SEACOR
Science & Engineering Analysis Corporation
90 New Montgomery Street, Suite 620
San Francisco, California 94105 - 4503
(415) 882-1548 o FAX: (415) 882-4406

LETTER OF TRANSMITTAL

Date: 7.6.94

Attn: MR. BRIAN P. OLIVA, REHS

Company: ACDEH

Address: 80 SWAN WAY, ROOM 200
OAKLAND, CA 94621

Project: City of EMERYVILLE Job No:

RE: UST REMOVAL @ 4331 SAN PABLO AVE.

Enclosed:
- ☐ Proposal
- ☐ Contract
- ☐ Report
- ☐ Letter
- ☒ Other: HEALTH + SAFETY PLAN

For:
- ☐ As Requested
- ☒ Review
- ☐ Your Information
- ☐ Approval
- ☐ Signature
- ☐ Return
- ☐ Other:

Comments:

Signature: Alessandra Bruni

Title: PROJECT GEOLOGIST

cc: MR. JUAN ARREGUIN - City of EMERYVILLE
MR. BRUCE SCARBROUGH - SEACOR

SEACOR

SITE HEALTH AND SAFETY PLAN:
UNDERGROUND STORAGE TANK FIELD OPERATIONS
4331 SAN PABLO AVENUE, EMERYVILLE, CALIFORNIA

SEACOR
90 New Montgomery Street
Suite 620
San Francisco, California 94105

SITE HEALTH AND SAFETY PLAN (HASP) DATA FORM

PROJECT IDENTIFICATION:

SEACOR PROJECT NO. : 50100-003-01

SITE NAME: 4331 San Pablo Avenue, Emeryville, CA

CLIENT: City of Emeryville, Engineering Department

WORK LOCATION ADDRESS: 4331 San Pablo Avenue, Emeryville, CA

SITE HISTORY:

One 550-gallon UST is located at the site and has been historically used to dispense diesel fuel to vehicles. The site is a City of Emeryville Fire Station.

SCOPE OF WORK:

A qualified contractor will saw cut and dispose of the asphalt surface overlaying the UST and remove and dispose of the UST. A SEACOR geologist will be on-site to oversee and document UST removal activities. Soil and/or groundwater samples will be collected from the UST excavation, and chemically analyzed. Analytes will include total petroleum hydrocarbons as diesel (TPHd), and benzene, toluene, ethylbenzene, and total xylenes (BTEX).

REVIEW AND APPROVAL DOCUMENTATION:

Prepared By:

Alessandra E. Bruni _____
Date

Reviewed By:

Alessandra E. Bruni 6.15.94
Site Safety Officer Date

_____
Project Manager Date

_____
Principal-In-Charge Date

Approved By:

Daniel A. Moore 6/24/94
Safety and Health Director Date

Project Start Date _____ End Date _____
This Site HASP Must Be Reissued/Reapproved For Any Activities Conducted After:

Date_____Amended Date(s) 1._____ 2._____ 3._____ 4._____ 5._____

SECTION 1
INTRODUCTION

1.1 Purpose

This document has been prepared to serve as a standard health and safety protocol for the identified tasks relating to underground storage tanks (UST) containing petroleum products. The purpose of this document is to provide consistent and comprehensive procedures to protect the health and safety of *SEACOR* personnel, *SEACOR* subcontractors, and the public during these field activities. Through this plan, it is expected that the high standard of *SEACOR* health and safety will be maintained by ensuring consistent application of the safety practices described herein.

1.2 Scope and Applicability

This standard Health and Safety Plan (the plan) has been developed to cover selected activities relating to underground storage tank projects. This plan applies only to USTs containing, or formerly containing petroleum hydrocarbon products such as gasoline, diesel fuel, heating fuels, lubricants, turbine fuel, or waste oil. The application of a standard plan is appropriate for these projects because of the foreknowledge of site conditions and hazards, and the repetitive nature of the work activities. Tasks involving USTs associated with chemicals or materials other than those mentioned are NOT covered under this plan. Furthermore, this plan is NOT valid for UST projects where Level B personal protection is required, or where entry or demolition of USTs is undertaken. Therefore, this plan applies to the following activities when they are performed on petroleum containing underground storage tanks:

- Activities associated with standard site characterizations such as soil and groundwater sampling.
- Tank and product dispensing line removal.
- Excavation of petroleum contaminated soil.
- Tank tightness testing.
- Installation of groundwater treatment systems and soil vapor extraction systems.
- UST installation oversight.

Actual subtasks relating to the identified activities will be discussed in detail in Section 3 - Task Risk Analysis. The plan is valid only when used to support the identified activities, and will not be accepted for use on projects other than described.

1.3 Site Specific Information

Although this plan is designed to address the known conditions of UST related projects, certain site specific information is necessary to complete it. Therefore, this information must be provided before the plan can be authorized for use. Sections 6 and 7 provide the relevant pages from the *SEACOR* corporate health and safety plan which must be completed and made part of the plan. Information regarding key personnel, sub-contractors, and emergency contacts must be identified on these pages. In addition, the plan requires the inclusion of *SEACOR* Safety Operating Practices for the respective activities and conditions expected on site. For example, the Drilling Safety Protocol must be included for site characterization activities, and similarly, heat stress monitoring procedures must be added when that particular hazard exists. These practices shall be attached to the plan as Attachment 1. Copies of *SEACOR* Safety Operating Practices can be obtained from the Corporate Safety and Health Director (CSHD).

SECTION 2
HAZARD ASSESSMENT

The hazard classifications expected to be encountered during the referenced tasks include physiochemical, chemical, physical, and biological hazards. Most of the hazards found on site emanate from the UST and associated contents. However, project location, site operations, and climatic conditions contribute to the overall hazard assessment.

2.1 Physiochemical Hazards

In gasoline UST removal activities, flammability and explosion hazards are of paramount concern. Vapors from stored products are likely to remain in the tank at high concentrations even after the contents and residues have been removed. Furthermore, vapors may be present in the excavation and the work area at concentrations sufficient to support combustion. Therefore, precautions will be taken to eliminate build-up of combustible vapors by properly purging or inerting tanks and venting displaced vapors. During these operations, all potential sources of ignition will be removed from the area and *SEACOR* Hot Work Permit procedures must be used. Frequent monitoring with a combustible gas indicator (CGI) is required. Due to lower vapor pressures and higher flashpoints, diesel fuel and heating oils do not present the extreme explosion hazard as that of gasoline. However, vapors from these fuels can accumulate in confined or low-lying spaces and, in the presence of an ignition source, cause an explosion. A fire extinguisher and emergency telephone numbers will be maintained on site. Table I presents the chemical properties of the components and/or products of concern.

2.2 Chemical Hazards

Although petroleum products are blends of numerous hydrocarbon compounds, most present relatively minor health hazard during UST related activities. However, benzene, toluene, ethyl benzene, and xylenes are regular constituents of gasoline, and do present the potential for ill health affects. All four of these substances have high vapor pressures (see Table I). Routes of exposure include inhalation, ingestion, and absorption through the skin and eyes. When high concentrations of these chemicals are inhaled, symptoms of intoxication may result. These symptoms, ranging from simple dizziness to excitement or unconsciousness, are similar to those produced by alcohol or anesthetic gases. If such effects occur, the individual should be removed to fresh air. Benzene and tetraethyl lead, an additional fuel additive, require special toxicity considerations and are discussed below.

Benzene is a known animal carcinogen and human leukemogen, as well as a suspected human carcinogen. The present exposure limit for benzene is 1 ppm as set by the Occupational Safety and Health Administration (OSHA) with a Short Term Exposure Limit (STEL) of 5 ppm. *SEACOR* has developed a special protocol for monitoring and responding to situations involving benzene (see Section 4.3.2).

Tetraethyl lead, an organic form of lead, can cause diseases of the central nervous system, the kidneys, and the blood. Skin absorption of this compound is a major route of entry into the

body, however, it can also be inhaled as a constituent of dust. Care should be taken to avoid inhalation of and contact with dust on UST sites. The OSHA exposure limit is 0.075 mg/m^3 of air while the ACGIH exposure limit is 0.1 mg/m^3.

2.3 Physical Hazards

Physical hazards vary in type and number among the tasks related to UST operations, and not all of the described physical hazards are necessarily present during individual UST related projects. However, it is reasonable to expect that some combination of these hazards will be present, and therefore will be discussed in the plan. Most of these hazards have specific Safety Operating Practices that will be attached on a site-by-site basis. Safety Operating Practices can be obtained through the Corporate Safety and Health Director (CSHD).

The weather presents a variety of physical hazards that will vary from season to season, and must be addressed accordingly. High temperatures frequently present the potential for heat stress. When conditions exist for potential heat stress, an appropriate heat stress monitoring program must be included in the plan, and must be implemented and documented on site. Warmer weather also presents the possibility for thunderstorms and lightning. UST projects requiring the use of drill rigs, cranes, backhoes, and similar equipment will be shutdown in the event of thunderstorms. Cold weather presents yet a different group of hazards including the potential for hypothermia, frost bite, freezing liquids and surfaces, faulty monitoring equipment, and metal stress. Appropriate precautions for cold weather operations will be made part of this plan.

