (1) Contact Tim Madden.

   (2) Isolate the ruptured water line.

   (3) Mobilize the water maintenance crew.

   (4) Contact NORCAL to clear new boring location.

2. **Fiber Optic Cable Break (Low Probability)**

   The fiber optic cable was recently installed in a shallow, visible trench 3 feet bgs. Therefore, the probability of puncturing a fiber optic line is very low.

   In the event of a fiber optic cable break:

   (1) Contact Tim Madden.

   (2) Mobilize fiber optic cable crew (using cellular phone).

   (3) Contact NORCAL to clear a new boring location.

3. **Electrical Utility Line Break (Low Probability)**

   The probability of puncturing an electrical utility line is low because NORCAL should be able to easily locate lines which are 13 kV.

   In the event of an electrical utility line break: (1) Contact Tim Madden.

   (2) Isolate damaged electrical unit.

   (3) Mobilize responsible electrical utility crew to repair damaged line.

   (4) Contact NORCAL to clear a new boring location.

4. **Gas Line Break (Low Probability)**

To minimize the risk of this dangerous situation occurring, WCFS will have the USCG mark the gas lines with paint prior to drilling. In addition, the site safety officer will bring a combustible gas indicator (CGI) to the site to be used during emergency conditions.

In the event of a gas line break:

(1) Contact Fire Department.

(2) If necessary, evacuate specifed area.

(3) Contact Tim Madden.

(4) Evaluate extent of damage and leak.

(5) Mobilize gas utility repair crew to repair damaged line.

(6) Contact NORCAL to clear a new boring location.

Appendix B
Traffic Plan

Point of Contact on Site: Tim Madden, USCG

In order to minimize the impact of drilling activities on USCG traffic flow, only three boring locations have been selected in high traffic areas. For these locations, the following measures will be taken:

(1) Building 19

The GEOPROBE Rig will be positioned to allow traffic to flow safely around cones and barricades down Icarus Drive while drilling Boring Hole 19-5. For boring hole number 6 (50 yards northwest from the NW corner of Building 19) , the rig will be positioned so that traffic going to the Coast Guard Wharf will not be impeded.

(2) Building 15

For Boring Hole 15-5 which is located on a road parallel to Spencer Road, WCFS will divert traffic starting at Building 44 onto Spencer Road to drill the hole while still allowing access to the Coast Guard Wharf.

Appendix C

Operating Procedure No. HS-507

507.0 PROCEDURES FOR FIELD INVESTIGATIONS OF UNDERGROUND SPILLS OF GASOLINE AND OTHER PETROLEUM DISTILLATE FUELS

507.1 PURPOSE

The purpose of this procedure is to establish sound and uniform health and safety procedures and guidelines for field operations associated with investigations of leakage of petroleum hydrocarbon fuels from underground storage tanks and pipes. When this procedure is used, Form HS-507 must be completed and approved and attached to the front of this procedure. Together the procedure and completed form shall comprise a site-specific safety plan.

507.2 SCOPE

This procedure identifies the types of fuels and field activities to which it applies, assesses the hazards of fuels, and describes risk control measures.

507.3 APPLICABILITY

This procedure applies to: collection of samples of surface and subsurface soil; construction, completion, testing, and abandonment of groundwater monitoring wells; collection of water samples from new and existing wells; and observing removal of underground fuel pipes and storage tanks at facilities that currently dispense or store:

(1) leaded gasoline,
(2) unleaded gasoline,
(3) gasohol,
(4) Numbers 1, 1D (diesel), 2, 2D (diesel), 4, 5, or 6 fuel oils,
(5) jet A, jet A-1, jet B, JP-1, JP-3, JP-4, and JP-5 fuels,
(6) crankcase oil,
(7) methanol (when used as a motor fuel), and/or
(8) stoddard solvent

This procedure shall not be used for confined space entry or for installing or operating pilot and full-scale fuel recovery systems. This plan may be used for the installation of vapor extraction systems only by appropriate modification and proper health and safety approvals. It is also not applicable to field work performed at refineries, sites where spills of chemicals other than the substances listed above have occurred, sites of unusual hazard, and any other site or activity for which the use of this plan is identified as inappropriate by the Operating Unit Health and Safety Officer (HSO).

