

11979-02

FINAL WORK PLAN

UNDERGROUND STORAGE TANK REMOVAL UNITED STATES COAST GUARD INTEGRATED SUPPORT COMMAND YERBA BUENA ISLAND, CALIFORNIA

WORK ORDER: DTCG88-01-N-6XB410
CONTRACT: DTCG88-00-D-6AL052

November 2001

Prepared for:

**United States Coast Guard
Civil Engineering Unit
2000 Embarcadero, Suite 200
Oakland, CA 94606-5337**

Prepared by:

**Tetra Tech, Inc.
180 Howard Street, Suite 250
San Francisco, CA 94105-1617**

APPENDIX B
SITE SAFETY AND HEALTH PLAN

SITE HEALTH AND SAFETY PLAN

FOR

**Underground Storage Tank
Removal at Building 44**

**Integrated Support Command
Alameda, California**

Prepared for:

**US Coast Guard
Civil Engineering Unit Oakland
2000 Embarcadero, Suite 200
Oakland, California 94606-5337**

**Work Order: DTCG88-01-N-6XB410
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Prepared by:

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SECTION 1

INTRODUCTION

1.1 GENERAL

In accordance with the scope of services PSN Number 33-001100 with the US Coast Guard (USCG), Civil Engineering Unit Oakland (CEU), Tetra Tech, Inc., (Tetra Tech) has been contracted for an underground storage tank (UST) removal at the Integrated Support Command (ISC), Alameda, California. The removal will be conducted at the Building 44 site at ISC. The fieldwork for this work scope consists of:

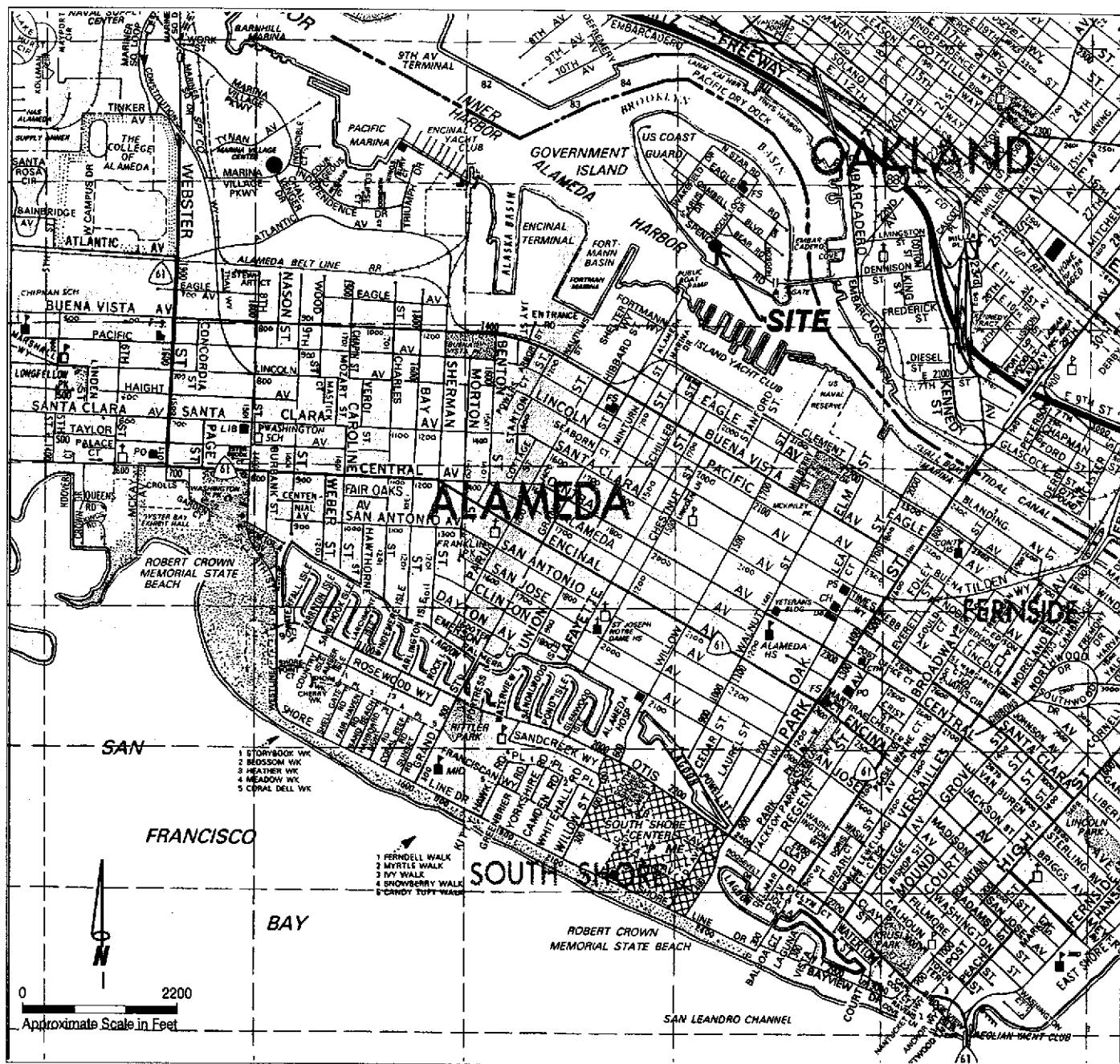
1. Removal and disposal of one waste oil UST , piping, contaminated soils, residual liquids, sludge's, and other waste materials.
2. Site restoration through soil replacement.
3. Sampling, testing, analysis, recording, and reporting as relating to contaminant identification, concentration estimation, project performance monitoring, and quality assurance.

1.2 SITE BACKGROUND

The Building 44 site is located within ISC at the intersection of McCullough Drive and Spencer Road on the west side of Government Island (Figure 1). The waste oil UST to be removed is on the east side of Building 44 (Figure 2). This tank is a 10,000 gallon double walled fiberglass UST that was installed in 1985. The USCG scope of services indicates that the tank may be inside a vault, although the 1985 as-built drawings submitted to Tetra Tech do not show this structure. This issue may be resolved during the site inspection prior to implementing the field work.