Heavy equipment is involved in most aspects of UST closures and site characterizations. When such equipment is operated by *SEACOR* or a *SEACOR* subcontractor, appropriate inspections and operating guidelines shall be employed as discussed in relevant operating practices. When work details require the use of hand tools and power hand tools caution and good judgment must be employed. In addition to general health hazard by way of electric shock and physical injury, power hand tools can act as ignition sources during UST operations. Electrical hand tool use requires utilization of Ground Fault Circuit Interrupters or establishment of an assured ground program. Hot work such as the cutting or welding of tanks is not covered under the plan. If these activities are required, an approved amendment to this plan is necessary. Similarly, the plan does not cover any form of confined space entry either into a tank or excavated areas.

UST closure and installation will require varying degrees of excavation. Physical hazards encountered during the excavation process range from moving heavy machinery to sloping and shoring concerns of the excavation itself. *SEACOR* personnel or their subcontractors are not permitted to enter any unsecured excavation. Excavations and trenches must comply with OSHA's standard (29 CFR 1926.651/652). If it is necessary that an excavation or trench be entered, the provisions of the OSHA standard must be fully implemented. A competent person must inspect all trenches and excavations prior to entry or commencement of work nearby. Prior to excavation a full utility search must be conducted to identify locations of underground services. Care must be taken during site activities to stay clear of overhead utilities.

UST operations are frequently conducted in high traffic areas. Proper signage and barricading must be employed to ensure that the area is visibly identified as a construction site. Site

operations must be conducted in such a fashion that the risk of injury from vehicular traffic is minimized.

2.4 Biological Hazards

The likelihood of injury through biological sources on standard UST projects is low. The typical setting for such work is mostly in urban/suburban areas where snakes, animals, or poisonous plants are not likely to be encountered. However, because of their ubiquitous nature, there is a potential exposure to insects. Untreated sewage may be encountered through the breaching of active sewer lines during excavation or drilling.

TABLE 1
PHYSICAL PROPERTIES OF CHEMICAL CONTAMINANTS OF CONCERN

Chemical Substance	Physical Hazard	Physical State	Flash Point/ LEL/UEL	BP/MP	Vapor Pressure	Water Soluble	Incompatibilities	Exposure Limits (PEL/TLV)
gasoline	flammable	liquid	-36°/F/ /	140°F/				300ppm/ 300ppm
benzene	flammable	gas	12°F/ 1.3% / 7.1%	176°F/ 42°F	75 mm	0.18	strong oxidizers chlorine	1 ppm/ 10 ppm
toluene	flammable	gas	40°F/ 1.3% / 7.1%	231°F/ -139°F	22 mm	0.05	strong oxidizers	100 ppm/ 100 ppm
ethyl benzene	flammable	gas	59°F/ 1.0% / 6.7%	277°F/ -139°F	7.1 mm	0.015	strong oxidizers	100 ppm/ 100 ppm
total xylenes	flammable	gas	81-90°F/ 1.1% / 7.0%	282°F/ -12 to -55	7-9 mm	0.00003	strong oxidizers	100 ppm/ 100 ppm
tetraethyl lead	combustible	liquid	200°F/ 1.85 / ?	228°F/ -109°F	0.2 mm	insol	strong oxidizers sulfuryl chloride	0.075 mg/m^3 0.1 mg/m^3
Methyl tert-butyl ether	flammable	gas		55°F/ -109°F	245 mm	4.8	acid solutions	none
diesel fuel	flammable	liquid						
heating oil	flammable	liquid						

SECTION 3
TASK RISK ANALYSIS

As previously described, there are a variety of hazards encountered during UST activities, but not all are necessarily present on any given project. The following discussion identifies the predictable and characteristic hazards associated with individual tasks, and comments on the likelihood of exposure from each.

3.1 UST Removal and Remedial Activities

The potential exposure to a physiochemical incident during the removal of USTs should be considered significant, although this assessment varies slightly with tank condition, contents, and ambient influences. In most cases involving petroleum storage tanks, the USTs initial internal atmosphere is too vapor-rich to support combustion. However, before the tank(s) can be removed that atmosphere must be brought down through the flammable range to a condition which is too lean to support combustion. The inerting/purging process and the resultant displacement of vapors is the primary physiochemical concern. However, risk associated with the process will be minimized when tank inerting/purging and site control procedures follow the *SEACOR* UST protocols.

Petroleum vapors liberated during tank inerting or purging present the most significant chemical hazard. Site personnel must move to a position upwind of the vapor source and perform continuous monitoring for the presence of volatile organic compounds (VOC) in the breathing zone. The protocol for personal protection described in Section 4 of this plan must be implemented if VOC are detected in the breathing zone at or above the prescribed action levels. Further chemical exposure is possible during the remediation of contaminated soils and/or the purging of associated product piping. Chemical exposure is possible through dermal contact during contaminated soil sampling activities, therefore, suitable hand protection is required. The referenced personal protection plan must be implemented during all of these activities.

Any of the hazards discussed in Section 2 may be present during UST removal. The likelihood of injury from such sources is possible. However, pre-planning and awareness will minimize these risks.

3.2 Site Characterizations

The likelihood of physiochemical incident during site characterization activities is relatively low. However, a very real potential exists for contact with underground and overhead utilities, and can result in severe physical injury. Of greater concern is injury from the physical hazards related to drilling. Such hazards range from simple pinch and impact injuries to significant trauma incidents. Regular drill inspections, utility locates, caution and awareness during drill operation, and proper oversight can limit these occurrences.

Because of the lack of interaction with contaminant sources and the relatively benign impact on subsurface conditions, site characterization activities present relatively low opportunity for

chemical exposure. Though contact and/or proximity to soil cuttings, core samples, and well liquids do present the potential for exposure, such exposures can be minimized through personal monitoring and use of prescribed personal protective wear.

3.3 Tank Tightness Testing

Chemical exposure is of greatest concern during tank tightness testing activities. This process usually involves direct handling of petroleum products and close proximity to organic vapors. Most testing techniques require product to be open to the atmosphere thereby creating the potential for ignition. Occasionally, tanks must be uncovered to facilitate testing. These operations introduce the previously discussed hazards related to excavation.

3.4 Installation of New USTs or Soil/Groundwater Treatment Systems

The installation of new USTs is usually in clean non-contaminated soils. Thus the likelihood of chemical hazard during this activity is negligible. If the installation of new USTs, or more likely, Soil/Groundwater Treatment systems is immediately following the removal and remediation of soils containing petroleum hydrocarbons, then there is the potential for health hazards from these operations, and the health and safety protocols described in this plan shall be implemented. As with UST removal, heavy equipment is used and should be considered as a physical hazard. Physiochemical hazards are not likely but may be present if petroleum products are brought on site. Ground-water treatment system installation involving product recovery may present the potential for physiochemical and chemical hazards. Equipment used for pumping of product or severely contaminated ground water should be certified as intrinsically safe.

SECTION 4
PERSONNEL PROTECTION PLAN

The major elements of the personnel protective plan are presented in this section. However, as iterated throughout the plan, there are key site and condition specific details that must be added to the plan to make it complete. The plan will not be approved without proper and relevant documentation of the supplemental personnel protective requirements attached.

4.1 Administrative Controls

4.1.1 Personnel Training and Medical Requirements

Consistent with *SEACOR* standard operating practices and Federal regulation, all *SEACOR* site personnel and *SEACOR* subcontractors must meet specified training and medical requirements. All *SEACOR* personnel must be authorized for field work through current training certification and annual medical examination. Sub-contractors must provide documentation of current training and medical authorization for each individual on site. In addition, sub-contractors must provide written documentation of their corporate training program, their medical surveillance program, and their ability to provide personal protective equipment for their personnel. Personal protective equipment will not be provided for non-*SEACOR* personnel.

An individual maintaining current supervisor status will be required to perform as the Site Safety Coordinator (SSC) for each project under which this plan is implemented The SSC will have supervisory status equivalent to or greater than the level of protection in which site activities are conducted. This individual will be responsible for the implementation of the principles and protocols established in this plan.

Each individual participating in site activities will be required to read and understand the content of this plan. Acknowledgement of that understanding will be demonstrated by signing the last page of this document.

4.1.2 Safety Operating Practices

Provided below is the list of *SEACOR* Safety Operating Practices for selected physical hazards that may be present during UST related activities. The SSC for the site will identify from this list the practices that are applicable to the site and are attached to this plan in Attachment 1. Where hazards exist beyond those presented by the list, the SSC will identify them in the spaces provided and attach the respective operating practice when available.