This plan is applicable to work involving the removal of underground fuel pipes and storage tanks only when used with and attached to the American Petroleum Institute (API) Recommended Practice 1604, Second Ed. 1987 as revised March 6, 1989, Removal and Disposal of Used Underground Petroleum Storage Tanks (attached).

This plan is applicable to work involving borings with power equipment only when used with and attached to Woodward-Clyde Operating Procedure HS-203, Safety Guidelines For Drilling.

This plan is applicable to work involving entry into excavations by Woodward-Clyde (W-C) or Woodward-Clyde subcontractor personnel only when used with and attached to Woodward-Clyde Operating Procedure HS-204, Safety Procedures for Trenching/Excavation.

507.4 RESPONSIBILITY AND AUTHORITY

A completed Form HS-507 shall be approved by the Project Manager and HSO prior to beginning work.

The Project Manager (PM) has overall responsibility for safe conduct of all field work, including ensuring full implementation of this procedure by the site manager, project staff and subcontractors assisting with field work. The PM shall assign (with the concurrence of the Operating Unit HSO or Health and Safety Coordinator (HSC)) a Site Safety Officer (SSO) to attend to day-to-day health and safety matters in the field The PM may elect, if qualified, to serve as SSO The SSO must be on-site whenever work by employees of W-C or its subcontractors is being performed at the site

Both the PM and SSO are authorized to suspend work when working conditions become unacceptable and are authorized to remove from the site any W-C and subcontractor employee whose conduct endangers the health and safety of the employee or of others.

507.5 HAZARD EVALUATION

Petroleum distillate fuels are mixtures of aliphatic and aromatic hydrocarbons, the constituent concentrations of which can vary significantly dependent upon the crude feedstock, refining process, and seasonal variations. The predominant types of compounds in fuels are paraffins (e.g., pentane, hexane), naphthenes (e.g., cyclohexane) and aromatics (e.g., benzene, toluene, polynuclear aromatics). Gasoline contains about 80 percent paraffins, 6 percent naphthenes, and 14 percent aromatics. JP-1 and 4 contain up to 48 percent paraffin, 38 percent naphthenes, and 20 percent aromatics. Fuel oils and certain jet fuels (JP-3 and 5) contain about 10 percent paraffin, up to 23 percent naphthenes, and up to 78 percent non-volatile aromatic hydrocarbons. Gasohol is gasoline containing 10 to 40 percent ethyl alcohol. Methanol as it is used as a motor fuel typically contains up to 20% gasoline to improve cold starting characteristics as a safety factor to provide a visible flame. To improve their burning properties, compounds such as tetraethyl-lead, methyl tertbutyl ether (MTBE) and ethylene dibromide (EDB) are often added to automotive and aviation fuels.

Petroleum distillate fuels exhibit relatively low acute inhalation and dermal toxicity. Concentrations of 160 to 270 ppm gasoline vapor have been reported to cause eye, nose, and throat irritation in people after several hours of exposure. Levels of 500 to 900 ppm have been reported to cause irritation and dizziness in one hour and 2,000 ppm has been reported to cause mild anesthesia in 30 minutes. Gasoline, kerosene, and some jet fuels will cause severe eye irritation on contact with the eye and low to moderate skin irritation on contact with the skin. Methanol can be toxic by either skin or inhalation exposure, and is unique in that it attacks the optic nerve. Methanol blindness can be irreversible

Ingestion of 10 to 15 grams (2 to 3 teaspoons) of gasoline has caused death in children. In adults, ingestion of 20 to 50 grams may produce severe symptoms of poisoning. The most dangerous aspect of ingestion of these motor fuels is the development of chemical pneumonia from the aspiration of gasoline or other fuels aspirating into the lungs. Aspiration of very small quantities of these motor fuels into the lungs is often fatal. Some gasoline additives, such as ethylene dichloride, ethylene dibromide, and tetraethyl- and tetramethyl-lead are highly toxic materials; however, their concentrations in gasoline are so low that their contribution to the overall toxicity of gasoline is negligible in most instances.

