



Cal/EPA

Department of
Toxic Substances
Control

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**BY FACSIMILE
(510) 547-1983**

Mr. Paul H. King
RGA Environmental Inc.
4701 Doyle Street, Suite 14
Emeryville, California 94608

Dear Mr. King:

**WOODFIN SUITE HOTEL/EMERY BAY MARKETPLACE , POWELL STREET
AND SHELLMOUND STREET, EMERYVILLE, CALIFORNIA - SITE SAFETY
PLAN**

The Department of Toxic Substances Control (DTSC) has reviewed the revised Site Safety Plan (SSP) and RGA's letter dated July 3, 1998. As the revised SSP adequately addressed DTSC's June 29, 1998 comments, DTSC approves the SSP. Please notify DTSC at least three days in advance of the start of field work or safety monitoring.

If you have any questions or comments, please contact Remedios Sunga at (510) 540-3840.

Sincerely,

Barbara J. Cook, P.E. Chief,
Northern California - Coastal
Cleanup Operations Branch

cc: See next page

ENVIRONMENTAL
PROTECTION

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July 6, 1998



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Peter M. Rooney
Secretary for
Environmental
Protection

Mr. Paul King
July 6, 1998
Page Two

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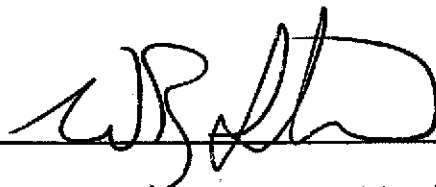
SITE SAFETY PLAN

**WOODFIN SUITE HOTELS
INTERSECTION OF POWELL AND SHELLMOUND STREETS
EMERYVILLE, CALIFORNIA**

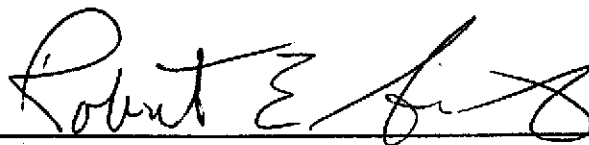
**Prepared for:
Woodfin Suite Hotels
12730 High Bluff Drive, Suite 250
San Diego, California 92130**

**Prepared by:
RGA Environmental, Inc.
4701 Doyle Street, Suite 14
Emeryville, CA 94608
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JULY 3, 1998



Warren R. Lehew, CSP # 12805



Robert E. Gils, CIH #1151

July 3, 1998

Remedios V. Sunga
Project Manager
California Environmental Protection Agency
Department of Toxic Substances Control
Northern California Region
Cleanup Operations Branch
700 Heinz Avenue, Suite 200
Berkeley, CA 94710-2737

Dear Ms. Sunga:

This letter will confirm our meeting of July 3, 1998, relating to perimeter and employee monitoring at the captioned site. Chemicals of concern are outlined in the Site Safety and Health Plan. It is also known that chemicals at the site vary in concentration as outlined in the Diagram "Areas with Elevated Concentrations of CAM Metals" (see Appendix L). To assess worker exposures representative workers in each of the work categories shown below will be monitored at the beginning of work, when site conditions change or when there is an observable change in conditions.

Work Categories

1. Indicator Pile Pilot hole drilling
2. Indicator Pile Driving
3. Utility Trenching and Excavation
4. General Site Worker

Worker and perimeter air monitoring will begin on the first day of work and at least weekly thereafter. If monitoring shows the migration of contaminant off site or workers are exposed above the action level, the frequency of monitoring will be increased. Woodfin will modify procedures to control the migration of contaminants. Initially workers will use protective equipment including respirators and Tyvec suits (level C). Workers will adjust the use of protective equipment pending personal monitoring results. Note it is anticipated that test results will permit workers to downgrade protective equipment to level D.

Initial Perimeter Monitoring

Initial perimeter air monitoring will be completed prior to any work at the site and weekly thereafter. The purpose of perimeter monitoring will be to determine baseline contaminant levels and the need for corrective action to maintain baseline levels.




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Materials of concern are listed below: Method of analysis will be via personal, area and perimeter monitoring. Organics will be evaluated using a PID meter in accordance with the HASP.

- Cadmium
- Copper
- Mercury
- Selenium
- Zinc
- Chromium
- Lead
- Antimony
- Organic

Should you have any questions, please call.



Robert E. Gils,

CIH #1151

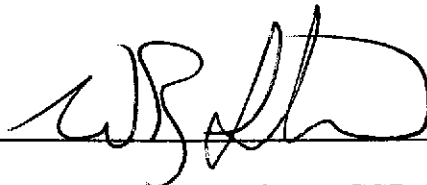
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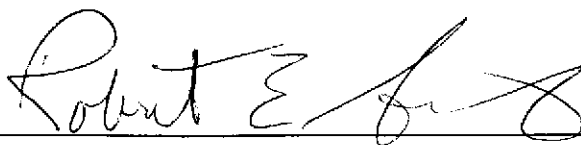
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Robert E. Gils, CIH #1151

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- A. Agreement and Acknowledgment Statement
- B. Site Safety Plan Amendment Sheet
- C. Definition of Hazard Evaluation Guidelines
- D. Hardage Construction Corporation Safety Manual
- E. Area Map
- F. Site Map
- G. Hospital Map
- H. RGA Site History Report Summary
- I. Site Plan Showing Groundwater Monitoring Wells
- J. 8 CCR 5192, Hazardous Waste Operations and Emergency Response
- K. City of Emeryville Noise Ordinance
- L. Maps of Sample Collection Locations
- M. 8 CCR 5156, Confined Spaces

1. INTRODUCTION

1.1 BACKGROUND

In general, the work scope consists of limited excavation of both fill and native soils and site grading. It is expected that the upper three to four feet of soils will be excavated as part of the overall building construction. Some areas of excavation will extend to five to seven feet deep, with a swimming pool (if installed) requiring excavation as deep as thirteen feet. Other general construction will also take place

The work site is located at the intersection of Powell and Shellmound Streets in Emeryville, California. An Area Map is attached in Appendix E. A Site Map is attached in Appendix F. The site has been determined by others to contain soils which are expected to be contaminated with various metals and oil and grease. Limited concentrations of diesel fuel may also be encountered if groundwater is exposed during construction. The contaminated soil has reportedly been previously classified, with approval by Alameda County Health Services Agency, and can be managed as non-hazardous waste¹.

In accordance with California Code of Regulations (CCR) Title 8, Section 5192, Hazardous Waste Operations and Emergency Response, Woodfin Suite Hotels (WSH) contracted RGA Environmental, Inc. (RGA) to develop for the property a Site Safety Plan (SSP) which will provide WSH field personnel and subcontractors with an understanding of the potential chemical/substance and physical hazards that exist or may arise while the tasks of this project are performed. This SSP is applicable to all locations of this Project. The starting and sequence of each location of work will depend on the needs of the project and the general contractor. Soil and groundwater at the site will be managed in accordance with a Contamination Mitigation Work Plan prepared by RGA dated April 9, 1998 and a Contamination Mitigation Work Plan prepared by RGA dated June 23, 1998. A copy of 8 CCR 5192 is attached as Appendix J.

Historical investigation of the site has included aerial photograph review, the collection of soil samples from boreholes, exploratory trenching, and collection of groundwater samples from groundwater monitoring wells at the site. The site has been used for industrial activities since the mid-1850's. Most notably, the site was occupied by a large manufacturing facility which manufactured roofing materials. The contaminants of concern identified at the site include petroleum hydrocarbons, metals and Polynuclear Aromatic Hydrocarbons (PAH's). Documentation of these previous investigations is summarized in RGA's May 15, 1998 Site History Report Summary.

¹ EMG letter dated April 12, 1996 titled, "Another Tree Development"

A copy of this report is attached with this Site Safety Plan as Appendix H. A Site Plan showing the groundwater monitoring well locations is attached as Appendix H.

Additional special attention will be made to monitor and control worker and general public exposure to naturally-occurring serpentine asbestos, petroleum hydrocarbons (fuels), and PAH's that may be present as a discoverable condition during excavation activities.

Disturbed soil may be sampled and tested prior to handling. The decision to sample will be based on discoverable conditions, i.e.: discoloration, oily residues, odor, etc, and on the need for possible further waste characterization. Sampling results will be reviewed by the Project Manager and the Health and Safety Manager and then included into this SSP. Further action may be required based on the review. Any additional procedures will be documented, included into the SSP, and then reviewed with all workers. Any discovered contaminated soils which are found to constitute a hazardous waste will be stockpiled on site pending being loaded and transported off-site to the proper disposal facility.

This SSP describes the procedures to be followed to reduce employee and public exposure to potential health hazards that may be present on the project site. The emergency response procedures necessary to respond to such hazards are also described within this SSP. The SSP is primarily designed to guide project personnel on how to respond to normal and extreme conditions that may arise during the project execution.

1.2 OBJECTIVE

The primary objective is to ensure the well being of observers, field personnel and the community surrounding the subject property. To do this, project staff, client personnel and approved subcontractors shall acknowledge and adhere to the policies and procedures established herein. Accordingly, all personnel assigned to this project shall read this SSP and sign the Agreements and Acknowledgment Statement (Appendix A) to certify that they have read, understood and agreed to abide by this SSP and its provisions, including the "Woodfin Suite Hotels Injury and Illness Prevention Program" (Appendix D).

Information contained in the SSP will be presented to all personnel and visitors at a pre-entry safety briefing. Additional safety information which becomes pertinent over the course of the project will be conveyed to WSH and subcontractor personnel through "tool-box safety meetings" and, if necessary, addenda to the SSP will be transmitted to pertinent subcontractors. In addition, project personnel listed in Section 8 will continuously exercise daily supervision and control of site activities as a part of their everyday practice. Safety issues will be addressed immediately and discussed with involved WSH or subcontractor personnel on a one-to-one basis.

WSH personnel have the authority to stop work activities and evacuate the area. The chart in Section 8 showing the "chain of command" shows who has the authority to stop work activities based on safety issues, beginning with the Project Manager.

1.3 AMENDMENTS

Any changes in the scope of work of this project and/or site conditions must be amended in writing on the Site Safety Plan Amendment Sheet (Appendix B) and approved by the Health and Safety Manager.

2. HAZARD EVALUATION

2.1 SITE CONDITIONS

The work site is located at the intersection of Powell and Shellmound Streets in Emeryville, California (see Appendices E and F). General site conditions may include soils containing various Metals and Oil & Grease, groundwater contaminated with Diesel fuel, and other potential contaminants (see Section 5 of this Plan). Several previous soil and groundwater investigations have been performed. Maximum contaminant levels (in milligrams per kilogram) encountered in soil samples are indicated in the following table.

Contaminant	Maximum Concentration Encountered (mg/kg)
Antimony	205.9
Arsenic	45.5
Barium	377
Beryllium	0.69
Cadmium	37.6
Chromium	363
Cobalt	18
Copper	46,819
Lead	10,634
Mercury	75.5
Molybdenum	4.3
Nickel	110
Silver	10.9
Vanadium	72
Zinc	24,317

It is possible that the exposure levels will reach Permissible Exposure Limits (PEL; see Section 5.2). Should a "Change In Conditions" occur, as perceived by project personnel (see section 8), WSH will notify the engineer and await further direction. If the nature of materials changes (i.e. irritating odors, soil discoloration), protective clothing, including gloves, respiratory protective devices and boots, may be needed and will be made available to those persons working in or around these specific areas.

2.2 SITE TASKS

The field tasks at this site may include:

- Excavation of classified non-hazardous and discovered hazardous waste soils
- Handling and loading of these soils
- Trucking activities
- Sampling for testing purposes

2.3 PROJECT TASK HAZARDS

All field task hazards are site specific. The following hazards may be encountered:

Contamination: Contact with contaminated surface or surfaces suspected of being contaminated should be avoided. This includes working through, kneeling or placing equipment in puddles, mud, discolored surfaces or on drums and other containers. Eating, smoking, drinking and/or the application of cosmetics is prohibited on this site in the immediate work area.

Falling Objects: Hard hats must be worn by all project staff and observers whenever construction activity is taking place.

Vehicle Traffic: Project staff and observers will be required to wear a fluorescent safety vest at all times when their work encroaches on active nearby roadways. In addition, use flags, tapes, barricades and cones to designate restricted areas and control traffic flow.

Explosion Protection: Explosion-proof equipment will be used in areas where the Site Safety Manager determines there is a potential for explosion.

Excavation or Other Work in Contaminated Areas: Skin and eye contact with contaminated soil may occur during work. Heavy-duty work gloves or butyl nitrile gloves, as appropriate, and approved safety goggles should be worn when contact with chemicals, contaminated soils and/or splash is possible.

2.3.1 Airborne Contaminants

The generation of potentially hazardous atmospheres may occur during this work. Hazard evaluation will be completed by project personnel (See Section 8). Hazard evaluation methods will include the use of a Photo Ionization Detector, Dräger tubes, combustible gas meter and other direct reading instruments to detect and quantify levels of carbon monoxide, petroleum vapors, explosive atmospheres, oxygen content and other gas and vapor levels when deemed necessary by the Health and Safety Manager due to specific activities on the jobsite.

To evaluate dust generation rates dust suppression effectiveness, samples for total airborne dust and for the metals identified in Section 5.1 will be conducted. Total dust samples will be collected on pre-weighed poly vinyl chloride (PVC) filters. Analysis of total dust samples will be performed by comparing the filter's gross weight after sampling with its tare weight before sampling. Samples for metals will be collected on 0.8 micron pore size mixed cellulose ester filters (MCE). These samples will be analyzed by Atomic Absorption methods specific for each metal.

Samples will be collected in the breathing zone of selected employees to evaluate the necessary respiratory protection as described in Sections 3.3 and 5.2. Additionally, samples will be collected at the perimeter boundaries of the work site to evaluate the suppression of fugitive dusts which leave the work site.

Hazard reduction includes the use of engineering controls (i.e. wetting methods) and personal protection equipment as necessary. For instance, workers may need personal protective equipment including respirators and Tyvek® suits during work, depending on the severity of hazardous operations.

2.3.2 Decontamination of Equipment

Skin and eye contact with Alconox detergent, methanol or other cleaning substances can occur while cleaning equipment. This hazard can be reduced with the use of butyl nitrile rubber or neoprene gloves and the use of safety goggles.

2.4 GENERAL CONSTRUCTION HAZARDS

General construction hazards, along with ways of identifying, handling, and preventing such hazards, are included in the "WSH Injury and Illness Prevention Program" (Appendix D). It should be noted that the CAL-OSHA construction safety orders are the basis for much of what is in this Injury and Illness Prevention Program, and the CAL-OSHA construction safety orders will be adhered to at all times on this project by WSH and all subcontractors. The following is a list of typical potential hazards and their control. Other controls may be developed as the situation(s) arise and the SSP shall be amended to include updates.

Potential Hazards and Control

2.4.1 Exposure to Metals

1. Stand up-wind of dust generating operations whenever possible.
2. Wear gloves when in contact with soil or contaminated surfaces.
3. Do not eat, drink, smoke and/or apply cosmetics on the construction site.
4. Utilize appropriate dust suppression techniques.
5. Decontaminate clothing and wash face, hands and exposed skin before leaving the site, eating or drinking.
6. If the airborne concentration of any metal exceeds its OSHA Permissible Exposure Limit (PEL), as identified in Section 5.2, utilize appropriate respiratory protective devices (respirators) to protect against the measured concentrations; alter or increase dust suppression activities; and increase the frequency of airborne dust monitoring.
7. If unknown materials are encountered, call the Project Manager or the Health and Safety Officer.

2.4.2 Exposure to Petroleum Products

1. Stand up-wind of petroleum products whenever possible.
2. Minimize contact and contact time with petroleum products.
3. Avoid walking through discolored areas, puddles, leaning on drums, or contacting anything that is likely to be contaminated.
4. Do not eat, drink, smoke, and/or apply cosmetics on the construction site.
5. Wear gloves when in contact with contaminated surfaces.
6. Safety glasses must be worn at a minimum.
7. Splash goggles must be worn when working with liquids.
8. >50 ppm organic vapors in breathing zone requires upgrade to Level C.
9. >750 ppm organic vapors in breathing zone requires upgrade from Level C to Level B.
10. If unknown materials are encountered, call the Project Manager or the Health and Safety Officer.

2.4.3 Vehicular Traffic

1. Wear traffic safety vest when vehicle hazard exists.
2. Use cones, flags, barricades, and caution tape to define work area.
3. Use vehicle to block work area.

4. Engage police detail for high-traffic situations.

2.4.4 Inclement Weather

Severe weather conditions are not anticipated, however if encountered, perform the following:

1. Stop outdoor work during electrical storms and other extreme weather conditions such as extreme heat or cold temperature.
2. Take cover indoors or in vehicles.
3. Listen to local forecasts for warnings about specific weather hazards such as tornadoes, hurricanes and flash floods.

2.4.5 Noise

All field personnel shall be required to wear hearing protective devices having a Noise Reduction Rating (NRR) of 28 or greater when:

1. Normal communication cannot be understood when field personnel are within three feet from one another.
2. You need to raise your voice above normal conversational speech due to loud noise sources.
3. Equipment such as a drill rig, jackhammer, cut saw, air compressor, blower, or other heavy equipment is operating on site.

Additionally, noise monitoring shall be performed at the beginning of each phase of the project to assess the actual noise exposure levels of each activity. Such monitoring will include an initial general noise survey with a sound level meter. Following the initial noise survey, those workers conducting operations in areas with peak noise levels above 85 decibels will be monitored by wearing a datalogging noise dosimeter. All employees will wear hearing protective devices unless and until monitoring establishes their typical 8-hour time weighted average noise exposure below 85 decibels.

Those sections of the City of Emeryville ordinances which cover nuisance noise, noise pollution and vibration will be followed, including Sections 5-13.01, 5-13.02, 5-13.03, 9-4.59.7, and 9-4.59.8 (see Appendix K).

2.4.5 Electric Shock

In the event that underground or overhead electrical utilities are present during construction activities, perform the following:

1. Maintain appropriate distance from overhead utilities; 20 foot minimum clearance from power lines required; 10 feet minimum clearance from shielded power lines.

2. Use ground-fault circuit interrupts as required.
3. Perform lockout/tagout procedures.
4. Use three-pronged plugs and extension cords.
5. Contact your local underground utility-locating service prior to conducting subsurface excavation or drilling activities.
6. Follow code requirements for electrical installations in hazardous locations.

2.4.7 Physical Injury

1. Wear hard hats and safety glasses when on site.
2. Maintain visual contact with the equipment operator and wear orange, safety vest when heavy equipment is used on site.
3. Avoid loose-fitting clothing or hanging or unfastened straps which may get caught in rotating machinery.
4. Prevent slips, trips, and falls; keep work area uncluttered.
5. Use the buddy system when lifting heavy or awkward objects.
6. Do not twist your body while lifting.

2.4.8 Heat Stress

Heat stress can strike workers performing physically strenuous work whenever they wear heavy protective clothing or equipment or whenever temperatures at the site exceed approximately 70 degrees Fahrenheit. Heavy clothing or protective equipment can hinder the body's natural cooling mechanisms. This can result in development of heat rash, heat cramps, heat exhaustion, heat stroke and death. The Health and Safety Manager will monitor workers for early signs of heat stress.

Heat stress exposure will be evaluated through hourly determination of the Wet Bulb Globe Temperature (WBGT). The WBGT shall be determined by either individual measurement of 1) natural wet bulb temperature, 2) dry bulb temperature, and 3) globe temperature, followed by manual calculation or maintaining a heat stress meter in an area of the work site that is representative of the conditions under which the employees are working. The formula for manual calculation of the WBGT outdoors with a solar load is: $0.7 \text{ wet bulb} + 0.2 \text{ globe} + 0.1 \text{ dry bulb}$.

The Heat Stress section of the ACGIH Threshold Limit Values for Chemical Substances and Physical Agents will be followed to give an appropriate work-rest regimen for each task based on the measured WBGT and the established work load, with appropriate correction factors incorporated based on any protective clothing worn by the workers.

To avoid heat stress on the job site, on days when the WBGT exceeds or is expected to exceed 70° F, workers and supervisors will:

1. Increase water intake while working.
2. Increase number of rest breaks and/or rotate workers in shorter work shifts.
3. Watch for signs and symptoms of heat exhaustion and fatigue.
4. Plan work for early morning or evening during hot months.
5. Use ice vests when necessary.
6. Rest in cool, dry areas.
7. In the event of heat stroke, bring the victim to a cool environment and initiate first aid procedures.

2.4.9 Cold Stress

Cold stress is not anticipated, however if encountered, perform the following:

1. Take breaks in heated shelters when working in extremely cold temperatures.
2. Remove the outer layer of clothing and loosen other layers to promote evaporation of perspiration upon entering the shelter.
3. Drink warm liquids to reduce the susceptibility to cold stress.
4. Wear appropriate hand protection and avoid prolonged hand contact with cold objects.

2.4.10 High Crime Areas

1. Be aware of surroundings.
2. Use the buddy system.
3. Request police detail when appropriate.

2.4.10 Insects

Neither excessive numbers of insects nor poisonous insects are expected at the site, however if encountered, perform the following:

1. Tuck pants into socks.
2. Wear long sleeves.
3. Use insect repellent.

2.4.11 Poisonous Plants (such as poison ivy, oak or sumac)

Poisonous plants are not known to exist at the site. If they are encountered, perform

the following:

1. Do not enter areas infected with poisonous plants.
2. Immediately wash any area that comes into contact with poisonous plants.

2.4.13 Ladders

1. Make sure ladder rungs are sturdy and free of cracks.
2. Use ladders with secure safety feet.
3. Pitch ladders at a 4:1 ratio.
4. Secure ladders at the top when possible.
5. Do not use ladders for access to air stripper towers.
6. Use non-conductive ladders near electrical wires.

2.4.14 Fire Control

1. Smoke only in designated areas.
2. Keep flammable liquids in closed containers.
3. Keep site clean; avoid accumulating combustible debris such as paper.
4. Follow Hot Work Safety Procedures when welding or performing other activities requiring an open flame.
5. Isolate flammable and combustible materials from ignition sources.
6. Ensure fire safety integrity of equipment installations according to Hazard Classification Diagram.

2.4.15 Static Electricity

Flammable atmospheres are not anticipated at the work site, however if a risk exists of creating or encountering a flammable atmosphere, perform the following:

1. Do not create static discharge in flammable atmosphere.
2. Electrically bond and ground pumps, transfer vessels, tanks, drums, bailers, and probes when moving liquids.
3. Electrically bond and ground vacuum trucks and the tanks they are emptying

3. PERSONAL PROTECTIVE EQUIPMENT

3.1 INTRODUCTION

It is important that personal protective equipment and safety requirements be appropriate to protect against the potential hazards at the site. Protective equipment will be selected based on the contaminant type(s), concentrations(s), and routes of entry. In situations where the type of materials and possibilities of contact are unknown or the hazards are not clearly identifiable, a more subjective determination must be made of the personal protective equipment needed.

Field personnel and visitors are required to wear the following clothing and equipment, as a minimum, while on the project.

- Hard Hat (required)
- Work boots (required)
- Safety Glasses (required)
- Long Sleeved Shirt (as appropriate)
- Fluorescent vest (as appropriate)
- Hearing protection (as appropriate)

3.2 LEVELS OF PROTECTION - GENERAL

Level A: Should be worn when the highest level of respiratory, skin, and eye protection is needed.

- SCBA
- Fully Encapsulating Suit

Level B: Should be selected when the highest level of respiratory protection is needed, but a lesser level of skin protection is required.

- Air supplied respirator
- Coated Tyvek[®] suit, such as Saranex
- Butyl nitrile rubber or neoprene gloves
- Inner latex or vinyl gloves
- Work boots
- Outer boots/chemical resistant
- Hard hat
- Fluorescent vest (as appropriate)
- Hearing protection (as appropriate)
- Inner Disposable Gloves (2 pairs recommended)

Level C: Should be selected when the types of airborne substances are known, the concentration is measured, and the criteria for using air-purifying respirators are met.

- Air purifying respirator, NIOSH approved, with HEPA filter or organic vapor cartridges, as appropriate
- Tyvek® suits (if splash hazard is possible, a coated suit must be worn)
- Butyl nitrile rubber or neoprene gloves
- Splash goggles/safety glasses if potential for splash (as appropriate)
- Work boots
- Outer boots/chemical resistant
- Inner disposable gloves (two pairs recommended)
- Hard hat
- Fluorescent vest (as appropriate)
- Hearing protection (as appropriate)

Level D : General work clothing is applicable for most work on this project. Changes in the nature of materials may require the use of additional protective equipment.

- Hard hat (required)
- Work boots (required)
- Heavy-duty work gloves, butyl nitrile rubber or neoprene gloves (as appropriate)
- Splash goggles/safety glasses if potential for splash (as appropriate)
- Fluorescent vest (as appropriate)
- Tyvek suit (as appropriate)
- Hearing protection (as appropriate)
- Fall protection (as appropriate)

3.3 REQUIRED PROTECTION

It is not anticipated that protective equipment beyond level D will be required for this project. Each new work operation will be performed in Level C Personal Protective Equipment (PPE) until air monitoring shows contaminant levels are consistently below the PEL, at which time the required PPE will be downgraded to Level D. The level of protection required throughout the job will be based upon observations and measurements by Project Personnel (see Section 8). Should a change in the nature of material be detected, WSH will perform additional analyses. Section 5.2 provides the OSHA PELs to be used to determine the appropriate respiratory protection level. The presence of an airborne concentration of a contaminant which exceeds its PEL will necessitate upgrading the required PPE to Level C. If the measured concentrations exceed the maximum use concentration (MUC) for the respirators employed for a given task, the PPE will be upgraded to Level B.

WSH will provide its employees with appropriate personal protective equipment as required. If respirators are deemed necessary, only NIOSH/MSHA certified respiratory protective equipment will be utilized.

3.3.1 Fit Testing Respirators

OSHA requires that respirators be fit-tested at least once every six months and that they be fit-tested properly for the facepiece-to-face seal. There are currently two methods acceptable for conducting these test, Qualitative and Quantitative Fit-Testing. The Qualitative method is a fast, easily conducted test that can be performed almost anywhere, while the Quantitative method requires the use of bulky test chambers and very expensive electronic equipment. Refer to 29 CFR 1910.134 for exact instructions on fit testing protocol and requirements.

Fit-testing must be repeated immediately if the employee has (a) a weight loss or gain of 20 pounds or more, (b) significant facial scarring in the area of the facepiece seal, (c) significant dental changes, or (d) reconstructive or cosmetic surgery.

Qualitative fit-testing is based on the wearer's subjective response to the test agent or chemical, of which the three most popular test are the irritant smoke test, the odorous vapor test, and the taste test. The following represents a brief summary of how to conduct each of these tests.

IRRITANT SMOKE TEST: The irritant smoke test is performed by directing an irritant smoke, usually either stannic oxy-chloride or titanium tetrachloride, from a smoke tube towards the respirator being worn. If the wearer cannot detect the irritant smoke, a satisfactory fit is assumed to be achieved.

The respirator wearer will react involuntarily, usually by coughing or sneezing, to a

leakage around or through the respirator. Since this type of test provokes an involuntary response from the employee, it is the preferred testing method when available. In this type of qualitative test, the person administering the test should be interested in any response to the smoke and not necessarily to the degree of response.

When an air-purifying respirator is being tested in this method, it has to be equipped with a high efficiency filter cartridge.

NOTE: The test substances are irritant to the eyes, skin and mucous membranes. Therefore, the respirator wearer should keep his/her eyes closed during testing.

ODOROUS VAPOR TEST: The odorous vapor test relies on the respirator wearer's ability to detect an odorous material, usually isoamyl acetate (banana oil) inside the respirator. The test is performed by passing an odorant saturated material around the outside of the respirator. If the wearer is unable to smell the chemical, then a satisfactory fit is assumed to be achieved. When an air-purifying respirator is tested by this method, it should be equipped with an organic cartridge which removes the test vapor from the air.

NOTE: This test is solely dependent upon the employee's honest response, since there is no involuntary reaction. For that reason, it is not to be preferred.

TASTE TEST: The taste test relies upon the wearer's ability to detect a chemical substance, either sodium saccharin or Bitrex[®], by tasting it inside the respirator. The test is performed by placing an enclosure over the respirator wearer's head and shoulders and spraying the test agent into the enclosure with a nebulizer. If the wearer is unable to taste the chemical, then a satisfactory fit is assumed to be achieved.

NOTE: This test is totally dependent on the wearer's honest indication of taste. There is no involuntary response, and therefore is not preferred as a method of testing. When conducting this type of test, the person being tested must not be allowed to eat, drink, or chew gum or tobacco for at least 15 minutes prior to taking the test.

3.3.2 Donning the Respirator

Once the type of respirator has been selected that is applicable and suitable for the purpose intended, the fit of the respirator should be adjusted. The employee should be given the opportunity to select a respirator which provides the most comfortable fit. The employee will be shown how to don and assess the device and should eliminate those which are obviously ill fitting. The employee should first inspect the respirator to ensure that it is not cracked or deformed, that all required valves and gaskets are present and in good condition, that any attached visor is intact and clear, and that the head straps are secure and have not lost their elasticity. The employee will first fasten the lower straps around the neck and then slip the upper straps over the top to the

crown of the head. Next, while holding the respirator securely, adjust both the lower and upper straps until the facepiece fits snug against the skin without being uncomfortably tight.

An assessment of comfort should include the following points:

- Chin properly placed.
- Fit across nose bridge.
- Positioning of mask on nose.
- Strap Tension.
- Room for safety glasses.
- Room to talk.
- Distance from nose to bridge.
- Tendency to slip.
- Cheeks filled out.
- Hindrance to movement.

3.4 REQUIRED PERSONAL HYGIENE

As a minimum, all jobsite personnel will be instructed to and be required to perform the following tasks before leaving the worksite or eating and drinking. For more detail see Appendix E.

- Clean work clothes and boots of native material;
- Remove and/or discard protective equipment as necessary and in a safe manner.
- Perform more extensive cleaning of, or remove, general work clothes if necessary.
- Thoroughly wash hands, face, and other exposed skin;

On-site facilities will be made available for these tasks to take place.

4. WORK ZONES AND SECURITY MEASURES

4.1 GENERAL

The work site will be controlled to reduce the possibility of exposure to any contaminants present and their transport by personnel or equipment from the site.

The possibility of exposure or translocation of contaminants can be reduced or eliminated utilizing the following control methods:

- Setting up security or physical barriers to exclude unnecessary personnel from areas of suspected contaminated soils.
- Minimizing the number of personnel and equipment on-site consistent with effective operations.
- Establishing work zones, decontamination and storage areas within the site.
- Establishing control points to regulate access to work zones.
- Minimizing the airborne dispersion of contaminants offsite.
- Implementing the appropriate personnel and equipment decontamination procedures.

A detailed map with designated areas will be developed by the Project Manager and the Health and Safety Manager to encompass the entire work zone.

Specific site preparations to best ensure the safety of the general public may change depending on the actual environmental conditions and the work procedures to be performed. These specific procedures are to be described in detail, on a daily basis if necessary, by the Project Manager and the Health and Safety Manager and included into the SSP as addenda. These changes will be reviewed with all affected personnel as they occur.

4.2 DUST SUPPRESSION

The appearance of visible dust provides an advanced warning that the dust suppression methods being employed may not be performing as intended. If visible clouds of dust are observed near any activity on the site, the dust control procedures being applied to that activity will be modified to afford greater protection. WSH shall use dust suppression methods which include water misting of excavation and soil handling areas to control airborne dusts. If normal water misting is not effective, the frequency of water spraying will be increased, the quantity of water used will be increased, the water will be amended with a commercially available suppressant chemical, or the activity will be modified to reduce soil agitation. Storage for potentially hazardous materials will be covered by polyethylene sheeting. Sheeting will be secured to control dislocation by wind.

5 CHEMICALS OF CONCERN

5.1 HEALTH EFFECTS

Potential health effects from an exposure to hazardous substances are dependent on several exposure factors such as toxicity of substances, duration of exposure, concentration during exposure and the overall health of the person exposed.

The potentially hazardous substances found at this site are carbon monoxide (mechanical equipment), metals (soil), diesel fuel (groundwater), PNA's, asbestos-containing serpentine rock, and oil and grease (soil). The only known hazardous substances that have been identified are metals and oil & grease in the soil and trace amounts of diesel fuel in the groundwater. The metals content in the soil is below the normally established level for hazardous waste. The levels of each metal and the potential associated hazard is low enough to have had the soil reclassified as non-hazardous waste. None of the other substances are expected to produce high exposure levels. See Appendix H for a summary of known contaminants. Maps showing the associated sample collection locations are included in Appendix L.

The following Sections constitute a health analysis of potential hazardous substances that may be encountered on the work site. The routes of exposure for these contaminants are dermal, ingestion and inhalation, as noted.

5.1.1 Carbon Monoxide

Carbon monoxide is formed as the result of the combustion of fuels. The gas powered vehicles to be used in this project will create carbon monoxide. Symptoms of exposure include headache, nausea and vomiting. Exposure route: inhalation.

5.1.2 Petroleum Related compounds

Gasoline powered vehicles will be used on this project. Gasoline constituents can be divided into five major groups: alkanes, alkenes, cycloalkanes, aromatics and additives. The aromatics are the constituents generally regarded to be of the greatest toxic concern. The major aromatics in gasoline are benzene, toluene, ethyl benzene and xylene. Of these, benzene is considered the most toxic. One characteristic effect of gasoline and its aromatic constituents is their ability to irritate the skin when repeated or prolonged exposure occurs. Exposure routes: inhalation, dermal.