HAZARD	PRESENT (Y/N)	TASK NO.	OP ATTACHED
1. Noise	(Y)	NA	SSP 10
2. Heat/Cold (Ambient Air)	(N)	NA	
3. "Hot Work"	(N)	NA	
4. Traffic (Site Control)	(N)	NA	
5. Heavy Equipment Operation	(Y)	NA	SSP 12
6. Lifting Equipment Operation	(Y)	NA	SSP 15
7. Excavating/Trenching	(Y)	NA	SSP 7
8. Haz. Mat. Use/Storage - flam. liq/gas	(Y)	NA	SSP 17
9. Hand Tools	(Y)	NA	SSP 13
10. Power Hand Tools	(Y)	NA	SSP 13
11. High Pressure Water/Stream	(N)	NA	
12. Inclement Weather	(N)	NA	
13. Drilling	(N)	NA	
14. Utilities	(Y)	NA	SSP 1
15. Confined Space Entry	(Y)	NA	SSP 2
16. Fire Prevention/Response Plan	(Y.)	NA	SSP 18

4.2 Engineering Controls

Personal protection through engineering controls on UST projects will follow those recommended guidelines established by the MFPA and API. These methods may include, but are not limited to, inerting/purging tanks, vapor ventilation, grounding and bonding.

4.3 Personal Protective Equipment

The following combinations of personal protective clothing will be employed in accordance with the Action Levels prescribed below.

4.3.1 Personal Protective Ensembles

	LEVEL D	LEVEL C (modified*)
Head	Hard Hat (when overhead hazards are present)	Hard Hat (when overhead hazards are present
Eye and Face	Safety Glasses with Sideshields	Safety Glasses with Sideshields (with Half Face APR)
Whole Body	Cotton Coveralls or similar Work ensemble	Cotton or Tyvek Coveralls
Hand - gloves - gloves	Cotton (if necessary) Vinyl Surgical (when sampling)	Cotton (if necessary) Vinyl Surgical (when sampling)
Foot - boots - booties	Steel toe	Steel toe Latex outer (when in contact with contaminated soils)
Respiratory	Not Required	Full/Half-Face APR with Organic vapor/acid gas/HEPA Cartridges

* Modified Level C using a Half-Face APR may be used according to the Action Levels stated below.

4.3.2 Action Levels for Personal Protective Ensembles

The following levels of protection shall be implemented based on the action levels and monitoring scheme described below. Figure 4-1 provides a graphic illustration of these action levels, the necessary exposure monitoring practice, and the required personal protective equipment.

Level D - Organic vapor concentrations in the Breathing Zone no greater than fifty (50) units above measured background as detected with direct reading instrumentation sensitive to aromatic hydrocarbon compounds (eg. OVA, HNU, OVM). VOC concentrations greater than 50 units will require upgrade to either Modified Level C or full Level C protection. However, when organic vapor concentrations exceed 25 units above background in the breathing zone over a fifteen minute period then site personnel shall initiate benzene specific monitoring using colorimetric detector tubes sensitive to 0.5 ppm Benzene. Specific Action Levels for benzene are graphically depicted in Figure 4-1. In lieu of PPE upgrade, site personnel may evacuate to a position upwind where organic vapor concentrations return to that of background.

Modified Level C - Sustained organic vapor concentrations in the Breathing Zone greater than 50 units above recorded background readings. At this point, Benzene-specific monitoring shall already have been initiated, and the conditions of Modified Level C shall be subject to these action levels as well. Modified Level C shall employ the use of a half-face APR instead of a full-face model (full Level C), while all other level C PPE requirements are employed. VOC concentrations

greater than 75 units will require upgrade to full Level C protection. This plan does NOT cover UST operations requiring Level B protection.

Level C - Organic vapor concentrations in the Breathing Zone greater than 75 units but less than 500 units above recorded background readings. Benzene-specific monitoring shall already have been initiated. Level C shall employ the use of a full-face APR as well as the other specified PPE. VOC concentrations greater than 500 units will require evacuation of the site. This plan does NOT cover UST operations requiring Level B protection.

4.3.3 Air Monitoring Instrumentation

The following instruments shall be used on site to ensure personal protection against the forementioned hazards. Table 2 presents important information regarding the response factors of the organic vapor monitoring instruments. All air monitoring equipment will be calibrated daily prior to use on site (and ideally, once more during the course of the work day). All instrument calibration records will be made on the pages supplied in Section 8 and maintained as part of this document.

- **Organic vapor detectors (PID / FID).** On standard UST sites, either photoionization or flame ionization detectors will be used to perform real-time evaluations of airborne concentrations of VOC. If a PID monitor (eg. Hnu or OVM) is selected, it should be accompanied by a 10.0 eV (OVM) or 10.2 eV (Hnu) detector module. As shown by Table 2, the Foxboro OVA 128 is suitable for use with all the expected chemical compounds. Monitoring with organic vapor detectors will be conducted continuously while in the vicinity of site operations, with periodic monitoring in the breathing zone(s) of site personnel. Response to detected VOC concentrations will follow the stated Action Levels.

- **Combustible Gas Indicator/Oxygen Meter (CGI/O_2).** This instrument will be required only when *SEACOR* personnel are responsible for ensuring that combustible atmospheres do not prevail in tanks during removal or at other locations on site. In the event that *SEACOR* must make the determination that USTs are in a non-combustible state prior to their removal, the SSC shall follow the established protocols for properly inerting/purging the tanks. Action Levels established for safe removal of USTs (or non-combustible conditions around the site) are less than 20% of the LEL for the substances contained in the tank AND less than 10% oxygen content of the measured atmosphere. **Note: at oxygen concentrations less than approximately 14%, the GasTech CGI/O_2 meter readings may become unreliable in the LEL mode.**

- **Colorimetric Detector Tubes.** Detector tubes sensitive to 0.5 ppm benzene in air will be employed on site as described in Section 4.3.2.

TABLE 2
RELATIVE RESPONSE CHARACTERISTICS
OF AIR MONITORING EQUIPMENT

Chemical Substance	Ionization Potential	Instrument Response OVA	Hnu (10.2eV)	Hnu (11.7)	OVM (10.0eV)
Benzene	9.245eV	150%	100%	122%	150%
Toluene	8.82eV	110%	100%	100%	200%
Ethyl Benzene	8.76eV	100%	NR	NR	59%
Xylene	8.5eV	111%	100%	NR	143%
Paraffinic Hydrocarbons	9.86 - 12.98eV				
(C1 - C4)		80 - 100%	NR	VR	VR
(C5 - C7)		80 - 100%	10 - 30%	>80%	VR

NR - No Response
VR - Variable response dependent upon compound. For best response use FID.

4.3.4 Emergency Contingency Plans and Equipment

- **Medical.** Site specific medical care facilities and emergency response contacts will be described in Section 6 of this plan. The forms provided in Section 6 must be fully completed for this plan to be authorized for use. In addition, a map illustrating the route to the referenced hospital must be added to that section. Site personnel covered under this plan must be aware of the location on site of this information (eg. SSC's project vehicle). A first aid kit adequate for treating minor injuries and an appropriate eye wash device will be maintained by the SSC in the project vehicle. Minor injuries incurred on site will initially be treated on site; professional medical attention may be sought as necessary at a later time. Injuries of a more extensive nature will be transported to the referenced medical facility. All injuries will be reported to the Safety and Health Director and the Corporate Safety Officer.

- **Fire/Explosion**. At least one Type ABC fire extinguisher will be maintained by the SSC in the project vehicle. Additional fire extinguishers are required if *SEACOR* is responsible for site-wide health and safety. In the event of a fire/explosion the SSC will make the determination as to whether the incident can be controlled with the manpower and equipment on site. If necessary, the referenced fire response agency will be contacted.

- **Spill Contingency**. Spill containment and clean-up will be the responsibility of the construction contractor or the *SEACOR* construction sub-contractor. These companies will provide the necessary equipment and manpower to properly handle such an emergency. In most cases, however, the USTs have been pumped free of any appreciable amount of liquids prior to

removal. These liquids are usually removed via vacuum truck where the likelihood of release is minimal. If such an event occurs and conditions present a health hazard to site personnel, the *SEACOR* SSC will assume responsibility for the safety of *SEACOR* personnel and their sub-contractors.

SECTION 5
DECONTAMINATION PLAN

5.1 Personal Decontamination

Waste resulting from contaminated personal protective equipment and disposable sampling equipment will be appropriately containerized on site. Arrangements will be made with the company contracted to dispose of contaminated soils to accept these wastes at the end of the project. Personnel shall wash hands and face upon leaving the site or prior to eating, drinking, or smoking.

5.2 Equipment Decontamination

Decontamination of non-disposable sampling equipment, hand tools, and heavy machinery will be performed prior to their leaving the site or at the conclusion of site activities. All equipment will be washed with detergent and water. Liquids resulting from this process will be collected, and arrangements made with the contracted waste handler to provide disposal. During site characterizations, sampling equipment may be decontaminated between boreholes to prevent cross-contamination. These liquids will similarly be contained and disposed of at the end of the project. Decontamination personnel are required to wear, at a minimum, latex gloves and suitable splash protective clothing including splash goggles.