Benzene is a minor component of petroleum distillate fuels with concentrations ranging from non-detectable to 5%, with gasoline typically at 1%. Benzene has been classified a known human carcinogen by the American Conference of Governmental Industrial Hygienists (ACGIH) based on the increased incidence of leukemia in certain oil refinery workers.

Petroleum distillate fuels are flammable. Under certain conditions, this property presents a greater risk than toxicity. Six of the fuels covered by this procedure are classified by the Federal Department of Transportation as flammable liquids as all six typically have flash points of 100 degrees F or less. These fuels are gasoline, gasohol, Jet B, JP-1, JP-4, and No. 1 fuel oil. Lower explosive limits of the fuels range from 0.6 to 1.4 percent (6,000 to 14,000 ppm).

507.6 HEALTH AND SAFETY CLEARANCE

W-C employees as well as subcontractor employees assigned to perform field activities covered by this procedure must be currently approved for hazardous waste field work, including:

- Current medical clearance to conduct hazardous waste field work and to wear a respirator;

- Successful completion of a respirator fit test within the last 12 months for the make and model of the respirator assigned to that individual for use at that site,

- Completion of training as required by Title 29 Code of Federal Regulations (CFR) 1910.120(e), including either:

  - 40 hours of hazardous waste worker basic instruction within the last 12 months, or,

  - 8 hours of hazardous waste worker refresher training within the last 12 months, subsequent to completion of 40 hours of basic hazardous waste worker training.

507.7 HEALTH AND SAFETY BRIEFING

Before field work begins, all field personnel, including subcontractor employees, must be briefed on their work assignments and the provisions of this procedure, and each person briefed must be given a copy of this document and each must acknowledge receipt and willingness to comply by submitting a signed safety compliance agreement to the W-C Project Manager. Individuals refusing to sign the agreement will be prohibited from working at the site.

507.8 PERSONAL PROTECTIVE EQUIPMENT (PPE)

Equipment listed below must be available on-site in appropriate sizes for use when needed.

1. National Institute for Occupational Safety and Health (NIOSH) approved full- or half-face respirator with organic vapor cartridges. Respirators must be worn when airborne hydrocarbon action levels are reached or exceeded.

2. Saranex or polyethylene coated Tyvek coveralls. Coated coveralls must be worn when product quantities of fuel are encountered and when fuel-saturated soil is handled.

3 Safety goggles or glasses Must be worn when working within 10 feet of operating heavy equipment (e g , drill rig, backhoe) Must be splash-proof when handling concentrated fuel product

4. Nitrile or neoprene gloves for all fuels except methanol. Workers handling methanol must wear butyl gloves. Gloves must be worn when handling contaminated soil or water, or when drilling or digging into contaminated soil. Confirm with your HSO the applicability of model and brand of gloves!

5. Neoprene or butyl rubber safety boots, calf-length. Must be worn when walking on obviously contaminated soil and when working within 10 feet of operating heavy equipment.

6. Hard hat. Must be worn when working within 10 feet of operating heavy equipment.

507.9 ORGANIC VAPOR MONITORING

507.9.1 Monitoring Instruments

Two instruments are required for this work:

1) Combustible Gas/Oxygen indicator (CGI/O_2) with readout in % Lower Explosive Limit (LEL) and %O_2.

2) Photoionization (PID) field survey instrument (HNU, ThermoEnvironmental 580A, Photovac Microtip, or equivalent)*, or, Flame ionization (FID) field survey instrument (Foxboro OVA or equivalent).