5.1.3 Diesel

Diesel powered vehicles will be used on this project. Limited concentrations of diesel have also been identified in the groundwater at this site. Diesel fuel components are less volatile than gasoline. Aliphatic hydrocarbons may be saturated or unsaturated open chain, branched or unbranched molecule. Health precautions include ventilation

for confined spaces. Symptoms of over exposure include nausea, vomiting, lung irritation and headache. Exposure routes: inhalation, dermal.

5.1.4 Oil and Grease

Oil and grease has been identified in the soil at this site. Oil and greases typically have a low order of toxicity. However, additives are frequently found in oils and greases which are significantly more toxic than the base oil itself. Prolonged skin contact with oil and grease can lead to skin disorders, the most common of which is dermatitis. In areas of elevated concentrations of oil and grease personal protection including respirators, chemical resistant suits and gloves, and protective glasses should be worn. Exposure routes: inhalation, dermal.

5.1.5 Antimony

Antimony has been identified at low concentrations in the soil at this site. Antimony is a brittle, silver-white metallic element. The metal is used chiefly in alloys with lead, notably in storage batteries and type metal. Antimony is also used in textiles, plastics, pigments, ceramics, rubber, matches, and camouflage paints. Signs of acute antimony poisoning include marked weight loss, loss of hair, dry, scaly appearance of the skin, and acute congestion of the heart, liver, and kidneys. Exposure routes: inhalation, ingestion.

5.1.6 Arsenic

Arsenic has been identified at low concentrations in the soil at this site. Arsenic metal is found widely in nature. Arsenic is utilized in alloys to increase metal hardness and heat resistance. Arsenic has a toxic effect on the nervous system. Occupational exposure to inorganic arsenic compounds is usually through inhalation, ingestion or skin contact. Acute effects at the point of entry may occur if exposure is excessive. Dermatitis may occur as an acute symptom but is more often the result of sensitization. Exposure routes: inhalation, ingestion.

5.1.7 Chromium

Chromium has been identified at low concentrations in the soil at this site. Occupational exposure to chromium has been found to cause skin and mucus membrane irritation and corrosion. Chrome has also been related to an increase in lung cancer. Exposure routes: inhalation, ingestion, dermal.

5.1.8 Copper

Copper has been identified at low concentrations in the soil at this site. Exposure to excessive amounts of copper fumes can result in fever, muscle ache, irritation of the eyes, cough upper respiratory tract irritation. Exposure routes: inhalation, ingestion.

5.1.9 Barium

Barium has been identified at low concentrations in the soil at this site. Barium is a dense alkaline-earth metal. This element occurs naturally in ore deposits and makes up 0.05% of the earth's crust. Barium and its compounds may be found in nature and are produced industrially for various uses such as in automotive paints, stabilizers for plastics, case hardening steels, bricks, tiles, lubricating oils, jet fuel and various types of pesticides. The barium ion is a muscle poison causing stimulation and then paralysis. Initial symptoms are gastrointestinal, including nausea, vomiting, colic, and diarrhea, followed by myocardial and general muscular stimulation with tingling in the extremities. Severe cases continue to include loss of tendon reflexes, general muscular paralysis, and death from respiratory arrest or ventricular fibrillation. Exposure routes: inhalation, ingestion.

5.1.10 Beryllium

One soil sample from this site contained trace concentrations of beryllium. Beryllium is a hard, brittle, gray-white metal. Beryllium is employed as a structural material in space technology; as a moderator and reflector of neutrons in nuclear reactors; as X-ray tube windows; in computer parts; and as an additive in solid propellant rocket fuels. Early animal studies indicated that beryllium was not a highly toxic element. When the commercial production of beryllium and its compounds expanded, however, workers engaged in the extraction of the element from its ores suffered from a number of ailments, including dermatitis, tracheobronchitis, and pneumonitis. Most of these workers were exposed to soluble beryllium salts, but some cases of acute pneumonitis resulted from handling beryllium oxide. Exposure routes: inhalation, ingestion, dermal.

5.1.11 Cadmium

Cadmium has been identified at low concentrations in the soil at this site. Cadmium is a soft, blue-white, malleable metal. Cadmium is used as a coating for other metals, in bearings, in brazing and low-melting alloys, in nickel-cadmium storage batteries, welding rods, and reactor control rods. Chronic exposure to cadmium has been associated with gastrointestinal symptoms, anemia, eosinophilia, anosmia, rhinitis, discoloration of teeth, microfractures, pulmonary emphysema, and kidney disease. Exposure routes: inhalation, ingestion.

5.1.12 Cobalt

Cobalt has been identified at low concentrations in the soil at this site. Cobalt is a silver-white metal with a bluish-grey cast. It is hard, magnetic, ductile, and somewhat malleable. Cobalt is an essential element for humans. It forms part of the molecule cyanocobalamin (vitamin B₁₂). The absence of cyanocobalamin is associated with a

variety of deficiency-disease states notably dealing with proper erythropoiesis. Chronic overexposure to cobalt has been observed to cause bronchitis, and impaired ventilatory function among cobalt production workers. Exposure routes: inhalation, ingestion.

5.1.13 Lead

Lead has been identified at moderate concentrations below hazardous waste levels in the soil at this site. Lead is a heavy, ductile, soft gray metal. Intake of excessive amounts of lead into the body can result in adverse blood effects, including central nervous system depression, abdominal pain, cholic and anemia. Exposure routes: inhalation, ingestion.

5.1.14 Nickel

Nickel has been identified at low concentrations in the soil at this site. Nickel is a lustrous silvery solid. Symptoms of exposure include headache, vertigo, nausea, gastrointestinal pain and general weakness. Target organs include the lungs, paranasal sinus and central nervous system. Exposure routes: inhalation, ingestion.

5.1.15 Mercury

Mercury has been identified at low concentrations in the soil at this site. Exposure to excessive amounts of Mercury can result in chest pain, gastrointestinal disorders and eye irritation. Exposure routes: inhalation, ingestion, dermal.

5.1.16 Molybdenum

Molybdenum has been identified at low concentrations in the soil at this site. Molybdenum is a silver-white metal or a dark-gray or black powder. Metallic molybdenum is used in high-temperature and tool steel alloys, in missile and aircraft parts, and in reactor vessels and metal-ceramic composites. Molybdenum is an essential mineral in human nutrition where it functions in xanthine oxidase and aldehyde oxidase. Chronic overexposure to molybdenum compounds has been shown to cause weakness, fatigue, headache, anorexia, eye, nose, and skin irritation and joint and muscle pains among mining and metallurgy workers. Exposure routes: inhalation, ingestion, dermal.

5.1.17 Vanadium

Vanadium has been identified at low concentrations in the soil at this site. Vanadium pentoxide is a yellow to rust-brown, noncombustible crystalline compound. Vanadium pentoxide is used as a catalyst in the oxidation of sulfur dioxide, oxides of nitrogen, and other substances. It is also used in the manufacture of yellow glass, as a photographic developer, and as a coating for welding electrodes. In addition,

vanadium is found in fuel oils at 250 to 400 ppm. Vanadium compounds act chiefly as irritants to the conjunctivae and respiratory tract. Prolonged exposures may lead to pulmonary involvement. Responses are acute, never chronic. Exposure routes: inhalation, ingestion.

5.1.18 Zinc

Zinc has been identified at low concentrations in the soil at this site. Zinc oxide is an odorless, nonflammable, white or yellowish-white powder. Zinc oxide is widely used in pigments, rubber, cosmetics and ointments, and electronic devices. The toxicity of zinc compounds by mouth is low. Metal fume fever (zinc chills, brass founder's ague, etc.) may result from the inhalation of zinc oxide fume. The symptoms include cough, dyspnea, fever, chills, substernal chest pain, nausea, and vomiting. Exposure routes: inhalation, ingestion.

5.2 CAL-OSHA PERMISSIBLE EXPOSURE LIMITS

The following table presents the Cal-OSHA permissible exposure limits. These concentrations represent the maximum allowable concentrations to which workers may be exposed during the work shift, expressed as an 8-hour time weighted average.

Contaminant	Cal-OSHA PEL Concentration
Antimony	0.5 milligrams per cubic meter (mg/M ³)
Arsenic	0.01 mg/M ³
Barium	0.5 mg/M ³
Beryllium	0.002 mg/M ³
Cadmium	0.005 mg/M ³
Carbon Monoxide	25 parts per million (ppm)
Chromium	0.5 mg/M ³
Cobalt	0.05 mg/M ³
Copper	1.0 mg/M ³
Dust, Total	10.0 mg/M ³
Dust, Respirable	5.0 mg/M ³

Contaminant	Cal-OSHA PEL Concentration
<u>Gasoline Constituents</u>	
Benzene	1.0 ppm
Toluene	50 ppm
Ethylbenzene	100 ppm
Xylene	100 ppm
Lead	0.05 mg/M ³
Molybdenum	10.0 mg/M ³
Nickel	1.0 mg/M ³
Oil (particulate or mist)	5.0 mg/M ³
Polynuclear Aromatic Hydrocarbons	0.2 mg/M ³
Vanadium (respirable)	0.05 mg/M ³
Zinc	10.0 mg/M ³

6. MONITORING PROCEDURES

6.1 INITIAL AND PERIODIC MONITORING

The greatest potential hazards to safety and health caused by chemical exposure at this site are:

1. Exposure to potentially hazardous substances through inhalation.
2. Exposure to potentially hazardous substances through skin contact and ingestion.

Air monitoring (photoionization detector, Dräger tubes, CO meter, combustible gas meter, O₂ meter, personal sampling pump, as appropriate) will be performed or arranged by the Health and Safety Manager. Representative sampling of personnel exposure to potentially hazardous substances shall be conducted on individuals working in contaminated areas. Personal sampling will continue until a pattern develops that characterizes the exposure. If exposures are less than the OSHA action levels (or PELs, where applicable) for these contaminants, sampling will be reduced to once a week. When new operations or phases begin, additional sampling will resume and recharacterization will begin. New operations or phases include breaking new ground, initiating new types of activities, and encountering unexpected conditions. Personnel to be sampled will include those with the highest potential for exposure. The

Health and Safety Manager will provide data to ensure that dust and vapor concentrations and combustible gas levels are within acceptable ranges and will provide selection criteria for increased levels of protection if needed.

Organic vapor respirator cartridges will be changed twice per day at a minimum. This can be done at a scheduled time or during respirator decontamination. If odor breakthrough is detected while wearing the respirator or breathing becomes difficult, change cartridges immediately. Filter cartridges will be changed whenever filter loading causes an unacceptable increase in breathing resistance, as determined by the worker.

Should a "change" in conditions occur, as compared to the baseline conditions and as determined by project personnel (listed in Section 8) (i.e., pungent odors, visible discoloration of soil, visibly contaminated ground water), increased monitoring will be performed at the direction of the Health and Safety Manager. The Project Manager will be notified immediately so that he can take any necessary precautions to protect the general public.

6.2 TASKS PERFORMED WITHIN A CONFINED SPACE

The scope of work for this project does not include confined space entry such as tanks, but may entail work within excavated areas (greater than 4'), which for the purposes of this plan, are considered confined areas. Confined space entry will be limited to personnel who have been requested to perform such entry and who have completed the OSHA prescribed confined space entry training prior to being assigned to any task requiring confined space entry. Prior to worker entry into a confined area all appropriate testing must be conducted by WSH. Air quality in confined spaces will be monitored for oxygen level, lower explosive limit (LEL), hydrogen sulfide, and petroleum hydrocarbons prior to allowing entry into such a space. All monitoring equipment must be calibrated and maintained in accordance with the manufacturer's recommendations. The level of protective equipment needed will be determined on the basis of this testing and applicable regulations, including 8 CCR 5156 (see Appendix M). See Section 7.4, Confined Spaces in the Hardage Construction Corporation's Safety Manual, located in Appendix D of this Site Safety Plan for additional information on confined space entry procedures at this jobsite.

Excavation and trenching deeper than five feet may require shoring or sloping. Section 7.2, Trenching and Excavation in the Hardage Construction Corporation's Safety manual will be the controlling document for shoring and sloping at this jobsite.

7. HEALTH AND SAFETY REQUIREMENTS

7.1 MEDICAL MONITORING PROGRAM

All WSH and subcontract field personnel must have annual medical evaluations in accordance with the company's Health and Safety Program policy. Additional reevaluation will be considered in the event of chemical over-exposure while working on this project.

The oil and grease and heavy metals known to exist on this project can affect specific organ systems, producing characteristic health effects. The medical evaluation will, therefore, focus on the liver, kidney, nervous system, blood systems, and skin and lung function. Laboratory testing will include complete blood count, and applicable kidney and liver-function tests. Other tests include skin examinations and blood analyses for metal concentrations.

7.2 WSH HAZARD CONTROL PROGRAMS

The following WSH hazard control programs are in effect and covered in the Hardage Construction Corporation Safety Manual in Appendix D. All subcontractors working on this job will comply with all aspects of these programs.

- Excavation and Trenching
- Housekeeping
- Hazard Communications
- Confined Spaces Injury
- Illness Prevention
- Respiratory Programs

7.3 TRAINING

All personnel working at this site should receive initial hazardous waste activity instruction and field experience as required under CCR Title-8 and GISO 5192 (Hazardous Waste Operations and Emergency Response). On-site managers and supervisors directly responsible for employees engaged in hazardous waste operations shall have had an additional eight hours of supervisory training as required under 29 CFR 1910.120, CCR Title-8 and GISO 5192.

The initial training and the 8 hour annual refresher training includes specific details on the following:

- Regulatory Requirements

- First Aid/CPR
- Health Hazard Recognition
- Confined Space Entry
- Respiratory Protection
- Air Monitoring
- Decontamination Procedures
- Hazard Communication
- Toxicology

These specifics are then complimented with actual hands-on experience with use of personal protective equipment and air monitoring equipment. Those supervisors and employees with CPR and first aid training will be identified at weekly tailgate safety meetings.

7.4 HAZARD COMMUNICATION

Communication of hazards on the work site will be by distribution of written hazard descriptions, posting of appropriate signage, and verbally at the weekly safety meetings. Section 8, Hazard Communication of the Hardage Construction Corporation Safety Manual (see Appendix D) will be the controlling document for hazard communication on this jobsite.

7.5 WORK ZONES ACCESS

Access within a 10 foot radius of any on-site operation is prohibited to all but WSH, subcontract field personnel and designated personnel. The work site shall be secured against unauthorized access by the public. The work site will be surrounded with a six foot high cyclone fence. Areas of excavation within the work site will be surrounded with caution tape and/or a barricade.

7.6 EMERGENCY EQUIPMENT

Vehicles used for site work will be equipped with a first aid kit and safety equipment including:

- fluorescent vests
- cones
- flags (as needed)
- barricades (as needed)
- fire extinguisher-dry chemical ABC-type extinguisher

- flashlight
- water, suitable for drinking
- portable eye wash
- appropriate emergency bandage material

7.7 ELECTRICAL EQUIPMENT AND GROUND-FAULT CIRCUIT INTERRUPTERS

All electrical equipment and power cables in and around wells or structures suspected of containing hazardous substance contamination must be intrinsically safe and equipped with a three-wire ground lead, rated explosion-proof for hazardous atmospheres. According to OSHA 29 CFR 1926.404, approved ground fault circuit interrupters (GFCI) must be used for all 120 volt, single phase, 15 and 20 ampere receptacle outlets on the site that are not in use by employees. Receptacles on the ends of extension cords are not part of the permanent wiring and, therefore, must be protected by GFCIs whether or not the extension cord is plugged into permanent wiring.

The GFCI is a fast-acting circuit breaker that senses small imbalances in the circuit caused by current leakage to ground, and in a fraction of a second shuts off the electricity. However, the GFCI will not protect the employee from line-to-line contact hazards (such as a person holding two "hot" wires or a hot and neutral wire in each hand). The GFCI does provide protection against the most common form of electrical shock hazard, the ground fault. It also provides protection against fires, overheating, and destruction of insulation on wiring.

GFCIs can be used successfully to reduce electrical hazards on construction sites. Tripping of GFCIs - interruption of current flow - can be caused by wet connectors and tools. It is good practice to limit exposure of connectors and tools to excessive moisture by using watertight or sealable connectors. Providing more GFCIs or shorter circuits can prevent tripping caused by the cumulative leakage from several tools or by leakage from extremely long circuits (Adapted from OSHA 3007; Ground-Fault Protection on Construction Sites, 1987).

7.8 FIRE PREVENTION

During confined space entry or whenever the potential exists for the buildup of a flammable atmosphere, periodic vapor concentration measurements should be taken with an explosimeter or combustimeter. If at any time the vapor concentrations exceed 20% of the Lower Explosive Limit (LEL), then the Site Safety Manager or designated field worker should immediately shut down all operations.

Only Factory Mutual (FM) approved fire safety cans will be used to transport and store flammable liquids.

All gasoline and diesel-driven engines requiring refueling must be shut down and allowed to cool before filling.

Smoking is not allowed during any operations within the work area.

No open flame or spark is allowed in any area containing petroleum products or other flammable liquids.

7.9 GENERAL HEALTH

Medicine and alcohol can increase the effects of exposure to toxic chemicals. Unless specifically approved by a qualified physician, prescription drugs should not be taken by personnel assigned to operations where the potential for absorption, inhalation, or ingestion of toxic substances exists. No persons are allowed on-site while under the influence of drugs or alcohol or under any diminished capacity, whatsoever.

Drinking alcoholic beverages is prohibited on the work site. Drinking alcoholic beverages and driving is prohibited at any time. Driving at excessive speeds is always prohibited.

Skin abrasions must be thoroughly protected to prevent chemicals from penetrating the abrasion.

It is recommended that contact lenses not be worn by persons working on the site.

7.10 ON-GOING TRAINING

In addition to the initial hazardous waste training, the health hazards posed by the primary contaminants on this project will be discussed over the course of the project at weekly "tool box safety meetings" to serve as a refresher to this instruction.

8. PROJECT PERSONNEL

The Health & Safety Manager will report to the WSH Project Manager relating to hazardous conditions and remedial measures. WSH will oversee conditions and act accordingly during all phases of the project. The following management structure will be instituted to successfully and safely complete this project. In addition, the following personnel including the Site Safety Manager have the authority to stop any construction activity or to modify work practices based on safety requirements. This authority is in effect during working and non-working hours.

8.1 PROJECT MANAGER

The project manager will be responsible for implementing the project and obtaining any necessary personnel or resources for the completion of the project.

8.2 HEALTH & SAFETY MANAGER

The Health and Safety Manager shall be responsible for the coordination and oversight of the following aspects of the Site Safety Plan: vapor, combustion gas, particulate, dermal exposure, and ventilation, and for the implementation of this Site Safety Plan on-site and assuring that all other applicable local, state and federal regulations are complied with.

8.3 PROJECT ENGINEER, SUPERVISOR & FOREMAN

In the event that the Project Manager and the Site Safety Manager are not on site, the Project Engineer or On-Site Supervisor will assume the responsibilities of the Site Safety Manager. If neither the Engineer or On-Site Supervisor are available, the Foreman will assume all responsibilities of the Site Safety Manager.

Project Engineer: _____

On-Site Supervisor: _____

General Foreman: _____

Foreman Area I: _____

Foreman Area II: _____

9. EMERGENCY RESPONSE

In the event of an accident or emergency, immediate action must be taken by the first person to recognize the event. First aid equipment is located on site inside all WSH vehicles. Notify (1) the Site Safety Manager and (2) the Project Manager and the Foreman about the situation immediately after emergency procedures are implemented.

Jobsite telephones are located in the contractor's trailer. Nearest public telephones are located at the Emeryville Public Market.

Emergency Equipment is located at the job trailer.

9.1 EMERGENCY TELEPHONE NUMBERS:

<u>Emergency:</u>	<u>Phone</u>
Local Police	911
Fire	911
State Police	911
Ambulance	911
Underground Service Alert (U.S.A.)	(800) 642-2444
Telephone Company	(800) 642-2444

Maps to hospital are also located in the office and in Appendices.

Primary Hospital:

Summit Medical Center
350 Hawthorne Avenue, Oakland
(510) 655-4000

From the site: Shellmound south, Shellmound becomes 40th Street, right onto Telegraph Avenue, left onto 34th Street. Hospital is on the right.

Secondary Hospital:

Alta Bates Hospital
2450 Ashby Avenue, Berkeley
(510) 540-0337

From the site: Shellmound north to Christie Avenue, left onto Christie Avenue, left onto Powell Street, Powell will merge into Adeline Street, continue on Adeline Street to Ashby Avenue, right onto Ashby Avenue, Hospital is on right after Telegraph Avenue.

Emergency Telephone Numbers:

Environmental Emergency:	Phone
Poison Control Center	(800) 523-2222
RGA Environmental, Inc. (Robert Gils)	(510) 547-7771
National Response Center (NRC)	(800) 424-8802
U.S. EPA (24 hour hotline)	(800) 424-9346
Alameda County Environmental Health: Susan Hugo	(510) 567-6780

Environmental Emergency:	Phone
Department of Toxic Substances Control: Remedios Sunga	(510) 540-3840
Regional Water Quality Control	(510) 286-1255
Emergency Services Agency	(510) 820-8468
_____ , Project Manager	Job Site - Home -
_____ , Health and Safety Manager	Mobile - Home - Mobile -

9.2 ENCOUNTERING HAZARDOUS SITUATIONS (REQUIRING EVACUATION)

In the event of an emergency, i.e. fires, explosions, or any unplanned sudden or non-sudden release of hazardous waste or hazardous waste constituents to air, soil, or surface water at the facility, the team member that observes this condition shall give an emergency alarm.

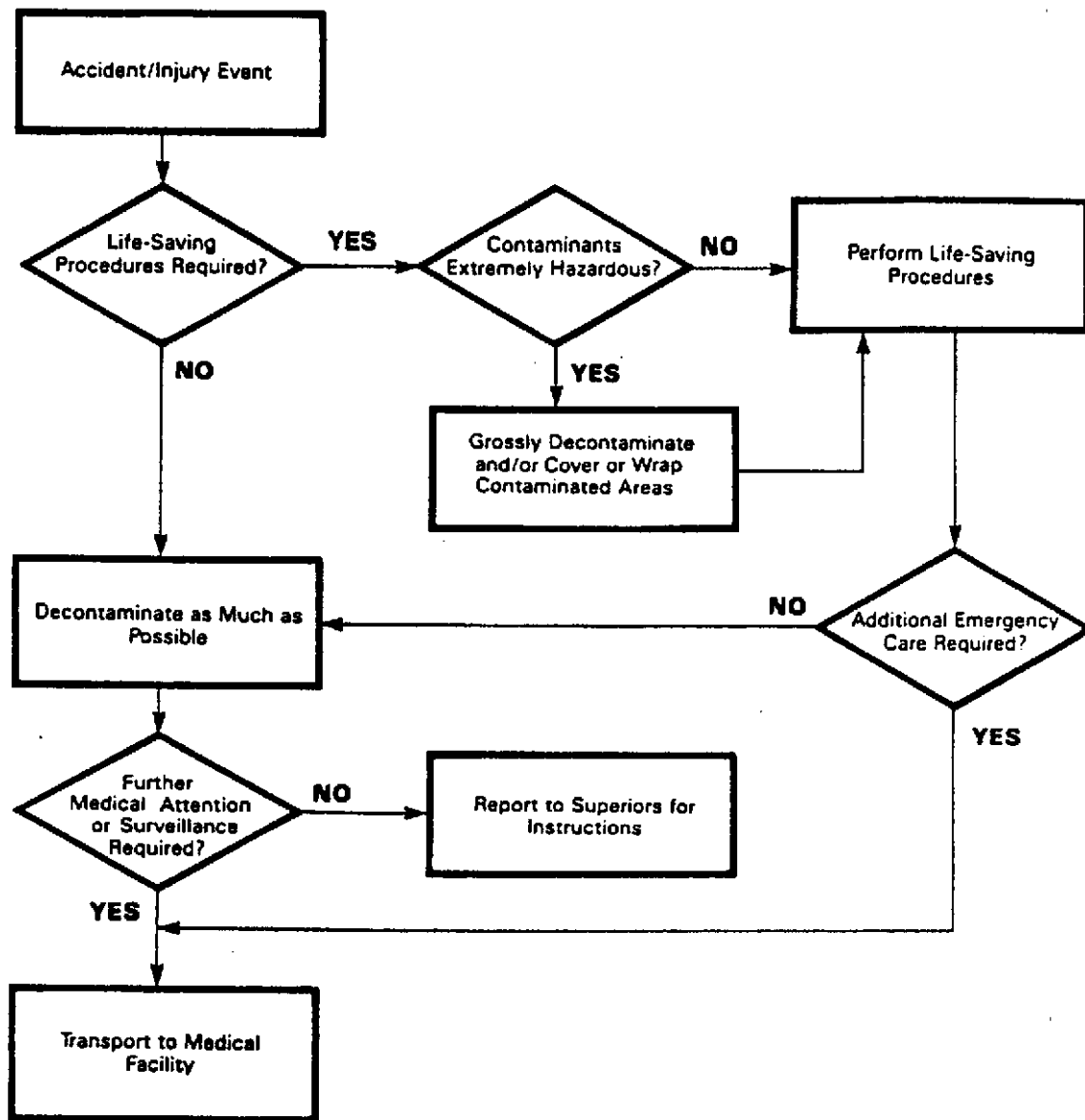
Actions taken will be dictated by the emergency. All appropriate local emergency response agencies shall be notified immediately. The police, fire department, emergency response teams and ambulance may be reached via telephone by dialing 911.

The nearest hospital and additional emergency contacts are listed above.

Personnel encountering a hazardous situation shall instruct others on site to evacuate the vicinity immediately and call the (1) Site Safety Manager, (2) the Project Manager, and (3) the Health & Safety Hygienist for instructions.

The site must not be re-entered until back-up help, monitoring equipment, and personal protective equipment are on hand.

Should an off-site hazardous spill occur, the safety and emergency procedures will be governed by those of the carrier, hauler, etc.



Occupational Safety and Health Guidance Manual for Hazardous Waste site Activities; Prepared by NIOSH, OSHA, USCG, EPA

9.3 USUAL PROCEDURES FOR INJURY

1. If the injury is minor, proceed to administer first aid.
2. Notify the Site Safety Manager, Project Manager, and the Health & Safety Hygienist of all accidents.

3. If the injury requires medical attention, notify the Site Safety Manager, Project Manager, and the Health & Safety Hygienist.
4. Telephone for ambulance/medical assistance if necessary. Whenever possible, notify the receiving hospital of the nature of physical injury or chemical overexposure. If no phone is available, transport the person to the nearest hospital.
5. Send/take this SSP with the MSDSs to the medical facility with injured person. Worker Compensation Insurance Information Packets are in the site office.
6. Notify the Site Safety Manager, Project Manager, and the Health & Safety Hygienists of all accidents, incidents and near-miss situations.
7. Complete Accident/Incident/Near-Miss Form as needed.
8. Notify and provide necessary information to the engineer for all accidents, incidents, and near-miss situations.

9.4 EMERGENCY TREATMENT

When transporting an injured person to a hospital, bring this Site Safety Plan to assist medical personnel with diagnosis and treatment. In all cases of chemical overexposure, follow standard procedures as outlined below for poison management, first aid, and, if applicable, cardiopulmonary resuscitation. Four different routes of exposure and their respective first aid/poison management procedures are outlined below.

9.4.1 Ingestion

Transport person to nearest hospital immediately.

9.4.2 Inhalation/Confined Space

DO NOT ENTER A CONFINED SPACE TO RESCUE SOMEONE WHO HAS BEEN OVERCOME UNLESS YOU ARE PROPERLY EQUIPPED WITH A SELF-CONTAINED BREATHING APPARATUS AND HAVE A STANDBY PERSON.

9.4.3 Inhalation/Other

Remove the person from the contaminated environment. Initiate CPR if necessary. Call or have someone call for medical assistance. Refer to MSDS for additional specific information. If necessary, transport the victim to the nearest hospital as soon as possible.

9.4.4 Skin Contact/Non-Caustic Contaminant (Petroleum, Gasoline, Oil, Grease, etc.)

Wash off skin with a large amount of water immediately. Remove any contaminated clothing and rewash skin using soap, if available. Transport person to a medical facility if necessary.

9.4.5 Skin contact/Corrosive Contaminant (Acids, Hydrogen Peroxide, etc.)

Wash off skin with a large amount of water immediately. Remove any contaminated clothing and rewash skin with water. Transport person to a medical facility if necessary.

9.4.6 Eyes

Hold eyelids open and rinse the eyes immediately with large amounts of water for 15 minutes. If possible, have the person remove his/her contact lenses (if worn). Never permit the eyes to be rubbed. Transport person to a medical facility as soon as possible.

APPENDIX A

AGREEMENT AND ACKNOWLEDGMENT STATEMENT

Site Safety Plan Agreement

WSH personnel have the authority to stop work performed by their subcontractors at this site if any work is not performed in accordance with the requirements of this Site Safety Plan.

All project personnel, observers and subcontractor personnel are required to sign the following agreement prior to conducting work at the site.

I have read and fully understand the Site Safety Plan and my individual responsibilities.

I agree to abide by the provisions of the Site Safety Plan.

Name/Company: _____

Signature: _____

Date: _____

APPENDIX B

SITE SAFETY PLAN AMENDMENT SHEET

Project Name: _____

Project Number: _____

Location: _____

Changes in field activities or hazards: _____

Proposed Amendment:

Proposed By: _____

Date: _____

Approved By (Project Manager): _____

Date: _____

Approved By (Health & Safety Manager): _____

Date: _____

Declined By: _____

Date: _____

Amendment Number: _____

Amendment Effective Date: _____

APPENDIX C

DEFINITION OF HAZARD EVALUATION GUIDELINES

Hazard: Airborne Contaminants

Guideline

Explanation

Threshold Limit Value
Time-Weighted Average
(TLV-TWA)

The time weighted average concentration for a normal eight hour work day and a forty hour work week, to which nearly all workers may be repeatedly exposed without adverse effect.

Permissible Exposure Limit (PEL)

Time weighted average concentrations similar to (and in many cases derived from) the Threshold Limit Values.

Immediately Dangerous to Life and Health
(IDLH)

"IDLH" or "Immediately dangerous to life or health" means any atmospheric condition that poses an immediate threat to life, or that is likely to result in acute or immediate severe health effects. This includes oxygen deficiency conditions.

Guideline

Explanation

Lower Explosive Limit (LEL)

The minimum concentration of vapor in air below which propagation of a flame will not occur in the presence of an ignition source.

Upper Explosive Limit (UEL)

Upper Explosive Limit (UEL)The maximum concentration of vapor in air above which propagation of a flame will not occur in the presence of an ignition source.

APPENDIX D

WOODFIN SUITE HOTELS

INJURY AND ILLNESS PREVENTION PROGRAM

HARDAGE CONSTRUCTION CORPORATION

SAFETY MANUAL

Woodfin Suites Hotel

June 1998

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8. HAZARD COMMUNICATION

1.1

CORPORATE SAFETY POLICY

Safety in all Hardage Construction Corporation operations is not just a corporate goal, **it is a requirement!**

To this end, we have formulated this written program to govern all the operations of Hardage Construction Corporation.

It is a condition of employment with Hardage Construction Corporation that all employees adhere to the requirements of this program, as well as the safety rules, instructions, and procedures issued in conjunction with this manual. Failure to do so will result in disciplinary action as outlined in the attached program.

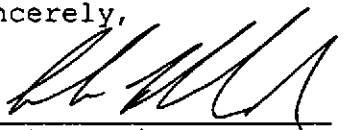
It is a condition of all subcontractors and purchase orders, which will include labor, issued by Hardage Construction Corporation that this program and the safety rules, instructions and procedures issued in conjunction with it, as well as all applicable federal, state and local codes and regulations be complied with. Failure to comply is considered a breach of contract items.

All visitors to any Hardage Construction Corporation operations, including but not limited to suppliers, owner's representatives, agents of the architect or engineer, regulatory authorities and insurance company representatives shall be required to follow all safety rules and regulations during their visit.

Hardage Construction Corporation will make an effort to ensure that the operations of other contractors, even those not under our control, do not endanger the safety of our employees and/or Subcontractors. All employees are required to report hazardous activities to appropriate Hardage Construction Corporation representatives.

The Safety Department, Project Managers, Project Superintendents, Project Coordinators and Foreman have the full support of management in enforcing the provisions of this program as it relates to responsibilities assigned to them.

Sincerely,



Chuck L. Hibert, Jr.
Project Manager

SAFETY DEPARTMENT

1. Act as a resource to the company on safety.
2. Develop and maintain the safety program.
3. Develop and implement safety training programs.
4. Assist in project safety planning.
5. Conduct routine safety inspections of projects.
6. Prepare project and company safety analysis.
7. Coordinate and advise Subcontractors on safety related issues, such as Hazard Analysis', Fall Protection, Scaffolding, etc., as requested by the Project Superintendent.
8. Coordinate, advise and attend corporate safety committee meetings.

PROJECT MANAGERS

1. Coordinate pre-planning meetings for project safety.
2. Dedicate project resources for safety.
3. Periodic safety performance reviews of projects.
4. Attend corporate safety committee meetings(as requested).

SUPERINTENDENTS

1. Responsible and accountable for project safety, through the appropriate company provided resources.
2. Designated jobsite competent person.
3. Schedule/coordinate pre-planning meetings for project.
4. Monitor safety performance on the project.
5. Identify and correct hazards.
6. Take progressive disciplinary action, when appropriate.
7. Coordinate and/or conduct project safety meetings.
8. Conduct accident investigations.
9. Attend corporate safety committee meetings(as requested).

FOREMAN

1. Responsible and accountable for the crew's safety.
2. Train/monitor individual employee safe work practices.
3. Conduct weekly and daily toolbox safety meetings.

EMPLOYEES

1. Attend orientation, weekly and daily safety meetings.
2. Follow company and project safety rules.
3. Use safety equipment supplied to them.
4. Do not proceed with work if unsafe conditions exist.
5. Participate in safety program.