SECTION 6

EMERGENCY CONTINGENCY INFORMATION

EMERGENCY CONTINGENCY INFORMATION

EMERGENCY CONTACTS AND PHONE NUMBERS:

Agency	Contact	Phone Number
Local Medical Emergency Facility	Summit Medical Center	(510) 655-4000/420-6080
SEACOR Health and Safety	Donald W. Moore	(415) 882-1548
Fire Department	City of Emeryville	911/(510) 596-3771
Police Department	City of Emeryville	911/(510) 596-3737
On-Site Coordinator	Alessandra E. Bruni	(415) 518-3670
Site Telephone	(415) 518-3670	NA
Nearest Telephone	On-site	NA

LOCAL MEDICAL EMERGENCY FACILITY(S):

NAME OF HOSPITAL: Summit Medical Center

ADDRESS: 350 Hawthorne Avenue, Oakland, California 94609 Phone No.: (510) 655-4000

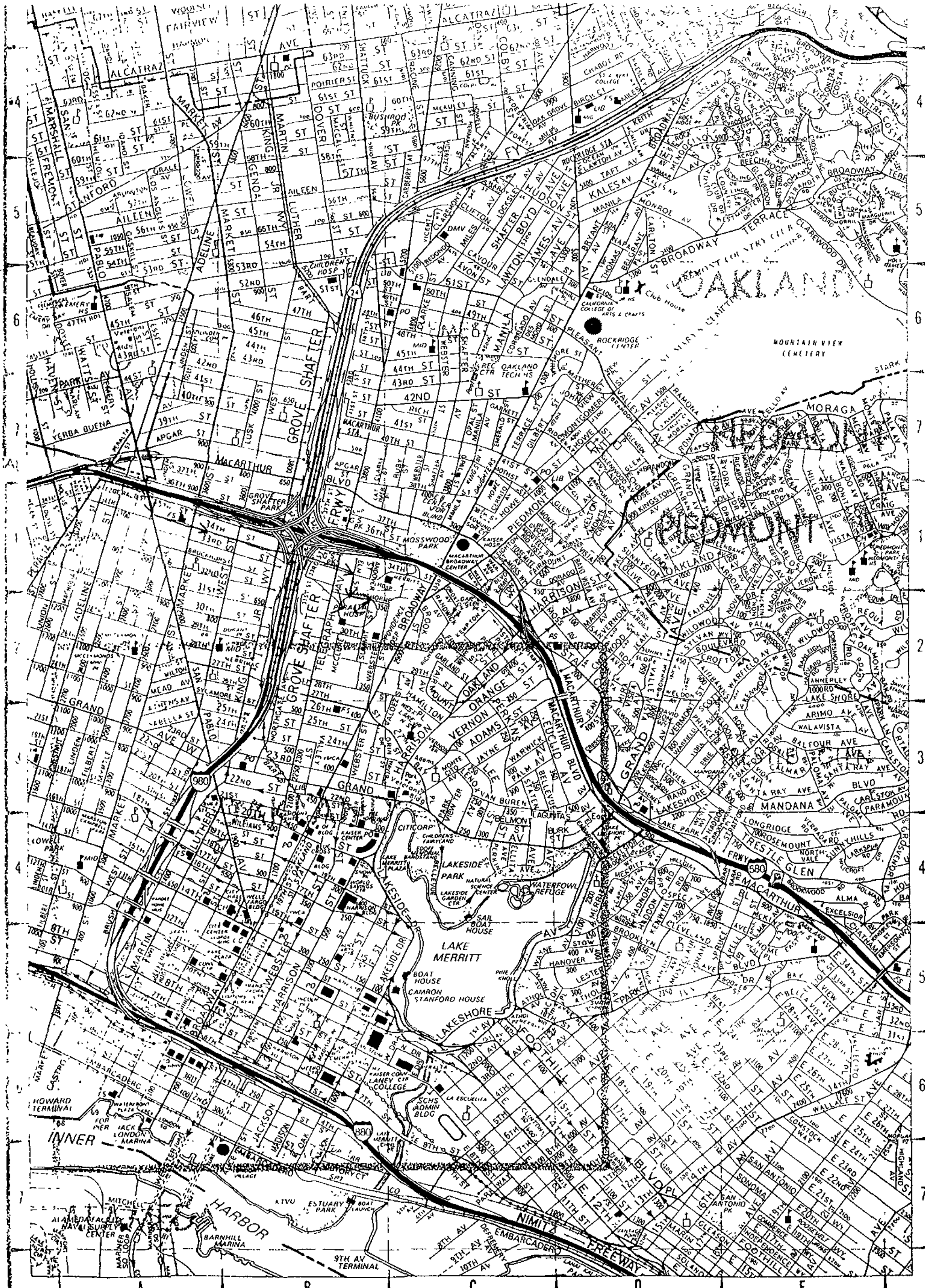
NAME OF CONTACT: Emergency Center Phone No.: (510) 420-6080

Type of Service - Physical Trauma only ☐ Chemical Exposure only ☐
Physical Trauma & Chemical Exposure ☒ Available 24 Hours ☒

ROUTE TO HOSPITAL: Travel approximately 1/2- mile south (right turn) on San Pablo Avenue from the site to 34th Street. Make a left turn onto 34th Street and travel east approximately 3/4-mile to Elm Street. Make a right turn onto Elm Street and travel south 1 block. Make a left turn on Hawthorne and travel east 1 block. Make a right turn onto Summit Street and make a right turn into Alta Bates Hospital. Follow posted signs to the Hospital Emergency Center.

TRAVEL TIME FROM SITE: 8 to 10 minutes. DISTANCE TO HOSPITAL: 1 and 3/4-miles.

24-HOUR AMBULANCE SERVICE: Acme Ambulance Company (510) 653-6622



FOR CONTINUATION SEE MAP 11

SECTION 7

SITE PERSONNEL AND CERTIFICATION STATUS

The National Environmental Health Association

(Incorporated 1937)

Issues This

Certificate of Completion

as Testimony That

ALESSANDRA E. BRUNI

has satisfactorily completed

8 Hour OSHA Computer Based Training Course

In Witness Whereof, we have ascribed our names and affixed our
Seal of the Association this 8th day of June, 1994
Expires 5th day of April, 1995

OSHA Program Administrator For NEHA

Certificate Of Completion

Science & Engineering Analysis Corporation

hereby certifies that

Dan Madsen

has successfully completed the 8-Hour Supervisor Health and Safety Training for Hazardous Waste Site Operations in accordance with 29 CFR 1910.120.

Concord, California

April 14, 1993

for Science & Engineering Analysis Corporation

4-27-93
Date

The National Environmental Health Association

(Incorporated 1937)

Issues This

Certificate of Completion

as Testimony That

DONALD MOORE

has satisfactorily completed

8 Hour OSHA Computer Based Training Course

In Witness Whereof, we have ascribed our names and affixed our Seal of the Association this 22 *day of* March, 1994

Expires 8 *day of* March, 1995

OSHA Program Administrator For NEHA

Certificate Of Completion

Science & Engineering Analysis Corporation

hereby certifies that

Bruce Scarbrough

has successfully completed the 8-Hour Health and Safety Refresher Training for Hazardous Waste Site Operations in accordance with 29 CFR 1910.120.

San Francisco, California

July 16, 1992

for Science & Engineering Analysis Corporation

8-25-92
Date

SECTION 8

INSTRUMENT CALIBRATION RECORDS

DIRECT READING AIR MONITORING INSTRUMENTS CALIBRATION RECORD

Date	Instrument, Model, Serial No.	Time	Calibration, Standard/ Concentration	Initial Setting & Reading	Final Setting & Reading	Comments	Calibrator Initials

ATTACHMENT 1

SEACOR
SAFETY OPERATING PRACTICES

10 NOISE PROTECTION

Related SSPs:	SSP 9	-	Hot Processes - Steam
	SSP 12	-	Heavy Equipment Operation
	SSP 30	-	Drilling Safety

Noise is defined as unwanted sound. Noise can cause sudden traumatic hearing loss; long-term, more slowly occurring, sensory-neural hearing loss which is irreversible; disruption of communication and masking of warning devices and alarms; and increased stress levels and effects on the cardiovascular and nervous systems. These latter two effects may occur at levels below that which cause damage to hearing and in situations where the conditions are more or less constant and daily.

OSHA regulations generally apply to 8-hour exposures, and consider 85 dBA as an action level for a Hearing Conservation Program.

Where feasible, noise exposure will be controlled by engineering controls. Where high noise levels are encountered and where engineering controls are infeasible or until engineering controls can be accomplished, hearing protection devices will be used for worker protection from noise-induced hearing loss.

Some of the sources of noise on hazardous materials, construction and industrial sites of a magnitude to cause hearing damage are: compressor motors, drill rig engine, hammer blows (from split spoon or other), compressor motors, compressed air, compressed water and heavy equipment. The list is not all inclusive.

Any sound level surveys indicating noise levels of 85 dBA or above, or, in the absence of sound level measuring instrumentation, any noise/sound preventing normal levels of vocal discussion between two individuals at arms length distance will dictate the need for hearing protection.

Hearing protection will be afforded by either disposable ear plugs or ear muffs. Administrative time control is not an acceptable method for preventing noise exposure since extreme noise for a short duration can cause severe, permanent hearing loss.

In addition to these protocols, *SEACOR*'s Hearing Conservation Program includes physical examination and audiometric testing during annual medical monitoring.