*PID instruments cannot readily detect methanol, and therefore may NOT be used on sites where methanol is or may be encountered.

507.9.2 Toxicity Action Levels

The toxicity action levels given below are set to comply with Occupational Safety and Health Administration (OSHA) Permissible Exposure Levels and ACGIH Threshold Limit Values (TLV). Gasoline averages approximately 1% benzene. Therefore, for fuels which may contain benzene, the action levels specified below are also set to comply with the proposed TLV of 0.1 ppm. These action levels are also adjusted for the relative response of common PID or FID instruments to motor fuel vapors.

Respirators must be worn when meter readings averaged over 10 minutes equal or exceed the action level for upgrade to Level C PPE. Workers must be evacuated from the area when organic vapor concentrations exceeding respiratory protective equipment protection factors are encountered.

507.9.2.1 **Toxicity Action Levels for Gasoline and Jet B**

TOXICITY ACTION LEVELS
GASOLINE AND JET B
(in PPM)

Instrument	Calibration Gas	Action Upgrade to Level C	Evacuate
Photoionization meter# (10.0 to 10.2 eV lamp)	HNU calibration gas* or Benzene	4	40** 200***
Photoionization meter# (10.0 to 10.2 eV lamp)	Isobutylene	6	60** 300***
Flame ionization meter (OVA-128)	Methane	10	100** 500***

Photoionization instruments do not work and shall not be used for work in high (>90%) humidity or rainy weather, or sites where methanol is or may be present.

* Although the calibration gas purchased for the HNU is isobutylene, the concentration identified on the cylinder for calibration of a HNU with 10.2 eV lamps is a benzene equivalent.

** for workers wearing half-face respirators.

*** for workers wearing full-face respirators

507.9.2.2 Toxicity Action Levels for Fuels other than Gasoline and Jet B

TOXICITY ACTION LEVELS
FUELS OTHER THAN GASOLINE, METHANOL AND JET B
(in PPM)

Instrument	Calibration Gas	Action Upgrade to Level C	Evacuate
Photoionization meter# (10.0 to 10.2 eV lamp)	HNU calibration gas* or Benzene	20	100** 600***
Photoionization meter# (10.0 to 10.2 eV lamp)	Isobutylene	35	200** 600***
Flame ionization meter (OVA-128)	Methane	100	300** 600***

Photoionization instruments do not work and shall not be used for work in high (>90%) humidity or rainy weather.

* Although the calibration gas purchased for the HNU is isobutylene, the concentration identified on the cylinder for calibration of HNU's with 10.2 eV lamps is a benzene equivalent.

** for workers wearing half-face respirators.

*** for workers wearing full-face respirators

All instruments shall be calibrated both immediately prior to commencing the day's field work and after work ceases for the day. Calibration and monitoring records shall be kept in the project file and provided to the operating unit HSO. Records shall include:

- Worker's name,
- Date,
- Time,
- Location,
- Temperature and humidity, and
- Calibration gas identity and concentration.
- Exposure data (time, location, and concentration)

507.9.3 Explosion Hazard Action Levels

The explosivity action levels below are set to prevent the creation of flammable or explosive atmospheres. Measurements should be taken at all locations where personnel are present or power/hand tools are in use. API procedures shall be followed for measurements in tanks or piping.

EXPLOSIVITY ACTION LEVELS
(% of the LEL)

Instrument	Action Level (Evacuate)
Combustible Gas Indicator	20%

The Combustible Gas Indicator (CGI) alarm must be set to sound at the action level. For this work it is highly recommended that hexane or methane to a pentane standard be used for calibration.

When measurements with a CGI indicate the presence of combustible gas levels equal to or exceeding the explosivity action level in the work area, the following action must be taken

1 Extinguish all possible ignition sources in the work area and shut down all powered equipment

2. Move personnel at least 100 feet away from work area.

3. Contact the Health and Safety Officer.

4. At the instruction of the HSO and after waiting 15 minutes for organic vapors to dissipate, the SSO or PM may use the CGI to, cautiously and with prudence, approach the worksite to determine the extent and concentration of organic emissions. The SSO or PM shall not enter any area where CGI readings exceed the explosivity action level, nor shall the SSO or PM make any approach if there is possibility of fire or explosion.