HARDAGE CONSTRUCTION CORPORATION

1.3

This program has been designed as a supplement to enhance continued management involvement regarding safety awareness by implementing a system of required meetings, jobsite inspections, reports and employee training/educating pertaining to safety on a regularly scheduled and monitored basis. Specific duty responsibilities and instruction have been used wherever possible so as to leave no voids in the implementation of the program. It is the intent of **Hardage Construction Corporation**, through this program, to provide a safe and efficient work environment for all employees, as well as to ensure public safety and property protection associated with company projects.

Motto: BE SAFE AND LIVE!!!

An effective accident prevention program requires proper safety attentiveness from everyone on the job. Once a possible hazard has been identified and remedial action taken, the situation shall be monitored to ensure that the remedy is maintained. This monitoring is accomplished through properly trained line supervision (Foreman). The basic rules that each employee shall know are as follows:

- 1) All employees shall be given a safety orientation by the Safety Department or Personnel Department before they start work. This orientation shall address general instructions regarding rules of the project, specific craft rules, and any particular portion of the work being performed at that time. In addition, The Safety/Personnel Department shall require that all new employees read and sign the "New Employees Introduction to Safety" (Refer to Form #300 -8/95) which shall be sent to the payroll department for employee files.
- 2) No employee is expected (or allowed) to undertake a task unless properly qualified for that task.
- 3) No employee shall undertake a task that is, or appears to be, unsafe.
- 4) Each employee shall participate in the weekly "toolbox" safety meetings and sign the weekly meeting form.
- 5) Where electrical grounding of equipment is necessary, grounding or shielding of all electrical equipment and work must be accomplished.
- 6) Equipment mechanical safeguards must be in place prior to equipment use.
- 7) Each employee shall remedy immediately and/or report to their Supervisor all unsafe conditions encountered on the project.
- 8) All injuries suffered by an employee, must be reported to the Project Superintendent at once.

9) **KEEP THE JOBSITE CLEAN!!!**

- 10) Any "horseplay" or intentional flagrant violation of the Safety and Health Program, including the consumption of alcoholic beverages or drugs while on the jobsite will not be tolerated by **Hardage Construction Corporation** and will result in immediate employee termination. This includes before, during, and after working hours.
- 11) Fall protection is required over 6 feet.
- 12) Never violate warning signs or barricades.
- 13) Report daily to your supervisor prior to beginning of work. If ill, your supervisor must be contacted prior to the start of your shift.
- 14) If you are not sure how to perform your assigned task safely, stop and consult your immediate supervisor.
- 15) Throwing of materials is prohibited.
- 16) Operate only the equipment that you have been trained and authorized to use.
- 17) Equipment requiring certified operators will be operated by certified operators.
- 18) Become familiar with all **Hardage Construction Corporation** construction and project safety rules. These will be explained or made available to you during your orientation period with your company.
- 19) Do not walk or stand under suspended loads.
- 20) Think before you lift; plan the lift; move close to the load; keep your back straight; bend your knees and lift with legs; do not lift and twist in same motion; if the load is too heavy, get help.

Willful failure to abide to safety rules and procedures will be subject for disciplinary action up to and including immediate terminations.

1.4

PROGRESSIVE DISCIPLINE PROGRAM

The Hardage Construction Progressive Discipline Program was developed to help create a greater individual awareness and responsibility for safety on our projects. Individual's and/or groups of individuals, i.e., supervisor and crew members violating project safety rules, will be subject to progressive discipline action, as described below.

Safety Violation Notices will be written by the Project Superintendent. An employee must report an unsafe act or condition to their direct supervisor or the Project Superintendent at anytime. It is important to take immediate action if a serious hazard has been identified.

1.4.1 GUIDELINES FOR DISCIPLINARY ACTION:

1. **Verbal warnings** may be appropriate for minor offences related to items that would not cause serious injury.
2. **Written warnings** shall be issued for any violation that could result in a serious injury.
3. **Serious violations** will follow the outlined scheduled of progressive disciplinary action:
 - A. **First Violation:** Employees receive a written warning notice.
 - B. **Second Violation:** if within 2 months of the first violation, will render the employee ineligible for work for Hardage Construction Corporation for a week.
 - C. **Third Violation:** within 6 months of the first violation will render the employee ineligible for work on the Hardage Construction Corporation's project for 1 year.
4. **Immediate termination** may result when the natures of the violations (s) make retention of the violator (s) unacceptable to **Hardage Construction Corporation**.

Wilful disregard for serious hazards will result in immediate termination. If at any time you are unsure of safety conditions or procedures, stop immediately and consult your direct supervisor.

1.4.2 GUIDELINES FOR DISCIPLINARY ACTION WHEN DEALING WITH SUBCONTRACTORS:

Verbal Warnings may be appropriate for minor offenses related to items that would not cause a serious injury.

Written Warnings shall be issued for any violation that could result in a serious injury.

Serious Violations will follow the outlined schedule of progressive disciplinary action:

1. **First Serious Violation:** Subcontractor receives a written warning notice. If safety violations reoccur, Subcontractors Management representatives' shall be required to present themselves at the jobsite and inform HCC what will be done to control further or continued violations. HCC may elect to withhold a select retention amount until satisfied that safety issues have been adequately addressed by the Subcontractor.

If the exposure presented by the violation is serious and there is a substantial probability of death or serious physical harm, the Superintendent shall take immediate actions, including stoppage of work, until the violation is corrected.

General Contracting SAFETY CODE

1.5

Safety of operations shall be incorporated in our construction work. Strict observances of the following Code is expected of each employee. Apply the Code in your daily work and be alert to changes that affect your area of operation.

1. GENERAL

- A. Hazardous machinery, equipment or conditions and unsafe practices or acts shall be reported to your supervisor at once.
- B. The use or possession of intoxicating beverages or drugs is prohibited on the job. Reporting to work intoxicated warrants immediate dismissal.
- C. Caution other employees exposed to hazards created by your work activities.
- D. Each jobsite shall have listed emergency telephone numbers and the site address in plain view of the project telephone.
- E. All injuries shall be reported promptly to an authorized representative so that arrangements can be made for medical or first aid treatment
- F. Authorization for medical services must be given by your supervisor for "On the Job" injuries before obtaining medical attention or seeing a doctor. Do not engage in horseplay on the job.
- G. Warning signs, barricades, guard rails, etc. shall be kept in place.
- H. Place guards around or over all roof openings, wall openings, floor openings, excavation, manholes, elevator shafts or any other opening where hazard of fall exists. All guards and covers shall be secured in place.
- I. Machinery and equipment shall be operated or repaired by qualified personnel.
- J. Keep out of hazardous areas when not a member of the work crew involved.
- K. Use the proper lifting technique to prevent back strain and injury.
- L. Do not enter manholes, underground vaults, chambers, tanks, silos, etc. until it has been determined that there is sufficient amount of oxygen and it contains no flammable or toxic gases or vapors.
- M. No employee is allowed to handle asbestos material without proper training in its removal and disposal (see O.S.H.A. 1926-58).
- N. No jobsite radios or tape players are allowed. (Communication radios are acceptable).

2. PERSONEL PROTECTIVE EQUIPMENT

- A. Hard hats shall be worn at all times.
- B. Proper construction attire is required. This includes shirts with sleeves, long pants, and hard-cover footwear with substantial soles. No tank tops, shorts, sweat pants, tennis shoes, or sandals are allowed.
- C. Wear appropriate dark goggles or welding helmet when working on or near arc, acetylene welding or burning.
- D. Wear safety glasses or face shield in areas where flying particles are encountered or hot material can splash.
- E. Protection for the hands and other parts of the body is required when exposed to potential cuts, burns, or harmful substances.
- F. Use body harnesses, shock absorbing lanyards and life lines when working at heights above 6 feet and where unprotected by guard rails or safety nets.
- G. Flag men, truck spotters, grade checkers, etc. shall wear red shirts or vests and use proper warning signs, and flags.
- H. All personal protective equipment shall be used in accordance with manufacture recommendations.

3. LADDERS, SCAFFOLDS

- A. Defective ladders will not be used.
- B. When using ladders other than stepladders, set feet securely, extended 3 feet above the landing and tie off at the top.
- C. Face the ladder going up or down with hands free of tools or materials.
- D. Before using scaffold, check proper blocking, bracing ties, guard rails and planking. If defective, do not use until corrected.
- E. Scaffold platforms shall be tightly planked for the full width of each work level, and kept clear of unnecessary tools or materials. Do not overload.
- F. Scaffolds or platforms 10 feet or more above ground shall be equipped with guardrails, toe boards, and all applicable safe guards.
- G. Before working on rolling scaffolds, check braces, guys, and wheel retainers, wheel locks and outriggers.
- H. All scaffolding shall be erected and dismantled in a safe manner and in accordance with OSHA requirements.
- I. Ladders shall be used for there intended use, in accordance with manufacture recommendations.

4. MACHINERY AND EQUIPMENT

- A. Oiling or replacing of machinery while in motion is prohibited unless special provisions to do so have been approved.
- B. Before any equipment is set in motion, operator must first check and be certain that no one will be injured by this action.
- C. No employee shall be allowed to operate power driven equipment until he/she has property trained in its safe operation.
- D. Before leaving equipment, ground the blade, bucket, scoop, pans, etc. and secure brakes.
- E. Motorized equipment shall be handled with caution in dangerous areas such as edges of deep fills, cut banks and steep slopes.
- F. When making repairs on equipment where blocking is required, be sure blocking is secure.
- G. Keep required clearance from all high voltage lines.
- H. Never swing suspended loads over workmen.
- I. Getting on or off equipment while it is in motion is prohibited.
- J. Riding equipment is prohibited unless provided with adequate riding facilities.
- K. Ignition keys shall be removed from all company vehicles and equipment when left unattended (even for short periods of time).
- L. Company vehicular usage is limited to those persons listed on the insurance company's list of qualified drivers - no exception. In all cases the use of seat belts is required.
- M. When using haul trailers, the trailer must be secured to the towing vehicle by means of two heavy-duty chains which must be crisscrossed as a safety cradle under the tongue of the hitch with only enough slack to allow proper turning.

- N. All welding cylinders, whether empty or full, shall be kept in an upright position, secured to either a welding cart, column, wall, or storage rack, and shall be stored with their caps in place.
5. **HAND TOOLS**
- A. Defective tools shall not be used. Keep all tools in good state of repair.
 - B. Do not carry sharp hand tools in clothing. Use proper carrying cases or tool kits.
 - C. Use hand tools only for the purpose for which they are intended.
 - D. Power actuated tools shall be used only by certified operators and with the proper personal protective equipment.
6. **ELECTRICAL**
- A. Check all portable electrical tools for proper ground and condition of cords. No splices in cords are allowed. If repairs are required, the cords may be shortened with new ends applied (with proper ground). Do not use if defective. Report defective material to your supervisor.
 - B. Heed high voltage warning signs and keep proper distance.
 - C. Do not lift or lower portable electric tools by means of the power cords. Use a rope.
 - D. Do not leave the cords of portable electric tools where equipment will run over them.
 - E. When necessary to suspend portable power tools, hang them from some stable object by means of a rope or similar support of adequate strength.
7. **FIRE HAZARDS**
- A. When welding or using torches, observe the following:
 - B. Be sure that hot sparks of slag do not come in contact with combustibles.
 - C. Have a portable fire extinguisher present.
 - D. Have and use a spray-type water bottle to wet down any nearby combustible materials before and after the work.
 - E. Maintain a minimum of ½ hour to watch on the area after torches have been extinguished.
 - F. Use only U.L. listed safety cans labeled flammable to store and transport flammables. These cans have a string-loaded cap over the pouring spout and a anti-flammable screen in the spout.
 - G. Keep only rags and waste material in proper containers.
 - H. Use fire protection equipment only for fire fighting.
 - I. All company vehicles, construction offices, and equipment storage trailers must be equipped with multi-purpose portable fire extinguishers. All employees shall be educational regarding the location and use of these as well as others on the site.
 - J. Report all fire hazards to your supervisor immediately.
 - K. Gasoline shall not be used for cleaning purposes.
 - L. Do not use flammable fuels for starting or for "warm-up" fires.
8. **FIRST AID**
- A. Obtain immediate first aid for all injuries, no matter how small, and report to your supervisor.
 - B. Know location of first-aid kit and emergency equipment.
 - C. Do not move seriously injured person unless he is exposed to further injury from fire, falling objects or other hazard.
 - D. Never remove foreign bodies from the eyes.
 - E. Use first-aid materials for emergency only.
9. **HOUSEKEEPING**
- A. Maintain good housekeeping in your area of work and storage yards.
 - B. Do not leave scrap on the ramps, runways, stairways or designated paths of travel.
 - C. Keep hoses, cables and ropes coiled, tied and in the clear.

Willful failure to abide by safety rules and procedures will be subject for disciplinary actions up to and including immediate termination.

This Safety Code is not to be considered "all inclusive", rather a general guideline. Where any portion of these standards are in conflict with, or less stringent than, any applicable Federal, State or local statutory safety regulations, then more stringent regulations take precedence.

Hardage Construction Corporation holds the right to modify this Safety Code at anytime, without prior notifications.

2.1 NEW EMPLOYEE SAFETY EDUCATION CHECKLIST

Name (Last, First, MI)

Date: _____

Project Name and Location

Job Number

Craft

This report shall be completed by the Safety and/or Personnel Department and new/transferred employee on the first day of employment.

I have been instructed in the following areas:

	YES	N/A
1. Hardage Construction Corp.'s Safety Policies and Program	_____	_____
2. Employee's Responsibilities	_____	_____
3. Progressive Discipline Program	_____	_____
4. Hardage Construction Corp. Drug and Alcohol Policy and Testing	_____	_____
5. Dress Code and Footwear	_____	_____
6. Company Vehicle Use Policy	_____	_____
7. When and Where to report unsafe conditions	_____	_____
8. When and Where to report near miss incidents	_____	_____
9. Accident Reporting Procedures	_____	_____
10. Designated Clinic/Hospital	_____	_____
11. Modified Duty/Return to Work	_____	_____
12. Lifting and Use of Material Handling Equipment	_____	_____
13. Personal Protective Equipment (PPE)	_____	_____
14. Tools and Equipment	_____	_____

15. All N/A answers must be explained by comments on back of a checklist.

Personnel/Safety Dept.	Date	Employee	Date
-------------------------------	-------------	-----------------	-------------

1. Joe E. Woods, Inc. Safety Policies and Programs

Joe E. Woods, Inc. has a written safety program and manual. Key elements of the Safety Manual include:

- A. Corporate Loss Control policies.
- B. Company vehicle use policies.
- C. Company responsibilities.
- D. Supervisor responsibilities.
- E. Accident procedural information.
- F. OSHA reporting information.
- G. Safety indoctrination and training/education information.
- H. Safety regulations and standards.

2. Employees Responsibilities

- A. Observe all of JWI's and jobsite safety rules, policies and program.
- B. Use correct tools and equipment for the job.
- C. Keep tools and equipment in good condition.
- D. Refrain from horseplay.
- E. Use required personal protective equipment.
- F. Report all accidents and injuries immediately.
- G. Cooperate fully with accident/incident investigations.
- H. Attend and participate in all safety meetings.
- I. Work safety and smartly.

3. Progressive Discipline Program

- A. Verbal Warnings.
- B. Written Warnings.
- C. Serious Warnings.
- D. Immediate Termination.

4. Drug and Alcohol Policy and Testing

Each employee shall review JWI's "Drug and Alcohol Abuse Policy". The policy must be signed by the employee(s) and forwarded to JWI's Personnel Department.

Note: Any person(s) that sustained a reportable accident, a substance abuse test will be administered. Additionally, any person(s) involved in any property or equipment damage that is valued at \$500 or more, shall be given a substance abuse test.

5. Dress Code and Footwear

Proper clothing shall be worn on the jobsite. No shorts or cut-offs. Sleeves shall be a minimum of 3 inches off the shoulders. Proper hard soled work boots shall be worn, no tennis

Shoes or loafers. Hard hats shall be worn on the jobsite at all times from the start of the project until the trim phases involving any interior or exterior overhead work is completed. (As determined by the Project Superintendent.)

6. Hardage Construction Vehicle Use Policy

- A. HCC's vehicles are to be driven exclusively by HCC personnel and for company business only.
- B. Absolutely no unauthorized passengers are to be transported at any time.
- C. All vehicles and equipment accidents, no matter how minor, must be reported immediately to the jobsite supervisor who will investigate and notify HCC's Safety Department before the end of the day the accident occurred.
- D. Seat belts shall be worn by all vehicle and equipment drivers and passengers.
- E. Vehicle shall be operated exclusively by authorized HCC drivers.

6. When and Where to Report Unsafe Conditions

All employees are responsible for jobsite safety. If you observe an unsafe condition and cannot or are not authorized to correct it, report it to your supervisor so that corrective action can be taken. Unsafe conditions can include faulty or broken tools, equipment, unprotected electrical suppliers, missing guards, etc.

7. When and Where to Report Near Miss Accidents

Near miss incidents are accidents where no injury or property damage was suffered. However, it is important that they be reported immediately to your supervisor. Near misses will be investigated to determine cause (s) and corrective actions to be taken to prevent reoccurrence.

8. Accident Reporting Procedures

All accidents resulting in bodily injuries or property damage, must be reported immediately to your supervisor. Any investigation will be conducted and corrective steps taken. **Failure to comply with Accident Reporting Procedures will result in disciplinary action up to and including termination.**

9. Designated Clinic/Hospital

HCC has identified a medical clinic or hospital to be used for treatment of workplace injuries. All injured workers will be required to seek first treatment as the designated facility except in the case of injuries when require immediate attention.

10. Modified Duty/Return to Work

HCC has a modified duty policy. After a modified duty release from treating physician the employee will be required to return to work if a modified duty job is available.

11. Lifting and Use of Material Handling Equipment

Review and educate proper lifting techniques.

- A. Lift only what you can handle without overexertion or straining.
- B. Lift with your legs, not your back.
- C. Lift comfortably and gradually without jerking.
- D. Lift close to your body.
- E. Lift without twisting - move your feet.
- F. Remember, pushing is better than pulling.
- G. Lift with a straight back - Never bend over.
- H. Emphasize and encourage two-man lifting. Encourage the use of material handling equipment, provide material handling equipment training.

12. Personal Protective Equipment

HCC's P.P.E. requirement, i.e., hard hats, safety vests eye protection, gloves, respirators, etc. Inform employee (s) of P.P.E. storage locations. Demonstrate proper use and fitting.

13. Tool and Equipment Training

Extent of training will depend on the employee's familiarity and experience with tools and equipment they will be using. Demonstrate how to properly and safely use tools or equipment and then ask the employee to demonstrate use.

14. Safety Rules/Program Enforcement and Disciplinary Procedures

All HCC's employees are responsible for observing and complying with company safety rules, policies and programs. Any employee violating company safety rules, policies or program will be disciplined, up to and including termination.

- In addition to required orientation and training, all employees shall receive specialized training if warranted by the nature of their occupational exposure.

HARDAGE CONSTRUCTION CORPORATION
SUBSTANCE ABUSE PROGRAM
EFFECTIVE DATE: June 1, 1998

Hardage Construction Corporation recognizes its obligation to insure a safe work environment for its employees. While we have always endeavored to provide this, the growing program or substance abuse (alcohol and drugs) within the workplace necessitates our adoption of this policy. Over 50 percent of all construction accidents can be attributed to substance abuse. We will not allow the use of alcohol or drugs on our premises, nor will we allow employees to work with the presence of drugs or alcohol in their systems which could potentially interfere with the safe performance of their jobs. All employees will sign an acknowledgment that they have read, understood and will abide by the terms of this policy. A safe workplace is the responsibility of every employee as well as management.

Employees who have a problem with drug or alcohol abuse are encouraged to come forward at any time, but especially prior to any condition requiring testing as outlined herein. We will help you find an appropriate, reasonable cost, treatment program which will allow you to maintain your job and get free of substance dependency.

1. **The possession or sale of alcohol and/or drugs anywhere on Hardage Construction's properties (e.g., offices, jobsites, supporting areas, parking lots, etc.) Can be grounds for immediate termination. Prescription drugs are excluded from this statement only if the drugs are currently prescribed to the employee. Supervisors may require employees to obtain a medical authorization letter stating the need for the prescribed drug and indicating that normally assigned duties may be safely performed under the influence of the prescribed drug. Over-the-counter drugs are not covered by this paragraph.**
2. **The use of alcohol or illegal drugs during the workday is always prohibited and can be grounds for termination. If you are taking prescription drugs or over-the-counter drugs which could impair your safe performance, you must advise you're immediate supervisor who may assign you to non-hazardous work or you may be sent home. We expect all employees to take personal responsibility to report to work with their systems free of illegal drugs and alcohol, and to remain that way through out the workday.**
3. **Your supervisor will require that you submit to a monitored urinalysis test under any of the following circumstances:**
 - A. **Your behavior matches an accepted profile or being under the influence of alcohol or drugs, during work hours.**
 - B. **You are a member of a crew or project team, which exhibits performance, or work habits that may indicate a substance abuse problem during work hours.**
 - C. **You are involved in a self-inflicted injury during work hours requiring medical attention.**
 - D. **You have been working in the vicinity of another worker who is injured during working hours and requires medical attention.**
 - E. **You are involved in, or have been working in the vicinity of, a non-injury property accident with an estimated cost greater than \$500 during working hours.**

Relative to the above, employees are advised that only in the case of sub-paragraphs A and B is there presumption of substance abuse. Testing done following an accident presumes no substance abuse and is done as a normal part of the post-accident investigation process.

Employees are reminded that all injuries must be reported to a supervisor immediately.

Employees who attempt to alter their specimen or refuse to be tested will be terminated. Should a specimen be found diluted to the degree that a positive/negative result is not obtainable, a re-test shall be taken within 48 hours. If the re-test is also diluted, the test shall be deemed positive and the employee will be subject to action outlined in paragraph 4. In the event an employee is so severely injured that a urine specimen cannot be collected, the results of a blood test performed as part of the medical treatment for the injury will be accepted.

Hardage Construction will implement random urinalysis testing whenever circumstances warrant.

1. Employees who test positive on a reconfirmed urinalysis test will be placed on a 14-day suspension without pay. They will be allowed back to work only upon proof of entering an approved substance rehabilitation program, appropriate to their situation, at their own expense and accompanied with a negative re-test. Employees are responsible for the cost of any drug tests as part of their program. They must abide by the rules of that program and must submit to random no-notice urinalysis test for a one-year period.

Hardage Construction shall pay the costs of the drug test required for re-entry into the labor force along with any test done subsequent to re-entry.

Any second positive test shall be grounds for disciplinary action up to and including termination.

Employees operating company vehicles who receive and are convicted of a DUI citation will be treated as would any employee testing positive in a urine screen; in addition, they will lose their authorization to operate company-owned vehicles, and may be subject to other disciplinary action up to and including termination, as circumstances warrant. Any employee arrested for a DUI, whether in a company vehicle or a non-company owned vehicle, must report such arrest to his or her supervisor. Any detrimental impact on **Hardage Construction** insurability or cost of insurance as a result of any employee's DUI conviction may be grounds for termination.

5. In accordance with the federal omnibus "Drug-Free Workplace Act of 1988," employees are advised of their obligation to notify their supervisor within five days after any conviction for criminal drug activity.

6. Employees who test positive, and who believe the test was in error, may request a re-test of the original specimen. If the re-test is positive, the terms of paragraph 4 will go into effect.

7. Prospective employees will be tested prior to starting, and will not be started if they test positive. Should a specimen be found diluted to the degree a positive/negative results is not obtainable, a re-test shall be taken within 24 hours, but prior to hire. Should the second test sample be found diluted also,

the test shall be deemed positive and the prospective employee will not be hired. Prospective employees must pay for the drug screen test; if they test negative. They will be reimbursed as agreed with the hiring official. If a prospective employee has been testing within the last 90 days by any contractor participating in the AGAC Drug-Free Jobsite Program, **Hardage Construction Corporation** will accept the result of that test as meeting the requirement's of the pre-employment screen.

8. All employees and supervisors will receive appropriate and on-going safety training and education relative to substance abuse control.
9. Hardage Construction Corporation management or its agents have the right to search its offices, jobsites, and supporting areas for banned substances. Your vehicle and other possessions brought onto **Hardage Construction Corporation's** construction property or areas are subject to this paragraph.

2.3

PERSONAL PROTECTIVE EQUIPMENT (PPE)

2.3.1

General Rules For Safety Equipment

Proper safety equipment is necessary for your protection. Hardage Construction Corporation provides the protective equipment.

Personal Protective Equipment (PPE) is equipment designed and intended for individual employee protection at the workplace; per ANSI specifications. PPE includes Respirators; Safety Belts and Harnesses; Eye Protection; Gloves; HardHats; Hearing Protection.

Use all safeguards, safety appliances or devices furnished for your protection and comply with all regulations that may concern or affect your safety. Wear your gear properly --- all snaps and straps fastened, cuffs not cut or rolled.

Each employee is responsible for use of personal protection equipment.

Certain jobs require standard safety apparel and appliances for the protection of the employee. Your supervisor will furnish you with the necessary approved protective appliances. These items shall be worn and effectively maintained as a condition of your continued employment and part of our mutual obligation to comply with the Occupational Safety and Health Act.

Safety goggles, glasses and face shields shall correspond to the degree of hazard, i.e., chemical splashes, welding flashes, impact hazard, dust etc. Do not alter or replace an approved appliance.

Rubber gloves and rubber aprons shall be worn when working with acids, caustics or other corrosive materials.

Protective footwear must be worn.

No jewelry shall be worn around power equipment.

Hearing protection appliances (approved muffs or plugs) shall be worn by all employees working within any area identified as having excess noise levels. Your supervisor will instruct you in the proper use of the appliance.

Subcontractors and their employees must come to a Hardage Construction Corporation Project with the required PPE for their work process. Hardage will not supply or loan PPE to Subcontractors or their employees. Hardage will schedule and coordinate meetings to inform Subcontractors of special PPE requirements.

Hardage Construction Corporation employees will have PPE explained and issued to them at project orientation. Once you have been issued PPE it is your responsibility to see that it is maintained in a safe working condition. Inspect it daily.

Some PPE may be furnished for a specific use or project only. This equipment will be signed out to each employee who will be responsible for its care and return before leaving the project. If it is not returned the employee will be held liable for the cost of the item.

2.3.2 Eye Protection

All employees must wear eye protection when work may cause eye injury. Special exposure situations will require the use of enhanced eye protection. Such as, Welding; Cutting with a Torch; Grinding. Appropriate eye and face protection must be used. Including a full face shield or welding glasses.

2.3.3. Fall Protection

A Full Body Harness and shock absorbing lanyards must be used when a fall exposure exists over 6 feet. Harnesses are available that adapt well to personal tool bags. Various types of lanyards will be provided to Hardage Construction Corporation employees. Appropriate type of lanyards will be assigned as best suited. For further information see the section 7.10 "Fall Protection".

2.3.4 Gloves

Gloves should be worn when work involves handling metal or sharp objects, and is mandatory in demolition and concrete pouring operation. For special work, which involves chemicals, the Hazard Communication section must be reviewed.

2.3.5 HardHats

Hardhats are mandatory. From the start of the project until the trim phases involving any interior or exterior overhead work is completed. (As determined by the Project Superintendent).

Wear hardhat, correctly. Keep it squarely on your head with the inside band properly adjusted.

2.3.6 Hearing Protection

2.3.6.1 Danger Noise

Exposing the ear to high levels of noise may cause hearing loss. This loss can be temporary or permanent. Temporary hearing loss or auditory fatigue occurs after a few minutes exposure to an intense noise but is recoverable following a period of time away from the noise. If the noise exposure is repeated, there may be only a partial hearing recovery and the loss becomes permanent. Typically, significant hearing losses occur first in the frequency range of 3,000 to 6,000 herz (Hz). Losses in this frequency range are not critical to speech perception, and the individual usually is completely unaware of this initial symptom. With longer exposures, the hearing loss spreads to lower frequencies, which will affect speech perception.

2.3.6.2 Noise Protection In Excessively Noisy Areas

Noise levels should be measured using a sound level meter or an octave band analyzer and records kept. Engineering controls should be used to reduce excessive noise levels; where possible. This may include closing rooms to noisy areas or adding acoustical barriers, etc. When engineering controls are not feasible, administrative controls (i.e. worker rotation) shall be used to minimize individual employee exposure to noise. An ongoing preventive health program will be utilized to educate employees in safe

levels of noise exposure; the effects of noise on their health, and use of personal protection equipment. To be effective, ear protectors must be properly fitted and employees will be instructed to their use and care. Always use clean earplugs.

When ambient or local noise levels exceed 85 d.b.a., hearing protection is required. (At 85 d.b.a., you must shout to be heard.)

For further information regarding Engineering Controls and/or Administrative Procedures for reducing noise levels, contact Hardage Construction Corporation.

2.3.7 Respiratory Protection

In emergencies, or when feasible engineering or administrative controls are not effective in controlling toxic substances, appropriate respiratory protective equipment shall be provided and be used.

Respiratory protective devices shall be approved by the U.S. Bureau of Mines/National Institute for Occupational Safety and Health or acceptable to the U.S. Department of Labor for the specific contaminant to which the worker is exposed.

Respiratory protective devices shall be appropriate for hazardous material involved and the extent and nature of the work requirements and conditions.

Workers required to use respiratory protective devices shall be thoroughly trained in their use.

Respiratory protective equipment shall be inspected regularly and maintained in good condition.

For further information regarding Engineering Controls and/or Administrative Procedures for respiratory protection, contact Hardage Construction Corporation's Safety Department.

2.3.8 Footwear

Protective footwear is required on all Hardage Construction projects. This shall include hard cover boots or shoes with soles allowing protection from construction debris. Tennis shoes or sandals are not allowed. Rubber boots should be worn for concrete work. It is recommended that employees use high quality work shoes or boots with cushioned insoles that add support and comfort while working.

MODIFIED DUTY (LIGHT WORK) PROGRAM**Hardage Construction Corporation has a Return to Work Program**

When an employee is injured, and if medical treatment is required, a return to work slip shall be requested by the injured employee from the physician. **The slip must be given to the Project Superintendent before that individual may return to work; the return to work slip must state that the individual is released to full duty with no restrictions, or restriction (a) as listed by the attending physician.** If the Project Superintendent has the availability to provide restricted work for the injured individual, they must be utilized.

2.5

BACK INJURY PREVENTION

1. Plan for the best use of material handling equipment.
2. Plan the job looking for items that could be pre-fabed.
3. Plan and select individuals for strategic positions in the crew.
4. Train employees in the correct method to do the job.
5. Take a few minutes and stretch out before work.
6. Back support aids are recommended, if used correctly.
7. For work that requires repetitive motion, consider job rotation of employees. This may aid in improvement of overall job skills and team building.
8. Use saw horses and a skill saw hanger vs. constant bending and picking.

2.5.1 Manual Lifting Rules

Manual lifting and handling of material be done by methods that ensure the safety of both the employees and the materials. It is **Hardage Construction's** policy that employees whose work assignments required heavy lifting be properly educated and physically qualified, by medical examination if deemed necessary.

The following are rules of manual lifting:

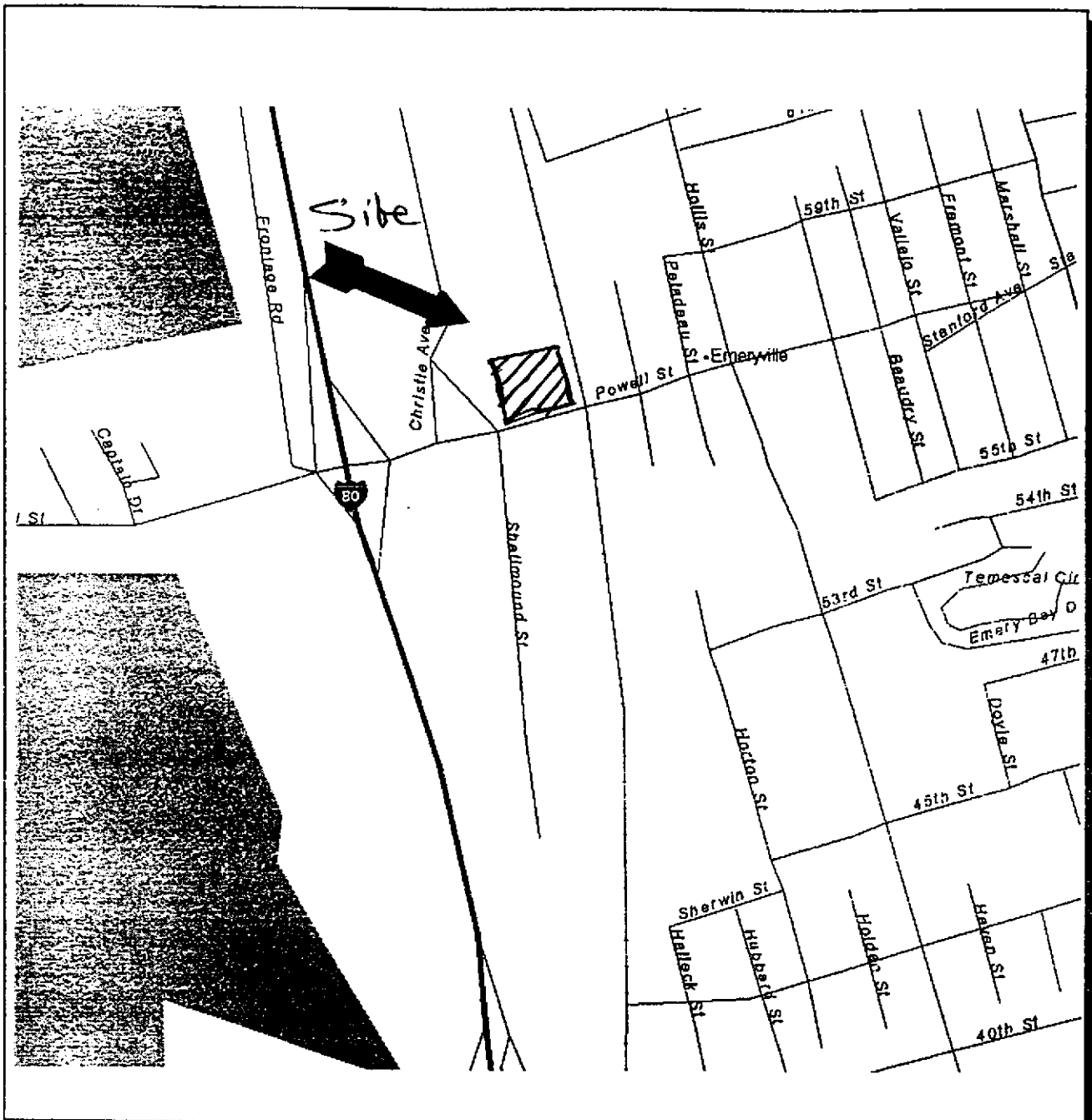
1. Inspect the load to be lifted for sharp edges, splinters, and wet or greasy spots.
2. Wear gloves when lifting or handling objects with sharp or splintered edges. These gloves must be free of oil, grease or other agents that may cause a poor grip.
3. Inspect the route over which the load is to be carried. It shall be in plain view and free of obstructions or spillage that could cause tripping or slipping.
4. Consider the distance the load is to be carried. Recognize the fact your gripping power may weaker over long distances.
5. Size up the load and make a preliminary "heft" to be sure the load is easily within your lifting capacity. If it is not, get help.
6. If team is lifting required, personnel shall be similar in size and physique. One person shall act as leader and give the commands to lift, lower, etc.
7. Two persons carrying long items carry it on the same shoulder side and walk in step. Shoulder pads shall be used to prevent cuts and help reduce fatigue.
8. To lift an object off the ground, the following are manual lifting steps:
 - A. Make sure of good footing and set your feet about 10 to 15 inches apart. It may help to set one foot forward of the other.
 - B. Assume a knee-bend or squatting position, keeping your back straight and upright. Get a firm grip and lift the object by straightening your knees - not your back.