The selection, use, maintenance and control of hearing protection is further defined in the *SEACOR* Personal Protective Equipment Program.

12 HEAVY EQUIPMENT OPERATION

Related SSPs: SSP 1 - Utilities
SSP 14 - Electrical Safety

12.1 Machinery and Mechanized Equipment Safety

Before any machinery or mechanized equipment is placed in use, it will be inspected and tested by a competent mechanic and certified to be in safe operating condition.

The employer will designate a competent person to be responsible for the inspection of all machinery and equipment daily and during use to make sure it is in safe operating condition. Tests will be made at the beginning of each shift during which the equipment is to be used to determine that the brakes and operating systems are in proper working condition. These inspections will be properly documented and *documentation maintained on site.*

Preventative maintenance procedures recommended by the manufacturer will be followed.

Any machinery or equipment found to be unsafe will be deadlined and its use prohibited until unsafe conditions have been corrected.

Inspections or determinations of road conditions and structures will be made in advance to ensure that clearances and load capacities are safe for the passing or placing of any machinery or equipment.

Machinery and mechanized equipment will be operated only by appropriately trained and designated personnel. Equipment deficiencies observed at any time that affect their safe operation will be corrected before continuing operation. Machinery or equipment will not be operated in a manner that will endanger persons or property, nor will the safe operating speeds or loads be exceeded.

Seats or equal protection will be provided for each person required to ride on equipment.

Getting off or on any equipment while it is in motion is prohibited.

Machinery or equipment requiring an operator will not be permitted to run unattended.

All machinery or equipment will be shut down and positive means taken to prevent its operation while repairs or manual lubrications are being done. Equipment designed to be serviced while running is exempted.

All repairs on machinery or equipment will be made at a location that will provide protection from traffic for repair persons. Heavy machinery, equipment or parts thereof that are suspended or held apart by slings, hoists or jacks also will be substantially blocked or cribbed before personnel are permitted to work underneath or between them. Bulldozer and scraper blades, end-loader buckets, dump bodies and similar equipment will be either fully lowered or blocked when being repaired or when not in use. All controls

will be in a neutral position, with the engines stopped and brakes set, unless work being performed on the machine requires otherwise.

Stationary machinery and equipment will be placed on a firm foundation and secured before being operated.

All points requiring lubrication during operation will have fittings so located or guarded to be accessible without hazardous exposure.

When necessary, all mobile equipment and the operating area will be adequately illuminated while work is in progress.

Mechanized equipment will be shut down prior to and during fueling operations. Closed systems, with automatic shutoff that will prevent spillage if connections are broken, may be used to fuel diesel powered equipment left running.

All towing devices used on any combinations of equipment will be structurally adequate for the weight drawn and securely mounted. Persons will not be permitted to get between a towed and towing piece of equipment until the towing equipment has been stopped.

All equipment with windshields will be equipped with powered wipers. Vehicles that operate under conditions that cause fogging or frosting of windshields will be equipped with operable defogging or defrosting devices.

All equipment left unattended at night, adjacent to a highway in normal use or adjacent to construction areas where work is in progress, will have lights or reflectors, or barricades equipped with lights or reflectors to identify the location of the equipment.

Whenever the equipment is parked, the parking brake will be set. Equipment parked on inclines will have the wheels chocked or track mechanism blocked and the parking brake set.

Lift trucks, stackers, etc., will have the rated capacity posted on the vehicle so as to be clearly visible to the operator. When auxiliary removable counterweights are provided by the manufacturer, corresponding alternate rated capacities also will be clearly shown on the vehicle. The ratings will not be exceeded.

Steering or spinner knobs will not be attached to the steering wheel unless the steering mechanism prevents road reactions from causing the steering handwheel to spin. When permitted, the steering knob will be mounted within the periphery of the wheel.

All industrial truck use will meet the requirements of design, construction, stability, inspection, testing, maintenance and operation defined in ANSI B56.1, Safety Standards for Powered Industrial Trucks.

The installation of live booms on material and personnel hoists is prohibited.

The controls of loaders, excavators or similar equipment with folding booms or lift arms will not be operated from a ground position unless so designed.

Personnel will not work or pass under the buckets or booms of loaders in operation.

Cranes and any other equipment used for lifting must be inspected as required and records of inspection must be maintained.

12.2 Drill Rigs

SEACOR will use the Drilling Safety Guide prepared by delegations of the Diamond Core Drilling Manufacturers Association and the National Drilling Contractors Association as published by the National Drilling Federation as the basic Safety Programs for all activities involving drill rigs or similar apparatus for the purpose of well installation or soil borings.

Copies of this document are available from Corporate Health and Safety.

12.3 Cranes/Lifting Equipment

Any piece of equipment used for lifting materials or personnel shall be used and maintained in strict accordance with manufacturer's directions and applicable OSHA regulations.

Load limits will be visibly posted on all lifting devices.

Only operators with demonstrated competence shall be permitted to operate lifting devices.

Lifting machinery and all elements of equipment involved in lifting or supporting loads must be inspected prior to use and at a minimum monthly. Inspections must be performed by a competent person and must be documented.

12.4 Aerial Lifts/Manlifts

Aerial lifts, including extensible boom platforms, aerial ladders, articulating boom platforms, vertical towers or combinations thereof, must be used in conformance with OSHA 29 CFR 1926.556, ANSI Standard A92.2 and manufacturer specifications and instructions.

- Electrical systems must be tested according to Section 5 of A92.2.
- Critical hydraulic lines, lines whose failure could result in free fall, must have bursting capacities four times the normal use pressure. Non-critical lines must be 2:1 bursting factors.
- Aerial lifts must be equipped with backup safety devices to prevent free descent if power supply systems or primary suspension systems fail.

- Secondary controls that can override the platform controls and emergency descent systems must also be provided in case of failure of primary systems.

- Mechanical power transmission apparatus must be appropriately guarded and guards kept in place.

Aerial lifts may not be field modified unless certified in writing by the manufacturer or a recognized testing laboratory to be in conformance with ANSI Standard A92.2 and 20 CFR 1926.556 and to be at least as safe as before the modification.

Aerial lifts must be maintained in safe operating condition at all times. Daily recorded inspections must be made to ensure welds are not cracked, lifting cables or chains are sound, hydraulic lines are tight and not leaking, control lines and cables are sound, electrical connections are tight and tires are sound.

Required daily testing for safe operation of lift controls must be recorded.

Aerial lifts must be operated by trained persons who are completely familiar with the safety and operating instructions prior to use.

- A manual of inspection and operation must be kept with the lift or be immediately available and must contain instructions for use as well as clearly indicating capacity, height limits, restrictions, warnings and cautions.

- A statement of insulation must be prominently displayed on the unit.

- Posted on the machine must be the name and address of manufacturer, listing of acceptable alterations or alternative operating procedures and a notice to operators to read and thoroughly understand the operating instructions before use.

Prior to moving over a highway or travel where overhead utility lines or obstructions may be present, ladders, platforms or towers must be locked in the down position.

- When moving with the boom up, an inspection must be made of the entire route of the move to ensure there are no obstructions, overhead utilities, underpasses or ground-terrain conditions that would prohibit a safe move.

- The operator/driver must have unobstructed view of his path of travel and a safe speed must be maintained.

- A recorded inspection must be made to ensure proper cradling of ladders, booms, platforms or towers and stowage of outriggers.

15 MANUAL LIFTING AND HANDLING OF HEAVY OBJECTS

15.1 Hazard

Improper lifting can result in cuts, pinches, and crushing; serious back, abdomen, arm and leg muscle injury; and joint injury. Even "light" objects, lifted improperly, can contribute to injury causing cuts and muscle injuries.

Cuts, Pinching and Crushing

Splinters, slivers, and sharp edges on objects to be lifted can result in cuts. Heavy objects can pinch or crush fingers, toes, arms and legs between the object and nearby objects, e.g., walls, tables, counters, railings and obstructions. Insects or other biological hazards on or under objects to be lifted can result in bites or scratches. Lifting of contaminated objects can lead to chemical or radioactive materials exposure.

Muscle and Joint Injuries

Muscle and joint injuries occur when objects to be lifted are too heavy or awkward, in restricted access areas, or are lifted improperly. Lifting tasks which are awkward and repetitive, involving even light objects, can lead to nerve and joint damage.

15.2 Recognition and Hazard Assessment

The need for manual lifting must be identified as a physical hazard when project tasks specifically require manual handling or use of heavy equipment, and the following safe lifting techniques must be instituted:

- Plan any lifting task, noting:
  - Contact hazards – Check each object before lifting for presence of splinters, slivers, sharp edges or parts, cracks and loose joints, signs of biological hazards and chemical or radioactive material contamination.
  - Weight of object – Unless involved in weight training, recommended safe lifting weights for an average man or woman are 50 and 35 pounds, respectively.
  - Size and shape of object – Large and oddly shaped objects are more difficult to lift, even within safe weight limits, due to imbalanced center of gravity.
  - Area in which lifting is to be done – Check for pinch points such as other objects close by and that there is room for safe lifting.
  - Conditions under which lifting is to be accomplished – Check for wet or slippery surfaces. Also consider level of protection to be used and that Level B or A protection

may add up to 40 pounds to be lifted as well as restricting range of motion and adding to area restriction by increasing bulk.