5. Personnel may reenter the work area only by clearance of the HSO after the cause of the emission has been determined and the source abated.

6. Prepare incident report and submit to the HSO.

507.9.4 Monitoring Guidelines

Personnel exposure monitoring should be performed as often as necessary and wherever necessary to protect field personnel from hazardous concentrations of organic vapors. Monitoring must be performed by individuals trained in the calibration, use and care of the required instruments.

Toxicity action levels are considerably lower then explosivity action levels. Therefore, initial and periodic monitoring should be conducted with the PID or FID. Monitoring shall be conducted in the worker's breathing zone, which is a 1 foot diameter sphere surrounding the worker's head. The alarm on this instrument should be set to sound at the action level. If vapors are measured continuously and the instrument must be unattended, the detector inlet should be located as close to the worker's breathing zone as possible. Decisions regarding respirator use should be based on breathing zone vapor concentrations of personnel expected to have the greatest exposures Particular effort should be made to monitor personnel exposures while trenching, boring or tank inerting progresses

Explosivity monitoring should be continuous, with the detector set at a location near and downwind of the source of emission. Additional monitoring with the CGI should be performed when organic vapor concentrations exceed the ppm range of the PID or FID instrument. If the alarm sounds while continuously monitoring with a CGI, initiate shut-down and evacuation procedures immediately.

507.10 AREA CONTROL

Access to hazardous and potentially hazardous areas of spill sites must be controlled to reduce the probability of occurrence of physical injury and chemical exposure of field personnel, visitors, and the public. A hazardous or potentially hazardous area includes any area where (1) field personnel are required to wear respirators, (2) borings are being drilled with powered augers, or (3) excavating operations with heavy equipment are being performed.

The boundaries of hazardous and potentially hazardous areas must be identified by cordons, barricades, or emergency traffic cones or posts, depending on conditions. If such areas are left unattended, signs warning of the danger and forbidding entry must be placed around the perimeter if the areas are accessible to the public. Trenches and other large holes must be guarded with wooden or metal barricades spaced no further than 20 feet apart and connected with yellow or yellow and black nylon tape not less than 3/4-inches wide. The barricades must be placed no less than two feet from the edge of the excavation or hole.

Entry to hazardous areas shall be limited to individuals who must work in those areas. Unofficial visitors must not be permitted to enter hazardous areas while work in those areas is in progress. Official visitors should be discouraged from entering hazardous areas, but may be allowed to enter only if they agree to abide by the provisions of this document, follow orders issued by the site safety officer, and are informed of the potential dangers that could be encountered in the areas.

507.11 DECONTAMINATION

Field decontamination of personnel and equipment is not required except when contamination is obvious (visually or by odor). Recommended decontamination procedures follow

507.11.1 Personnel Decontamination

Gasoline, kerosene, jet fuel, and gasohol should be removed from skin using a mild detergent and water. Hot water is more effective than cold. Liquid dishwashing detergent is more effective than hand soap.

507.11.2 Equipment Decontamination

Gloves, respirators, hard hats, boots and goggles should be cleaned as described under Section 507.11.1; however, if boots do not become clean after washing with detergent and water, wash them with a strong solution of trisodium phosphate and hot water.

Sampling equipment, augers, vehicle undercarriages, and tires should be steam or high pressure washer cleaned. The steam cleaner is a convenient source of hot water for personnel and protective equipment cleaning.

507.12 SMOKING

Smoking and open flames are strictly prohibited at sites under investigation.