- C. Carry the load close to your body (not on extended arms). To turn or change position, shift your feet - don't twist your back. The steps for setting an object on the ground are the same as above, but in reverse.

Hardage Construction encourages employees to research mechanical methods for moving materials versus manual efforts.

APPENDIX E.

AREA MAP



**Area Map
Shellmound Street & Powell Street
Emeryville, CA**



Source:
RGA Environmental, Inc
Emeryville, CA

RGA Environmental Inc.
4701 Doyle St., Ste. 14
Emeryville, California 94608

Scale:
1 in. = 800 ft.
approximately

APPENDIX F.

SITE MAP

Southern Pacific Railroad
Right-of-Way

**SUBJECT
SITE**

Shellmound Street

Powell Street Overpass

**Site Map
Shellmound Street & Powell Street
Emeryville, CA**



Source:

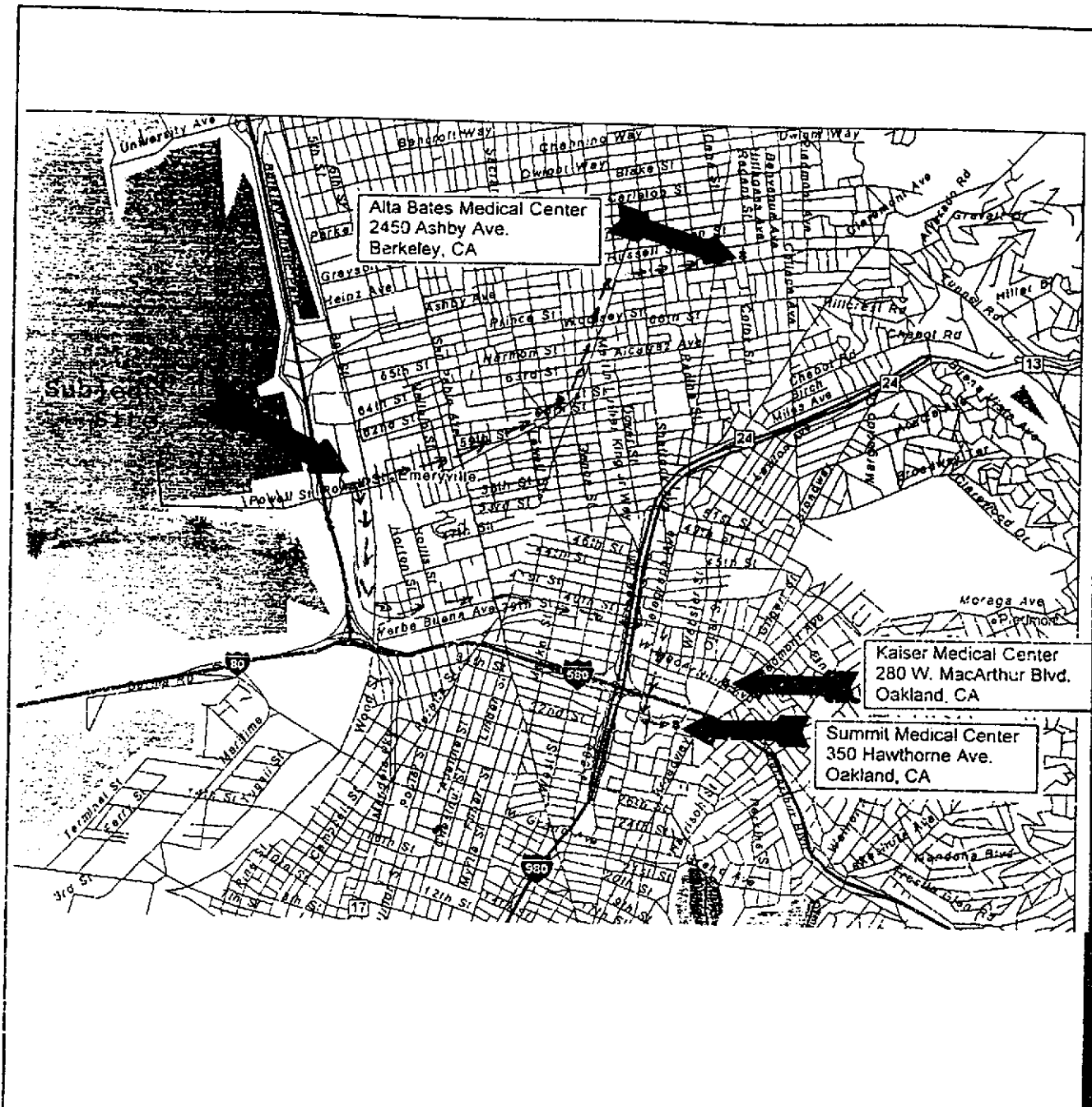
RGA Environmental, Inc.
Emeryville, CA

RGA Environmental Inc.
4701 Doyle St., Ste. 14
Emeryville, California 94608

Not to Scale

APPENDIX G.

HOSPITAL MAP



Area Map
 (showing Hospital Locations)
Shellmound Street & Powell Street
Emeryville, CA



Source:
 RGA Environmental, Inc.
 Emeryville, CA

RGA Environmental Inc.
 4701 Doyle St., Ste. 14
 Emeryville, California 94608

Not to Scale

APPENDIX H.

RGH SITE HISTORY REPORT SUMMARY

May 15, 1998
Letter 0164.L6

Ms. Susan Hugo
Alameda County Department of Environmental Health
1131 Harbor Bay Parkway
Alameda, CA 94502

RE: SITE HISTORY REPORT SUMMARY
RGA Job # HSHI3628
Hardage Suite Hotels, Inc. Site
Intersection of Shellmound Street and Powell Street
Emeryville, California

Dear Ms. Hugo:

At the request of Mr. Chuck Pendry of Hardage Suite Hotels, Inc, you will find enclosed a summary of the following documents for the subject site. The purpose of this letter is to provide a summary of the findings of previous site investigations.

<u>Report Date</u>	<u>Report Author</u>	<u>Report Title</u>
05/18/90	Tenera Environmental Service	Review of Site Characterization Studies and Proposed Work Plan
05/22/90	Applied Geosciences Inc.	Preliminary Site Assessment
06/08/90	Alameda County Env. Health	Proposed Remedial Actions (letter)
07/05/90	Tenera Environmental Service	Supplemental Site Characterization Studies
03/08/90	Alameda County Env. Health	ATDC Project (letter)
02/12/92	Applied Geosciences Inc.	Phase II Subsurface Investigation
06/22/95	EMG	Phase I Environmental Site Assessment
03/25/96	EMG	Results of Groundwater Sampling
04/12/96	EMG	Another Tree Development



4701 Doyle Street
Suite 14
Emeryville, CA 94608

510 547 7771
FAX 547 1983

11/06/97	JPC Geologists, Inc.	Escrow Summary Of The California Real Estate Environmental
11/21/97	RGA	Groundwater Monitoring and Sampling Report
12/11/97	RGA	Environmental Assessment Update Report

Each of these is summarized below.

TENERA ENVIRONMENTAL SERVICE "REVIEW OF SITE CHARACTERIZATION STUDIES AND PROPOSED WORK PLAN" DATED 5/18/90

Tenera Environmental Services (Tenera) met with the Alameda County Department of Environmental Health (ACDEH) caseworker, Dennis Byrne, and the property owner, Another Tree Development Corporation (ATDC) on May 10, 1990 to discuss development of the site. In response to a request from the ACDEH, Tenera prepared the document "Review of Site Characterization Studies and Proposed Work Plan" dated May 18, 1990. In the work plan, Tenera reviewed and summarized reports by others which discussed the history of development and use of the Property. Tenera concluded that the nature and location of existing and potential sources of soil and groundwater contamination on the site had been adequately identified through prior site investigations. Tenera provided recommendations as follows:

- a. ACDEH approve excavation and disposal of a localized area of elevated metal concentrations which exceeded the applicable TTLC values.
- b. ACDEH grant approval to leave asphalt-like waste material in place and to cap the area where the asphalt-like material was present with building foundations, paving, or similar materials.
- c. Complete a focused groundwater investigation in conjunction with development of the site. The investigation would include the installation and sampling of groundwater monitoring wells.

In the report it was stated that previous investigations in 1982 (Woodward Clyde), 1987 and 1988 (Earth Metrics, Inc.) included 14 borings for purposes of environmental sampling, 18 borings for purposes of geotechnical sampling, and eight trenches for purposes of identifying buried obstructions. The locations of these borings and trenches are shown on Figure 3-1 in the report. These soil borings were designated as WCC1, 1A, 2, 2A, 2B, 2C, 6 and 6A by Woodward-Clyde (1982); and EM8, 8A, 8B, 8C, 8D, 8E, 8F, B1, B2, TP1, TP2, TP3, TP4, TP5, TP6, TP7, and TP8 by Earth Metrics, Inc. (1988).

The results of soil sample analyses for inorganic and organic constituents are summarized in the report in Tables 3-1 and 3-2, respectively. The sample results are summarized in this letter as Tables A1 and A2, respectively.

No groundwater monitoring wells were installed at the site. A brief discussion of groundwater monitoring wells in the vicinity of the site (the closest one being approximately 100 feet north of the site) and the results of samples collected from the wells is provided. Observations and interpretations of the findings of the previous groundwater investigations relative to the subject site are also provided.

APPLIED GEOSCIENCES, INC. "PRELIMINARY SITE ASSESSMENT" DATED 5/22/90

The objective of this investigation was to assess the likelihood that potentially hazardous materials may be present at the site from past and/or present uses of the site and of the immediate site vicinity. The report discussed previous site investigations, previous property use, and potential sources of the asphalt-like material and elevated metals concentrations at the site discussed previously by Tenera. The estimated thickness of buried asphaltic material at the site is shown in Figure 10 in the report. The locations of soil borings from previous investigations are designated as EM8 by Earth Metrics, Inc. (1988); and 1, 2, 3, 4 and 5 by Geomatrix (1987) are shown on Figure 3 in the report.

The report discussion (Section 7.0) contains observations from review of historical aerial photographs which indicate that contamination at the site may have originated from the following.

- Historical industrial use of the site for manufacturing of roofing materials and floor covering may have resulted in petroleum-based products impacting the site.
- A conveyor used to load railway cars may have resulted in the accumulation of tar-like substances where the conveyor terminated at a former railway spur.
- In the vicinity of the former railroad spur and a former concrete holding tank, elevated concentrations of heavy metals may have originated from spilling during loading railcars.

The report contained six recommendations, including assessment of groundwater quality at the site and periodic review of reports of hazardous waste sites in the vicinity of the site to assess the potential impact to the site.

ALAMEDA COUNTY DEPARTMENT OF ENVIRONMENTAL HEALTH "PROPOSED REMEDIAL ACTIONS" DATED 6/8/90

The ACDEH responded to the Tenera work plan in a letter dated June 8, 1990. In the letter, the ACDEH granted approval for excavation of the localized area of soil and for the groundwater monitoring well sites suggested in the work plan. The ACDEH also requested that the nature and extent of the asphalt-like material identified beneath a portion of the site be characterized.

TENERA ENVIRONMENTAL SERVICE "SUPPLEMENTAL SITE CHARACTERIZATION STUDIES" DATED 7/5/90

This report described the results of supplemental site investigations completed at the subject site, and discussed TENERA's findings regarding the existence and nature of the asphaltic material reported to have been present on the site during prior site investigations. TENERA concluded that they had identified the extent of the asphalt-like material and stated that the material was not hazardous.

The borings shown on Figure 2-2 in the report (designated as B-1, B-2, B-3, B-4, B-5, B-6, B-7 and B-8) were completed for purposes of assessing the existence and extent of the asphalt-like waste material, and for the collection of samples for laboratory analysis. Observations of soil from the borings showed that varying thicknesses ranging from 5 to 8 inches at depths of 2 to 4 feet of a black silty clay matrix with a slight oily odor were present in several of the eight borings.

Samples from borings B-1, B-2, B-3 and B-5 were analyzed for total petroleum hydrocarbons (in the heavy hydrocarbon range, consistent with the assessment for asphaltic material), and for benzene, toluene, ethylbenzene and xylenes (BTEX). Total petroleum hydrocarbon concentrations ranging from less than 50 ppm to 420 ppm were detected in all samples, and BTEX was not detected. Analysis of one sample (B2) for Title 22 hazardous waste determination showed that the sample would not be classified as a hazardous waste. The sample results are summarized in Table B1, attached with this letter.

APPLIED GEOSCIENCES INC. "PHASE II SUBSURFACE INVESTIGATION" DATED 2/12/92

The objective of this investigation was to assess the presence of hazardous materials in the soil or groundwater beneath the site from off-site and/or on-site sources, and in drums identified at the site that contained unidentified liquid.

Three borings were installed along the eastern property boundary, designated as ATD1, ATD2, and ATD3, and three borings were installed along the western portion of the site, designated as ATD5, ATD6, and ATD7. These borings were subsequently converted to groundwater monitoring wells. At the boring EM8 location (identified during a previous investigation) a borehole was advanced to a depth of approximately 5 to 10 feet below the groundwater table and converted to groundwater monitoring well ATD4. The locations of these wells are shown in Figure 2 in the report. The locations of other borings designated as HA1, HA2, HA3, HA4, HA5, HA6, HA7, B1, B2, B3, B4 and B5, as well as six surface grab samples designated as GS1, GS2, GS3, GS4, GS5, and GS6 are also shown on Figure 2 in the report.

Laboratory analysis for samples from ATD1, ATD2, ATD3, ATD4, ATD5, ATD6, ATD7, HA1, HA2, HA3, HA4, HA5, HA6, HA7, HA8, B1, B2, B3, B4 and B5 was performed for soil samples collected at depths of 0.5, 3.0, 4.5 and 6.0 feet below the ground surface in each boring and are summarized in Tables C1 and C2 of this letter.

The report presented findings and recommendations which included the following:

- a. The concentrations of metals and/or petroleum products detected during the investigation might warrant classification of the subsurface soil as hazardous.
- b. The findings of the investigation should be reviewed with the ACDEH caseworker to determine the applicability of the previous approvals for site development by the ACDEH.
- c. Groundwater had been determined to flow to the west and/or southwest.
- d. The laboratory results of on-site groundwater monitoring wells indicate that surrounding properties which are reported on regulatory agency databases have not significantly impacted the Property.

EMG "PHASE I ENVIRONMENTAL SITE ASSESSMENT" DATED 6/22/95

The purpose of this report was to assess environmental conditions at the site.

The report discussed previous property uses and identified the presence of two groundwater monitoring wells at the site. The EMG report identified the most recent investigation of the site as being documented in a report by AGI dated February 12, 1992, and stated that the County's comments on the 1992 investigation were not provided or available. The EMG report provided several recommendations, including that the wells be sampled. These wells were not sampled for this report.

EMG "RESULTS OF GROUNDWATER SAMPLING" DATED 3/25/96

The objective of this report was to evaluate water quality in the two identified groundwater monitoring wells at the site. One groundwater sample was collected from each well. The results are shown in Table D1, attached with this letter.

EMG "ANOTHER TREE DEVELOPMENT" DATED 4/12/96

The objective of this report was to clarify environmental issues at the subject site which had been discussed in earlier EMG reports. EMG reported that based on distance (a minimum of 700 feet from the property), the environmental issues associated with the CALSITES sites identified in earlier EMG reports are likely not significant, and that impact from these sites to the subject site is unlikely. Additionally, should metals, petroleum, or BTEX contamination have migrated (assuming they were present) from these CALSITES onto the subject site, the contaminants would have been identified during the groundwater analyses. EMG reported that based on the lack of a contaminant source at the property, the soil at the property is not subject to possible contaminants which might cause a change of posture on the part of the ACDEH.

JPC GEOLOGISTS, INC. "ESCROW SUMMARY OF THE CALIFORNIA REAL ESTATE ENVIROCHECK

JPC Geologists, Inc. obtained current lists of known hazardous substance contaminated sites from government agencies that oversee clean-up at contaminated sites. The report consisted of locating the center point of the subject property relative to the hazardous substance contaminated sites.

RGA ENVIRONMENTAL, INC. "GROUNDWATER MONITORING AND SAMPLING REPORT" DATED 11/21/97

This report documents the results of the monitoring and sampling of two groundwater monitoring wells at the subject site.

The well caps for the two groundwater monitoring wells designated as MW1 and MW2 were observed to have been labeled previously by others as ATD7 and ATD5, respectively, as shown on Figure 2 in the report. A third monitoring well was located where pallets of pipe had been stored during the sampling episodes, also shown on Figure 2 in the report.

The sampling results for MW1 and MW2 are shown Table E1 attached with this letter.

RGA ENVIRONMENTAL, INC. "ENVIRONMENTAL ASSESSMENT UPDATE REPORT" DATED 12/11/97

The objective of this report was to assess the site which included:

- a. A physical inspection of the subject Property and visual observation for evidence of hazardous material used and potential hazardous waste contamination.
- b. A review and comparison of agency listings to determine if new potential contaminant sources have been identified in the vicinity of the Property since 1995.
- c. Inquiry and communications with relevant agencies regarding availability of files for review of evidence of past hazardous materials use, contamination, or remediation on the subject site or properties within a one mile distance from the Property boundaries.
- d. Review of available reports documenting past investigations of historical property use and subsurface investigations at or near the site.

Based on the findings of this Phase I Update, RGA Environmental, Inc. provided the following recommendations:

- a. Secure the Property boundary to prevent the additional accumulation of any other potentially hazardous waste.

- b. Containerize and remove any hazardous waste which is present at the Property which could impact the Property.
- c. Submit a work plan to the ACDEH for monitoring and sampling of the existing groundwater monitoring wells, and the addition of any groundwater monitoring wells, as necessary, to satisfy the request set forth by the ACDEH for groundwater monitoring well downgradient of the asphalt-like material.

Should you have any questions please do not hesitate to call us at (510) 547-7771.

Very Truly Yours,

RG Environmental, Inc.

Karin Schroeter

Karin Schroeter
Project Manager

Paul H. King

Paul H. King
California Registered Geologist

Attachments: Tables A1, A2, B1, C1, C2, D1, E1

Cc: Chuck Hibert, Hardage Suite Hotels, Inc.

PHK/bj
0164.L6

TAB E A1

Summary of Inorganic Substance Determinations on Soil Samples

Sample Description (a)	Analytical Determination (b) (c)																			
	Silver mg/kg (ppm)	Arsenic mg/kg (ppm)	Barium mg/kg (ppm)	Beryllium mg/kg (ppm)	Cadmium mg/kg (ppm)	Cobalt mg/kg (ppm)	Total Chromium mg/kg (ppm)	Hexavalent Chromium mg/kg (ppm)	Copper mg/kg (ppm)	Mercury mg/kg (ppm)	Manganese mg/kg (ppm)	Molybdenum mg/kg (ppm)	Nickel mg/kg (ppm)	Lead mg/kg (ppm)	Antimony mg/kg (ppm)	Selenium mg/kg (ppm)	Thallium mg/kg (ppm)	Vanadium mg/kg (ppm)	Zinc mg/kg (ppm)	Tin mg/kg (ppm)
A. Woodward-Clyde 1982																				
Boring WCC1							76	--	30				32	15						70
Boring WCC1A																				
Boring WCC2		3.5			--	11	46	--	370				38	340						350
Boring WCC1A																				
Boring WCC2A																				
Boring WCC2B																				
Boring WCC2C																				
Boring WCC6					--		880	0.2	230				56	110						550
Boring WCC6A																				
B. Earth Metrics, Inc. 1987																				
Boring EM8 (@ 3ft BGS)	20.4	19.2	377.2	--	24.8	6.5	133.3		46,819.0	40.1	264.3	--	61.7	2,129.9	--	39.8	--	23.9	24,317.3	140.7
Boring EM8 (@ 5 ft BGS)	--	--	29.4	--	2.7	8.9	34.0	--	72.8	--	214.6	--	35.3	7.6	--	--	--	22.8	77.5	--
Boring EM8A	--	--	30.1	--	4.02	7.3	24.7		61.1	--	545.5	4.3	7.7	12.1	--	--	--	32.4	77.3	
Boring EM8B	4.1	20.6	203.8	--	26.8	9.7	105.7		4,025.7	35.4	761.2	<5.3	37.9	2347.7	89.6	<48.7	--	45.3	8,663.4	
Boring EM8C	10.9	45.5	92.2	--	37.6	15.3	181.6		11,663.2	42.9	1,181.7	<6.8	82.7	7,080.5	205.9	<39.6	<9.9	59.0	13,337.4	
Boring EM8D	--	--	71.6	--	1.8	4.6	33.0		44.9	--	94.4	--	20.3	29.1	<9.9	<3.9	<9.9	18.1	61.7	
Boring EM8E	5.7	17.9	184.4	--	9.91	5.0	363.6		4,585.4	75.5	350.4	--	<12.3	10,634.7	105.7	<12.5	--	14.6	3,787.3	
Boring EM8F	0.4	--	120.9	--	3.43	5.0	45.1		77.4	--	298.3	--	18.6	210.9	--	--	--	42.1	226.1	

NOTES:

- (a) See Figure 3-1 for locations of borings.
- (b) The "--" symbol in this table indicates not detected. See below for detection limits.
- (c) A blank space or no entry in the table indicates not analyzed.

DETECTION LIMITS:

- A. Woodward-Clyde 1982: Cadmium, 0.5 mg/kg; Hexavalent Chromium, 0.2 mg/kg.
- B. Molybdenum, 1.0 mg/kg; Selenium, 4.0 mg/kg; Silver, 0.4 mg/kg; Thallium, 10.0 mg/kg; and Tin, 2.0 mg/kg.

TABLE A2

Summary of Organic Substance Determinations
on Soil Samples from the Another Tree Emeryville Project

Analytical Determination (a)	Boring EM-8 @ 3-3.5 ft	Boring EM-8 @ 5-5.5 ft	Boring EM-8C @ 3.5 ft
Oil and Grease	95	< 6	
Polynuclear Aromatic Hydrocarbons			
Naphthalene			<6.2
Acenaphthylene			<12.5
Acenaphthene			<6.2
Fluorene			<1.2
Phenanthrene			4.3
Anthracene			<0.2
Fluoranthene			30.2
Pyrene			16.7
Benzo(a) anthracene			2.6
Chrysene			0.8
Benzo(b) fluoranthene			3.7
Benzo(k) fluoranthene			3.1
Benzo(a) pyrene			0.8
Dibenz(ah) anthracene			2.4
Benzo(ghi) perylene			1.8
Indenopyrene			1.0

NOTES:

- (a) All values expressed in parts per million (ppm).
 (b) A blank space or no entry in the table indicates not analyzed.

SOURCE:

Earth Metrics, Inc. 1988. Draft Work Plan for Soils Contamination Characterization of Marketplace Site in Emeryville, California. The Martin Group, January 28, 1988.

TABLE B1

Summary of Analytical Determinations
 Supplemental Site Characterization Program
 Another tree Emeryville Project

Analytical Determination (a)	Sample Description			
	B-1 @ 3 ft	B-2 @ 4 ft	B-3 @ 2 ft	B-5 at 4 ft
Total Petroleum Hydrocarbons (EPA 418.1)	420	<50	53	130
Benzene, Toluene, Ethylbenzene, and Xylenes (EPA 8020)	ND	ND	ND	ND
Chlorinated Hydrocarbons (EPA 8010)	-	ND	-	-
Semi-Volatile Organics (EPA 8270)	-	(b)	-	-
Title 22 Analysis	-	-	-	-
Reactivity	-	NR	-	-
Corrosivity	-	NC	-	-
Ignitability	-	NI	-	-
Toxicity	-	-	-	-
96-hour Bioassay	-	>750	-	-
Inorganics	-	-	-	-
Antimony	-	1	-	-
Arsenic	-	3	-	-
Barium	-	240	-	-
Beryllium	-	0.4	-	-
Cadmium	-	6.1	-	-
Chromium	-	37	-	-
Cobalt	-	6	-	-
Copper	-	16	-	-
Fluoride	-	2.7	-	-
Lead	-	6	-	-
Mercury	-	0.07	-	-
Molybdenum	-	3	-	-
Nickel	-	25	-	-
Selenium	-	ND	-	-
Silver	-	ND	-	-
Thallium	-	ND	-	-
Vanadium	-	46	-	-
Zinc	-	36	-	-

NOTES:

- (a) All values in parts per million, unless otherwise noted.
- (b) Pyrene was detected in the sample at the detection limit of 0.03 parts per million. No other semi-volatile organic substances were detected in the sample.

LEGEND:

- ND: Not detected.
- NR: Not reactive per criteria of Article 11, Chapter 30, Title 22 CCR.
- NC: Not corrosive per criteria of Article 11, Chapter 30, Title 22 CCR.
- NI: Not ignitable per criteria of Article 11, Chapter 30, Title 22 CCR.
- The "-" symbol indicates not analyzed.

TABLE C1
SAMPLE ANALYSIS RESULTS (1)

Sample Number	Depth (3)	Analytical Methods (4)	Reported Results (5)
ATD1W-1	GW	8080 413.2 TPH-D	BRL (6) 1 ppm BRL
ATD1W-2	GW	8270 TPH-G	(7) BRL
ATD2W-1	GW	413.2 TPH-D	3 ppm BRL
ATD2W-2	GW	8270 TPH-G	(8) BRL
ATD3W-1	GW	624 413.2 TPH-D	BRL 1 ppm BRL
ATD3W-2	GW	8270 TPH-G	BRL BRL
ATD4W-1	GW	624 413.2 TPH-D	BRL 2 ppm BRL
ATD4W-2	GW	8270 TPH-G	BRL BRL
ATD5W-1	GW	8080 413.2 TPH-D	BRL 2 ppm BRL
ATD5W-2	GW	8270 TPH-G	BRL BRL
ATD6W-1	GW	624 413.2 TPH-D	(9) 4 ppm BRL
ATD6W-2	GW	8270 TPH-G	BRL BRL

TABLE C1
SAMPLE ANALYSIS RESULTS (1)

Sample Number	Depth (3)	Analytical Methods (4)	Reported Results (5)
ATD7W-1	GW	413.2 TPH-D	3 ppm BRL
ATD7W-2	GW	8270 TPH-G	BRL BRL
ATD8W-1 (10)	GW	413.2 TPH-D	4 ppm BRL
ATD1-1	2.5	8080 413.2 TPH-D	BRL 7,500 ppm 36 ppm
ATD1-2	5	413.2 TPH-D	1,300 ppm 14 ppm
ATD1-3	7.5	413.2 TPH-D	BRL BRL
ATD1-4	10	413.2 TPH-D	BRL BRL
ATD1-5	15	413.2 TPH-D	BRL 6 ppm
ATD2-1	2.5	8080 413.2 TPH-D	BRL 8 ppm BRL
ATD2-4	10	8080 413.2 TPH-D	BRL 8 ppm BRL
ATD3-1	2.5	8080 413.2 TPH-D	BRL 140 ppm BRL
ATD3-2	5	413.2 TPH-D	BRL BRL

TABLE C1
SAMPLE ANALYSIS RESULTS (1)

Sample Number	Depth (3)	Analytical Methods (4)	Reported Results (5)
ATD3-3	7.5	413.2 TPH-D	BRL BRL
ATD3-4	10	413.2 TPH-D	BRL BRL
ATD4-1	2.5	413.2 TPH-D	2,500 ppm 42 ppm
ATD4-2	5	413.2 TPH-D	BRL 7 ppm
ATD4-3	7.5	8240 413.2 TPH-D	BRL BRL 7 ppm
ATD4-4	10	413.2 TPH-D	BRL 6 ppm
ATD5-1	2.5	413.2 TPH-D	6,100 ppm 230 ppm
ATD5-3	7.5	413.2 TPH-D	9 ppm BRL
ATD5-4	10	413.2 TPH-D	160 ppm 6 ppm
ATD6-1	2.5	413.2 TPH-D	35 ppm BRL
ATD6-2	5	8240 8270 TPH-G 413.2 TPH-D	(11) (12) 160 ppm 240 ppm 11 ppm
ATD6-3	7.5	TPH-G 413.2 TPH-D	0.62 ppm 38 ppm BRL

TABLE C1
SAMPLE ANALYSIS RESULTS (1)

Sample Number	Depth (3)	Analytical Methods (4)	Reported Results (5)
ATD6-4	10	413.2 TPH-D	24 ppm BRL
ATD7-1	2.5	413.2 TPH-D	3,900 ppm 130 ppm
ATD7-2	5	413.2 TPH-D	360 ppm 11 ppm
ATD7-3	7.5	413.2 TPH-D	10 ppm 21 ppm
ATD7-4	10	413.2 TPH-D	BRL BRL
HA1-1	1.5	8080 TPH-D	BRL BRL
HA1-2	3	8080 TPH-D	BRL BRL
HA2-1	1.5	8080 TPH-D	BRL BRL
HA2-1D (13)	1.5	8080 TPH-D	BRL BRL
HA3-1	2.5	8270 TPH-G	(14) 2.7 ppm
HA4-1	2.5	8270 TPH-G	(15) BRL
HA5-1	2.5	8270 TPH-G	(14, 16) 45 ppm
HA5-2	4.5	8270 TPH-G	(14, 16) 37 ppm
HA6-1	2.5	8270 TPH-G	(16) BRL

TABLE C1
 SAMPLE ANALYSIS RESULTS (1)

Sample Number	Depth (3)	Analytical Methods (4)	Reported Results (5)
HA8-1	2.5	8270 TPH-G	(14) BRL
HA8-2	4.5	8270 TPH-G	(14) BRL
B1-1	1.5	8080 413.2 TPH-D	BRL 18 ppm 5 ppm
B1-2	3.5	413.2 TPH-D	BRL BRL
B2-1	1.5	413.2 TPH-D	2,000 ppm 14 ppm
B2-2	3.5	413.2 TPH-D	70 ppm 6 ppm
B3-1	1.5	8080 413.2 TPH-D	BRL 5,100 ppm 16 ppm
B3-2	3.5	413.2 TPH-D	BRL 6 ppm
B4-1	1.5	413.2 TPH-D	3,400 ppm 16 ppm
B4-2	3.5	413.2 TPH-D	8 ppm 14 ppm
B5-1	1.5	413.2 TPH-D	230 ppm 12 ppm
B5-2	3.5	413.2 TPH-D	6 ppm 7 ppm

TABLE C1
SAMPLE ANALYSIS RESULTS (1)

Sample Number	Depth (3)	Analytical Methods (4)	Reported Results (5)
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NOTES:

1. Sample analysis performed on the given samples with the exception of California Assessment Manual (CAM) metals analysis.
2. The first alphanumeric combination in the sample number (e.g. ATD1 is the sample location designation shown in Figure 2.
3. Approximate depth in feet below the ground surface (BGS) except for groundwater samples, which are indicated "GW".
4. Analyses performed in general accordance with the EPA methods whose numbers or analytes are listed.
5. For water samples, results are reported in milligrams per liter (mg/L), which is approximately equivalent to parts per million (ppm), or in micrograms per liter (ug/L), which is approximately equivalent to parts per billion (ppb). For soil samples, results are reported in kilogram (mg/kg), which is equivalent to ppm, or in micrograms per kilogram (ug/kg), which is equivalent to ppb.
6. BRL = below the reporting limits for the analytical method utilized.
7. Caprolactam, 2,5-dimethyl benzenebutanoic, and 3 methylbenzoil were tentatively identified at concentrations of 29 ppb, 140 ppb, and 17 ppb, respectively, in sample no. ATD1W-2. The tentatively identified compounds are typical of fabric and perfume.
8. Seven semivolatile organic compounds (SVOCs) were tentatively identified in sample no. ATD2W-2. The tentatively identified compounds are typical of decaying animal matter. The estimated concentrations of the tentatively identified compounds ranged from 25 ppb (1-hexadecanol) to 3,500 ppb (1,11-dodecadiene).
9. Benzene, toluene, ethylbenzene, and total xylenes (BTEX) were reported in sample no. ATD6W-1 at concentrations of 6 ppb, 5 ppb, 3 ppb, and 5 ppb, respectively. The Maximum Contaminant Level (MCL) of benzene for primary drinking water, as promulgated in title 22, Division 4, Chapter 15, Article 5.5 of the California Code of Regulations (CCR), is 1 ppb. Four volatile organic compounds (VOCs) were tentatively identified in sample no. ATD6W-1. The tentatively identified compounds are typical of a petroleum hydrocarbon product. The estimated concentrations of the tentatively identified compounds ranged from 9 ppb (2-pentane) to 39 ppb (methyl cyclopentane).