Initially, the waste oil UST received bilge water and oily water from the USCG ships through underground pipelines that ran to the docks where the ships there harbored. Oily water and waste oil were periodically pumped out of the tank and disposed of off-site. At some later time, an oil/water separator was installed, which decanted most of the water for disposal to the sanitary sewer system before the waste oil was stored in the tank. At a further later time, the pipelines to the docks were taken out of service,

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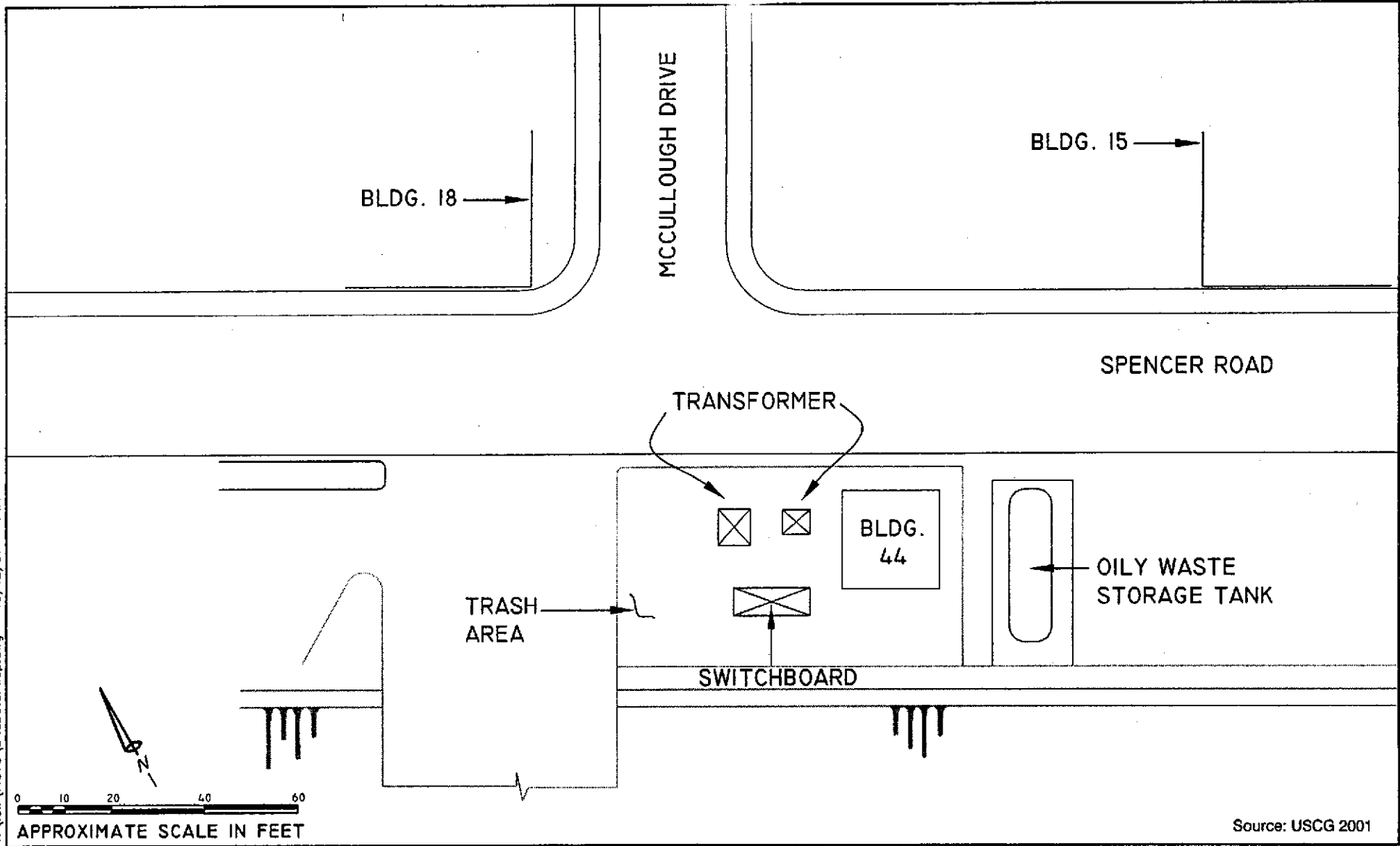


Source: Thomas Brothers, 1993

Site Location Map

Bldg. 44 UST Removal
Alameda, California

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Source: USCG 2001

Site Plan

Bldg. 44 UST Removal
Alameda, California

and oily wastewater and waste oil was transported to the UST by tanker trucks. The separation process and off-site disposal procedure remained the same. Most recently, the monitoring system that detects potential leaks in the tank has failed. The UST was taken out of service because of this system's failure. The USCG decided that the costs and risks of maintaining this oily-water UST were not justified, and that the UST, the associated piping, and associated monitoring system, should be removed and disposed of off-site.

The construction drawings indicate that the depth to the bottom of the tank is approximately twelve feet below grade. The depth to the shallowest groundwater is not known, however, because of the site's elevation above sea level, and its proximity to the bay, groundwater may be above the bottom of the tank, and could be encountered during the excavation to remove the tank.

1.3 PURPOSE AND SCOPE

This Site Health and Safety Plan (SHSP) prescribes basic procedural and minimum equipment requirements for worker protection for Tetra Tech's employees, subcontractors, and authorized visitors who enter work areas. Each subcontractor is responsible for the health and safety of their employees and for compliance with applicable Occupational Health & Safety Administration (OSHA) regulations. This SHSP is designed to comply with the intent and spirit of both federal and state legislation. The SHSP has been reviewed and approved by the Health and Safety Manager and conforms to Tetra Tech's corporate policy manual for hazardous waste projects.