507.13 INERTING OF TANKS

Whenever W-C personnel must be present during removal or transport of fuel storage tanks, the SSO or designee must determine whether or not the procedures to be used by the firm responsible for tank removal/transport agree with API Recommended Practice 1604, Second Ed. 1987 as revised March 6, 1989, Removal and Disposal of Used Underground Petroleum Storage Tanks. If the firm's procedures, especially those addressing removal/inactivation of flammable vapors, disagree substantially with API's procedures, the PM and HSO must be notified immediately (by telephone, if possible). In turn, the PM shall inform the client that W-C personnel will not report to the site during tank/removal operations unless proper procedures are used. If the firm responsible for tank removal/transport is under subcontract to W-C, the W-C project manager shall require the subcontractor to follow API procedures

507.14 EXCAVATIONS

Tank or pipe removal may involve trenching/excavation operations. W-C employees or contractors shall use remote sampling such as poles or backhoe buckets to avoid excavation entry. If the excavations must be entered, the hazards of trench collapse and accumulated vapors must be considered. W-C Operating Procedures for Confined Space Entry (HS-205) and Safety Guidelines for Trenching/Excavations (HS-204) must be followed.

FORM HS-507
SITE SAFETY PLAN
FIELD INVESTIGATION OF UNDERGROUND FUEL SPILLS
USCG ISC ALAMEDA UST
PAGE 1 OF 2

Administrative Information

Project number: SK9746B/0000

Project Name: ISC Alameda UST

Project Manager: Chris Vais

Operating Unit: WCFS

Site Safety Officer: John Wharton

Health/Safety Officer: M de Bettencourt

Date of Issue: 9 January 1998

Effective Dates: Thru 31 March 1998

Site Information: Coast Guard Island, Building 15 and Building 19, Alameda, CA
(See attached map)

History: Site investigation of two USTs (capacity 1,000 gallons) which formerly held gasoline (leaded) and were taken out of service about 20 years ago. The UST at Building 19 was removed from the ground. During the removal, contaminated soil was noted to be adjacent to the tank. The UST under Building 15 was filled in place with cement/grout. Some contamination was noted to be in the vicinity of the tank during road construction in 1990. Site is to be investigated to determine the extent and nature of the contaminant plume. A significant number of utility lines exist in the immediate proximity of the tank locations.

Material Spilled: USTs formerly were used for gasoline storage. The gasoline is assumed to have been leaded due to the age of the tanks and the history of operations.

Field Activities: Sample oil and water with a Geo-Probe rig at four to six locations near each tank. Field activity is planned to occur within one workday.

Emergency Telephone Numbers:

Fire Dept:	911
Ambulance	911
Police	911
Hospital	523-4357 (Alameda General Hospital)
Project Manager	Christopher Vais 874-3164 or 874 1710
Health and Safety Officer	Mike de Bettencourt 874-1710

FORM HS-507
SITE SAFETY PLAN
FIELD INVESTIGATION OF UNDERGROUND FUEL SPILLS
USCG ISC ALAMEDA UST

Hospital Information.

Name: Alameda General Hospital
Address: 2070 Clinton Avenue, Alameda, CA 94501
Route: See attached map.

Authorized Field Personnel:

John Wharton
Mike de Bettencourt
Gary Floyd

Subcontractors:
Name: Gregg Drilling and Testing Incorporated
Address: 950 House Road, Martinez, CA94553
Phone Number: (510) 313 5800