TABLE C1

SAMPLE ANALYSIS RESULTS (1)

Sample Number	Depth (3)	Analytical Methods (4)	Reported Results (5)
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10. Sample No. ATD8W-1 is a duplicate of sample no. ATD4W-1.
11. Eight volatile organic compounds (VOCs) were tentatively identified in sample no. ATD6-2. The tentatively identified compounds ranged from 4 ppm (1,2,3-trimethyl cyclopentane) to 8.5 ppm (2, 6-dimethyl 2-octane).
12. Five semivolatile compounds (SVOCs) were reported and an additional seventeen SVOCs were tentatively identified in sample no. ATD6-2. Naphthalene, 2-methylnaphthalene, phenanthrene, di-n-butylphthalate, and bis(2-ethylhexyl) phthalate were reported at concentrations of 0.11 ppm, 0.35 ppm, 0.15 ppm, 0.19 ppm, and 0.33 ppm, respectively. The tentatively identified compounds are typical of a petroleum hydrocarbon product. The estimated concentrations of the tentatively identified compounds ranged from 0.33 ppm (1,4,5-trimethyl naphthalene) to 2.5 ppm (octacasane).
13. Sample no. HA2-1D was obtained directly beneath sample no. HA2-1 and was considered an approximate duplicate soil sample. It is not possible to obtain a true duplicate soil sample due to the inherently homogeneous nature of the soil.
14. Di-n-butylphthalate (160 ppb) was reported and 12 other compounds were tentatively identified in sample no. HA3-1. Di-n-butylphthalate was also reported in the method blank and may have been a laboratory artifact. The tentatively identified compounds are typical of petroleum hydrocarbon related compounds, were also tentatively identified in sample nos. HA5-1, HA5-2, HA8-1, and HA8-2.
15. Di-n-butylphthalate was reported in sample no. HA4-1 at a concentration of 980 ppb. Di-n-butylphthalate was also reported in the method blank and may have been a laboratory artifact in this sample. No other compounds were reported or tentatively identified in sample no. HA4-1.
16. Eight SVOCs were reported in sample no. HA5-1. The concentrations of the SVOCs ranged from 110 ppb (phenanthrene) to 260 ppb (cyrysene). The reported SVOCs are typically related to oil products. the reported compounds, and other related compounds, were also reported in sample nos. HA5-2 and HA6-1.

TABLE C2

CAM Metals Sample Analysis Results (1)

Sample Number	Depth (3)	Analyte (4)	Reported Results (5)	10X STLC (6)	TTLIC MCL
ATD1W-1	GW	CAM Metals	Low	--	--
ATD2W-1	GW	CAM Metals	Low	--	--
ATD3W-1	GW	CAM Metals	Low	--	--
ATD4W-1	GW	CAM Metals	Low	--	--
ATD5W-1	GW	Chromium	80 ppb	--	50 ppb
ATD6W-1	GW	CAM Metals	Low	--	--
ATD7W-1	GW	CAM Metals	Low	--	--
ATD1-1	2.5	CAM Metals	Low	--	--
ATD1-2	5	Copper Lead	460 ppm 200 ppm	250 ppm 50 ppm	2,500 ppm 1,000 ppm
ATD1-3	7.5	CAM Metals	Low	--	--
ATD1-4	10	CAM Metals	Low	--	--
ATD1-5	15	CAM Metals	Low	--	--
ATD2-1	2.5	CAM Metals	Low	--	--
ATD2-4	10	CAM Metals	Low	--	--
ATD3-1	2.5	Lead	270 ppm	50 ppm	1,000 ppm
ATD3-2	5	CAM Metals	Low	--	--
ATD3-3	7.5	CAM Metals	Low	--	--
ATD3-4	10	CAM Metals	Low	--	--
ATD4-1-2	2.5	Copper Lead Mercury	970 ppm 750 ppm 15 ppm	250 ppm 50 ppm 2 ppm	2,500 ppm 1,000 ppm 20 ppm
ATD4-2-2	5	CAM Metals	Low	--	--
ATD4-3-2	7.5	CAM Metals	Low	--	--

TABLE C2

CAM Metals Sample Analysis Results (1)

Sample Number	Depth (3)	Analyte (4)	Reported Results (5)	10X STLC (6)	TTLIC MCL
ATD4-4-4	10	CAM Metals	Low	--	--
ATD5-1-2	2.5	Lead Mercury	190 ppm 4.7 ppm	50 ppm 2 ppm	1,000 ppm 20 ppm
ATD5-3-2	7.5	CAM Metals	Low	--	--
ATD5-4-2	10	CAM Metals	Low	--	--
ATD6-1-2	2.5	CAM Metals	Low	--	--
ATD6-2-2	5	CAM Metals	Low	--	--
ATD6-3-2	7.5	CAM Metals	Low	--	--
ATD6-4-2	10	CAM Metals	Low	--	--
ATD7-1-2	2.5	Lead Mercury	290 ppm 57 ppm	50 ppm 2 ppm	1,000 ppm 20 ppm
ATD7-2-2	5	CAM Metals	Low	--	--
ATD7-3-2	7.5	CAM Metals	Low	--	--
ATD7-4-2	10	CAM Metals	Low	--	--
HA1-1	1.5	CAM Metals	Low	--	--
HA1-2	3	CAM Metals	Low	--	--
HA2-1	1.5	CAM Metals	Low	--	--
HA2-1D (9)	1.5	Lead	110 ppm	50 ppm	1,000 ppm
B1-1-2	1.5	CAM Metals	Low	--	--
B1-2-2	3.5	CAM Metals	Low	--	--
B2-1-2	1.5	Lead	62 ppm	50 ppm	1,000 ppm
B2-2-2	3.5	CAM Metals	Low	--	--
B3-1-2	1.5	Lead	110 ppm	50 ppm	1,000 ppm

TABLE C2

CAM Metals Sample Analysis Results (1)

Sample Number	Depth (3)	Analyte (4)	Reported Results (5)	10X STLC (6)	TTLIC MCL
B3-2-2	3.5	CAM Metals	Low	--	--
B4-1-2	1.5	Lead	63 ppm	50 ppm	1,000 ppm
B4-2-2	3.5	CAM Metals	Low	--	--
B5-1-2	1.5	Copper	5,200 ppm	250 ppm	2,500 ppm
		Lead	1,200 ppm	50 ppm	1,000 ppm
		Mercury	4.6 ppm	2 ppm	20 ppm
B5-2-2	3.5	CAM Metals	Low	--	--

Soluble CAM Metals Sample Analysis Results

HA3-1 (10)	2.5	CAM Metals	Low	--	--
HA4-1 (10)	2.5	CAM Metals	Low	--	--
HA5-1 (10)	2.5	Chromium	15 ppm	--	5 ppm
		Lead	8 ppm	--	5 ppm
		Mercury	1.6 ppm	--	0.2 ppm
HA5-2 (10)	4.5	Lead	4.6 ppm	--	5 ppm
HA6-1 (10)	2.5	CAM Metals	Low	--	--
HA8-1 (10)	2.5	CAM Metals	Low	--	--
HA8-2 (10)	4.5	Cadmium	0.76 ppm	--	1 ppm
		Chromium	5 ppm	--	5 ppm
		Copper	56 ppm	--	25 ppm
		Lead	130 ppm	--	5 ppm
		Mercury	0.18 ppm	--	0.2 ppm
		Zinc	270 ppm	--	250 ppm

TABLE C2

CAM Metals Sample Analysis Results (1)

Sample Number	Depth (3)	Analyte (4)	Reported Results (5)	10X STLC (6)	TTLC MCL
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NOTES:

1. Sample analysis for metals regulated in the California Code of Regulations (CCR). CAM metals analysis is conducted in general accordance with EPA Method Nos. 3005, 6010, and 7000, depending on the metal.
2. The first alphanumeric combination in the sample number (e.g. ATD1) is the sample location designation shown in Figure 2.
3. Approximate depth in feet below the ground surface (BGS) except for groundwater samples, which are indicated "GW".
4. A specific analyte is listed when the reported results of the analyte exceeded current regulatory guidelines.
5. For water samples, results are reported in milligrams per liter (mg/L), which is approximately equivalent to parts per million (ppm). For soil samples, results are reported in milligrams per kilogram (mg/kg), which is equivalent to ppm or micrograms per kilogram (ug/kg), which is equivalent to parts per billion (ppb).
6. 10X STLC = 10 times the Soluble Threshold Limit Concentration (STLC). Samples that are reported to contain concentrations exceeding 10X STLC have the potential to have a soluble fraction that exceeds the STLC, as promulgated in CCR, Title 22, Division 4.5, Chapter 10.
7. TTLC = Total Threshold Limit Concentration (for waste soils) as promulgated in CCR, Title 22, Division 4.5, Chapter 10. MCL = Maximum Contaminant Level (for primary drinking water) as promulgated in CCR, Title 22, Chapter 15, Article 5.5.
8. "Low" means that the 17 metals analyzed in the sample were reported in concentrations judged to be at background or slightly elevated levels.
9. Sample no. HA2-1D was obtained directly beneath sample no. HA2-1 and was considered an approximate duplicate soil sample. It is not possible to obtain a true duplicate soil sample due to the inherently homogeneous nature of the soil.
10. Sample nos. HA3-1, HA4-1, HA5-1, HA6-1, HA8-1, and HA8-2 were analyzed for soluble CAM metals. The regulatory limits listed under the TTLC/MCL column are STLC as promulgated in CCR, Title 22, Division 4.5, Chapter 10.

TABLE D-1

Analytical Results

Sample No.	BTEX (ug/L)	TPH-DRO (ug/L)	TPH-GRO (ug/L)	RCRA Metals (mg/L)
MW-1	ND	ND	ND	Berium - 0.09
MW-2	ND	ND	ND	Barium - 0.140 Mercury - 0.002

TABLE E-1

Summary of Laboratory analytical Results
Groundwater Samples

Samples Collected on November 9, 1997

Well No.	TPH-D	TPH-G	MTBE	Benzene	Toluene	Ethyl- benzene	Total Xylenes
MW1	240	NA	NA	NA	NA	NA	NA
MW2*	220	NA	NA	NA	NA	NA	NA

Samples Collected on November 5, 1997

Well No.	TPH-D	TPH-G	MTBE	Benzene	Toluene	Ethyl- benzene	Total Xylenes
MW1**	210	ND	ND	ND	ND	ND	ND
MW2**	230	ND	ND	ND	ND	ND	ND

Notes:

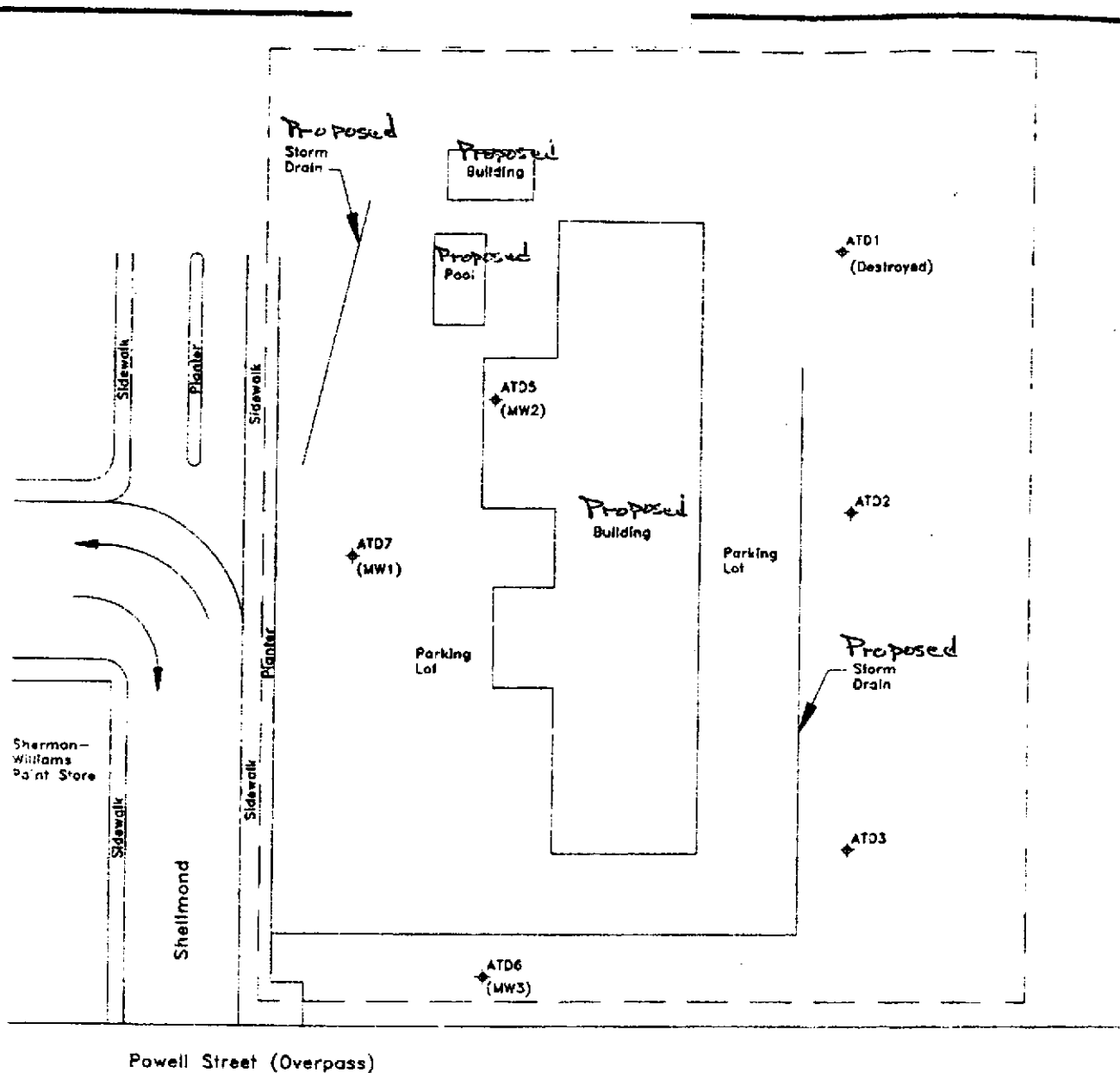
Results are in ug/L, unless otherwise indicated.

* Chromium was not detected.

** The metals arsenic, barium, cadmium, chromium, mercury, lead, selenium, and silver were either not detected or were detected at concentrations below their respective Maximum Contaminant Levels (MCLs) with the exception of chromium, which was detected in well MW2 at a concentration of 0.010 ug/L.

APPENDIX I.

SITE PLAN SHOWING GROUNDWATER MONITORING WELLS



LEGEND

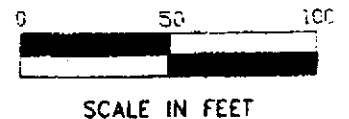
- ⊕ Monitoring Well Location
- Property Boundary

FIGURE 2
SITE PLAN
 Hardage Suite Hotels, Inc.
 Intersection of Shellmond and Powell Street (Northeast corner)
 Emeryville, California



Base Map From:
 RGA Environmental Inc.
 November, 1987
 Mission Engineers, Inc.
 August 6, 1991
 Applied GeoSciences
 February, 1992
 (8310840055)

RGA Environmental, Inc.
 1260 45th Street
 Emeryville, California 94608



APPENDIX J.

**8 CCR 5192, HAZARDOUS WASTE OPERATIONS AND EMERGENCY
RESPONSE**

§5192. Hazardous Waste Operations and Emergency Response.

(a) Scope, Application and Definitions.

(1) Scope: This section covers the following operations, unless the employer can demonstrate that the operation does not involve employee exposure or the reasonable possibility for employee exposure to safety or health hazards:

(A) Clean-up operations or hazardous substance removal work required by a governmental body, whether Federal, state, local or other involving hazardous substances that are conducted at uncontrolled hazardous waste sites (including, but not limited to, the Environmental Protection Agency's (EPA) National Priority Site List (NPL), state priority site lists, sites recommended for the EPA, NPL, and initial investigations of government identified sites which are conducted before the presence or absence of hazardous substances has been ascertained),

(B) Corrective actions involving hazardous waste clean-up operations at sites covered by the Resource Conservation and Recovery Act of 1976 (RCRA) as amended (42 U.S.C. 6901, et seq) and Chapters 6 5 and 6 8 of Division 20 of the California Health and Safety Code;

(C) Voluntary clean-up operations at sites recognized by Federal, state, local or other governmental bodies as uncontrolled hazardous waste sites.

(D) Operations involving hazardous wastes that are conducted at treatment, storage, and disposal (TSD) facilities regulated by 40 CFR Parts 264 and 265 pursuant to RCRA; or facilities regulated by Chapter 6 5 of Division 20 of the California Health and Safety Code; or by agencies under agreement with U.S.E.P.A. to implement RCRA regulations; and

(E) Emergency response operations for releases of, or substantial threats of releases of, hazardous substances without regard to the location of the hazard.

(2) Application.

(A) All requirements of Title 8 of the California Code of Regulations apply pursuant to their terms to hazardous waste operations (whether covered by this section or not). If there is a conflict or overlap, the provision more protective of employee safety and health shall apply without regard to 8 CCR 3202(a).

(B) Hazardous substance clean-up operations within the scope of subsections (a)(1)(A) through (a)(1)(C) of this section must comply with all subsections of this section except subsections (p) and (q).

(C) Operations within the scope of subsection (a)(1)(D) of this section must comply only with the requirements of subsection (p) of this section.

NOTES AND EXCEPTIONS TO (a)(2)(C):

A. All provisions of subsection (p) of this section cover any treatment, storage, or disposal (TSD) operation regulated by 40 CFR parts 264 and 265 or by Chapter 6 5 of Division 20 of the California Health and Safety Code, and required to have a permit or interim status from EPA pursuant to 40 CFR 270.1 or from the Department of Health Services (DHS) pursuant to Chapter 6 5 of Division 20 of the California Health and Safety Code.

B. Employers who are not required to have a permit or interim status because they are conditionally exempt small quantity generators under 40 CFR 261.5 or are generators who qualify under 40 CFR 262.34 for exemptions from regulation under 40 CFR parts 264, 265 and 270 ("excepted employers") are not covered by subsections (p)(1) through (p)(7) of this section. Excepted employers who are required by the EPA or state agency such as the Department of Health Services (DHS) to have their employees engage in emergency response or who direct their employees to engage in emergency response are covered by subsection (p)(8) of this section, and cannot be exempted by (p)(8)(A) of this section. Excepted employers who are not required to have employees engage in emergency response, who direct their employees to evacuate in the case of such emergencies and who meet the requirements of subsection (p)(8)(A) of this section are exempt from the balance of subsection (p)(8) of this section.

C. If an area is used for hazardous waste treatment, storage, or disposal, any emergency response operations in that area shall comply with subsection (p)(8) of this section. In other areas not used for treatment, storage, or disposal of hazardous waste, any emergency response operation shall comply with subsection (q) of this section. Compliance with the requirements of subsection (q) of this section shall be deemed to be in compliance with the requirements of subsection (p)(8) of this section.

(D) Emergency response operations for releases of, or substantial threats of releases of, hazardous substances which are not covered by subsections (a)(1)(A) through (a)(1)(D) of this section must only comply with the requirements of subsection (q) of this section.

(3) Definitions.

Buddy system: A system of organizing employees into work groups in such a manner that each employee of the work group is designated to be observed by at least one other employee in the work group. The purpose of the buddy system is to provide quick assistance to employees in the event of an emergency.

Certified employee: An employee that has completed all of the requirements for training certification delineated in subsection (e)(6) of this section.

Certified supervisor: A supervisor that has completed all of the requirements for training certification delineated in subsection (e)(6) of this section.

Clean-up operation: An operation where hazardous substances are removed, contained, incinerated, neutralized, stabilized, cleared-up, or in any other manner processed or handled with the ultimate goal of making the site safer for people or the environment.

Decontamination: The removal of hazardous substances from employees and their equipment to the extent necessary to preclude the occurrence of foreseeable adverse health effects.

Emergency response, or responding to emergencies: A response effort by employees from outside the immediate release area or by other designated responders (i.e., mutual aid groups, local fire departments, etc.) to an occurrence which results, or is likely to result, in an uncontrolled release, which may cause high levels of exposure to toxic substances, or which poses danger to employees requiring immediate attention. Responses to incidental releases of hazardous substances where the substance can be absorbed, neutralized, or otherwise controlled at the time of release by employees in the immediate release area, or by maintenance personnel are not considered to be emergency responses within the scope of this standard. Responses to releases of hazardous substances where there is no immediate safety or health hazard (i.e., fire, explosion, or chemical exposure) are not considered to be emergency responses.

NOTE: The "immediate release area" can be the entire geographic boundary of the employee's assigned work area.

Facility: A. Any building, structure, installation, equipment, pipe or pipeline (including any pipe into a sewer or publicly owned treatment works), well, pit, pond, lagoon, impoundment, ditch, storage container, motor vehicle, rolling stock, or aircraft, or B. any site or area where a hazardous substance has been deposited, stored, disposed of, placed, or otherwise come to be located, but does not include any consumer product in consumer use or any water-borne vessel.

Hazardous materials response (HAZMAT) team: An organized group of employees, designated by the employer, which is expected to perform work to handle and control actual or potential leaks or spills of hazardous substances requiring possible close approach to the substance. The team members perform responses to releases or potential releases of hazardous substances for the purpose of control or stabilization of the incident. A HAZMAT team is not a fire brigade nor is a typical fire brigade a HAZMAT team. A HAZMAT team, however, may be a separate component of a fire brigade or fire department.

Hazardous substance: Any substance designated or listed under A. through D. below, exposure to which results or may result in adverse effects on the health or safety of employees:

A. Any substance defined under Section 101(14) of CERCLA or under Sections 25316 and 25317 of the California Health and Safety Code;

B. Any biological agent and other disease-causing agent which after release into the environment and upon exposure, ingestion, inhalation, or assimilation into any person, either directly from the environment or indirectly by ingestion through food chains, will or may reasonably be anticipated to cause death, disease, behavioral abnormalities, cancer, genetic mutation, physiological malfunctions (including malfunctions in reproduction) or physical deformations in such persons or their offspring;

C. Any substance listed by the U.S. Department of Transportation and regulated as hazardous materials under 49 CFR 172.101 and appendices, and

D. Hazardous waste as herein defined.

Hazardous substance removal work. Clean-up work at any of the following:

A. A site where removal or remedial action is taken pursuant to any of the following:

1. Chapter 6.8 (commencing with Section 25300) of Division 20 of the Health and Safety Code, regardless of whether the site is listed pursuant to Section 25356 of the Health and Safety Code.

2. The federal Comprehensive Environmental Response, Compensation and Liability Act of 1980 (42 U.S.C. Sec. 9601 et seq.)

3. Any operations covered under subsections (a)(1)(A) through (a)(1)(C) of this section.

B. A site where corrective action is taken pursuant to Section 25187 or 25200.10 of the Health and Safety Code or the federal Resource Conservation and Recovery Act of 1976 (42 U.S.C. Sec. 6901 et seq.)

C. A site where clean-up of a discharge of a hazardous substance is required pursuant to Division 7 (commencing with Section 13000) of the Water Code.

D. A site where removal or remedial action is taken because a hazardous substance has been discharged or released in an amount that is reportable pursuant to Section 13271 of the Water Code or the federal Comprehensive Environmental Response, Compensation and Liability Act of 1980 (42 U.S.C. Sec. 6901 et seq.). Hazardous substance removal work does not include work related to a hazardous substance spill on a highway.

Hazardous waste. A waste or combination of wastes as defined in 40 CFR 261.3, or regulated as hazardous waste in California pursuant to Chapter 6.5, Division 20, California Health and Safety Code, or B. those substances defined as hazardous wastes in 49 CFR 171.3.

Hazardous waste operation. Any operation conducted within the scope of this regulation including hazardous substance removal work as defined in Labor Code Section 142.7(b).

Hazardous waste site, or site. Any facility or location at which hazardous waste operations within the scope of this regulation take place.

Health hazard. A chemical, mixture of chemicals or a pathogen for which there is statistically significant evidence, based on at least one study conducted in accordance with established scientific principles, that acute or chronic health effects may occur in exposed employees. The term "health hazard" includes chemicals which are carcinogens; toxic or highly toxic agents; reproductive toxins; irritants; corrosives; sensitizers; hepatotoxins, nephrotoxins, neurotoxins; agents which act on the hematopoietic system; and agents which damage the lungs, skin, eyes, or mucous membranes. It also includes stress due to temperature extremes. Further definition of the terms used above can be found in Title 8, California Code of Regulations, Section 5194.

IDLH or Immediately dangerous to life or health. An atmospheric concentration of any toxic, corrosive or asphyxiant substance that poses an immediate threat to life or would cause irreversible or delayed adverse health effects or would interfere with an individual's ability to escape from a dangerous atmosphere.

Incidental release. An incidental release is one that does not cause a health or safety hazard to employees and does not need to be cleaned up immediately to prevent death or serious injury to employees.

Oxygen deficiency. That concentration of oxygen by volume below which air supplying respiratory protection must be provided. It exists in atmospheres where the percentage of oxygen by volume is less than 19.5 percent oxygen.

Permissible exposure limit (PEL). The exposure, inhalation or dermal permissible exposure limit specified in 8 CCR, Chapter 4, Subchapter 7, Groups 14 and 15; and Group 16, Articles 107, 109, and 110.

Post-emergency response. That portion of an emergency response performed after the immediate threat of a release has been stabilized or eliminated and clean-up of the site has begun. If post emergency response is performed by an employer's own employees who were part of the initial emergency response, it is considered to be part of the initial response and not post-emergency response. However, if a group of an employer's own employees, separate from the group providing initial response, performs the clean-up operation, then the separate group of employees would be considered to be performing post-emergency response and subject to subsection (q)(1) of this section.

Pre-job health and safety conference. A health and safety conference or briefing held prior to entering a site for the purpose of initiating hazardous substance removal work.

Published exposure level. The exposure limits published in "NIOSH Recommendations for Occupational Safety and Health Standards 1988" incorporated by reference, or if no limit is specified, the exposure limits published in the standards specified by the American Conference of Governmental Industrial Hygienists in their publication "Threshold Limit Values and Biological Exposure Indices for 1989-90" dated 1989 incorporated by reference.

Qualified person. A person with specific training, knowledge and experience in the area for which the person has the responsibility and the authority to control.

Site safety and health supervisor (or official). The individual located on a hazardous waste site who is responsible to the employer and has the authority and knowledge necessary to implement the site safety and health plan and verify compliance with applicable safety and health requirements.

Small quantity generator. A generator of hazardous wastes who in any calendar month generates no more than 1,000 kilograms (2,205 pounds) of hazardous waste in that month.

Uncontrolled hazardous waste site. An area where an accumulation of hazardous waste creates a threat to the health and safety of individuals or the environment or both. Some sites are found on public lands, such as those created by former municipal, county, or state landfills where illegal or poorly managed waste disposal has taken place. Other sites are found on private property, often belonging to generators or former generators of hazardous waste. Examples of such sites include, but are not limited to, surface impoundments, landfills, dumps, and tank or drum farms. Normal operations at TSD sites are not covered by this definition.

Uncontrolled release. An uncontrolled release is the accidental release of a hazardous substance from its container. If not contained, stopped, and removed, the release would pose a hazard to the employees in the immediate area or in areas in the path of the release, or from its byproducts or its effects (such as toxic vapors, fire, over-pressurization, toxic gases, or toxic particulates).

(b) Safety and health program.

NOTE TO (b): Safety and health programs developed and implemented to meet other Federal, state, or local regulations are considered acceptable in meeting this requirement if they cover or are modified to cover the topics required in this subsection. An additional or separate safety and health program is not required by this subsection.

(1) General.

(A) Employers shall develop and implement a written safety and health program for their employees involved in hazardous waste operations. The program shall be designed to identify, evaluate, and control safety and health hazards, and provide for emergency response for hazardous waste operations.

(B) The written safety and health program shall incorporate the following:

1. An organization structure;
2. A comprehensive workplan;
3. A site-specific safety and health plan which need not repeat the employer's standard operating procedures required in subsection (b)(1)(B)6. of this section;
4. The safety and health training program;
5. The medical surveillance program;
6. The employer's standard operating procedures for safety and health; and
7. Any necessary interface between general program and site specific activities.

(C) Site excavation. Site excavations created during initial site preparation or during hazardous waste operations shall be shored or sloped as appropriate to prevent accidental collapse in accordance with 8 CCR, Chapter 4, Subchapter 4, Article 6.

(D) Contractors and sub-contractors. An employer who retains contractor or sub-contractor services for work in hazardous waste operations shall inform those contractors, sub-contractors, or their representatives of the site emergency response procedures and any potential fire, explosion, health, safety or other hazards of the hazardous waste operation that have been identified by the employer, including those identified in the employer's information program. Each contractor/sub-contractor is responsible for compliance with all safety and health protection requirements for its employees. An employer's safety and health plan can be used by contractors/sub-contractors at the site if it appropriately addresses their activity and potential safety and health hazards.

(E) Program availability. The written safety and health program shall be made available to any contractor or subcontractor or their representative who will be involved with the hazardous waste operation; to employees, to employee designated representatives; to Division representatives, and to personnel of other Federal, state, or local agencies with regulatory authority over the site.

(2) Organizational structure part of the site program.

(A) The organizational structure part of the program shall establish the specific chain of command and specify the overall responsibilities of supervisors and employees. It shall include, at a minimum, the following elements:

1. A general supervisor (or Certified supervisor for hazardous substance removal work) who has the responsibility and authority to direct all hazardous waste operations.
2. A Site Safety and Health Supervisor who has the responsibility and authority to develop and implement the site safety and health plan and verify compliance.
3. A Qualified Person for operations defined as hazardous substance removal work, who shall be responsible for scheduling any air sampling, laboratory calibration of sampling equipment, evaluation of soil or other contaminated materials sampling results, and for conducting any equipment testing and evaluating the results of the tests.
4. All other personnel needed for hazardous waste site operations and emergency response and their general functions and responsibilities.
5. The lines of authority, responsibility, and communication.

(B) The organizational structure shall be reviewed and updated as necessary to reflect the current status of waste site operations.

(3) Comprehensive workplan part of the site program: The comprehensive workplan part of the program shall address the tasks and objectives of the site operations and the logistics and resources required to reach those tasks and objectives.

(A) The comprehensive workplan shall address anticipated clean-up activities, as well as normal operating procedures, which need not repeat the employer's procedures available elsewhere.

(B) The comprehensive workplan shall define work tasks and objectives and identify the methods for accomplishing those tasks and objectives.

(C) The comprehensive workplan shall establish personnel requirements for implementing the plan.

(D) The comprehensive workplan shall provide for the implementation of the training required in subsection (e) of this section.

(E) The comprehensive workplan shall provide for the implementation of the required informational programs required in subsection (i) of this section.

(F) The comprehensive workplan shall provide for the implementation of the medical surveillance program described in subsection (f) of this section.

(4) Site-specific safety and health plan part of the program.

(A) General: The site safety and health plan, which must be kept on site, shall address the safety and health hazards of each phase of site operation and include the requirements and procedures for employee protection.

NOTE TO (A): In general, a site plan organized as a single document, with component sections/appendices covering all tasks, operations, and contractors/sub-contractors, may be used to promote use efficiency, and enhance completeness, clarity, and coordination.

(B) Elements: The site safety and health plan, as a minimum, shall address the following:

1. A safety and health risk or hazard analysis for each site task and operation found in the workplan.
2. Employee training assignments to assure compliance with subsection (e) of this section.
3. Personal protective equipment (PPE) to be used by employees for each of the site tasks and operations being conducted as required by the personal protective equipment program in subsection (g)(5) of this section.
4. Medical surveillance requirements in accordance with the program in subsection (f) of this section.
5. Frequency and types of air monitoring, personnel monitoring, and environmental sampling techniques and instrumentation to be used, including methods of maintenance and calibration of monitoring and sampling equipment to be used.
6. Site control measures in accordance with the site control program required in subsection (d) of this section.
7. Decontamination procedures in accordance with subsection (k) of this section.
8. An emergency response plan meeting the requirements of subsection (l) of this section for safe and effective responses to emergencies, including the necessary PPE and other equipment.
9. Confined space entry procedures.
10. A spill containment program meeting the requirements of subsection (j) of this section.

(C) Pre-entry briefing: The site-specific safety and health plan shall provide for pre-entry briefings to be held prior to initiating any site activity, and at such other times as necessary to ensure that employees are apprised of the site safety and health plan and that this plan is being followed. The information and data obtained from site characterization and analysis work required in subsection (c) of this section shall be used to prepare and update the site safety and health plan.