If site conditions change during the project, Tetra Tech and its subcontractors will be required to modify operations, which may include upgrading or downgrading levels of personal protection. Tetra Tech's Program Manager and Health and Safety Manager will permit no amendments to this SHSP without prior approval. Modifications to this SHSP will be recorded on the SHSP Amendment Form, included as Appendix B. The Field Supervisor must retain copies of modifications to this SHSP on-site.

Tetra Tech's employees, subcontractors, site visitors, and other authorized personnel who enter any area of the jobsite are subject to the provisions of this SHSP. Personnel who are assigned work within or plan to enter any area of the job site must read the site SHSP and verify through signature that they are familiar with its provisions. The Site Safety Plan Acknowledgment Form is located in Appendix C. Unauthorized personnel are not permitted in the restricted work zones.

During development of this plan, consideration was given to current safety standards as defined by the Environmental Protection Agency (EPA)/OSHA/National Institute for Occupational Safety and Health (NIOSH), health effects and exposure guidelines/limits for known contaminants, and procedures designed to protect against the potential for exposure to unknown substances. Specifically, the following reference sources have been consulted:

SECTION 2

HAZARD ANALYSIS

2.1 DESCRIPTION OF SITE TASKS

Following is a list of the general tasks that may be conducted for this Scope of Services at ISC Alameda Building 44:

1. Erect or install construction support facilities.
2. Remove structures and debris to clear the site for tank removal activities.
3. Lockout/tagout electrical lines as necessary.
4. Pump waste material from tanks/pipelines prior to removal.
5. Disconnect, back flush, plug, and/or cap pipelines as necessary.
6. Remove above-grade pipelines, pumps, and/or soils as necessary.
7. Purge the tank/pipeline atmosphere and ground the tank/pipeline prior to removal.
8. Demolish concrete/asphalt slabs in traffic areas.
9. Clean the tanks before removal from the excavation area.
10. Excavate and remove pipelines associated with the tanks.
11. Excavate and remove the tank.
12. Collect and analyze confirmation soil sampling and liquid/soil waste characterization samples.
13. Backfill and compact the excavation site with soil.
14. Transport tanks and excavated soil/liquids to an offsite disposal facility.

A listing of task descriptions and hazards analyses for each task is provided in Appendix D.

Table 2.1 provides a summary of chemical hazards that may be encountered at ISC Alameda. Information on the physical and chemical properties of the contaminants and hazardous chemicals at ISC Alameda, including the pathways of exposure, are provided in the MSDSs located in Appendix E.

2.4 MECHANICAL

Machinery, which may be on-site, includes loaders, backhoes, excavators, trucks, drilling rigs, personnel lifts, and compactors. Only qualified operators will be allowed to operate the equipment. During operation of swing equipment such as excavators or backhoes, the swing radius will be communicated by the equipment operator to prevent employees from being struck by rotating machinery. Appropriate clearance from electrical wires will be maintained. Safe distance requirements are as follows: voltage less than 50 Kv; clearance = 15 feet. Voltage greater than 50 Kv; clearance = 15 feet + $(\text{voltage (Kv)} - 50 \text{ Kv}) / 30 \text{ Kv}$.

All motorized vehicles will be driven and ridden safely. Vehicles will not be overloaded with riders or supplies. Federal regulations require seat belts to be worn by all personnel when in vehicles on government property. Machinery such as backhoes, excavators, trucks, personnel lifts, and compactors will be inspected visually upon arrival and departure from the project. Each equipment operator will perform a daily inspection of equipment prior to use.

2.5 TRAFFIC

Traffic control measures may be required at ISC Alameda due to its condition as an active base, with inactive areas, and because the site to be remediated is located in a moderate traffic area. In this area, the work site will be cordoned off with high-visibility, "Caution: Do Not Enter" barricade tape. Traffic cones and or barricades will be positioned to alert base traffic of on going construction activity. Any construction traffic through the base will follow the designated construction routes posted by the USCG.

2.6 NOISE

Control of noise hazards will be in accordance with 29 CFR 1910.95. Hearing protection will be worn in noise hazard areas. Hearing protection may include earplugs or earmuffs. Noise hazard areas include operation of heavy equipment, pumps, location in vicinity of air traffic, etc. The primary noise sources will be identified before and during the project. Tetra Tech also has a hearing conservation program in effect; this program requires the use of hearing protection for employees exposed to noise levels above 85 dBA.

2.7 FALL PREVENTION/PROTECTION

Fall hazards will be identified at the site; fall controls will address employee awareness and good housekeeping. Good housekeeping practices should be followed at all times to provide walking paths free of tripping hazards. When employees are working at elevations, fall prevention and protection measures will be in place. These controls

Table 2-1
Chemical Hazards Of Concern *(continued)*

Chemical (Ionization Potential)	Promulgated Exposure Limits	Routes of Exposure	Symptoms & Target Organs
Lead	PEL: 0.050 mg/m ³ TLV: 0.050 mg/m ³ STEL: NA IDLH: 100 mg/m ³	Inhalation Absorption Contact	Skin irritation, headache, nausea, CNS, GI system.
Nickel (dust)	PEL: 1.0 mg/m ³ TLV: 1.5 mg/m ³ STEL: NA IDLH: 10 mg/m ³	Inhalation Absorption Contact	Skin irritation, headache, CNS, kidney, lung.
Zinc (dust)	PEL: 5.0 mg/m ³ TLV: 10.0 mg/m ³ STEL: 10.0 mg/m ³ IDLH: 500 mg/m ³	Inhalation Absorption Contact	Skin irritation, fever, CNS, lung.

Notes and Abbreviations:

- The TLV provided for diesel fuel represents a "notice of intended change" listing by the ACGIH (2000).
- Ionization potential is from the NIOSH Pocket Guide to Chemical Hazards in electron volts (eV).
- PEL: Permissible Exposure Limit from OSHA 1910, Time Weighted Average (TWA) unless indicated by C (Ceiling).
- TLV: Threshold Limit Value set by the American Conference of Governmental Industrial Hygienists (ACGIH).
- (Ca): Suspected or Confirmed Human Carcinogen by the ACGIH.
- STEL: Short Term Exposure Limit by the ACGIH.
- IDLH: Immediately Dangerous to Life and Health from the NIOSH Pocket Guide to Chemical Hazards.
- NA: Not Available

include: standard guardrail protection (upper, mid-rails, and toe board); safety nets; and/or 100 percent tie-off with a full body harness and lanyard.