- Route to be traveled if lifting involves carrying – Check walking and working surfaces for slip and trip hazards, note ramps, changes on level of elevation and ladders or stairways that need to be negotiated.

15.3 Prevention and Protection Programs

- Identify the potential for contact hazards on objects to be lifted before lifting. Check each object before lifting, remove any noted hazards as feasible, wear gloves (at a minimum cotton, leather or kevlar, chemical resistant, etc.), depending on the nature of the hazard. Also wear safety boots, coveralls and chemical protection as appropriate.

- Avoid contact with cracks or loose joints or cover to reduce hazards of pinching if hands or body can come into contact.

- Workers must know their lifting limitations, plan lifting, keep themselves reasonably in shape and get help if uncertain that they can lift safely. Managers must plan and allow for safe lifting. **Safe lifting takes time.**

- Lifting an object from the floor:

  - Determine that object is within safe weight limit.

  - Check for contact hazards.

  - Check floor for slip hazards.

  - Check that there is ample space between the object to be lifted and other objects to avoid pinching or crushing.

  - Check that there is ample room to squat, lift, turn or maneuver without twisting the back or other muscles or joints.

  - Walk the intended route of travel to identify and remove slip and fall hazards, if possible.

  - Identify changes in elevation, steps, ramps, stairs and ladders which must be negotiated.

- To lift objects which are square or rectangular in shape or form:

  - Place one foot slightly in front of the other.

  - Squat as close to the object as possible.

- Grasp one of the top corners away from the body, tilt forward at the hips, keep the back straight and tuck in the chin.
- Test to be sure the object is loose from floor and will lift without snagging.
- Straighten the legs, keeping the back bone straight, pull the object into the body and stand up slowly and evenly without jerking or twisting.
- If turning or change of direction is required, turn with feet without twisting the torso and step in the direction to travel.

- To set an object down, reverse the sequence, being sure not to trap the bottom hand between the object and the surface on which the object is set.

This system at first feels and seems awkward. Workers must be trained and have the opportunity to use the system with lighter objects before performing heavy lifting. **For other shaped objects, the only modification needed should be handhold position.** When two or more persons are lifting, have a plan and a set of signals so lifting occurs simultaneously.

Do not carry objects in a manner which obstructs vision in line of travel and of feet and footing.

Carry objects so one hand is free for travel on stairs or there is unobstructed view of footing. Two hands must be free for travel on ladders.

15.4 Manual Handling of Heavy Objects

Hazard

Manual maneuvering or handling of heavy objects without actually lifting is often required on hazardous materials, RCRA facilities and construction sites. This often involves moving drums or other containers. Manual handling of heavy objects, even when not actually lifting, can pose all of the hazards of lifting including cuts, pinches, bruises, crushing, muscle and joint strain, and hazardous material and biological hazard contact.

Recognition and Risk Assessment

The need for manual handling of heavy objects must be addressed in the planning stages of project Health and Safety Plan preparation. Drums and other containers which must be maneuvered for access to information or sampling locations that are inaccessible to mechanical handling equipment require manual handling and special precautions. When handling of heavy objects does not actually involve lifting, workers can safely handle heavier objects, even those weighing several hundred pounds, if proper techniques are used. In many instances, the procedures involve balancing and taking advantage of the shape of the object.

Prevention and Protection Programs

MANUAL LIFTING AND HANDLING OF HEAVY OBJECTS

Prior to performing manual handling, it must be determined that it can be done safely and that mechanical assistance is infeasible.

Mechanical equipment or assistance such as dollies, carts, come-alongs or rollers are to be used whenever possible. Mechanical assistance must be of proper size, have wheels sized for the terrain, and be designed to prevent pinching or undue stress on wrists. Objects to be moved must be secured to prevent falling and properly balanced to prevent tipping.

The minimum protection for manual handling is heavy cotton or leather gloves, safety boots and coveralls. Metatarsal guards, chemical protective clothing and metal mesh or kevlar gloves must be used as risk of heavy items falling, hazardous materials contact and sharp edges, splinters or slivers increases.

Workers must be aware of their handling capacities and work within their capacities.

Objects to be manually handled must be checked prior to beginning movement for contact hazards and ensure handling will not trap hands, arms, legs or feet between the object and other objects, walls or railings.

Properly trained personnel may roll round or cylindrical objects if rolling will not damage the structural integrity. Rolling must be controlled by chutes, tag-lines or other means of limiting acceleration. Workers must not be positioned downhill from rolled objects. Use of the legs for pushing and tag-line control of rolled objects must be stressed.

Only properly trained personnel may move cylindrical objects by hand. Cylindrical objects, such as drums that must remain upright, are handled manually by slightly tilting the object using the legs for control and balancing the object on the bottom edge. The handler then walks beside the object, with the object tilted toward the body, positioning the hands on the top edge away from the body and moving so they do not cross, thus, maintaining the balance and a steady controlled forward motion. Motion must be controlled so that stopping walking and moving the hands will stop forward motion.

Prior to moving cylindrical objects in this way, the route of travel must be walked to identify any changes of elevation, potholes or other obstructions that could cause the object to snag, tip or get out of control.

Flat, square or rectangular objects are most easily handled using makeshift rollers or skids to break the friction with the resting surface and pushing, using the legs.

7 EXCAVATING/TRENCHING

Related SSPs:	SSP 1	-	Utilities
	SSP 2	-	Confined Spaces Entry
	SSP 5	-	Inclement Weather
	SSP 12	-	Heavy Equipment Operation
	SSP 21	-	Ladder Safety

No person may enter a trench or work at the foot of the face of an excavation until **the Site Health and Safety Officer has inspected** and determined whether sloping or shoring is required to protect against cave-in or subsidence and the appropriate protection has been installed.

Trench and excavations must be inspected regularly and documented by competent persons to ensure that changes in temperature, precipitations, shallow ground water, overburden or nearby building weight, vibration or nearby equipment operation have not caused weakening of sides, faces and floors, and that protection is being maintained.

This assessment must be made prior to and during use, regardless of whether or not personnel will be working within the excavation and/or when heavy equipment is operated nearby to ensure the trench or excavation will support the weight of the equipment without subsiding and possibly causing the equipment to tip.

Sufficient ramps or ladders must be provided to trenches or excavations to allow quick egress. Ladders must be placed so as to require no more than 25 feet of lateral travel, must be secured from shifting and must extend at least 3 feet above the landing point of the excavation. Use, construction and maintenance of ladders must conform to ladder safety requirements.

A competent person must design and supervise construction of shoring, sheeting and/or sloping.

Material removed from a trench or excavation must be placed far enough from the edge (at least 2 feet) to prevent its sliding into the excavation and/or from stressing the trench or excavation walls.

Access to trenching areas must be controlled and limited to those persons who are authorized. Prior to entering a trench or excavation, workers must notify the site supervisor, site health and safety coordinator and nearby equipment operator whose activities could affect the trench or excavation.

If trenches or excavations are near walkways or roadways, guards or warning barriers must be placed to alert pedestrians and drivers of the presence of the trench or excavation. If possible, trenches or excavations should be covered or filled in when unattended; otherwise, strong barriers must be placed around the trench or excavation, and lighting must be provided at night if the trench or excavation is near walkways or roadways.

All trenching and excavation operations shall comply with 29 CFR 1926 Subpart P.

17 HAZARDOUS MATERIALS USE AND STORAGE

Related SSPs: SSP 18 - Fire Prevention/Protection/Response Plans

17.1 Flammable Liquids

Flammable liquids shall be stored in approved containers in flammable storage cabinets or storerooms, or 25 feet from any other storage or office area or any ignition sources.

Fuels shall be separated from oxidizers and corrosives and must be separated from flammables and stored in approved cabinets or storerooms, or separated by 25 feet from other storage areas or buildings.

Approved grounding and bonding procedures shall be used for transfer of flammable liquids from one container to another.

Areas where flammable liquids are stored or flammable vapors may be released must be evaluated and classed by hazard class, group and location (Division) according to the National Electric Code (National Fire Protection Association). Electrical equipment use must conform to these codes.

All tanks, containers and pumping equipment, portable or stationary, used for the storage or handling of flammable and combustible liquids will be listed by Underwriters Laboratory or Factory Mutual or approved by the MSHA.

As a minimum, a 10 lb fire extinguisher appropriate for the type of fire that could occur must be within 25 feet of any accumulation of 5 gallons or more of flammable liquids or gases.

Material Safety Data Sheets (MSDSs) must be maintained on site for all hazardous materials stored or used. In addition, labeling requirements as specified by OSHA's Hazard Communication Standard and *SEACOR*'s Hazard Communication Practice (Health and Safety Practice 13) shall be followed.