(D) For operations defined as Hazardous substance removal work, a Pre-job health and safety conference shall be held before the start of actual work. The conference shall include representatives of the

owner or contracting agency, the contractor, the employer, employees, and employee representatives; and shall include a discussion of the employer's safety and health program and the means, methods, devices, processes, practices, conditions, or operations which the employer intends to use in providing a safe and healthy place of employment.

(E) Effectiveness of site safety and health plan: Inspections shall be conducted by the site safety and health supervisor or, in the absence of that individual, another individual who is knowledgeable in occupational safety and health, acting on behalf of the employer as necessary to determine the effectiveness of the site safety and health plan. Any deficiencies in the effectiveness of the site safety and health plan shall be corrected by the employer.

(c) Site Characterization and Analysis.

(1) General: Hazardous waste sites shall be evaluated in accordance with this subsection to identify specific site hazards and to determine the appropriate safety and health control procedures needed to protect employees from the identified hazards.

(2) Preliminary evaluation: A preliminary evaluation of a site's characteristics shall be performed prior to site entry by a qualified person to aid in the selection of appropriate employee protection methods prior to site entry. Immediately after initial site entry, a more detailed evaluation of the site's specific characteristics shall be performed by a qualified person to further identify existing site hazards and to further aid in the selection of the appropriate engineering controls and personal protective equipment for the tasks to be performed.

(3) Hazard identification: All suspected conditions that may pose inhalation or skin absorption hazards that are immediately dangerous to life or health (IDLH) or other conditions that may cause death or serious harm shall be identified during the preliminary survey and evaluated during the detailed survey. Examples of such hazards include, but are not limited to, confined space entry, potentially explosive or flammable situations, visible vapor clouds, or areas where biological indicators such as dead animals or vegetation are located.

(4) Required information: The following information to the extent available shall be obtained by the employer prior to allowing employees to enter a site:

(A) Location and approximate size of the site.

(B) Description of the response activity and/or the job task to be performed.

(C) Duration of the planned employee activity.

(D) Site topography and accessibility by air and roads.

(E) Safety and health hazards expected at the site.

(F) Pathways for hazardous substance dispersion.

(G) Present status and capabilities of emergency response teams that would provide assistance to hazardous waste clean-up site employees at the time of an emergency.

(H) Hazardous substances and health hazards involved or expected at the site, and their chemical and physical properties.

(5) Personal protective equipment: Personal protective equipment (PPE) shall be provided and used during initial site entry in accordance with the following requirements:

(A) Based upon the results of the preliminary site evaluation, an ensemble of PPE shall be selected and used during initial site entry which will provide protection to a level of exposure below PELs and published exposure levels for known or suspected hazardous substances and health hazards and will provide protection against other known and suspected hazards identified during the preliminary site evaluation. If there is no PEL or published exposure level, the employer may use other published studies and information as a guide to appropriate personal protective equipment.

(B) If positive-pressure self-contained breathing apparatus is not used as part of the entry ensemble, and if respiratory protection is warranted by the potential hazards identified during the preliminary site evaluation, an escape self-contained breathing apparatus of at least five minute's duration shall be carried by employees during initial site entry.

(C) If the preliminary site evaluation does not produce sufficient information to identify the hazards or suspected hazards of the site, an ensemble providing protection equivalent to Level B PPE shall be provided as minimum protection and direct reading instruments shall be used as appropriate for identifying IDLH conditions. (See Appendix B for guidelines on Level B protective equipment, and a description of Level B hazards.)

(D) Once the hazards of the site have been identified, the appropriate PPE shall be selected and used in accordance with subsection (g).

(6) Monitoring: The following monitoring shall be conducted during initial site entry when the site evaluation produces information that shows the potential for ionizing radiation or IDLH conditions, or when the site information is not sufficient to rule out these possible conditions:

(A) Monitoring with direct reading instruments for hazardous levels of ionizing radiation

(B) Monitoring the air with appropriate direct reading test equipment (i.e., combustible gas meters, detector tubes) for IDLH and other conditions that may cause death or serious harm (combustible or explosive atmospheres, oxygen deficiency, toxic substances.)

(C) Visually observing for signs of actual or potential IDLH or other dangerous conditions

(D) An on-going air monitoring program in accordance with subsection (h) shall be implemented after site characterization has determined the site is safe for the start-up of operations.

(7) Risk identification: Once the presence and concentrations of specific hazardous substances and health hazards have been established, the risks associated with these substances shall be identified. Employees who will be working on the site shall be informed of any risks that have been identified. In situations covered by the Hazard Communication standard, 8 CCR 5194, training required by that standard need not be duplicated.

NOTE TO (e)(7): Risks to consider include, but are not limited to:

A. Exposures exceeding the PELs, and published exposure levels.

B. IDLH concentrations.

C. Potential skin absorption and irritation sources.

D. Potential eye irritation sources.

E. Explosion sensitivity and flammability ranges.

F. Oxygen deficiency.

(8) Employee notification: Any information concerning the chemical, physical, and toxicologic properties of each substance known or expected to be present on site that is available to the employer and relevant to the duties an employee is expected to perform shall be made available to the affected employees prior to the commencement of their work activities. The employer may utilize information developed for the hazard communication standard, 8 CCR 5194, for this purpose.

(d) Site Control.

(1) General: Appropriate site control procedures shall be implemented to control employee exposure to hazardous substances before clean-up work begins.

(2) Site control program: A site control program for protecting employees which is part of the employer's site safety and health program required in subsection (b) of this section shall be developed during

the planning stages of a hazardous waste clean-up operation and modified as necessary as new information becomes available.

(3) Elements of the site control program: The site control program shall, as a minimum, include: A site map, site work zones; the use of a "buddy system;" site communications including alerting means for emergencies; the standard operating procedures or safe work practices; and, identification of nearest medical assistance. Where these requirements are covered elsewhere they need not be repeated.

(e) Training

(1) General.

(A) All employees working on site (such as but not limited to equipment operators, general laborers, and others) exposed to hazardous substances, health hazards, or safety hazards, and their supervisors and management responsible for the site shall receive training meeting the requirements of this subsection before they are permitted to engage in hazardous waste operations that could expose them to hazardous substances, safety, or health hazards, and they shall receive review training as specified in this subsection.

(B) Employees shall not be permitted to participate in or supervise field activities until they have been trained to a level required by their job function and responsibility.

(2) Elements to be covered: The training shall thoroughly cover the following:

(A) Names of personnel and alternates responsible for site safety and health;

(B) Safety, health and other hazards present on the site;

(C) Use of PPE;

(D) Work practices by which the employee can minimize risks from hazards;

(E) Safe use of engineering controls and equipment on the site;

(F) Medical surveillance requirements including recognition of symptoms and signs which might indicate overexposure to hazards, and

(G) Subsections 7. through 10. of the site safety and health plan set forth in subsection (b)(4)(B) of this section.

(3) Initial training

(A) General site workers (such as equipment operators, general laborers, and supervisory personnel) engaged in hazardous substance removal or other activities which expose or potentially expose workers to hazardous substances and health hazards shall receive a minimum of 40 hours of instruction off the site, and a minimum of three days actual field experience under the direct supervision of a trained, experienced supervisor.

(B) Workers on site only occasionally for a specific limited task (such as, but not limited to, ground water monitoring, land surveying, or geophysical surveying) and who are unlikely to be exposed over PELs and published exposure levels shall receive a minimum of 24 hours of instruction off the site, and the minimum of one day actual field experience under the direct supervision of a trained, experienced supervisor.

(C) Workers regularly on site who work in areas which have been monitored and fully characterized indicating that exposures are under PELs and published exposure levels where respirators are not necessary, and the characterization indicates that there are no health hazards or the possibility of an emergency developing, shall receive a minimum of 24 hours of instruction off the site and the minimum of one day actual field experience under the direct supervision of a trained, experienced supervisor.

(D) Workers with 24 hours of training who are covered by subsections (e)(3)(B) and (e)(3)(C) of this section, and who become general site workers or who are required to wear respirators, shall have the additional 16 hours and two days of training necessary to total the training specified in subsection (e)(3)(A).

(4) Management and supervisor training: On-site management and supervisors directly responsible for, or who supervise employees engaged in, hazardous waste operations shall receive 40 hours initial training, and three days of supervised field experience (the training may be reduced to 24 hours and one day if the only area of their responsibility is employees covered by subsections (e)(3)(B) and (e)(3)(C)) and at least eight additional hours of specialized hazardous waste operations management training at the time of job assignment on such topics as, but not limited to, the employer's safety and health program and the associated employee training program, PPE program, spill containment program, and health hazard monitoring procedure and techniques.

(5) Qualifications for trainers: Trainers shall be qualified to instruct employees about the subject matter that is being presented in training. Such trainers shall have satisfactorily completed a training program for teaching the subjects they are expected to teach, or they shall have the academic credentials and instructional experience necessary for teaching the subjects. Instructors shall demonstrate competent instructional skills and knowledge of the applicable subject matter.

(6) Training certification: Employees and supervisors that have received and successfully completed the training and field experience specified in subsections (e)(1) through (e)(4) of this section shall be certified by their instructor or the head instructor and trained supervisor as having successfully completed the necessary training. A written certificate shall be given to each person so certified. Any person who has not been so certified or who does not meet the requirements of subsection (e)(9) of this section shall be prohibited from engaging in hazardous waste operations.

(7) Emergency response: Employees who are engaged in responding to hazardous emergency situations at hazardous waste clean-up sites that may expose them to hazardous substances shall be trained in how to respond to such expected emergencies.

(8) Refresher training: Employees specified in subsection (e)(1) of this section, and managers and supervisors specified in subsection (e)(4) of this section, shall receive eight hours of refresher training annually on the items specified in subsection (e)(2) and/or (e)(4) of this section, any critique of incidents that have occurred in the past year that can serve as training examples of related work, and other relevant topics.

(9) Equivalent training: Employers who can show by documentation or certification that an employee's work experience and/or training has resulted in training equivalent to that training required in subsections (e)(1) through (e)(4) of this section shall not be required to provide the initial training requirements of those subsections to such employees. However, certified employees or employees with equivalent training new to a site shall receive appropriate, site specific training before site entry and have appropriate supervised field experience at the new site. Equivalent training includes any academic training or the training that existing employees might have already received from actual hazardous waste site work experience.

(f) Medical Surveillance.

(1) General: Employers engaged in operations specified in subsections (a)(1)(A) through (a)(1)(D) of this section and not covered by (a)(2)(C) exceptions, and employers of employees specified in subsection (q)(9) shall institute a medical surveillance program in accordance with this subsection.

(2) Employees covered: The medical surveillance program shall be instituted by the employer for the following employees:

(A) Any employee who is or may be exposed to hazardous substances or health hazards at or above the PELs or, if there is no PEL, above the published exposure levels for these substances, without regard to the use of respirators, for 30 days or more a year.

(B) Any employee who wears a respirator during any part of a day for a period of 30 days or more in a year, or as required by 8 CCR 5144.

(C) Any employee who is injured, becomes ill or develops signs or symptoms due to possible overexposure involving hazardous substances or health hazards from an emergency response or hazardous waste operation; and

(D) Members of HAZMAT teams.

(3) Frequency of medical examinations and consultations: Medical examinations and consultations shall also be made available by the employer to each employee covered under subsection (f)(2) on the following schedules:

(A) For employees covered under subsections (f)(2)(A), (f)(2)(B), and (f)(2)(D):

1. Prior to assignment.
2. At least once every twelve months for each employee covered, unless the attending physician believes a longer interval (not greater than biennially) is appropriate.
3. At termination of employment or reassignment to an area where the employee would not be covered if the employee has not had an examination within the last six months.
4. As soon as possible, upon notification by an employee either that the employee has developed signs or symptoms indicating possible overexposure to hazardous substances or health hazards or that the employee has been injured or exposed above the PELs or published exposure levels in an emergency situation.
5. At more frequent times, if the examining physician determines that an increased frequency of examination is medically necessary.

(B) For employees covered under subsection (f)(2)(C) and for all employees including those of employers covered by subsection (a)(1)(E) who may have been injured, received a health impairment, developed signs or symptoms which may have resulted from exposure to hazardous substances resulting from an emergency incident, or exposed during an emergency incident to hazardous substances at concentrations above the PELs or the published exposure levels without the necessary personal protective equipment being used:

1. As soon as possible following the emergency incident or development of signs or symptoms;
2. At additional times, if the examining physician determines that follow-up examinations or consultations are medically necessary.

(4) Content of medical examinations and consultations.

(A) Medical examinations required by subsection (f)(2) of this section shall include a medical and work history (or updated history if one is in the employee's file) with special emphasis on symptoms related to the handling of hazardous substances and health hazards, and to fitness for duty including the ability to wear any required PPE under conditions (e.g., temperature extremes) that may be expected at the work site.

(B) The content of medical examinations or consultations made available to employees pursuant to subsection (f) shall be determined by the examining physician. The guidelines in the Occupational Safety and Health Guidance Manual for Hazardous Waste Site Activities (see Appendix D, Reference #10) should be consulted.

(5) Examination by a physician and costs: All medical examinations and procedures shall be performed by or under the supervision of a licensed physician, preferably one knowledgeable in occupational medicine, and shall be provided without cost to the employee, without loss of pay, and at a reasonable time and place.

(6) Information provided to the physician: The employer shall provide one copy of this standard and its appendices to the attending physician, and in addition, the following for each employee:

- (A) A description of each employee's duties as they relate to the employee's exposures.
- (B) Each employee's exposure levels or anticipated exposure levels.
- (C) A description of any PPE used or to be used by each employee.

(D) Information from previous medical examinations of each employee which is not readily available to the examining physician.

(E) Information required by 8 CCR 5144 for each employee.

(7) Physician's written opinion.

(A) The employer shall obtain and furnish the employee with a copy of a written opinion from the examining physician containing the following:

1. The physician's opinion as to whether the employee has any detected medical conditions which would place the employee at increased risk of material impairment of the employee's health from work in hazardous waste operations or emergency response, or from respirator use.
2. The physician's recommended limitations upon the employee's assigned work.
3. A statement that the employee has been informed by the physician of the results of the medical examination and any medical conditions which require further examination or treatment.

(B) The written opinion obtained by the employer shall not reveal specific findings or diagnoses unrelated to occupational exposures.

(C) The physician shall provide the results of the medical examination and tests to the employee if requested.

(8) Recordkeeping.

(A) An accurate record of the medical surveillance required by subsection (f) shall be retained. This record shall be retained for the period specified and meet the criteria of 8 CCR 3204.

(B) The record required in subsection (f)(8)(A) shall include at least the following information:

1. The name and social security number of the employee.
2. Physician's written opinions, recommended limitations, and results of examinations and tests.
3. Any employee medical complaints related to exposure to hazardous substances.
4. A copy of the information provided to the examining physician by the employer, with the exception of the standard and its appendices.

(g) Engineering Controls, Work Practices, and Personal Protective Equipment for Employee Protection: Engineering controls, work practices, PPE, or a combination of these shall be implemented in accordance with this subsection to protect employees from exposure to hazardous substances and safety and health hazards.

(1) Engineering controls, work practices and PPE for substances regulated in 8 CCR, Ch. 4, Subch. 7, Groups 14, 15, and 16.

(A) Engineering controls and work practices shall be instituted to reduce and maintain employee exposure to or below the PELs of substances regulated by 8 CCR 5155, except to the extent that such controls and practices are not feasible.

NOTE TO (g)(1)(A): Engineering controls which may be feasible include the use of pressurized cabs or control booths on equipment, and/or the use of remotely operated material handling equipment. Work practices which may be feasible are removing all non-essential employees from potential exposure during opening of drums, wetting down dusty operations and locating employees upwind of possible hazards.

(B) Whenever engineering controls and work practices are not feasible or not required, any reasonable combination of engineering controls, work practices, and PPE shall be used to protect employees to reduce exposure to or below established PELs or exposure limits for substances regulated by 8 CCR, Ch. 4, Subch. 7, Group 16.

(C) The employer shall not implement a schedule of employee rotation as a means of compliance with PELs or exposure limits except when there is no other feasible way of complying with the applicable ionizing radiation exposure standards

(D) The provisions of 8 CCR, Ch. 4, Subch. 7, Groups 14 and 15 shall be followed.

(2) Engineering controls, work practices, and PPE for substances not regulated in 8 CCR, Ch. 4, Subch. 7, Groups 14, 15, and 16. An appropriate combination of engineering controls, work practices, and personal protective equipment shall be used to reduce and maintain employee exposure to or below the published exposure levels for hazardous substances and health hazards not regulated by 8 CCR, Ch. 4, Subch. 7, Groups 14, 15, and 16. The employer may use the published literature and Material Safety Data Sheets (MSDS's) as a guide in making the employer's determination as to what level of protection the employer believes is appropriate for hazardous substances and health hazards for which there is no PEL or published exposure level.

(3) Personal protective equipment selection.

(A) Personal protective equipment (PPE) shall be selected and used which will protect employees from the hazards and potential hazards they are likely to encounter as identified during the site characterization and analysis.

(B) Personal protective equipment selection shall be based on an evaluation of the performance characteristics of the PPE relative to the requirements and limitations of the site, the task-specific conditions and duration, and the hazards and potential hazards identified at the site.

(C) Positive pressure self-contained breathing apparatus (SCBA) or positive pressure airline respirators equipped with an escape air supply shall be used when chemical exposure levels present will create a substantial possibility of immediate death, immediate serious illness or injury, or impair the ability to escape.

(D) Totally-encapsulating chemical protective suits (protection equivalent to Level A protection as recommended in Appendix B) shall be used in conditions where skin absorption of a hazardous substance may result in a substantial possibility of immediate death, immediate serious illness or injury, or impair the ability to escape.

(E) The level of protection provided by PPE selection shall be increased when additional information on site conditions shows that increased protection is necessary to reduce employee exposures below established PELs and published exposure levels for hazardous substances and health hazards. (See Appendix B for guidance on selecting PPE ensembles.)

(F) Personal protective equipment shall be selected and used to meet the requirements of 8 CCR, Ch. 4, Subch. 7, Group 2, Articles 10 and 10.1, and 8 CCR 5144 of the General Industry Safety Orders, and additional requirements specified in this section.

NOTE TO (g)(3) The level of employee protection provided may be decreased when additional information or site conditions show that decreased protection will not result in hazardous exposures to employees.

(4) Totally-encapsulating chemical protective suits.

(A) Totally-encapsulating suits shall protect employees from the particular hazards which are identified during site characterization and analysis.

(B) Totally-encapsulating suits shall be capable of maintaining positive air pressure. (See Appendix A for a test method which may be used to evaluate this requirement.)

(C) Totally-encapsulating suits shall be capable of preventing inward test gas leakage of more than 0.5 percent. (See Appendix A for a test method which may be used to evaluate this requirement.)

(5) Personal protective equipment (PPE) program: A written personal protective equipment program, which is part of the employer's safety and health program required in subsection (b) of this section or required in subsection (p)(1) of this section and which is also a part of the site-specific safety and health

plan shall be established. The PPE program shall address the elements listed below. When elements, such as donning and doffing procedures, are provided by the manufacturer of a piece of equipment and are attached to the plan, they need not be rewritten into the plan as long as they adequately address the procedure or element.

(A) PPE selection based upon site hazards,

(B) PPE use and limitations of the equipment,

(C) Work mission duration,

(D) PPE maintenance and storage,

(E) PPE decontamination and disposal,

(F) PPE training and proper fitting,

(G) PPE donning and doffing procedures,

(H) PPE inspection procedures prior to, during, and after use,

(I) Evaluation of the effectiveness of the PPE program, and

(J) Limitations during temperature extremes, heat stress, and other appropriate medical considerations.

(h) Monitoring.

(1) General.

(A) Monitoring shall be performed in accordance with this subsection where there may be a question of employee exposure to hazardous concentrations of hazardous substances in order to assure proper selection of engineering controls, work practices, and PPE so that employees are not exposed to levels which exceed PELs, or published exposure levels if there are no PELs, for hazardous substances.

(B) Air monitoring shall be used to identify and quantify airborne levels of hazardous substances, and health and safety hazards in order to determine the appropriate level of employee protection needed on site.

(2) Initial entry: Upon initial entry, representative air monitoring shall be conducted to identify any IDLH conditions, exposure over PELs or published exposure levels, exposure over a radioactive material's dose limits, or other dangerous situations such as the presence of flammable atmospheres or oxygen-deficient environments.

(3) Periodic monitoring: Periodic monitoring shall be conducted when the possibility of an IDLH condition or flammable atmosphere has developed or when there is indication that exposures may have risen over PELs or published exposure levels since prior monitoring. Situations where it shall be considered whether the possibility that exposures have risen are as follows:

(A) When work begins on a different portion of the site.

(B) When contaminants other than those previously identified are being handled.

(C) When a different type of operation is initiated (e.g., drum opening as opposed to exploratory well drilling).

(D) When employees are handling leaking drums or containers or working in areas with obvious liquid contamination (e.g., a spill or lagoon).

(4) Monitoring of high-risk employees: After the actual clean-up phase of any hazardous waste operation commences; for example, when soil, surface water or containers are moved or disturbed; the employer shall monitor those employees likely to have the highest exposures to hazardous substances and health hazards likely to be present above PELs or published exposure levels by using personal sampling frequently enough to characterize employee exposures.

If the employees likely to have the highest exposure are over PELs or published exposure levels, then monitoring shall continue in order to identify all employees likely to be above those limits. The employer may utilize a representative sampling approach by documenting that the employees and chemicals chosen for monitoring are based on the criteria stated above.

NOTE TO (h): It is not required to monitor employees engaged in site characterization operations covered by subsection (c) of this section.

(i) Informational Programs: Employers shall develop and implement a program, which is part of the employer's safety and health program required in subsection (b) of this section, to inform employees, contractors, and subcontractors (or their representatives) actually engaged in hazardous waste operations of the nature, level, and degree of exposure likely as a result of participation in such hazardous waste operations. Employees, contractors, and subcontractors working outside of the operations part of a site are not covered by this regulation.

(j) Handling Drums and Containers

(1) General

(A) Hazardous substances and contaminated soils, liquids, and other residues shall be handled, transported, labeled, and disposed of in accordance with this subsection.

(B) Drums and containers used during the clean-up shall meet the appropriate U.S. Department of Transportation (DOT), OSHA, and EPA regulations for the wastes that they contain.

(C) When practical, drums and containers shall be inspected and their integrity shall be assured prior to being moved. Drums or containers that cannot be inspected before being moved because of storage conditions (i.e., buried beneath the earth, stacked behind other drums, stacked several tiers high in a pile, etc.) shall be moved to an accessible location and inspected prior to further handling.

(D) Unlabeled drums and containers shall be considered to contain hazardous substances and handled accordingly until the contents are positively identified and labeled.

(E) Site operations shall be organized to minimize the amount of drum or container movement.

(F) Prior to movement of drums or containers, all employees exposed to the transfer operation shall be warned of the potential hazards associated with the contents of the drums or containers.

(G) U. S. Department of Transportation (DOT) specified salvage drums or containers and suitable quantities of proper absorbent shall be kept available and used in areas where spills, leaks, or ruptures may occur.

(H) Where major spills may occur, a spill containment program which is part of the employer's safety and health program required in subsection (b) of this section shall be implemented to contain and isolate the entire volume of the hazardous substance being transferred.

(I) Drums and containers that cannot be moved without rupture, leakage, or spillage shall be emptied into a sound container using a device classified for the material being transferred.

(J) A ground-penetrating system or other type of detection system or device shall be used to estimate the location and depth of buried drums or containers.

(K) Soil or covering material shall be removed with caution to prevent drum or container rupture.

(L) Fire extinguishing equipment meeting the requirements of 29 CFR, Ch. 4, Subch. 7, Group 27 of the General Industry Safety Orders shall be on hand and ready for use to control incipient fires.

(2) Opening drums and containers: The following procedures shall be followed in areas where drums or containers are being opened:

(A) Where an airline respirator system is used, connections to the bank of air cylinders shall be protected from contamination and the entire system shall be protected from physical damage.

(B) Employees not actually involved in opening drums or containers shall be kept a safe distance from the drums or containers being opened.

(C) If employees must work near or adjacent to drums or containers being opened, a suitable shield that does not interfere with the work operation shall be placed between the employee and the drums or containers being opened to protect the employee in case of accidental explosion.

(D) Controls for drum or container opening equipment, monitoring equipment, and fire suppression equipment shall be located behind the explosion-resistant barrier.

(E) When there is a reasonable possibility of flammable atmosphere being present, material handling equipment and hand tools shall be of the type to prevent sources of ignition.

(F) Drums and containers shall be opened in such a manner that excess interior pressure will be safely relieved. If pressure cannot be relieved from a remote location, appropriate shielding shall be placed between the employee and the drums or containers to reduce the risk of employee injury.

(G) Employees shall be instructed not to stand upon or work from drums or containers.

(3) Material handling equipment: Material handling equipment used to transfer drums and containers shall be selected, positioned and operated to minimize sources of ignition related to the equipment from igniting vapors released from ruptured drums or containers.

(4) Radioactive wastes: Drums and containers containing radioactive wastes shall not be handled until such time as their hazard to employees is properly assessed.

(5) Shock sensitive wastes: As a minimum, the following special precautions shall be taken when drums and containers containing or suspected of containing shock-sensitive wastes are handled:

(A) All non-essential employees shall be evacuated from the area of transfer.

(B) Material handling equipment shall be provided with explosive containment devices or protective shields to protect equipment operators from exploding containers.

(C) An employee alarm system capable of being perceived above surrounding light and noise conditions shall be used to signal the commencement and completion of explosive waste handling activities.

(D) Continuous communications (i.e., portable radios, hand signals, telephones, as appropriate) shall be maintained between the employee-in-charge of the immediate handling area and both the site safety and health supervisor and the command post until such time as the handling operation is completed. Communication equipment or methods that could cause shock sensitive materials to explode shall not be used.

(E) Drums and containers under pressure, as evidenced by bulging or swelling, shall not be moved until such time as the cause for excess pressure is determined and appropriate containment procedures have been implemented to protect employees from explosive relief of the drum.

(F) Drums and containers containing packaged laboratory wastes shall be considered to contain shock-sensitive or explosive materials until they have been characterized.

CAUTION: Shipping of shock sensitive wastes may be prohibited under U. S. Department of Transportation (DOT) regulations. Employers and shippers should refer to 49 CFR 173.21 and 173.50.

(6) Laboratory waste packs: In addition to the requirements of subsection (j)(5), the following precautions shall be taken, as a minimum, in handling laboratory waste packs (lab packs).

(A) Lab packs shall be opened only when necessary and then only by an individual knowledgeable in the inspection, classification, and segregation of the containers within the pack according to the hazards of the wastes.

(B) If crystalline material is noted on any container, the contents shall be handled as a shock-sensitive waste until the contents are identified.

(7) Sampling of drum and container contents: Sampling of containers and drums shall be done in accordance with a sampling procedure which is part of the site safety and health plan developed for and available to employees and others at the specific worksite.

(8) Shipping and transport.

(A) Drums and containers shall be identified and classified prior to packaging for shipment.

(B) Drum or container staging areas shall be kept to the minimum number necessary to safely identify and classify materials and prepare them for transport.

(C) Staging areas shall be provided with adequate access and egress routes.

(D) Bulking of hazardous wastes shall be permitted only after a thorough characterization of the materials has been completed.

(9) Tank and vault procedures.

(A) Tanks and vaults containing hazardous substances shall be handled in a manner similar to that for drums and containers, taking into consideration the size of the tank or vault.

(B) Appropriate tank or vault entry procedures as described in the employer's safety and health plan and meeting the requirements of 8 CCR, Ch. 4, Subch. 7, Article 108 of the General Industry Safety Orders shall be followed whenever employees must enter a tank or vault.

(k) Decontamination.

(1) General. Procedures for all phases of decontamination shall be developed and implemented in accordance with this subsection.

(2) Decontamination procedures.

(A) A decontamination procedure shall be developed, communicated to employees, and implemented before any employees or equipment may enter areas on site where potential for exposure to hazardous substances exists.

(B) Standard operating procedures shall be developed to minimize employee contact with hazardous substances or with equipment that has contacted hazardous substances.

(C) All employees leaving a contaminated area shall be appropriately decontaminated; all contaminated clothing and equipment leaving a contaminated area shall be appropriately disposed of or decontaminated.

(D) Decontamination procedures shall be monitored by the site safety and health supervisor to determine their effectiveness. When such procedures are found to be ineffective, appropriate steps shall be taken to correct any deficiencies.

(3) Location. Decontamination shall be performed in geographical areas that will minimize the exposure of uncontaminated employees or equipment to contaminated employees or equipment.

(4) Equipment and solvents. All equipment and solvents used for decontamination shall be decontaminated or disposed of properly.

(5) Personal protective clothing and equipment.

(A) Protective clothing and equipment shall be decontaminated, cleaned, laundered, maintained, or replaced as needed to maintain its effectiveness.

(B) Employees whose non-impermeable clothing becomes wetted with hazardous substances shall immediately remove that clothing and proceed to shower. The clothing shall be disposed of or decontaminated before it is removed from the work zone.

(6) Unauthorized employees. Unauthorized employees shall be instructed not to remove protective clothing or equipment from change rooms.

(7) Commercial laundries or cleaning establishments: Commercial laundries or cleaning establishments that decontaminate protective clothing or equipment shall be informed of the potentially harmful effects of exposures to hazardous substances.

(8) Showers and change rooms: Where the decontamination procedure indicates a need for regular showers and change rooms outside of a contaminated area, they shall be provided and meet the requirements of 8 CCR, Ch. 4, Subch. 7, Article 9 of the General Industry Safety Orders. If temperature conditions prevent the effective use of water, then other effective means for cleansing shall be provided and used.

(l) Emergency Response by Employees at Uncontrolled Hazardous Waste Sites.

(1) Emergency response plan.

(A) An emergency response plan shall be developed and implemented by all employers within the scope of subsections (a)(1)(A)-(B) of this section to handle anticipated emergencies prior to the commencement of hazardous waste operations. The plan shall be in writing and available for inspection and copying by employees, their representatives, Division personnel, and other governmental agencies with relevant responsibilities.

(B) Employers who will evacuate their employees from the danger area when an emergency occurs, and who do not permit any of their employees to assist in handling the emergency, are exempt from the requirements of this subsection if they provide an emergency action plan complying with 8 CCR 3320 of the General Industry Safety Orders.

(2) Elements of an emergency response plan. The employer shall develop an emergency response plan for emergencies which shall address, as a minimum, the following:

(A) Pre-emergency planning.

(B) Personnel roles, lines of authority, and communication.

(C) Emergency recognition and prevention.

(D) Safe distances and places of refuge.

(E) Site security and control.

(F) Evacuation routes and procedures.

(G) Decontamination procedures which are not covered by the site safety and health plan.

(H) Emergency medical treatment and first aid.

(I) Emergency alerting and response procedures.

(J) Critique of response and follow-up.

(K) Personal protective equipment (PPE) and emergency equipment.

(3) Procedures for handling emergency incidents.

(A) In addition to the elements for the emergency response plan required in subsection (1)(2), the following elements shall be included for emergency response plans:

1. Site topography, layout, and prevailing weather conditions.

2. Procedures for reporting incidents to local, state, and federal governmental agencies.

(B) The emergency response plan shall be a separate section of the Site Safety and Health Plan.

(C) The emergency response plan shall be compatible and integrated with the disaster, fire and/or emergency response plans of local, state, and federal agencies.

(D) The emergency response plan shall be rehearsed regularly as part of the overall training program for site operations.

(E) The site emergency response plan shall be reviewed periodically and, as necessary, be amended to keep it current with new or changing site conditions or information.

(F) An employee alarm system shall be installed in accordance with § CCR, Ch. 4, Subch. 7, Article 165 of the General Industry Safety Orders to notify employees of an emergency situation, to stop work activities if necessary, to lower background noise in order to speed communication, and to begin emergency procedures.

(G) Based upon the information available at time of the emergency, the employer shall evaluate the incident and the site response capabilities and proceed with the appropriate steps to implement the site emergency response plan.

(m) Illumination: Areas accessible to employees shall be lighted to not less than the minimum illumination intensities listed in Table H-1 while any work is in progress:

Table H-1 Minimum Illumination Intensities in Foot-Candles

Foot candles	Area or operations
5	General site areas
3	Excavation and waste areas, accessways, active storage areas, loading platforms, refueling, and field maintenance areas.
5	Indoors: Warehouses, corridors, hallways, and exitways.
5	Tunnels, shafts, and general underground work areas. (EXCEPTION: Minimum of 10 foot-candles is required at tunnel and shaft heading during drilling, mucking, and scaling. Mine Safety and Health Administration approved cap lights shall be acceptable for use in the tunnel heading.)
10	General shops (e.g., mechanical and electrical equipment rooms, active storerooms, barracks or living quarters, locker or dressing rooms, dining areas, and indoor toilets and workrooms.)
30	First aid stations, infirmaries, and offices.

(n) Sanitation at Temporary Workplaces.

(1) Potable water.

(A) An adequate supply of potable water shall be provided on the site.

equipped with a tap, and shall be otherwise designed, constructed, and serviced so that sanitary conditions are maintained. Water shall not be dipped from containers.

(C) Any container used to store, dispense, or distribute drinking water shall be clearly marked as to the nature of its contents and not used for any other purpose.

(D) Where single service cups (to be used but once) are supplied, both a sanitary container for the unused cups and a receptacle for disposing of the used cups shall be provided.

(2) Nonpotable water.

(A) Outlets for nonpotable water, such as water for industrial or fire-fighting purposes, shall be identified to indicate clearly that the water is unsafe and is not to be used for drinking, washing, or cooking purposes.

(B) There shall be no cross-connection, open or potential, between a system furnishing potable water and a system furnishing nonpotable water.

(3) Toilet facilities.