2.8 FALLING OBJECTS

All personnel must wear hard hats whenever construction type activity is taking place (e.g., excavation). The hard hat must be worn properly and not altered in anyway that would lessen the degree of protection offered. All hard hats must meet American National Standards Institute (ANSI) Standard Z89.1, 1986.

2.9 BIOLOGICAL HAZARDS

Poisonous animals, plants, and insects may also be encountered. Construction employees will be briefed by the site safety officer (SSO) on biological hazards prior to performance of fieldwork. Biological hazards include poisonous snakes and insects indigenous to northern California. In the event of a snakebite, the victim shall be taken to the closest emergency medical facility.

2.10 ELECTRICAL HAZARDS

Underground or overhead lines may present a potential for electrocution. Construction employees will make efforts to identify above and below grade utilities. Utility lines must be considered energized until positively determined otherwise. Subsurface

2. The excavation design will be selected from and be in accordance with written tabulated data, such as charts and tables. At least one copy of the tabulated data will be maintained at the work site during excavation. The tabulated data shall include:
 - (A.) Identification of the parameters that affect the selection of a sloping or benching system drawn from the data,
 - (B.) Identification of the limits of use of the data, to include the magnitude and configuration of slopes determined to be safe,
 - (C.) Explanatory information as may be necessary to aid the user in correctly selecting a protective system from the data, and
 - (D.) The identity of the registered professional engineer who approved the data.

3. The sloping or benching system will be designed by a registered engineer and at least one copy of the design will be maintained at the work site during excavation. Designs will be in writing and will include:
 - (A.) The magnitude and configuration of slopes determined to be safe for the site excavation, and
 - (B.) The identity of the registered professional engineer who approved the design.

2.14 UNDERGROUND AND ELECTRICAL UTILITIES

Tetra Tech will stake or surface spray paint the area proposed for excavation. Tetra Tech will also conduct a subsurface utility survey, and clearly mark the location and if possible, the depth, of each utility. The USCG will be contacted and will be responsible for disconnecting overhead utilities, and turning off power to the facilities involved to facilitate safe removal of the tanks. Lockout and tagout procedures will be followed in the event electrical utilities are encountered at the site. Utilities will be avoided by placing all excavation locations no closer than five feet to any of the marked utilities. If it is required to excavate closer than this margin, the area will be hand excavated to the suspected depth of the utility before proceeding.

2.15 SURFACE AND EQUIPMENT CONTAMINATION

Contact with contaminated surfaces, or surfaces suspected of being contaminated should be avoided. This includes walking through, kneeling or placing equipment in puddles, mud, discolored surfaces, or on drums and other containers. Eating, smoking, drinking and/or activities, which involve hand to face/mouth area, are prohibited in the immediate work area(s). This reduces the likelihood of contamination by ingestion.

2.16 FIRE/EXPLOSION PREVENTION

Construction workers will be trained on potential causes of fires and explosions and will be trained on fire prevention and safety. Portable fire extinguishers will be readily accessible. In the event of a fire, field team members will evacuate the site and contact the local fire department. During equipment operation, vapor concentration measurements will be taken with a CGI. If at any time the vapor concentrations exceed 10% of the LEL, the Field Supervisor or designated field worker should immediately shut down all operations. Only approved safety cans will be used to transport and store

SECTION 3

KEY PERSONNEL AND RESPONSIBILITIES

The following is a summary of key project personnel and their responsibilities:

<u>Title</u>	<u>Name</u>	<u>Responsibilities</u>
Program Manager	Brad Hall (Tetra Tech)	Coordinate program administration with USCG.
Project Manager	Gary Floyd (Tetra Tech)	Coordinate all aspects of the project to ensure a safe and successful completion.
Field Supervisor	Dick Brunner (Tetra Tech)	Direct all site and safety operations from the field to provide a safe and successful completion.
Subcontractor Field Supervisor	Mike St. Pierre (Foss)	Direct all subcontractor (Foss) operations from the field to provide a safe and successful completion.
Project Health & Safety Manager	Roy Roenbeck (Tetra Tech)	Review field operations (audit if warranted or requested), monitor site-specific trends, and review the SHSP for corporate and regulatory compliance.
Site Safety Officer (SSO)	Dick Brunner (Tetra Tech)	Implement and enforce all health and safety activities at the site and all employees, sub-contractors and visitors to the site.

- Complete medical and occupational histories,
- Physical examination,
- Pulmonary function tests,
- Eye examination and visual acuity,
- Audiometry,
- Complete blood count.

The medical evaluation shall categorize employees as fit-for-duty and able to wear respiratory protection. Documentation is the responsibility of each employer. Each employee shall be able to provide proof of documentation. Specific medical requirements for Tetra Tech's employees are outlined in the corporate health and safety manual for hazardous waste projects.

In addition, medical monitoring shall be provided at the following times:

- When employees have been injured, receives a health impairment, develops signs or symptoms, which may have resulted from an exposure.
- As soon as possible upon notification by an employee that the employee has developed signs or symptoms indicating possible over-exposure to hazardous substances, health hazards or exposure above an OSHA permissible exposure limit (PEL).
- At least once every twelve months for each employee covered unless the physician determines a longer appropriate interval.
- As soon as possible following an emergency incident where personnel may have been exposed.
- At termination of employment or reassignment to an area not covered (if the employee has not been examined within six months).

4.3 SITE-SPECIFIC MEDICAL MONITORING

If changes in the work conditions occur or unseen circumstances arise, the Field Supervisor will be in contact with the Health and Safety Manager to determine if/what additional monitoring is needed.