17.2 Compressed Gas Cylinders

- Cylinders of compressed gas must be stored upright and/or secured to prevent their falling over. The supplier of gas must be consulted prior to storing gas cylinders in other than an upright position.
- Cylinder caps must be in place when cylinders are not in use.
- Cylinders should be stored out of direct sunlight.
- Cylinders containing fuel (e.g., acetylene) must be separated from oxidizers (e.g., oxygen, carbide) by 20 feet or a 5-foot high fire wall with a minimum ½-hour fire resistance if outside, or 1-hour rating if inside.

HAZARDOUS MATERIALS USE AND STORAGE

Material Safety Data Sheets (MSDSs) must be maintained on site for all hazardous materials stored or used. In addition, labeling requirements as specified by OSHA's Hazard Communication Standard and *SEACOR*'s Hazard Communication Practice (Health and Safety Practice 13) shall be followed.

13 HAND AND POWER HAND TOOLS

Related SSPs:	SSP 1	-	Utilities
	SSP 2	-	Confined Spaces Entry
	SSP 5	-	Inclement Weather
	SSP 8	-	Welding/Cutting/Burning
	SSP 10	-	Noise Protection
	SSP 11	-	Compressed Gases
	SSP 12	-	Heavy Equipment Operation
	SSP 14	-	Electrical Safety
	SSP 15	-	Manual Lifting and Handling of Heavy Objects
	SSP 16	-	Housekeeping
	SSP 17	-	Hazardous Materials Use and Storage
	SSP 18	-	Fire Prevention/Protection/Response Plans
	SSP 26	-	Materials Handling

Work with other than the simplest non-powered hand tools shall be performed only by those persons competent by reason of formal training or documented experience.

In addition to the above-related Standard Safety Procedures, the following procedures must be followed.

Unsafe hand tools shall not be issued or used. All hand tools will be kept in good repair and used only for the purposes for which they were designed. Wrenches with sprung jaws, where slippage could occur, impact tools with mushroomed heads, and wooden handled tools with cracks or splinters are examples of unsafe hand tools. Tools having defects that will impair their strength or render them unsafe will be tagged or made inoperable and removed from service.

Guards must be in place during operation on all power tools designed to accommodate them. Guards and safety devices must remain in place on power tools unless removed according to manufacturer's instruction for maintenance by a competent person and must be replaced before use. Belts, gears, shafts, drums, flywheels, chains or other rotating, reciprocating or moving parts exposed to employee contact or representing other hazards must be guarded.

Proper personal protective equipment must be used when operating power tools or hand tools that may produce projectiles, cuts or abrasion, dust, fumes, mists or light, or which pose a risk of harm to arms, legs, or feet if dropped.

Throwing tools or materials from one location to another, from one person to another, or dropping them to lower levels is not permitted.

Only nonsparking tools will be used in locations where sources of ignition may cause a fire or explosion.

Power tools will be inspected, tested and determined to be safe for operation prior to use. Continued periodic inspections will be made to ensure safe operating condition and proper maintenance.

Electric powered tools must be approved, double insulated or grounded in accordance with 1926.404.

Rotating or reciprocating portable power tools will have a constant pressure switch that will shut off the power when the tool is released by the operator. A portable power tool may have a lock-on control provided turn-off can be accomplished by a single motion of the same finger or fingers that turned it on.

Hydraulic fluid used in powered tools will retain its operating characteristics at the most extreme temperatures to which it will be exposed.

Manufacturer's safe operating pressures for hydraulic hoses, valves, pipes, filters, and other fittings will not be exceeded.

All hydraulic or pneumatic tools that are used on or around energized lines or equipment will have nonconducting hoses having adequate strength for the normal operating pressures.

Loose and frayed clothing, loose long hair, dangling jewelry, rings, chains, and wristwatches will not be worn while working with any power tool or machine.

All woodworking tools and machinery will meet applicable requirements of ANSI 01.1, Safety Code for Woodworking Machinery.

Extension cords:

- Must meet UL or other rating criteria according to OSHA.
- Use will be limited to essential tasks.
- Must be tested for continuity before each use and must be connected to grounded outlets or ground fault circuit interrupters must be used.
- Must be inspected daily for loose insulation, broken or missing plugs, bared wires, etc.
- Grounding of outlets used for portable tools must be confirmed before use.
- Must not be allowed to become tripping or slipping hazards.
- Must not be used for lifting or tying off, and shall be disconnected by pulling on the plug.

Any piece of equipment used for lifting materials or personnel shall be used and maintained in strict accordance with manufacturer's directions and applicable OSHA regulations.

Load limits will be visibly posted on all lifting devices.

Only operators with demonstrated competence shall be permitted to operate lifting devices.

Lifting machinery and all elements of equipment involved in lifting or supporting loads must be inspected prior to use and at a minimum monthly. Inspections must be performed by a competent person and must be documented.

1 UTILITIES

Related SSPs:	SSP 7	-	Excavating/Trenching
	SSP 9	-	Hot Processes - Steam
	SSP 12	-	Heavy Equipment Operation
	SSP 14	-	Electrical Safety
	SSP 30	-	Drill Rigs

1.1 Survey for and Identification of Utilities

Prior to beginning work on site or in or around facilities, buildings or other structures that could be served by or connected to utilities, a search must be conducted by the SHSO or official locating service, ideally in association with someone familiar with the facility, to identify any overhead, underground and in-work place utilities such as:

- Electrical lines and appliances
- Gas lines
- Pipelines
- Steam lines
- Water lines
- Sewer lines
- Pressured air lines

The location of any utility that could pose a risk to workers must be communicated to all workers during site safety indoctrination. Utilities should be marked or access otherwise restricted to avoid chance of accidental contact.

Utilities shall be considered "live" or active until a reliable source has documented them to be otherwise.

1.2 Overhead Utilities

For operations adjacent to overhead power lines, the following conditions must exist:

- Overhead transmission and distribution lines will be carried on towers and poles which provide safe clearance over roadways and structures.

- Clearances will be adequate for the movement of vehicles and for the operation of construction equipment.

Overhead or above ground electric lines shall be considered "live" or active until a reliable source has documented them to be otherwise.

Elevated work platforms, ladders, scaffolding, manlifts, drill or vehicle superstructures shall be erected a minimum of 20 feet (the actual distance is dependant upon the voltage of the line) from overhead electrical lines until the line is de-energized, grounded or shielded, and a competent electrician has certified that arcing can not occur between the work place or superstructure.

For other overhead or in-place utilities, workers must be instructed to use care in working under or around utilities to avoid hot surfaces, loud noises, pressured gases or air, leaking of pipelines, discharge of stream or hot liquids, and must work to prevent accidental contact with or breakage.

1.3 Underground Utility Searches

No excavating, drilling or boring shall be done until a thorough underground utility survey, conducted by knowledgeable persons or agencies, has been made and it is found safe to begin.

Even when a search is completed, drilling, boring and excavation should commence carefully until past the depth at which such utilities are usually located.

All underground utilities shall be considered "live" or active until reliable sources demonstrate otherwise.

The SHSO is responsible for ensuring underground utility searches are performed and procedures are adhered to.

2 CONFINED SPACES ENTRY

Related SSPs: SSP 8 - Welding/Cutting/Burning
SSP 9 - Hot Processes - Steam

No task(s) involving Confined Spaces Entry may be undertaken without the written approval of the Health and Safety Director.

The Site Health and Safety Officer is responsible for recognizing confined spaces and gaining approval from the Health and Safety Director prior to entry.

A confined space is any space having a limited means of access/egress, which is subject to the accumulation of toxic or flammable contaminants, or has an oxygen deficient atmosphere. Confined spaces include, but are not limited to, storage tanks, process vessels, bins, boilers, ventilation or exhaust ducts, sewers, underground utility vaults, tunnels, pipelines and open top spaces more than 4 feet in depth such as pits, tubs, vaults and vessels.

No task(s) involving Confined Spaces Entry may begin until an appropriate Confined Space Entry Permit is issued. Permits must be reissued at the beginning of each work day, each work shift, or if the confined space has not been monitored within ½ hour. Specific Confined Spaces Entry procedures are found below.

A confined space provides the potential for unusually high concentrations of contaminants, explosive atmospheres, limited visibility and restricted movement. This section will establish requirements for safe entry into, continued work in, and safe exit from confined spaces. Additional information regarding confined space entry can be found in 29 CFR 1926.21, 29 CFR 1910, and NIOSH 80-106.

2.1 Definitions

- Confined Space: A space or work area not designed or intended for normal human occupancy, having limited means of accress/egress and poor natural ventilation which is subject to the accumulation of toxic or flammable contaminants, or has an oxygen deficient atmosphere; and/or any structure, including building or rooms, that have limited means of egress.

- Confined Space Entry Permit (CSEP): A document to be initiated by the supervisor of personnel who are to enter into and/or work within a confined space. The Confined Space Entry Permit (CSEP) will be completed by the personnel involved in the entry and approved by the SHSO before personnel will be permitted to enter the confined space. The CSEP shall be valid only for the performance of the work identified and for the location and time specified. The beginning of a new shift with change of personnel will require the issuance of a new CSEP.