(A) A minimum of one separate toilet facility shall be provided for each 20 employees or fraction thereof of each sex. Such facilities may include both toilets and urinals provided that the number of toilets shall not be less than one-half of the minimum required number of facilities.

EXCEPTION: Where there are less than 5 employees, separate toilet facilities for each sex are not required provided the toilet facilities can be locked from the inside and contain at least one toilet.

(B) Under temporary field conditions, provisions shall be made to assure that at least one toilet facility is available.

(C) Hazardous waste sites, not provided with a sanitary sewer, shall be provided with the following toilet facilities unless prohibited by local codes:

1. Chemical toilets;
2. Recirculating toilets;
3. Combustion toilets; or
4. Flush toilets.

(D) The requirements of this subsection for sanitation facilities shall not apply to mobile crews having transportation readily available to nearby toilet facilities.

(E) Doors entering toilet facilities shall be provided with entrance locks controlled from inside the facility.

(F) Toilet facilities shall be kept clean, maintained in good working order, and provided with an adequate supply of toilet paper.

(4) Food handling: All food service facilities and operations for employees shall meet the applicable laws, ordinances, and regulations of the jurisdictions in which they are located.

(5) Temporary sleeping quarters: When temporary sleeping quarters are provided, they shall be heated, ventilated, and lighted.

(6) Washing facilities: The employer shall provide adequate washing facilities for employees engaged in operations where hazardous substances may be harmful to employees. Such facilities shall be in near proximity to the worksite; in areas where exposures are below PELs and published exposure levels and which are under the control of the employer; and shall be so equipped as to enable employees to remove hazardous substances from themselves.

(7) Showers and change rooms: When hazardous waste clean-up or removal operations commence on a site and the duration of the work will require six months or greater time to complete, the employer shall provide showers and change rooms for all employees exposed to hazardous substances and health hazards involved in hazardous waste clean-up or removal operations.

(A) Showers shall be provided and shall meet the requirements of § CCR 3366(f).

(B) Change rooms shall be provided and shall meet the requirements of § CCR 3367. Change rooms shall consist of two separate change areas separated by the shower area required in subsection (n)(7)(A) of this section. One change area, with an exit leading off the worksite, shall provide employees with a clean area where they can remove, store, and put on street clothing. The second area, with an exit to the worksite, shall provide employees with an area where they can put on, remove, and store work clothing and personal protective equipment.

(C) Showers and change rooms shall be located in areas where exposures are below the PELs and published exposure levels. If this cannot be accomplished, then a ventilation system shall be provided that will supply air that is below the PELs and published exposure levels.

(D) Employers shall assure that employees shower at the end of their work shift and when leaving the hazardous waste site.

(e) New Technology Programs.

(1) The employer shall develop and implement procedures for the introduction of effective new technologies and equipment developed for the improved protection of employees working with hazardous waste clean-up operations, and the same shall be implemented as part of the site safety and health program to assure that employee protection is being maintained.

(2) New technologies, equipment, or control measures available to the industry, such as the use of foams, absorbents, adsorbents, neutralizers, or other means to suppress the level of air contaminants while excavating the site or for spill control, shall be evaluated by employers or their representatives. Such an evaluation shall be done to determine the effectiveness of the new methods, materials, or equipment before implementing their use on a large scale for enhancing employee protection. Information and data from manufacturers or suppliers may be used as part of the employer's evaluation effort. Such evaluations shall be made available to the Division upon request.

(p) Certain Operations Conducted Under the Resource Conservation and Recovery Act of 1976 (RCRA) Employers conducting operations at treatment, storage, and disposal (TSD) facilities specified in subsection (a)(1)(D) of this section shall provide and implement the programs specified in this subsection. (See the "NOTES AND EXCEPTIONS" to subsection (a)(2)(C) of this section for employers not covered.)

(1) Safety and health program: The employer shall develop and implement a written safety and health program for employees involved in hazardous waste operations that shall be available for inspection by employees, their representatives, and Division personnel. The program shall be designed to identify, evaluate, and control safety and health hazards in their facilities for the purpose of employee protection; to provide for emergency response meeting the requirements of subsection (p)(8) of this section; and to address as appropriate site analysis, engineering controls, maximum exposure limits, hazardous waste handling procedures, and uses of new technologies.

(2) Hazard communication program: The employer shall implement a hazard communication program meeting the requirements of 8 CCR 5194 as part of the employer's safety and health program.

NOTE TO 8 CCR 5192: The exemption for hazardous waste provided in 8 CCR 5194 is applicable to this section.

(3) Medical surveillance program: The employer shall develop and implement a medical surveillance program meeting the requirements of subsection (f) of this section.

(4) Decontamination program: The employer shall develop and implement a decontamination procedure in accordance with subsection (k) of this section.

(5) New technology program: The employer shall develop and implement procedures meeting the requirements of subsection (o) of this section for introducing new and innovative equipment into the workplace.

(6) Material handling program: Where employees will be handling drums or containers, the employer shall develop and implement procedures meeting the requirements of subsections (j)(1)(B) through (H), and (K) of this section, as well as (j)(3) and (j)(4) of this section prior to starting such work.

(7) Training program.

(A) New employees: The employer shall develop and implement a training program, which is part of the employer's safety and health program, for employees exposed to health hazards or hazardous substances at TSD operations to enable employees to perform their assigned duties and functions in a safe and healthful manner so as not to endanger themselves or other employees. The initial training shall be for 24

hours and refresher training shall be for eight hours annually. Employees who have received the initial training required by this subsection shall be given a written certificate attesting that they have successfully completed the necessary training.

(B) Current employees: Employers who can show by an employee's previous work experience and/or training that the employee has had training equivalent to the initial training required by this subsection, shall be considered as meeting the initial training requirements of this subsection with respect to that employee. Equivalent training includes the training that existing employees might have already received from actual site work experience. Current employees shall receive eight hours of refresher training annually.

(C) Trainers: Trainers who teach initial training shall have satisfactorily completed a training course for teaching the subjects they are expected to teach, or they shall have the academic credentials and instruction experience necessary to demonstrate a good command of the subject matter of the courses and competent instructional skills.

(8) Emergency response program.

(A) Emergency response plan: An emergency response plan shall be developed and implemented by all employers. Such plans need not duplicate any of the subjects fully addressed in the employer's contingency planning required by permits, such as those issued by the U. S. Environmental Protection Agency, provided that the contingency plan is made part of the emergency response plan. The emergency response plan shall be a written portion of the employer's safety and health program required in subsection (p)(1) of this section. Employers who will evacuate their employees from the worksite location when an emergency occurs and who do not permit any of their employees to assist in handling the emergency are exempt from the requirements of subsection (p)(8) if they provide an emergency action plan complying with 8 CCR 3220.

(B) Elements of an emergency response plan: The employer shall develop an emergency response plan for emergencies which shall address, as a minimum, the following areas to the extent that they are not addressed in any specific program required in this subsection:

1. Pre-emergency planning and coordination with outside parties.
2. Personnel roles, lines of authority, and communication.
3. Emergency recognition and prevention.
4. Safe distances and places of refuge.
5. Site security and control.
6. Evacuation routes and procedures.
7. Decontamination procedures.
8. Emergency medical treatment and first aid.
9. Emergency alerting and response procedures.
10. Critique of response and follow-up.
11. Personal protective equipment (PPE) and emergency equipment.

(C) Training.

1. Training for emergency response employees shall be completed before they are called upon to perform in real emergencies. Such training shall include the elements of the emergency response plan, standard operating procedures the employer has established for the job, the PPE to be worn and procedures for handling emergency incidents.

EXCEPTION #1: An employer need not train all employees to the degree specified if the employer divides the work force in a manner such that a sufficient number of employees who have responsibility to control emergencies have the training specified, and all other employees, who may first respond to an

emergency incident, have sufficient awareness training to recognize that an emergency response situation exists and that they are instructed in that case to summon the fully trained employees and not attempt control activities for which they are not trained.

EXCEPTION #2: An employer need not train all employees to the degree specified if arrangements have been made in advance for an outside fully-trained emergency response team to respond in a reasonable period and all employees, who may come to the incident first, have sufficient awareness training to recognize that an emergency response situation exists and they have been instructed to call the designated outside fully-trained emergency response team for assistance.

2. Employee members of TSD facility emergency response organizations shall be trained to a level of competence in the recognition of health and safety hazards to protect themselves and other employees. This would include training in the methods used to minimize the risk from safety and health hazards; in the safe use of control equipment; in the selection and use of appropriate personal protective equipment; in the safe operating procedures to be used at the incident scene; in the techniques of coordination with other employees to minimize risks; in the appropriate response to over-exposure from health hazards or injury to themselves and other employees; and in the recognition of subsequent symptoms which may result from over-exposures.

3. The employer shall certify that each covered employee has attended and successfully completed the training required in subsection (p)(8)(C) of this section, or shall certify the employee's competency at least yearly. The method used to demonstrate competency for certification of training shall be recorded and maintained by the employer.

(D) Procedures for handling emergency incidents.

1. In addition to the elements for the emergency response plan required in subsection (p)(8)(B) of this section, the following elements shall be included for emergency response plans to the extent that they do not repeat any information already contained in the emergency response plan:

a. Site topography, layout, and prevailing weather conditions.

b. Procedures for reporting incidents to local, state, and federal governmental agencies.

2. The emergency response plan shall be compatible and integrated with the disaster, fire and/or emergency response plans of local, state, and federal agencies.

3. The emergency response plan shall be rehearsed regularly as part of the overall training program for site operations.

4. The site emergency response plan shall be reviewed periodically and, as necessary, be amended to keep it current with new or changing site conditions or information.

5. An employee alarm system shall be installed in accordance with 8 CCR 6184 to notify employees of an emergency situation, to stop work activities if necessary, to lower background noise in order to speed communication, and to begin emergency procedures.

6. Based upon the information available at time of the emergency, the employer shall evaluate the incident and the site response capabilities and proceed with the appropriate steps to implement the site emergency response plan.

(q) Emergency Response to Hazardous Substance Releases: This subsection covers employers whose employees are engaged in emergency response no matter where it occurs except that it does not cover employees engaged in operations specified in subsections (a)(1)(A) through (a)(1)(D) of this section. Those emergency response organizations who have developed and implemented programs equivalent to this subsection for handling releases of hazardous substances pursuant to Section 303 of the Superfund Amendments and Reauthorization Act of 1986 (Emergency Planning and Community Right-to-Know Act of 1986, 42 U.S.C. 11003) shall be deemed to have met the requirements of this subsection.

(1) Emergency response plan: An emergency response plan shall be developed and implemented to handle anticipated emergencies prior to the commencement of emergency response operations. The plan shall

be in writing and available for inspection and copying by employees, their representatives, and Division personnel. Employers who will evacuate their employees from the danger area when an emergency occurs, and who do not permit any of their employees to assist in handling the emergency, are exempt from the requirements of this subsection if they provide an emergency action plan in accordance with 8 CCR 322D.

(2) Elements of an emergency response plan: The employer shall develop an emergency response plan for emergencies which shall address, as a minimum, the following to the extent that they are not addressed elsewhere:

(A) Pre-emergency planning and coordination with outside parties.

(B) Personnel roles, lines of authority, training, and communication.

(C) Emergency recognition and prevention.

(D) Safe distances and places of refuge.

(E) Site security and control.

(F) Evacuation routes and procedures.

(G) Decontamination.

(H) Emergency medical treatment and first aid.

(I) Emergency alerting and response procedures.

(J) Critique of response and follow-up.

(K) Personal protective equipment (PPE) and emergency equipment.

(L) Emergency response organizations may use the local emergency response plan or the state emergency response plan or both, as part of their emergency response plan, to avoid duplication. Those items of the emergency response plan that are being properly addressed by the SARA Title III plans may be substituted into their emergency plan or otherwise kept together for the employer and employee's use.

(3) Procedures for handling emergency response.

(A) The senior emergency response official who has ultimate site control responsibility shall confirm that the Incident Command System (ICS) is in place and the position of Incident Commander (IC) instituted. All emergency responders and their communications shall be coordinated and controlled through the ICS.

NOTE TO (q)(3)(A): The "senior official" at an emergency response is the most senior official on the site who has the responsibility for controlling the operations at the site until the emergency response official who is determined to have ultimate incident control authority arrives. Initially it is the senior officer on the first-arrive piece of responding emergency apparatus to arrive on the incident scene, usually a police or fire vehicle. As more senior officials arrive the position is passed up the line of authority which has been previously established. As there may be several separate spheres of responsibility at a given site (police, fire, CalTrans, for example), there may be several "senior officials," each responsible for his/her own employees. The "senior emergency response official" who will have ultimate site control responsibility is established in the Hazardous Material Incident Contingency Plan for the State of California (January 1991), promulgated by the State Office of Emergency Services (OES) as directed by Health and Safety Code, Sec. 25503 (HS 25503), and California Code of Regulations, Title 19, Division 2 (19 CCR, Div. 2: Office of Emergency Services) and in coordination with the various city and county, i.e., area emergency response plans.

(B) The individual in charge of the ICS shall identify, to the extent possible, all hazardous substances or conditions present and shall address as appropriate site analysis, use of engineering controls, maximum exposure limits, hazardous substance handling procedures, and use of any new technologies.

(C) Based on the hazardous substances and/or conditions present, the individual in charge of the ICS shall implement appropriate emergency operations, and assure that the PPE worn is appropriate for the

hazards to be encountered. However, PPE shall meet, at a minimum, the criteria contained in 8 CCR 3401-3408 when worn while performing fire fighting operations beyond the incipient stage for any incident.

(D) Employees engaged in emergency response and exposed to hazardous substances presenting an inhalation hazard or potential inhalation hazard shall wear positive pressure self-contained breathing apparatus (SCBA) while engaged in emergency response, until such time that the individual in charge of the ICS determines through the use of air monitoring that a decreased level of respiratory protection will not result in hazardous exposures to employees.

(E) The individual in charge of the ICS shall limit the number of emergency response personnel at the emergency site in those areas of potential or actual exposure to incident or site hazards, to those who are actively performing emergency operations. However, operations in hazardous areas shall be performed using the buddy system in groups of two or more.

(F) Back-up personnel shall stand by with equipment ready to provide assistance or rescue, and shall not engage in activities that will detract from that mission. Back-up personnel shall be protected, at a minimum, as the same level as the entry team. Advance first aid support personnel, at a minimum, shall also stand by with medical equipment and transportation capability.

(G) The individual in charge of the ICS shall designate a safety official, who is knowledgeable in the operations being implemented at the emergency response site, with specific responsibility to identify and evaluate hazards and to provide direction with respect to the safety of operations for the emergency at hand.

(H) When activities are judged by the safety official to be an IDLH condition and/or to involve an imminent danger condition, the safety official shall have the authority to alter, suspend, or terminate those activities. The safety official shall immediately inform the individual in charge of the ICS of any actions needed to be taken to correct these hazards at the emergency scene.

(I) After emergency operations have terminated, the individual in charge of the ICS shall implement appropriate decontamination procedures.

(J) When deemed necessary for meeting the tasks at hand, approved SCBA may be used with approved cylinders from other approved SCBA, provided that such cylinders are of the same capacity and pressure rating. All compressed air cylinders used with SCBA shall meet U. S. Department of Transportation (DOT) and National Institute for Occupational Safety and Health (NIOSH) criteria.

(4) Skilled support personnel: Personnel, not necessarily an employer's own employees, who are skilled in the operation of certain equipment, such as mechanized earth moving or digging equipment or crane and hoisting equipment, and who are needed temporarily to perform immediate emergency support work that cannot reasonably be performed in a timely fashion by an employer's own employees, and who will be or may be exposed to the hazards at an emergency response scene, are not required to meet the training required in this subsection for the employer's regular employees.

However, these personnel shall be given an initial briefing at the site prior to their participation in any emergency response. The initial briefing shall include instruction in the wearing of appropriate personal protective equipment, what chemical hazards are involved, and what duties are to be performed. All other appropriate safety and health precautions provided to the employer's own employees shall be used to assure the safety and health of these support personnel.

(5) Specialist employees: Employees who, in the course of their regular job duties, work with and are trained in the hazards of specific hazardous substances, and who will be called upon to provide technical advice or assistance at a hazardous substance release incident to the individual in charge, shall receive training or demonstrate competency in the area of their specialization annually.

(6) Training: Training shall be based on the duties and function to be performed by each responder of an emergency response organization. The skill and knowledge levels required for all new responders (those hired after the effective date of this standard) shall be conveyed to them through training before they are permitted to take part in actual emergency operations on an incident. Employees who participate, or are

expected to participate, in emergency response, shall be given training in accordance with the following subsections:

(A) First Responder, Awareness Level (FRA): First responders at the awareness level are individuals who are likely to witness or discover a hazardous substance release and who have been trained to initiate an emergency response sequence by notifying the proper authorities of the release. They would take no further action beyond notifying the authorities of the release. First responders at the awareness level shall have sufficient training or have had sufficient experience to objectively demonstrate competency in the following areas:

1. An understanding of what hazardous substances are, and the risks associated with them in an incident.
2. An understanding of the potential outcomes associated with an emergency created when hazardous substances are present.
3. The ability to recognize the presence of hazardous substances in an emergency.
4. The ability to identify the hazardous substances, if possible.
5. An understanding of the role of the first responder awareness individual in the employer's emergency response plan (including site security and control), and the U.S. Department of Transportation's Emergency Response Guidebook.
6. The ability to realize the need for additional resources, and to make appropriate notifications to the communication center.

(B) First Responder, Operations Level (FRO): First responders at the operations level are individuals who respond to releases or potential releases of hazardous substances as part of the initial response to the site for the purpose of protecting nearby persons, property, or the environment from the effects of the release. They are trained to respond in a defensive fashion without actually trying to stop the release. Their function is to contain the release from a safe distance, keep it from spreading, and prevent exposures. First responders at the operational level shall have received at least eight hours of training or have had sufficient experience to objectively demonstrate competency in the following areas in addition to those listed for the awareness level; and the employer shall so certify:

1. Knowledge of the basic hazard and risk assessment techniques.
2. Know how to select and use proper PPE provided to the first responder operational level.
3. An understanding of basic hazardous materials terms.
4. Know how to perform basic control, containment, and/or confinement operations and rescue injured or contaminated persons within the capabilities of the resources and PPE available with their unit.
5. Know how to implement basic equipment, victim, and rescue personnel decontamination procedures.
6. An understanding of the relevant standard operating procedures and termination procedures.

(C) Hazardous Materials Technician: Hazardous materials technicians are individuals who respond to releases or potential releases of hazardous substances for the purpose of stopping the release. They assume a more aggressive role than a first responder at the operations level in that they will approach the point of release in order to plug, patch, or otherwise stop the release of a hazardous substance. Hazardous materials technicians shall have received at least 24 hours of training of which 8 hours shall be equivalent to the first responder operations level and in addition have competency in the following areas; and the employer shall so certify:

1. Know how to implement the employer's emergency response plan.
2. Know the classification, identification, and verification of known and unknown materials by using field survey instruments and equipment.

3. Be able to function within an assigned role in the ICS.
4. Know how to select and use proper specialized chemical PPE provided to the hazardous materials technician.
5. Understand hazard and risk assessment techniques.
6. Be able to perform advanced control, containment, and/or confinement operations and rescue injured or contaminated persons within the capabilities of the resources and PPE available with the unit.
7. Understand and implement equipment, victim, and rescue personnel decontamination procedures.
8. Understand termination procedures.
9. Understand basic chemical and toxicological terminology and behavior.

(D) Hazardous Materials Specialist: Hazardous materials specialists are individuals who respond with and provide support to hazardous materials technicians. Their duties parallel those of the hazardous materials technician, however, those duties require a more directed or specific knowledge of the various substances they may be called upon to contain. The hazardous materials specialist would also act as the site liaison with Federal, state, local, and other government authorities in regards to site activities. Hazardous materials specialists shall have received at least 24 hours of training equal to the technician level and in addition have competency in the following areas; and the employer shall so certify:

1. Know how to implement the local emergency response plan.
2. Understand classification, identification and verification of known and unknown materials by using advanced survey instruments and equipment.
3. Know of the state emergency response plan.
4. Be able to select and use proper specialized chemical PPE provided to the hazardous materials specialist.
5. Understand in-depth hazard and risk techniques.
6. Be able to perform specialized control, containment, and/or confinement operations within the capabilities of the resources and PPE available.
7. Be able to determine and implement decontamination procedures.
8. Have the ability to develop a site safety and health control plan.
9. Understand chemical, radiological, and toxicological terminology and behavior.

(E) Incident Commander/On-scene Manager: Incident commanders, who will assume control of the incident scene beyond the first responder awareness level, shall receive at least 24 hours of training equal to the first responder operations level and in addition have competency in the following areas; and the employer shall so certify:

1. Know and be able to implement the employer's incident command system.
2. Know how to implement the employer's emergency response plan.
3. Know and understand the hazards and risks associated with employees working in chemical protective clothing.
4. Know how to implement the local emergency response plan.
5. Know of the state emergency response plan and of the Federal Regional Response Team.
6. Know and understand the importance of decontamination procedures.

NOTE TO (q)(6)(E): Management personnel who, during an emergency situation, stay out of the hazardous area and who are not taking charge of the incident, and are not a "specialist" employee under subsection (q)(5) of this section are not subject to the provisions of this section.

(7) Trainers: Trainers who teach any of the above training subjects shall have satisfactorily completed a training course for teaching the subjects they are expected to teach, such as the courses offered by the California Specialized Training Institute, the California State Fire Marshal's Office, the University of California, or the U. S. National Fire Academy; or they shall have the training and/or academic credentials and instructional experience necessary to demonstrate competent instructional skills and a good command of the subject matter of the courses they are to teach.

(8) Refresher training.

(A) Those employees who are trained in accordance with subsection (q)(6) of this section shall receive annual refresher training of sufficient content and duration to maintain their competencies, or shall demonstrate competency in those areas at least yearly.

(B) A statement shall be made of the training or competency; and if a statement of competency is made, the employer shall keep a record of the methodology used to demonstrate competency.

(9) Medical surveillance and consultation.

(A) Members of an organized and designated HAZMAT team, and hazardous materials specialists shall receive a baseline physical examination and be provided with medical surveillance as required in subsection (f) of this section.

(B) Any emergency response employee who exhibits signs or symptoms which may have resulted from exposure to hazardous substances during the course of an emergency incident, either immediately or subsequently, shall be provided with medical consultation as required in subsection (f)(3)(B) of this section.

(10) Chemical protective clothing: Chemical protective clothing and equipment to be used by organized and designated HAZMAT team members, or to be used by hazardous materials specialists shall meet the requirements of subsections (g)(3) through (5) of this section.

(11) Post-emergency response operations: Upon completion of the emergency response, if it is determined that it is necessary to remove hazardous substances, health hazards, and materials contaminated with them (such as contaminated soil or other elements of the natural environment) from the site of the incident, the employer conducting the clean-up shall comply with one of the following:

(A) Meet all of the requirements of subsections (b) through (o) of this section; or

(B) Where the clean-up is done on plant property using plant or workplace employees, such employees shall have completed the training requirements of the following: § CCR 3220, § CCR 5144, § CCR 5194, and other appropriate safety and health training made necessary by the tasks that they are expected to perform such as the use of PPE, and decontamination procedures. All equipment to be used in the performance of the clean-up work shall be in serviceable condition and shall have been inspected prior to use.

APPENDIX K.

CITY OF EMERYVILLE NOISE ORDINANCE

lic place in the City during the hours when school is in session.

(Sec. 1, Ord. 128, thereafter codified in Sec. 15.22, E.T.C., as amended by Ord. 82-010, eff. June 1, 1982)

**5-12.06. Visiting Poolrooms
Prohibited: Responsibility of
Owners.**

It shall be unlawful for any owner or manager of any public place where pool or billiards are played to permit any person under the age of eighteen (18) years to visit such place or to engage in playing pool or billiards therein during the hours when school is in session.

(Sec. 2, Ord. 128, thereafter codified in Sec. 15.22, E.T.C., as amended by Ord. 82-010, eff. June 1, 1982)

**CHAPTER 13.
NOISE POLLUTION**

Sections:

- 5-13.01 Nuisances Defined
- 5-13.02 Nuisances: Abatement: Notices
- 5-13.03 Exceptions

5-13.01. Nuisances Defined.

The persistent maintenance or emission of any noise or sound produced by human, animal, or mechanical means between the hours of 9:00 p.m. and 7:00 a.m. of the following day, which noise or sound, by reason of its raucous or nerve-racking nature, shall disturb the peace or comfort or be injurious to any person, shall be punishable as set forth in Chapter 2 of Title 1 of this Code.

(Sec. 2, Ord. 384, thereafter codified in Sec. 14.2, E.T.C., as amended by Ord. 81-06, eff. Nov. 19, 1981)

**5-13.02. Nuisances: Abatement:
Notices.**

Whenever the existence of any nuisance set forth in Section 5-13.01 of this chapter shall come to the attention of the Health Officer, it

shall be his duty to notify in writing the occupant of the premises upon which such nuisance exists, specifying the measures necessary to abate such nuisance. If such nuisance is not abated within forty-eight (48) hours thereafter, the occupant so notified shall be deemed guilty of a violation of the provisions of this chapter, and the Health Officer shall summarily abate such nuisance.

(Sec. 2, Ord. 384, thereafter codified in Sec. 14.3, E.T.C.)

5-13.03. Exceptions.

The provisions of this chapter shall not apply to the following:

(a) The playing of music by a band, the blowing of a bugle, or the announcing of any show, entertainment, or event upon the public streets for which the Chief of Police has granted a special permit specifying the time and place when and where such music may be played, such bugle may be blown, or such announcement may be made;

(b) The blowing of any whistle or horn or the ringing of any bell or other noise necessary as a vehicular traffic warning or signal;

(c) Any licensed peddler calling his wares in an ordinary tone of voice or ringing a bell or blowing a horn of moderate size in front of the residence of any customer of such peddler for the purpose of announcing the presence of such peddler; and

(d) Any public celebration public function on a public holiday or other public occasion generally celebrated.

(Sec. 3, Ord. 384, thereafter codified in Sec. 14.4, E.T.C.)

a.m. to 5:00 p.m. on all days except Saturdays, Sundays, and legal holidays.

(3) **Written Notice.** For buildings located in industrial districts, the owner of the live/work building shall provide written notice to all live/work unit occupants that the surrounding area may be subject to levels of noise, dust, fumes or other nuisances at higher levels than would be expected in residential areas. Specific sources of these nuisances may be identified if appropriate and if possible.

(Sec. 3 (part), Ord. 88-11, eff. Oct. 6, 1988; as amended by Sec. 3, Ord. 90-16, eff. Dec. 13, 1990)

9-4.58.13. Conversion of Live/Work Buildings.

(a) **Nonresidential District.** In a nonresidential district, any live/work building may be converted to wholly nonresidential uses which are permitted in that district.

(b) **Residential District.** In a residential district, no live/work building may be converted to wholly nonresidential uses; however, it may be converted to wholly residential uses.
(Sec. 3 (part), Ord. 88-11, eff. Oct. 6, 1988)

9-4.58.14. Change of Use or Occupancy.

The owner or occupant of a live/work unit shall notify the City of any change in use or occupancy. Any change of use or occupancy shall require a zoning compliance approval.
(Sec. 3 (part), Ord. 88-11, eff. Oct. 6, 1988)

ARTICLE 59. PERFORMANCE STANDARDS

Sections:

- 9-4.59.1 Title and Purpose
- 9-4.59.2 Classes of Performance Standards
- 9-4.59.3 Applicability of Performance Standards
- 9-4.59.4 Air Quality: Noxious Materials
- 9-4.59.5 Air Quality: Noncontaminated Emissions
- 9-4.59.6 Air Quality: Odor

- 9-4.59.7 Noise
- 9-4.59.8 Vibration
- 9-4.59.9 Light and Glare
- 9-4.59.10 Sewage and Industrial Waste

9-4.59.1. Title and Purpose.

Article 59 establishes the performance standards. The purpose of these standards is to implement policies described in the Public Health and Safety chapter of the General Plan. Performance standards achieve this purpose by mitigating potential nuisances to acceptable limits.
(Sec. 3 (part), Ord. 88-11, eff. Oct. 6, 1988)

9-4.59.2. Classes of Performance Standards.

The following classes of performance standards are established:

(a) **Class A.** It is the intent of Class A standards to provide for uses whose operational characteristics may produce noise, odors, vibration, glare, and other nuisances. The standards are designed to protect uses on adjoining or nearby sites from effects which could adversely affect their functional or economic viability.

(b) **Class B.** It is the intent of Class B standards to make allowances for industrial uses whose associated processes produce noise, particulate matter and air contaminants, vibration, odor, glare, or other nuisances which would adversely affect the functional and economic viability of other uses. The standards, when combined with standards imposed by other governmental agencies, serve to provide basic health and safety protection for persons employed within or visiting the area.
(Sec. 3 (part), Ord. 88-11, eff. Oct. 6, 1988)

9-4.59.3. Applicability of Performance Standards.

All uses except those classified under the General Industrial use type shall meet the Class A performance standards. Uses classified under the General Industrial use type shall meet the Class B performance standards.
(Sec. 3 (part), Ord. 88-11, eff. Oct. 6, 1988)

9-4.59.4. Air Quality: Noxious Materials.

All existing or proposed uses producing dust, dirt, ash, charred paper, soot, grime, carbon or other noxious material which can or may cause damage to the health of any individual, animal or vegetation, damage to property, or the physical soiling or discoloring of the surfaces of any structure or materials located outside the property lines of the parcel of land from which such emission emanates, shall have the source of the contaminant muffled or controlled in a manner that will prevent the issuance, continuance or recurrence of any emission that is, or may be, detectable beyond the property line of the premises. All uses shall comply with the requirements of the Bay Area Quality Management District.

(Sec. 3 (part), Ord. 88-11, eff. Oct. 6, 1988)

9-4.59.5. Air Quality: Noncontaminated Emissions.

All existing or proposed uses shall have all intakes and exhausts on all air-handling equipment designed, installed, and operated in such a manner so as to prevent any perceptible acceleration of air movement across property lines. Cooling towers and condensers shall be designed, installed, and operated in a manner which will prevent water spray from being carried across property lines.

(Sec. 3 (part), Ord. 88-11, eff. Oct. 6, 1988)

9-4.59.6. Air Quality: Odor.

All uses shall be so operated as not to permit matter causing offensive odors which are perceptible to the average person at or beyond any lot line of the lot containing such uses.

(Sec. 3 (part), Ord. 88-11, eff. Oct. 6, 1988)

9-4.59.7. Noise.

Noise at lot lines shall not exceed the maximum permitted sound level as set forth in the Noise Standards Table adopted by the City Council.

(Sec. 3 (part), Ord. 88-11, eff. Oct. 6, 1988)

9-4.59.8. Vibration.

Vibration in the form of earth-borne oscillations at any lot line shall not cause displacement which exceeds the limit stated in the Vibration Standards Table adopted by the City Council.

(a) Exceptions. The limits in the Vibration Standards Table shall not apply to operations involved in the construction or demolition of structures or caused by motor vehicles or trains.

(b) Abutting Districts. No use shall cause any perceptible displacement at any lot line abutting a residential or commercial district.
(Sec. 3 (part), Ord. 88-11, eff. Oct. 6, 1988)

9-4.59.9. Light and Glare.

The maximum allowable intensities for illumination are prescribed in the Light and Glare Standards Table adopted by the City Council.

(a) Measurement. Illumination levels shall be measured with a photoelectric photometer following the standard spectral luminous efficiency curve adopted by the International Commission on Illumination.

(b) Residential Areas. In addition to the standards in the Light and Glare Standards Table, any use shall not produce glare so as to cause illumination in residential areas of such intensity as to be readily discernible within residences which have closed window coverings.

(c) Nuisances. Flickering or intrinsically bright sources of illumination shall be controlled so as not to be a nuisance in residential or commercial districts.

(Sec. 3 (part), Ord. 88-11, eff. Oct. 6, 1988)

9-4.59.10. Sewage and Industrial Waste.

All sewage and industrial waste systems shall comply with all requirements of the East Bay Municipal Utility District and the City Engineer. All industrial wastes not approved for deposit in sewer lines shall be disposed of in a manner approved by the City Engineer.

(Sec. 3 (part), Ord. 88-11, eff. Oct. 6, 1988)

TABLE V-4: NOISE/LAND USE COMPATIBILITY

LAND USE CATEGORY	RECOMMENDED NOISE LEVELS, L _{dn} (dBA)							INTERIOR, MAX.
	EXTERIOR RANGE							
	50	55	60	65	70	75	80	
Residential: Low Density	[Pattern: Diagonal lines /]							45
								45
Medium to High Density	[Pattern: Diagonal lines \]							50
								55
Commercial: Hotel	[Pattern: Diagonal lines /]							60
								65
Office	[Pattern: Diagonal lines \]							65
								70
Restaurant, Retail	[Pattern: Diagonal lines /]							70
								75
Other	[Pattern: Diagonal lines \]							75
								80
Industrial: Light Industrial	[Pattern: Diagonal lines /]							55
								50 living area
Custom Manufacturing	[Pattern: Diagonal lines \]							70
								75
Other	[Pattern: Diagonal lines /]							75
								80
Public/Quasi-Public: School, Library, Church,	[Pattern: Diagonal lines \]							45
								55
Hospital, Theater	[Pattern: Diagonal lines /]							55
								60
Other	[Pattern: Diagonal lines \]							60
								65
Open Spaces: All Categories	[Pattern: Diagonal lines /]							—
								—

KEY:



NORMALLY ACCEPTABLE

Specified land use is acceptable, assuming standard building construction.



CONDITIONALLY ACCEPTABLE

Standard building construction is not adequate for specified land use; however, mitigation measures may be easily employed to reduce noise to acceptable levels. An analysis of the measures by a qualified acoustical professional is required, to be approved by the City.