4.4 RECORDKEEPING REQUIREMENTS

Tetra Tech will maintain the following project records. Each subcontractor will also be responsible for maintaining and providing the following reports and records to Tetra Tech:

- Fit to Work Form, signed by Physician, as required.
- Respiratory Training Records, as required.
- Respirator Fit-Test Results Records, as required.

SECTION 5

PERSONNEL PROTECTION

5.1 DEFINITION OF LEVELS OF PROTECTION

The individual components of protective clothing and equipment must be assembled into a full protective ensemble that protects the worker from site-specific hazards and minimizes the hazards and drawbacks of the personal protective equipment (PPE) itself.

Level A Should be worn when hazardous substances have been identified and require the highest level of protection for skin, eyes, and respiratory system based on either the measured (or potential for) high concentrations of vapors, gases, or particulates; or the site operations and work functions involve a high potential for splash, immersion, or exposure to unexpected vapors, gases, or particulates that are harmful to skin or capable of being absorbed through intact skin; or substances with a high degree of hazard to the skin are known or suspected to be present and skin contact is possible.

Level B Should be worn when the type and atmospheric concentrations have been identified and require a high level of respiratory protection and moderate skin protection; or the atmosphere contains less than 19.5% oxygen.

Level C Should be worn when the atmospheric contaminants, liquid splashes, or other direct contact will not adversely affect, or be absorbed through, any exposed skin; or the types of air contaminants have been identified, concentrations measured, and an air-purifying respirator is available that can remove the contaminants.

Level D Should be worn when the atmosphere contains no known hazard or work functions preclude splashes, immersion, or the potential for unexpected inhalation of or contact with hazardous levels of any chemicals.

5.2 LEVELS OF PROTECTION ASSIGNED TO TASKS

Level D, Modified Level D, and Level C are planned for the specific site tasks at ISC Alameda Building 44. Listed below is the PPE required for each task.

Level C PPE

Upgrade based on air monitoring results as described in Section 6.0.

- Site dedicated work clothing (types dictated by weather conditions);
- Tyvek disposable coveralls with hood;
- Inner and outer chemical-resistant gloves,
 - Outer: Nitrile (or similar),
 - Inner: N-DEX (or similar);
- Hard hat;
- Chemical resistant, steel-toe, steel-shank work boots;
- Air purifying respirator equipped with NIOSH/MSHA and HEPA approved cartridges or canister for removal of organic vapors, toxic particulates;
- Cool vests (as dictated by weather conditions);
- Insulated coveralls, boots, gloves, headliner (winter operations);
- Splash protection (where required);
- Hearing protection (where required);
- Orange safety vest if working near vehicular traffic.

5.3 REASSESSMENT OF PROTECTION PROGRAM

The level of protection provided by PPE selection shall be upgraded or downgraded based upon a change in site conditions, air monitoring, results, or findings of investigations. The Field Supervisor/SSO, in consultation with the Health and Safety Manager, shall be responsible for deciding when and if an upgrade or downgrade in PPE is warranted.

When a significant change occurs, the protection program should be reassessed. Some indicators of the need for reassessment are:

- Commencement of a new work phase that begins on a different portion of ISC Alameda;
- Change in job tasks during a work phase;
- When temperature extremes or individual medical considerations limit the effectiveness of PPE;
- Contaminants other than those previously identified are encountered;
- Change in ambient levels of contaminants;
- Change in work scope, which affects the degree of contact with contaminants.

SECTION 6

FREQUENCY AND TYPES OF AIR MONITORING

6.1 AREA AIR MONITORING

Direct area air monitoring shall be performed to quantify airborne contaminants in order to verify and determine the level of worker protection required. All monitoring equipment shall be calibrated, operated, and maintained according to the manufacturer's specifications. Appendix G provides a summary of instrument descriptions and general inspection/maintenance procedures. Instruments should be calibrated and operated by properly trained personnel in accordance with the instruments operating manual. Initially, all field personnel shall wear Level D protective clothing and PPE at the site. Levels of protection shall be increased as required by the action levels presented in Table 6.1. If an increase in the level of protection is required, work shall be halted and shall resume only when all personnel are properly outfitted.

6.2 TANK MONITORING PROGRAM

The tank will be monitored during the product material removal and during the tank removal. The primary concern is the explosive level of the air/product mixture in the tank. The tank will be emptied, and the air space within the tank will be sufficiently exchanged with carbon dioxide by adding "dry ice" to render the tank inert. An explosive meter will be used by the SSO to assure that the tank remains inert. Furthermore, the SSO will monitor all of the workers and their equipment to eliminate the risk of sparks or open flames in the work area. General guidance for the tank monitoring will be followed in accordance with the API publication 1604 for the safe removal of USTs.

6.3 PERSONAL AIR MONITORING

Whenever direct monitoring methods indicate that employee exposures to hazardous substances and/or health hazards may be at or above a permissible exposure limit (PEL), or in the absence of a PEL or any other published exposure limit, indirect (personal air sampling) monitoring methods in accordance with NIOSH/OSHA guidelines shall be implemented.

Table 6-1
Area Air Monitoring Program And PPE Action Levels *(continued)*

Instrument	Health and Safety Concern	Monitoring Frequency / Detection Level	Action Level ¹	Action
Mini-ram Particulate Monitor	Suspended particles	Continuously or as required by SSO or Health and Safety Manager / 0.1 mg/m ³	< 5 mg/m ³ sustained	Level D
			> 5 to 10 mg/m ³ sustained	Level C (half-face APR ² with organic vapor/HEPA cartridges)
			> 10 mg/m ³ sustained	Level C (full-face APR ² with organic vapor/HEPA cartridges)
CGI	At the source and work area	Continuously or as required by SSO or Health and Safety Manager	> 10% LEL	All work will cease, leave affected area until LEL is below 10%, call the Health and Safety Manager
O ₂ Meter	OBZ and at the source and work area	Continuously or as required by SSO or Health and Safety Manager	≤ 19.5% O ₂ , or ≥ 23.0% O ₂	Evacuate site; notify SSO or Health and Safety Manager

¹ Sustained ambient conditions persisting at least 5 minutes or more during continuous monitoring.