- Confined Space Observer: An individual assigned to monitor the activities of personnel working within a confined space. The confined space observer monitors and provides external assistance to those inside the confined space. The confined space observer summons rescue personnel in the event of emergency and assists the rescue team.

2.2 General Provisions

- When possible, confined spaces should be identified with a posted sign that reads: "CAUTION - CONFINED SPACE."

- Only personnel trained and knowledgeable of the requirements of these Confined Space Entry Procedures will be authorized to enter a confined space or be a confined space observer.

- A Confined Space Entry Permit must be issued prior to the performance of any work within a confined space. The CSEP will become a part of the permanent and official record of the site.

- Natural ventilation shall be provided for the confined space prior to initial entry and for the duration of the CSEP. Positive/forced mechanical ventilation may be required. However, care should be taken not to spread contamination outside of the enclosed area.

- If flammable liquids, gases, or vapors may be contained within the confined space, explosion proof equipment will be used and continuous hazard monitoring performed. All equipment shall be positively grounded.

- The contents of any confined space shall, where necessary, be removed prior to entry. All sources of ignition must be removed prior to entry.

- Feed lines to confined spaces shall be broken and blanked-out, and sources of electrical or mechanical energy that could activate any area of the confined space must be identified and shall be tagged and locked out prior to anyone entering a confined space. The lock-out/tag-out procedures must be documented in the CSEP.

- Hand tools used in confined spaces shall be in good repair, explosion proof and spark proof, and selected according to intended use. Where possible, pneumatic power tools are to be used.

- Hand-held lights and other illumination utilized in confined spaces shall be equipped with guards to prevent contact with the bulb and must be explosion proof.

- Compressed gas cylinders, except cylinders used for self-contained breathing apparatus, shall not be taken into confined spaces. Gas hoses shall be removed from the space, and the supply turned off at the cylinder valve when personnel exit from the confined space.

- If a confined space requires respiratory equipment or where rescue may be difficult, safety belts, body harnesses and lifeline will be used. The outside observer shall be provided with the same equipment as those working within the confined space.

- A ladder is required in all confined spaces deeper than the employee's shoulders. The ladder shall be secured and not removed until all employees have exited the space.

- Only self-contained breathing apparatus or NIOSH approved airline respirator equipped with a 5-minute emergency air supply (egress bottle) shall be used in untested confined spaces or in any confined space with conditions determined immediately dangerous to life and health.

- Where air-moving equipment is used to provide ventilation, chemicals shall be removed from the vicinity to prevent introduction into the confined space.

- Vehicles shall not be left running near confined space work or near air-moving equipment being used for confined space ventilation.

- Smoking in confined spaces is prohibited.

- Any deviation from these Confined Space Entry Procedures requires the prior written permission of the Corporate Health and Safety Director.

2.3 Procedure for Confined Space Entry

- Evaluate the job to be done and identify the potential hazards before work in a confined space is scheduled.

- Ensure that all process piping, mechanical and electrical equipment, etc., have been disconnected, purged, blanked-off or locked and tagged as necessary.

- If possible, ensure removal of any materials that may produce toxic or air displacing gases, vapors or dust.

- Initiate a Confined Space Entry Permit (CSEP).

- Ensure that any hot work (welding, burning, open flames or spark producing operation) that is to be performed in the confined space has been approved by the SHSO and is indicated on the CSEP.

- Ensure that the space is adequately ventilated before starting work in the confined space and for the duration of the time that the work is to be performed in the space.

- Ensure that the personnel who enter the confined space and the confined space observer are familiar with the content and requirements of this instruction.

- Ensure remote atmospheric testing of the confined space prior to employee entry and before validation/revalidation of a CSEP to ensure the following:

  1. Oxygen content between 19.5% - 23.0%.

  2. No concentration of combustible gas in the space. Air monitoring will be done throughout the confined space and specifically performed at the lowest point in the space.

  3. The absence of other atmospheric contaminants, if the space has contained toxics, corrosives or irritants.

If these conditions can not be met or maintained, the appropriate Level of Protection as specified in the site-specific HASP must be used. If remote testing is not possible, Level B personal protective equipment is required as described in *SEACOR* Health and Safety Practice 7 - Personal Protective Equipment. Continuous monitoring for oxygen content and combustible gases will be carried into the confined space with the entry team.

- Designate whether hot or cold work will be allowed. If all monitoring tests as required by the CSEP are satisfactory, then complete the CSEP listing any safety precautions, protective equipment or other requirements.

- The CSEP must be posted at the work site, and a copy placed in the project health and safety file after use.

The CSEP shall be considered void if work in the confined space does not start within one-half hour after testing is performed or if significant changes within the confined space atmosphere or project scope occurs.

The posted CSEP shall be removed at the completion of the job or the end of the shift, whichever is first.

2.4 Confined Space Observer

- While personnel are inside the confined space, a confined space observer will monitor the activities and provide external assistance to those in the space. The observer will have no other duties that may take his attention away from the work or require him to leave his post at the confined space at any time while personnel are in the space.

- The confined space observer shall maintain some form of contact with all personnel in the confined space. Visual contact is preferred, if possible.

- The observer shall be instructed by his supervisor in the method for contacting rescue personnel in the event of an emergency.

- If irregularities within the space are detected by the observer, personnel within the space will be ordered to exit.

- In the event of an emergency, the observer must NEVER enter the confined space prior to contacting and receiving assistance from a helper. Prior to this time, he should attempt to remove personnel with the lifeline and to perform all other rescue functions from OUTSIDE the space.

- A helper shall be designated to provide assistance to the confined space observer in case the observer must enter the confined space to retrieve personnel.

18 FIRE PREVENTION/PROTECTION/RESPONSE PLANS

Related SSPs:	SSP 8	-	Welding/Cutting/Burning
	SSP 12	-	Heavy Equipment Operation
	SSP 17	-	Hazardous Materials Use and Storage

18.1 Fire Protection - Response Plans and Prevention

Prior to beginning any activity where fire is a hazard, a fire contingency plan must be formulated, approved and communicated to all affected personnel. The plan must address the following, as appropriate:

- Workers must know the location, use and limitations of available fire extinguishers.
- Fire extinguishers must be provided on the basis of potential types of fires.
- Fire extinguishers must be inspected daily by the Site Health and Safety Officer to ensure that they are where they should be and are charged. A log must be kept of these inspections. At a minimum annually, fire extinguishers must be inspected by a competent agency and dated. Fire extinguishers must have clearly indicated uses and limits information.
- A fire notification or alarm system must be established and communicated to all employees.
- The telephone number for the local fire response agency must be prominently posted in the work place or located where every employee has immediate access.
- Smoking will be prohibited in all areas where flammable, combustible or similar hazardous materials are stored, except in those locations specifically provided for such purpose and approved by the Site Health and Safety Officer.
- All major motorized equipment will be equipped with a fire extinguisher of a type and make approved by the National Board of Fire Underwriters.
- Fire lanes to provide access to all areas will be maintained free of obstruction.
- Material storage will be arranged to minimize the spread of fire internally and to permit access for fire fighting.
- Clearance will be maintained around lights and heating units to prevent ignition of combustible materials.
- All sources of ignition will be prohibited in areas where flammable liquids are stored, handled and processed. Suitable NO SMOKING signs will be posted in all such areas.

18.2 Fire Protective Gear

When working around controlled open fires or hot processes such as kilns or incinerators, engineering controls provide much of the personal protection. Special activities involved in this type of work and uncontrolled fire situations often require use of personal protective equipment.

Fire fighting personal protective gear, to be used for fire fighting purposes, will only be issued after approval by Corporate Health and Safety to persons who have been trained in accordance with 29 CFR 1910.156(c). Personal protective equipment shall be provided in accordance with and conform to and be constructed to the provisions of 29 CFR 1910.156(e). All other fire or heat protective gear will be prescribed on a case-by-case basis in a site- or project-specific personal protective equipment plan. Since there is little in OSHA to establish criteria for construction and use of such equipment, selection will be based on industry and consensus standards or, if unavailable, manufacturers' information and instructions.

18.3 Fire Extinguisher Requirements

Fire extinguishers appropriate in size and classification shall be present, readily accessible and ready for use in all areas where there is potential for fires. Fire extinguishers must be used in conjunction with an emergency response or contingency plan. Health and Safety Plans must identify number, type and location of all fire extinguishers related to a specific project.

HEALTH AND SAFETY PLAN SIGN-OFF FORM

SEACOR

HEALTH AND SAFETY PLAN
AGREEMENT OF UNDERSTANDING

By signing below, I acknowledge that I have read and understood the contents of this site health and safety plan. Furthermore, I have had the opportunity to ask questions regarding safety practices and specific hazards related to this site. My signature below indicates that I agree to follow the practices set-forth in this health and safety plan during my activities on site.

Site Safety Coordinator	Signature	Date
Name (Print)	Signature	Date
Name (Print)	Signature	Date
Name (Print)	Signature	Date
Name (Print)	Signature	Date
Name (Print)	Signature	Date
Name (Print)	Signature	Date
Name (Print)	Signature	Date
Name (Print)	Signature	Date
Name (Print)	Signature	Date