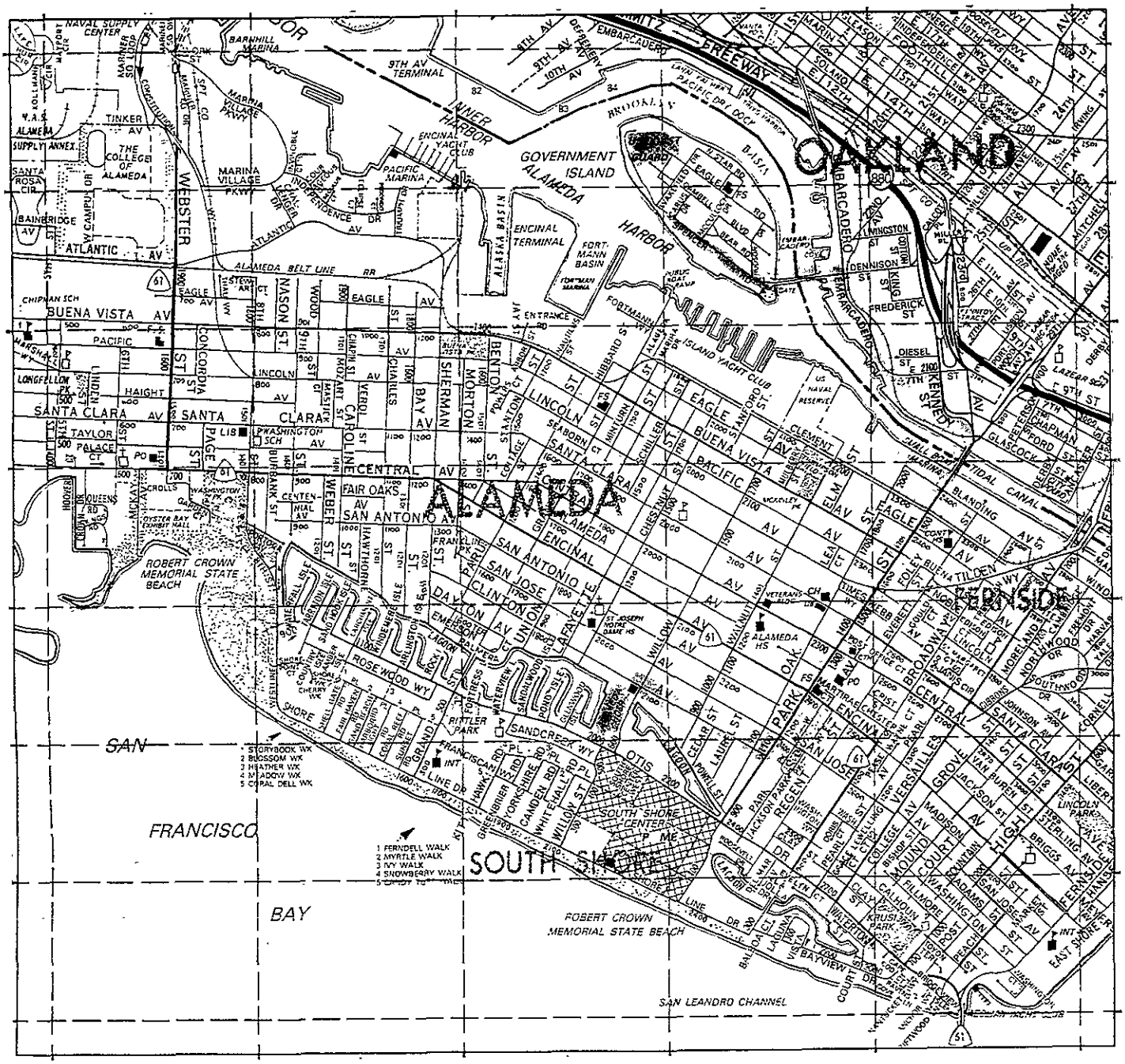
Name: Norcal Underground Locating
Address: Ken Dolan. 1176 Doralee Way, San Jose, CA 95125
Phone Number: (408) 266-0363, (408)485-2291

APPROVALS

Project Manager **Date**

Health and Safety Officer Date

Corporate Health and Safety Officer Date
(Signature required only for modified plans)



Route to Alameda General Hospital: Exit the Coast Guard Island Main Gate on Dennison Street. Turn Right at the light on Embarcadero, then Right on Kennedy Street. Follow the signs to Alameda via the Park Street Bridge. After nine blocks on Park Street, turn right on Clinton Avenue. Alameda General Hospital is on the left side of the road three blocks up.