² APRs will be equipped with combination organic vapor/HEPA dust cartridges rated for 500 micron dust emissions.

OVA = Organic Vapor Analyze O₂ = Oxygen

LEL = Lower Explosion Limit

ppm = Parts per million

CGI = Combustible Gas Indicator

OBZ = Operator Breathing Zone

7.3 WORK ZONE DEFINITIONS

The three general zones regularly established at contaminant removal sites are the exclusion zone, contamination reduction zone, and support zone. These zone designations are defined as follows:

- The *exclusion zone* is defined as the area where contamination is either known or likely to be present, or because of activity, will provide a potential to cause harm to personnel. Entry into the exclusion zone requires the use of personal protective equipment.
- The *contamination reduction zone* is the area where personnel conduct personal and equipment decontamination. It is essentially a buffer zone between contaminated areas and clean areas. Support activities to be conducted in this zone will require at a minimum personal protective equipment of Level D. Emergency supplies will be located at this zone.
- The *support zone* is situated in clean areas where the chance to encounter hazardous materials or conditions is minimal. Personal protective equipment is therefore not required.

The exclusion zone and the contamination reduction zone are restricted work zones. Access to the restricted work zones shall be only to personnel having undergone the requisite training as specified in Section 4 and under the requisite medical surveillance program as specified in Section 5, and also having certified by signature that they have read, understand, and will abide by the SHSP (Appendix C).

7.4 SITE SECURITY

Activities covered by this SHSP are located at an inactive tank area at the active ISC Alameda facility. In inactive areas, the boundary of the exclusion and contamination reduction zones will be cordoned-off with high-visibility, "Caution: Do Not Enter" barricade tape to prevent access to unauthorized personnel. The excavation area will be surrounded with fencing to limit access to unauthorized personnel.

7.5 SAFE WORK PRACTICES

All persons entering and/or working on the environmental remedial action for soil and contaminant removal at ISC Alameda shall follow the following safe work practices:

- All persons working on this project shall read and sign this SHSP prior to entering or working at Building 44. The master copy (with signature sheet) of this safety plan will be held by the Field Supervisor (see Appendix C).
- There will be no smoking, eating, chewing gum or tobacco, drinking, taking medicines, or other activities which require hand to mouth/face actions in the exclusion or contamination reduction zones.

Supervisor/SSO and/or Health and Safety Manager to be present, and shall be performed by personnel properly trained in confined space entry.

- When using portable electric tools and appliances, use three-wire grounded extension cords and ground fault circuit interrupters to reduce the potential for electrical shock.
- If an employee discovers any signs of radioactivity, explosives or unusual conditions such as dead animals, they will exit immediately and report their findings to the Field Supervisor/SSO and/or Health and Safety Manager.
- An adequate supply of potable water shall be available on-site. Portable containers used to dispense drinking water shall be capable of being tightly closed and equipped with a tap. Water shall not be dipped from containers.
- Restroom facilities (portable) shall be made available at hazardous waste site locations according to Table H-120.2 in 29 CFR 1910.120 (n) 3I.
- First aid equipment will be available based on MSDS requirements.
- Prior to opening an excavation, there will be a determination of whether there is the possibility of underground installations such as sewer, electrical, or other utility lines.
- Any surface encumbrances located so as to create a hazard to employees involved in the excavation work will be removed. This applies to any structure, natural or artificial condition that may, due to the excavation, create a hazard to employees or visitors.
- If there is rainfall or other hazard-increasing occurrence, safety considerations will be increased proportional to the increased risk.
- Visitors will not be allowed in the area unless approved by the Project Manager.
- Stand clear of all heavy equipment while in use. Do not approach the heavy equipment until they have been shut down and the equipment operator gives permission.

SECTION 9

EMERGENCY RESPONSE/CONTINGENCY PLAN

9.1 NOTIFICATION OF EMERGENCY RESPONSE AUTHORITIES

Prior to starting site work, the local fire, police, rescue authorities, and nearby hospital personnel will be contacted and briefed to determine their response capabilities and to obtain a response commitment. Also, all off-site emergency personnel will be advised of the site emergency and decontamination procedures.

9.2 PERSONNEL ROLES AND LINES OF AUTHORITY

The Field Supervisor and Project Manager have the primary responsibility for evacuating the site in emergency situations. This includes taking appropriate measures to ensure the safety of site personnel and the public. Possible actions may involve evacuation of personnel from the site area, and evacuation of adjacent facilities. He/she is additionally responsible for ensuring that corrective measures have been implemented, appropriate authorities notified, and follow-up reports completed. The Health and Safety Manager may be called upon to act on the behalf of the Project Manager, and will direct responses to any medical emergency.

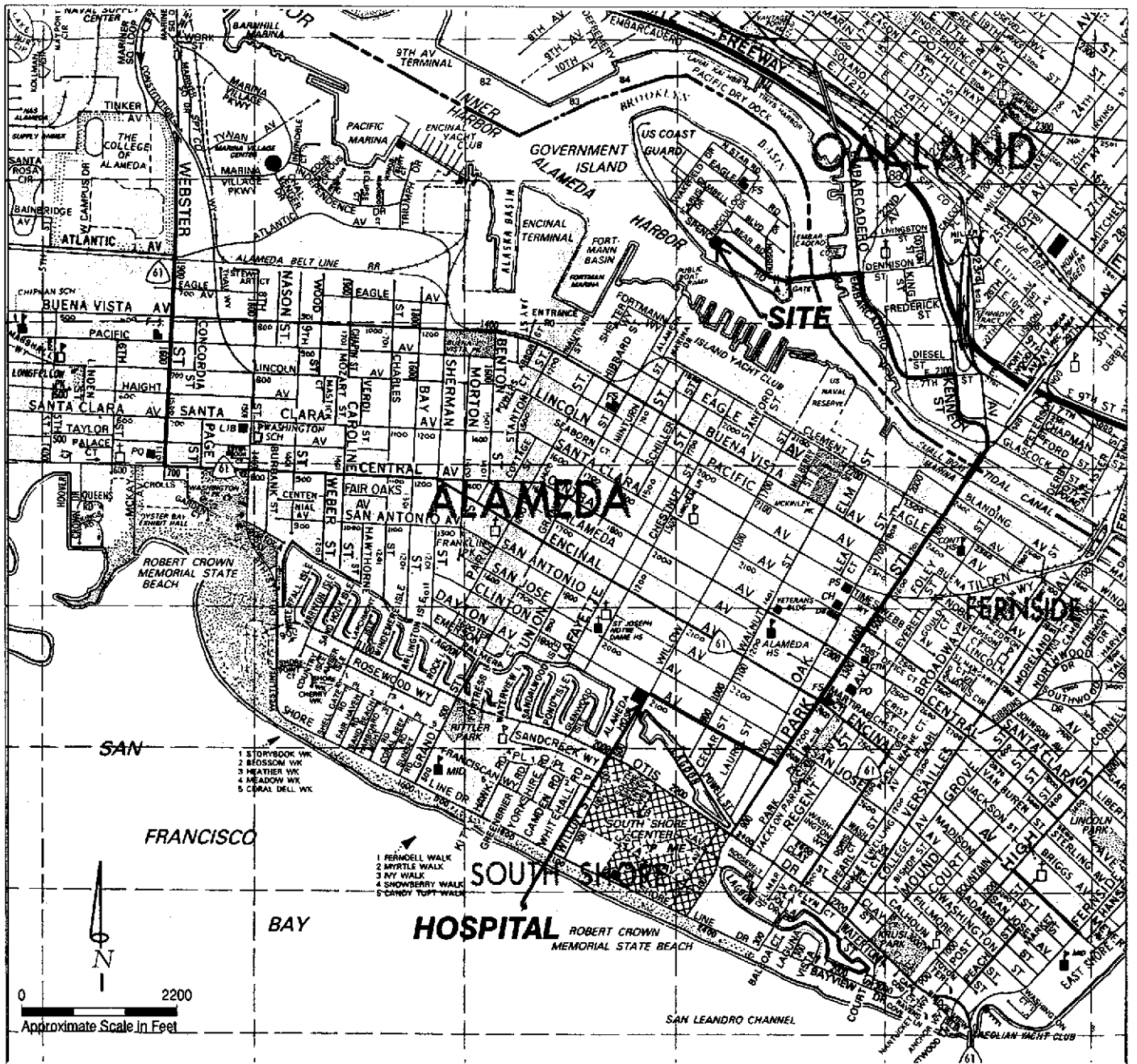
9.3 NEAREST MEDICAL ASSISTANCE

Primary Emergency Contact: Alameda Hospital
2070 Clinton Avenue
(corner of Clinton Avenue and Willow Street)
Alameda, California 94501
(510) 522-3700 Main
(510) 523-4357 Emergency

Route to Hospital:

From the ISC Alameda Building 44 site, head down Spence Road and exit the facility via the main gate and bridge. Proceed across the bridge and make a right turn onto the Embarcadero Freeway. Follow the Embarcadero Freeway for approximately one-half mile, until it turns into East 7th Street. Make a quick right turn off of East 7th Street and onto Kennedy Street, and proceed for one-quarter mile until reaching Park Street. Follow Park Street across the bridge (onto Alameda Island) and proceed for

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Source: Thomas Brothers, 1993

Emergency Route Map to Hospital

Bldg. 44 UST Removal
Alameda, California

**Table 9-1
Emergency Contacts**

Organization	Contact	Emergency Telephone
Ambulance	Ambulance	On Post – 911 Off Post – 911
Fire	Fire Department	On Post – 911 Off Post – 911
Hospital	Alameda Hospital	Main -- (510) 522-3700 Emergency - (510) 523-4357
ISC Point of Contact	LT John Hickey	(510) 437-3285
USCG	Joseph Sabel	(510) 535-7239
Superfund / RCRA Hotline	N/A	(800) 424-9346
Poison Control Center	N/A	(800) 362-0101
National Response Center	N/A	(800) 424-8802
Center for Disease Control	N/A	(404) 488-4100
Chemtrec	N/A	(800) 424-9300
Program Manager	Brad Hall (Tetra Tech)	(415) 974-1221
Project Manager	Gary Floyd (Tetra Tech)	(415) 974-1221
Field Supervisor/SSO	Dick Brunner (Tetra Tech)	(415) 974-1221
Project H&S Manager	Roy Roenbeck (Tetra Tech)	(415) 974-1221

N/A = Not Applicable

9.6 EMERGENCY MEDICAL TREATMENT PROCEDURES

Any person who becomes ill or injured in the exclusion and/or contamination reduction zones must be decontaminated to the maximum extent possible. If the injury or illness is minor, full decontamination should be completed and first aid administered prior to transport. If the patient's condition is serious, at least partial decontamination should be completed (i.e., complete disrobing of the victim and redressing in clean coveralls or wrapping in a blanket).

First aid should be administered while awaiting an ambulance or paramedics. All injuries and illnesses must immediately be reported to the Project Manager, Field Supervisor/SSO, and Health and Safety Manager. During active phases of the project, a minimum of two available on-site employees will first aid/CPR trained. The American Red Cross will certify the aforementioned personnel in standard first aid and adult CPR.

Any person being transported to a clinic or hospital for treatment should be accompanied with a complete copy of the SHSP. Any vehicle used to transport contaminated personnel will be treated and cleaned as necessary. Any person who becomes ill or injured without the concern of contamination shall also seek appropriate medical assistance.

APPENDIX A
HEALTH AND SAFETY PLAN APPROVAL FORM

APPENDIX B
SITE HEALTH AND SAFETY PLAN AMENDMENT FORM

APPENDIX C
SITE SAFETY PLAN ACKNOWLEDGMENT FORM

APPENDIX D
TASK DESCRIPTION AND HAZARD ANALYSIS

CLEARING/GRADING

General hazards encountered during mobilization include the following:

- Back strain from clearing vegetation for site support areas with hand held cutting tools.
- Irritation from dust generated from road construction.
- Driving vehicles, placing trailers, and collecting rubbish, on uneven surfaces creates a possibility of the vehicle rolling, getting stuck in mud or ditches, or of an accident due to flat tires or striking obstacles, and the vehicles.
- Crushing or pinching hazard due to trailer placement.
- Several types of hazards can be associated with utility hook-up depending on the particular work activity. Construction of temporary poles for electrical and/or telephone lines can disturb potentially contaminated soils.

Hazard Prevention

- Back strain can be prevented by frequent breaks in routine. Use slow, even, movements and proper lifting techniques (i.e., with the legs). Work gloves will reduce the incidence of hand injury and blisters associated with the use of hand tools.
- Dust suppression techniques, i.e., wetting the soil with water, will reduce dust exposure.
- Proper vehicle maintenance will prevent avoidable vehicle breakdown in the field. In order to minimize accidents from uneven terrain, a site surveillance should be performed on foot to choose a clear driving path.
- Seatbelts should be worn at all times.
- At a minimum, all heavy equipment shall have the safety features outlined in OSHA 29 CFR 1910 & 1926 Subpart O.
- Heavy equipment operators should have proper training and experience, and documentation of both. The general provisions of 1910 & 1926 would apply.
- Hazards associated with the particular utility would be anticipated and the subcontractor or employer should undertake proper measures. General provisions of 29 CFR 1910 & 1926 Subpart K, should be implemented in order to prevent electrical hazards.

SUBSURFACE SOIL SAMPLING

For the purposes of this hazard identification section, surface soil sampling will be considered any soil sampling completed by hand using a trowel, split spoon, shovel, auger, or other type of handheld tool. Hazards generally associated with soil sampling include:

- Contact with or inhalation of contaminants, potentially in high concentrations in sampling media
- Back strain and muscle fatigue due to lifting, shoveling and augering techniques.
- Contact with or inhalation of decontamination solutions.

Hazard Prevention

- To minimize exposure to chemical contaminants, a thorough review of suspected contaminants should be completed and implementation of an adequate protection program.
- Proper lifting (pre-lift weight assessment, use of legs, multiple personnel) techniques will prevent back strain. Use slow easy motions when shoveling, augering, and digging to decrease muscle strain.
- Material Safety Data Sheets for all decontamination solutions will be included with each Site Health and Safety Plan.
- First aid equipment will be available based on MSDS requirements.

DRUM HANDLING AND SAMPLING

A variety of hazards are associated with drum handling and sampling and include the following:

- Detonations
- Fires and explosion
- Vapor generation
- Physical injury due to moving heavy containers by hand and working around stacked drums.

Hazard Prevention

- Minimize handling as much as possible
- Use equipment and procedures that isolate workers from hazardous substances
- Comply with OSHA 29 CFR Parts 1910 and 1926, EPA 40 CFR Part 265, and DOT 49 CFR Parts 171 through 178.
- Drum inspection, opening, sampling, and characterization should follow the guidelines in the EPA's Standard Operating Safety Guides (SOSG), 1992 - Chapter 10 - Drum Handling.
- Before handling or sampling drums inspect for:
 - a) Symbols, words, or marks on drum to indicate the nature of its contents
 - b) Signs of deterioration (i.e., corrosion, rust, leaks)
 - c) Signs that drum is under pressure (i.e., swelling and bulging)
 - d) Drum type (i.e., polyethylene, PVC-lined, exotic metal, etc.)
 - e) Configuration of drum head
- If drum opening, sampling, or handling is performed the procedures in Appendix I should be followed.

BREAKING CONCRETE PADS
using a breaker mounted on a bobcat

Potential Hazards:

- Flying particles
- Noise
- Falls from bobcat or bobcat rollover
- Hydraulic line break

Prevention/Controls:

- Wear PPE: safety glasses, hearing protection
- Wear seat belt during operation of bobcat
- Inspect all hydraulic lines to verify that they are in good condition, replace as necessary

COMPACTING SOILS
using gasoline powered compactor

Potential Hazards:

- Noise
- Strains when moving compactor
- Falls going into/out of excavation
- Excavation cave-in
- Fire during refueling operations

Prevention/Controls:

- Wear hearing protectors
- Use slow, gradual motions when moving compactor, get help when needed
- Use steps or ladder when change in elevation is greater than 19"
- Slope or shore excavation per OSHA requirements if excavation is greater than 5' in depth
- Allow compactor to cool before refueling
- Use UL/FM approved metal safety containers for storage of gasoline

EXCAVATING AND TRANSPORTING OPERATIONS
utilizing backhoes, front-end loaders, dump trucks, etc.

Potential Hazards:

- Struck by moving equipment
- Struck by falling material
- Noise
- Falls from equipment
- Hydraulic line failure
- Undetected underground utilities
- Several equipment/materials becoming unsecured and becoming a falling/crushing hazard.

Prevention/Controls:

- Discontinue operation if unauthorized personnel are in the work area. Use spotters to assist operators in avoiding blind areas
- No operation outside vehicles during loading operations. All haulage vehicles shall have a cab shield and/or canopy able to protect the driver from shifting or falling materials
- Wear proper hearing protection
- Inspect all hydraulic lines to verify that they are in good working condition; replace as necessary
- Have existing underground utilities located prior to beginning excavation activities
- Secure equipment properly and inspect during transport.

INSTALLATION and REMOVAL of PIPING SYSTEMS
by Manual & Mechanical Means

Potential Hazards:

- Struck by moving equipment
- Noise
- Strains from handling pipe
- Excavation fall hazards

Prevention/Controls:

- Discontinue operation if unauthorized personnel are in the work area. Use spotters to assist operator visibility in blind areas
- Wear proper hearing protection
- Use gradual, slow movements when handling pipe. Get help when needed and use mechanical means when possible
- Barricade excavations when not involved in current work activities. Do not work between lifting or excavating equipment and the excavation walls.