NORMALLY UNACCEPTABLE

The specified land use should be discouraged unless the City finds the project to be in the public interest and a detailed analysis by a qualified acoustical professional shows that specific measures which are to be included in the project would reduce indoor and outdoor noise to acceptable levels. The analysis and attenuation measures must be approved by the City.

APPENDIX L.

MAPS OF SAMPLE COLLECTION LOCATIONS

EO-720.0

3-2

Tenera
May 18, 1990

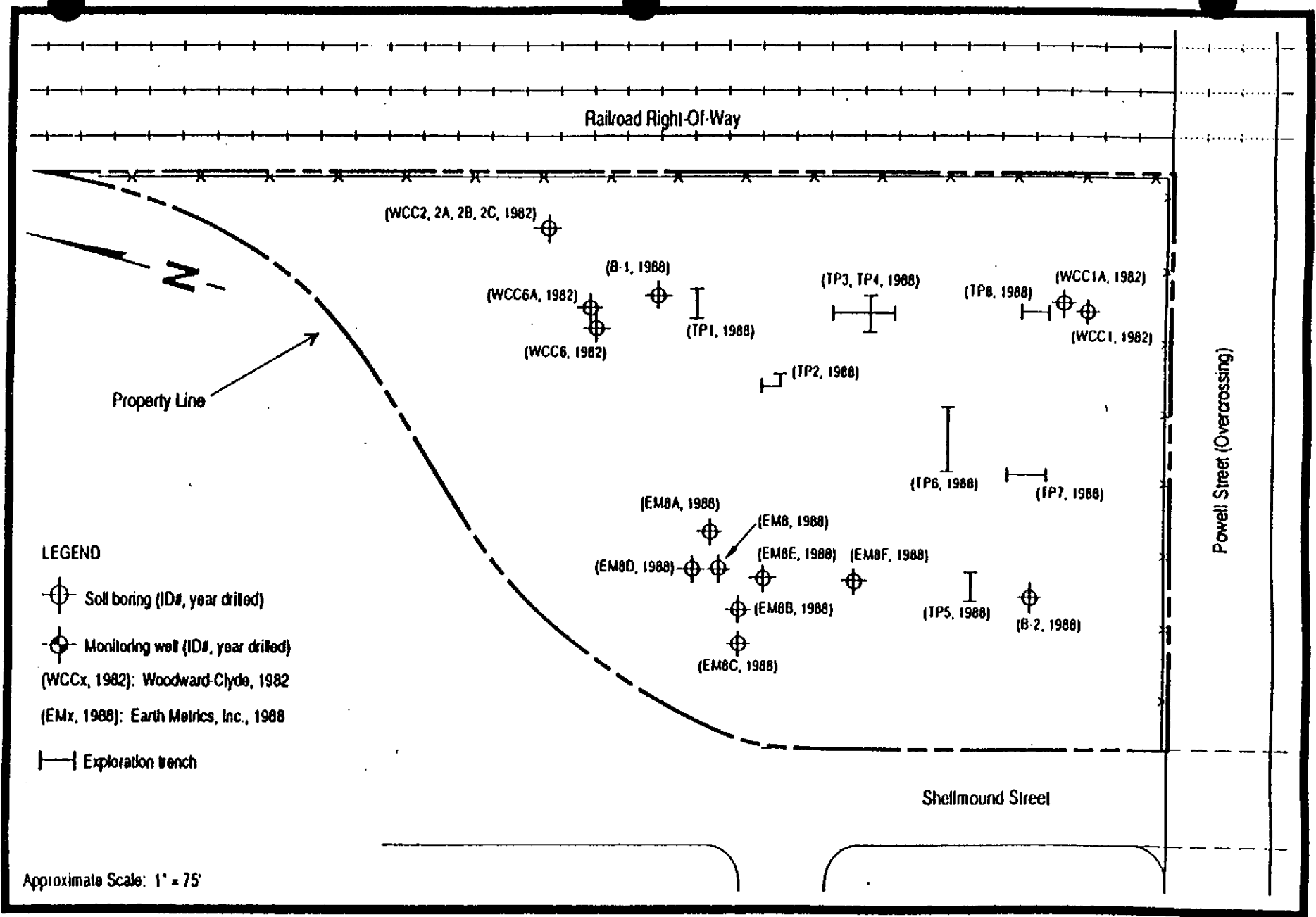
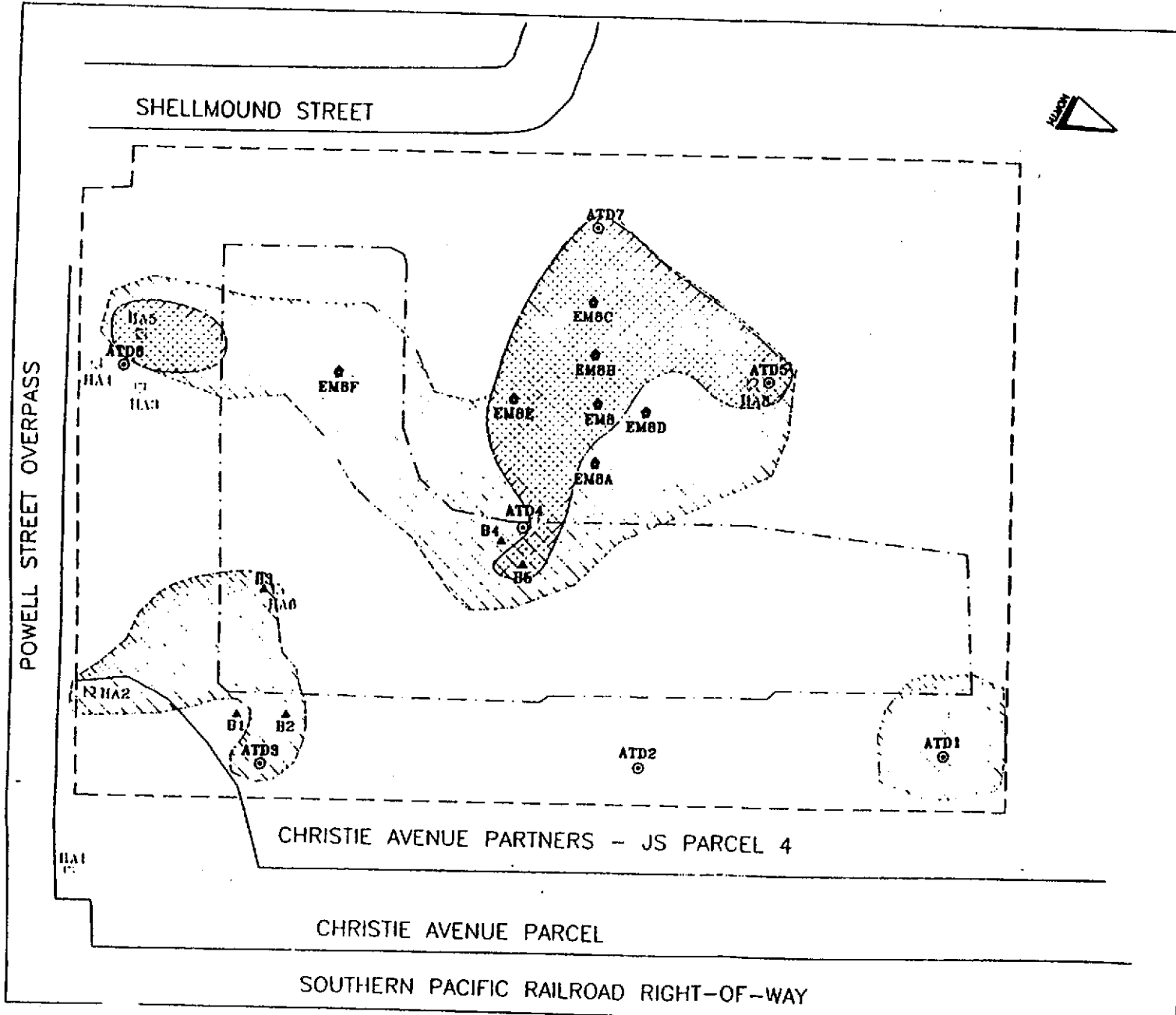


Figure 3-1
Plan of Previous Borings and Explorations
on Site of Another Tree Emeryville Project

2/12/92
Applied
Geosciences



EXPLANATION

--- SITE BOUNDARY
 --- CURB LINE

▲ LOCATION AND DESIGNATION OF SOIL BORING
 B5

● LOCATION AND DESIGNATION OF EARTH METRIC BORINGS
 EMB

▨ AREAS THAT ARE IMPACTED WITH LEAD METALS
 HAA1

▩ AREAS THAT ARE POTENTIALLY IMPACTED WITH LEAD METALS
 HAA2

NOTES:

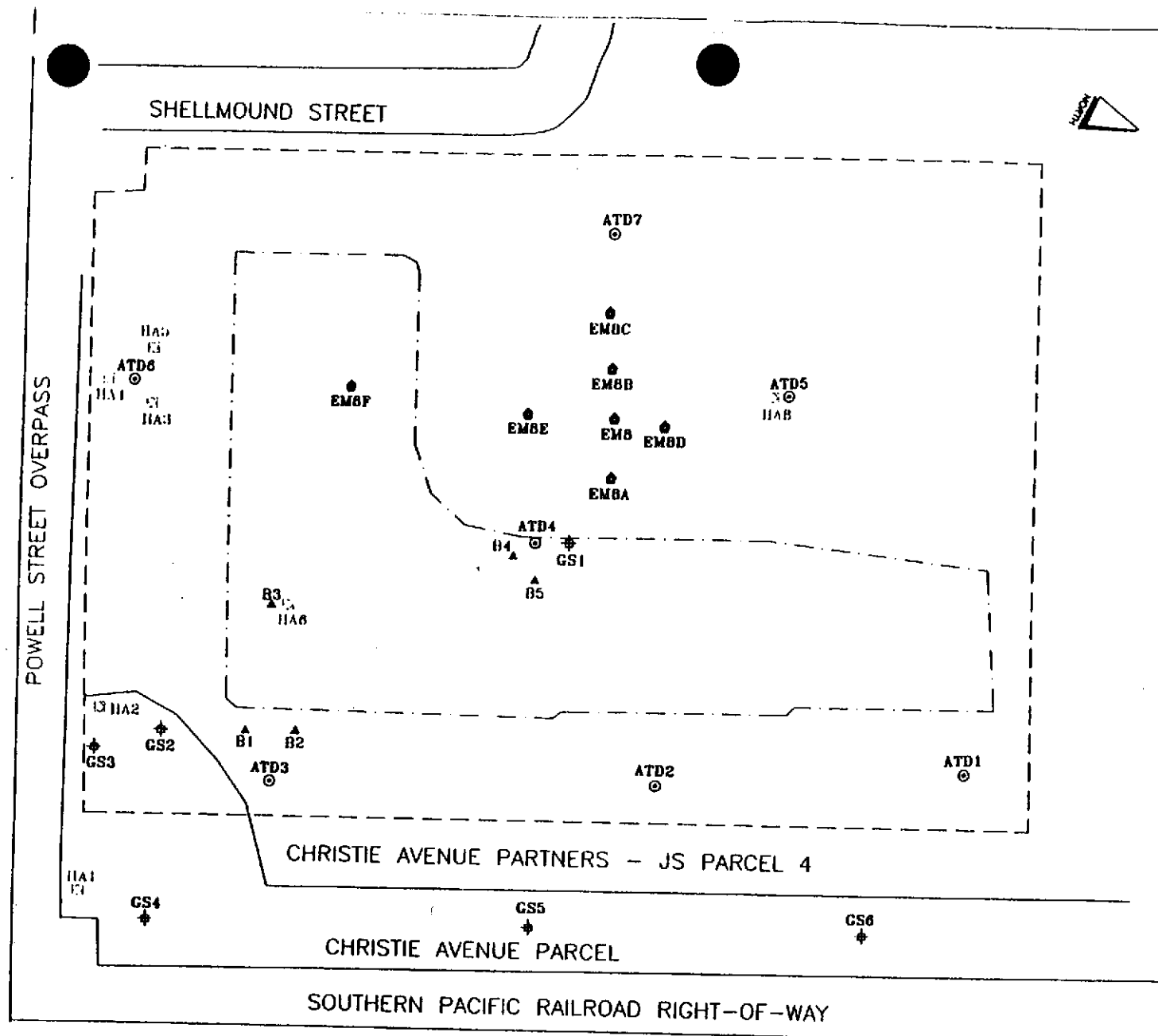
- (1) ALL LOCATIONS AND DIMENSIONS ARE APPROXIMATE
- (2) PARCEL BOUNDARY LOCATION OBTAINED FROM INFORMATION SUPPLIED BY UNION BANK
- (3) BOUNDARIES SHOWN FOR THE AREAS IMPACTED BY LEAD METALS ARE APPROXIMATE. ACTUAL AREA THAT IS IMPACTED MAY BE GREATER THAN THAT WHICH IS SHOWN.

0 25 50 100
 SCALE (FEET)

APPLIED GEOSCIENCES INC.
 Engineering, Biology and Remediation Materials Consultants

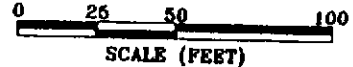
AREAS WITH ELEVATED CONCENTRATIONS OF LEAD METALS

PROJECT NO. A90174' FIGURE 4



- LOCATION
- - - SITE BOUNDARY
- CURB LINE
- ▲ LOCATION AND DESIGNATION OF SOIL BORING
- ✦ LOCATION AND DESIGNATION OF GS1 GRAB SOIL SAMPLE
- LOCATION AND DESIGNATION OF ATD1 AIR TEST DRILL
- ⊕ LOCATION AND DESIGNATION OF EMB EARTH METRIC BORING

NOTES: (1) ALL LOCATIONS AND DIMENSIONS ARE APPROXIMATE
 (2) PARCEL BOUNDARY LOCATION OBTAINED FROM INFORMATION SUPPLIED BY UNION BANK

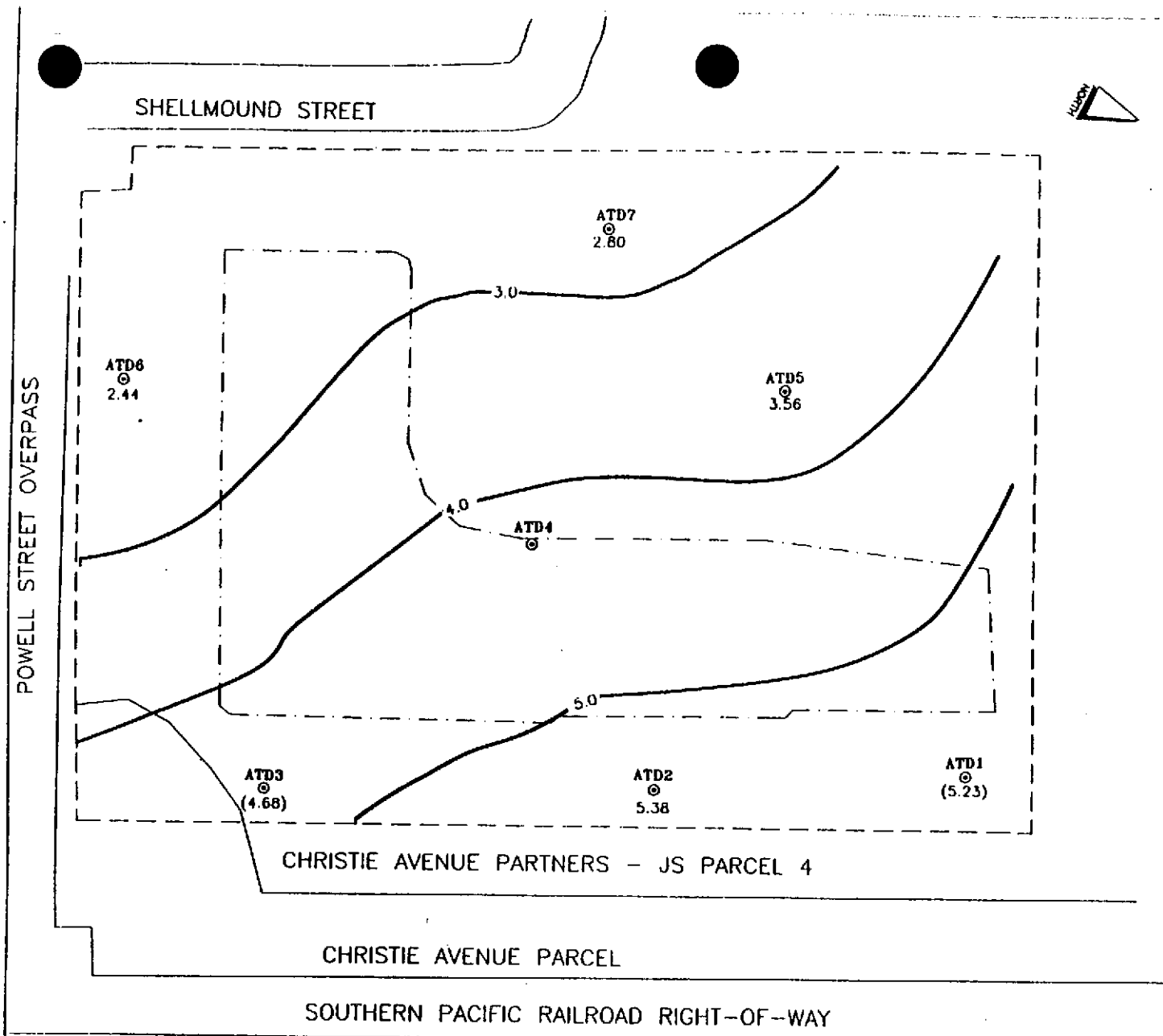


APPLIED GEOSCIENCES INC.
 Engineering Geology and Hazardous Materials Consultants

SITE PLOT PLAN

PROJECT NO. A901749A FIGURE 2

2/12/92
 Applied GeoSciences



ELEVATION

--- SITE BOUNDARY

--- CURB LINE

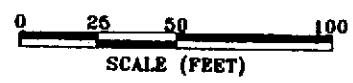
--- GROUNDWATER MONITORING WELL DESIGNATION AND LOCATION

○ ATD2
5.66

--- PERCHED GROUNDWATER ELEVATION - ELEVATION IN PARENTHESES INDICATES LOWER AQUIFER ELEVATION

--- 5.0 --- PERCHED GROUNDWATER ELEVATION CONTOUR (FEET ABOVE MEAN SEA LEVEL)

- NOTES: (1) ALL LOCATIONS AND DIMENSIONS ARE APPROXIMATE
 (2) PARCEL BOUNDARY LOCATION OBTAINED FROM INFORMATION SUPPLIED BY UNION BANK
 (3) SURVEY DATA PROVIDED BY MISSION ENGINEERS APPENDIX A.4 OF THIS REPORT



APPLIED GEOSCIENCES INC.
 Engineering Geology and Hazardous Materials Consultants

PERCHED ZONE
 GROUNDWATER ELEVATION
 CONTOUR MAP
 (AUGUST 1991)

PROJECT NO. A901749A FIGURE 3

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APPENDIX M.

8 CCR 5156, CONFINED SPACES

Article 108. Confined Spaces

§5156. Scope, Application and Definitions.

(a) Scope. This Article prescribes minimum standards for preventing employee exposure to confined space hazards, as defined by Section 5156(b), within such spaces as silos, tanks, vats, vessels, boilers, compartments, ducts, sewers, pipelines, vaults, bins, tubs, and pits.

(b) Application and definitions.

(1) For operations and industries not identified in subsection (b)(2), the confined space definition along with other definitions and requirements of section 5157. Permit-Required Confined Spaces shall apply.

(2) The confined space definition along with other definitions and requirements of section 5158, Other Confined Space Operations shall apply to:

(A) Construction operations regulated by section 1502;

(B) Agriculture operations (including cotton gins) defined by section 3437;

(C) Marine terminal operations defined in section 3460;

(D) Telecommunication manholes and unvented vaults regulated by section 8616;

(E) Grain handling facilities regulated by section 5178.

(F) Natural gas utility operation within distribution and transmission facility vaults defined in Title 49 Code of Federal Regulations Part 191, 192 and 193; or

(G) Electric utility operations within underground vaults. See section 2700 for a definition of vault.

Note: Shipyard operations are regulated by section 8355

§5157. Permit-Required Confined Spaces.

(a) Scope and application. This section contains requirements for practices and procedures to protect employees from the hazards of entry into permit-required confined spaces. This section applies to employers, as specified in section 5156(b)(1).

(b) Definitions.

Acceptable entry conditions means the conditions that must exist in a permit space to allow entry and to ensure that employees involved with a permit-required confined space entry can safely enter into and work within the space.

Attendant means an individual stationed outside one or more permit spaces who monitors the authorized entrants and who performs all attendant's duties assigned in the employer's permit space program.

Authorized entrant means an employee who is authorized by the employer to enter a permit space.

Blanking or blinding means the absolute closure of a pipe, line, or duct by the fastening of a solid plate (such as a spectacle blind or a skillet blind) that completely covers the bore and that is capable of withstanding the maximum pressure of the pipe, line, or duct with no leakage beyond the plate.

Confined space means a space that:

(1) Is large enough and so configured that an employee can bodily enter and perform assigned work; and

(2) Has limited or restricted means for entry or exit (for example, tanks, vessels, silos, storage bins, hoppers, vaults, and pits are spaces that may have limited means of entry); and

(3) Is not designed for continuous employee occupancy.

Double block and bleed means the closure of a line, duct, or pipe by closing and locking or tagging a drain or vent valve in the line between the two closed valves.

Emergency means any occurrence (including any failure of hazard control or monitoring equipment) or event internal or external to the permit space that could endanger entrants.

Engulfment means the surrounding and effective capture of a person by a liquid or finely divided (flowable) solid substance that can be aspirated to cause death by filling or plugging the respiratory system or that can exert enough force on the body to cause death by strangulation, constriction, or crushing.

Entry means the action by which a person passes through an opening into a permit-required confined space. Entry includes ensuing work activities in that space and is considered to have occurred as soon as any part of the entrant's body breaks the plane of an opening into the space.

Entry permit (permit) means the written or printed document that is provided by the employer to allow and control entry into a permit space and that contains the information specified in subsection (f).

Entry supervisor means the person (such as the employer, foreman, or crew chief) responsible for determining if acceptable entry conditions are present at a permit space where entry is planned, for authorizing entry and overseeing entry operations, and for terminating entry as required by this section.

NOTE: An entry supervisor also may serve as an attendant or as an authorized entrant, as long as that person is trained and equipped as required by this section for each role he or she fills. Also, the duties of entry supervisor may be passed from one individual to another during the course of an entry operation.

Hazardous atmosphere means an atmosphere that may expose employees to the risk of death, incapacitation, impairment of ability to self-rescue (that is, escape unaided from a permit space), injury, or acute illness from one or more of the following causes:

(1) Flammable gas, vapor, or mist in excess of 10 percent of its lower flammable limit (LFL);

(2) Airborne combustible dust at a concentration that meets or exceeds its LFL;

NOTE: This concentration may be approximated as a condition in which the dust obscures vision at a distance of 5 feet (1.52 M) or less.

(3) Atmospheric oxygen concentration below 19.5 percent or above 23.5 percent;

(4) Atmospheric concentration of any substance for which a dose is published in Group 14 for Radiation and Radioactivity or a permissible exposure limit is published in section 5155 for Airborne contaminants and which could result in employee exposure in excess of its dose or permissible exposure limit;

NOTE: An atmospheric concentration of any substance that is not capable of causing death, incapacitation, impairment of ability to self-rescue, injury, or acute illness due to its health effects is not covered by this provision.

(5) Any other atmospheric condition that is immediately dangerous to life or health.

NOTE: For air contaminants for which a dose is not published in Group 14 for Radiation and Radioactivity or a permissible exposure limit is not published in section 5155 for Airborne contaminants, other sources of information such as: Material Safety Data Sheets that comply with section 5194, published information, and internal documents can provide guidance in establishing acceptable atmospheric conditions.

Hot work permit means the employer's written authorization to perform operations (for example, riveting, welding, cutting, burning, and heating) capable of providing a source of ignition.

Immediately dangerous to life or health (IDLH) means any condition that poses an immediate or delayed threat to life or that would cause irreversible adverse health effects or that would interfere with an individual's ability to escape unaided from a permit space.

NOTE: Some materials—hydrogen fluoride gas and cadmium vapor, for example—may produce immediate transient effects that, even if severe, may pass without medical attention, but are followed by sudden, possibly fatal collapse 12-72 hours after exposure. The victim "feels normal" from recovery from transient effects until collapse. Such materials in hazardous quantities are considered to be "immediately" dangerous to life or health.

Inerting means the displacement of the atmosphere in a permit space by a noncombustible gas (such as nitrogen) to such an extent that the resulting atmosphere is noncombustible.

NOTE: This procedure produces an IDLH oxygen-deficient atmosphere.

Isolation means the process by which a permit space is removed from service and completely protected against the release of energy and material into the space by such means as: Blanking or blinding; misaligning or removing sections of lines, pipes, or ducts; a double block and bleed system; lockout or tagout of all sources of energy; or blocking or disconnecting all mechanical linkages.

Line breaking means the intentional opening of a pipe, line, or duct that is or has been carrying flammable, corrosive, or toxic material, an inert gas, or any fluid at a volume, pressure or temperature capable of causing injury.

Non-permit confined space means a confined space that does not contain or, with respect to atmospheric hazards, have the potential to contain any hazard capable of causing death or serious physical harm.

Oxygen deficient atmosphere means an atmosphere containing less than 19.5 percent oxygen by volume.

Oxygen enriched atmosphere means an atmosphere containing more than 23.5 percent oxygen by volume.

Permit-required confined space (permit space) means a confined space that has one or more of the following characteristics:

- (1) Contains or has a potential to contain a hazardous atmosphere;
- (2) Contains a material that has the potential for engulfing an entrant;
- (3) Has an internal configuration such that an entrant could be trapped or asphyxiated by inwardly converging walls or by a floor which slopes downward and tapers to a smaller cross-section; or
- (4) Contains any other recognized serious safety or health hazard.

Permit-required confined space program (permit space program) means the employer's overall program for controlling, and, where appropriate, for protecting employees from, permit space hazards and for regulating employee entry into permit spaces.

Permit system means the employer's written procedure for preparing and issuing permits for entry and for returning the permit space to service following termination of entry.

Prohibited condition means any condition in a permit space that is not allowed by the permit during the period when entry is authorized.

Rescue service means the personnel designated to rescue employees from permit spaces.

Retrieval system means the equipment (including a retrieval line, chest or full-body harness, wristlets, if appropriate, and a lifting device or anchor) used for non-entry rescue of persons from permit spaces.

Testing means the process by which the hazards that may confront entrants of a permit space are identified and evaluated. Testing includes specifying the tests that are to be performed in the permit space.

NOTE: Testing enables employers both to devise and implement adequate control measures for the protection of authorized entrants and to determine if acceptable entry conditions are present immediately prior to, and during, entry.

(c) General requirements.

(1) The employer shall evaluate the workplace to determine if any spaces are permit-required confined spaces.

NOTE: Proper application of the decision flow chart in Appendix A would facilitate compliance with this requirement.

(2) If the workplace contains permit spaces, the employer shall inform exposed employees, by posting danger signs or by any other equally effective means, of the existence and location of and the danger posed by the permit spaces.

NOTE: A sign reading "DANGER — PERMIT-REQUIRED CONFINED SPACE, DO NOT ENTER" or using other similar language would satisfy the requirement for a sign.

(3) If the employer decides that its employees will not enter permit spaces, the employer shall take effective measures to prevent its employees from entering the permit spaces and shall comply with subsections (c)(1), (c)(2), (c)(6), and (c)(8).

(4) If the employer decides that its employees will enter permit spaces, the employer shall develop and implement a written permit space program that complies with this section. The written program shall be available for inspection by employees and their authorized representatives.

(5) An employer may use the alternate procedures specified in subsection (c)(5)(B) for entering a permit space under the conditions set forth in subsection (c)(5)(A).

(A) An employer whose employees enter a permit space need not comply with subsections (d) through (f) and (h) through (k), provided that:

1. The employer can demonstrate that the only hazard posed by the permit space is an actual or potential hazardous atmosphere;

2. The employer can demonstrate that continuous forced air ventilation alone is sufficient to maintain that permit space safe for entry;

3. The employer develops monitoring and inspection data that supports the demonstrations required by subsections (c)(5)(A)1. and 2.;

4. If an initial entry of the permit space is necessary to obtain the data required by subsection (c)(5)(A)3., the entry is performed in compliance with subsections (d) through (k);

5. The determinations and supporting data required by subsections (c)(5)(A)1., 2. and 3. are documented by the employer and are made available to each employee who enters the permit space under the terms of subsection (c)(5); and

6. Entry into the permit space under the terms of subsection (c)(5)(A) is performed in accordance with the requirements of subsection (c)(5)(B).

NOTE: See subsection (c)(7) for reclassification of a permit space after all hazards within the space have been eliminated.

(B) The following requirements apply to entry into permit spaces that meet the conditions set forth in subsection (c)(5)(A).

1. Any conditions making it unsafe to remove an entrance cover shall be eliminated before the cover is removed

2. When entrance covers are removed, the opening shall be promptly guarded by a railing, temporary cover, or other temporary barrier that will prevent an accidental fall through the opening and that will protect each employee working in the space from foreign objects entering the space.

3. Before an employee enters the space, the internal atmosphere shall be tested, with a calibrated direct-reading instrument, for the following conditions in the order given:

a. Oxygen content,

b. Flammable gases and vapors, and

c. Potential toxic air contaminants.

4. There may be no hazardous atmosphere within the space whenever any employee is inside the space.

5. Continuous forced air ventilation shall be used, as follows:

a. An employee may not enter the space until the forced air ventilation has eliminated any hazardous atmosphere.

b. The forced air ventilation shall be so directed as to ventilate the immediate areas where an employee is or will be present within the space and shall continue until all employees have left the space;

c. The air supply for the forced air ventilation shall be from a clean source and may not increase the hazards in the space.

6. The atmosphere within the space shall be periodically tested as necessary to ensure that the continuous forced air ventilation is preventing the accumulation of a hazardous atmosphere.

7. If a hazardous atmosphere is detected during entry:

a. Each employee shall leave the space immediately;

b. The space shall be evaluated to determine how the hazardous atmosphere developed; and

c. Measures shall be implemented to protect employees from the hazardous atmosphere before any subsequent entry takes place.

8. The employer shall verify that the space is safe for entry and that the pre-entry measures required by subsection (c)(5)(B) have been taken, through a written certification that contains the date, the location of the space, and the signature of the person providing the certification. The certification shall be made before entry and shall be made available to each employee entering the space.

(6) When there are changes in the use or configuration of a non-permit confined space that might increase the hazards to entrants, the employer shall reevaluate that space and, if necessary, reclassify it as a permit-required confined space.

(7) A space classified by the employer as a permit-required confined space may be reclassified as a non-permit confined space under the following procedures:

(A) If the permit space poses no actual or potential atmospheric hazards and if all hazards within the space are eliminated without entry into the space, the permit space may be reclassified as a non-permit confined space for as long as the non-atmospheric hazards remain eliminated.

(B) If it is necessary to enter the permit space to eliminate hazards, such entry shall be performed under subsections (d) through (k). If testing and inspection during that entry demonstrate that the hazards within the permit space have been eliminated, the permit space may be reclassified as a non-permit confined space for as long as the hazards remain eliminated.

NOTE: Control of atmospheric hazards through forced air ventilation does not constitute elimination of the hazards. Subsection (c)(5) covers permit space entry where the employer can demonstrate that forced air ventilation alone will control all hazards in the space.

(C) The employer shall document the basis for determining that all hazards in a permit space have been eliminated through a certification that contains the date, the location of the space, and the signature of the person making the determination. The certification shall be made available to each employee entering the space.

(D) If hazards arise within a permit space that has been declassified to a non-permit space under subsection (c)(7), each employee in the space shall exit the space. The employer shall then reevaluate the space and determine whether it must be reclassified as a permit space, in accordance with other applicable provisions of this section.

(8) When an employer (host employer) arranges to have employees of another employer (contractor) perform work that involves permit space entry, the host employer shall:

(A) Inform the contractor that the workplace contains permit spaces and that permit space entry is allowed only through compliance with a permit space program meeting the requirements of this section;

(B) Apprise the contractor of the elements, including the hazards identified and the host employer's experience with the space, that make the space in question a permit space;

(C) Apprise the contractor of any precautions or procedures that the host employer has implemented for the protection of employees in or near permit spaces where contractor personnel will be working.

(D) Coordinate entry operations with the contractor, when both host employer personnel and contractor personnel will be working in or near permit spaces, as required by subsection (d)(11); and

(E) Debrief the contractor at the conclusion of the entry operations regarding the permit spaced program followed and regarding any hazards confronted or created in permit spaces during entry operations.

(9) In addition to complying with the permit space requirements that apply to all employers, each contractor who is retained to perform permit space entry operations shall:

(A) Obtain any available information regarding permit space hazards and entry operations from the host employer;

(B) Coordinate entry operations with the host employer, when both host employer personnel and contractor personnel will be working in or near permit spaces, as required by subsection (d)(11); and

(C) Inform the host employer of the permit space program that the contractor will follow and of any hazards confronted or created in permit spaces, either through a debriefing or during the entry operation.

(d) Permit-required confined space program (permit space program). Under the permit required confined space program required by subsection (c)(4), the employer shall:

(1) Implement the measures necessary to prevent unauthorized entry;

(2) Identify and evaluate the hazards of permit spaces before employees enter them;

(3) Develop and implement the means, procedures, and practices necessary for safe permit space entry operations, including, but not limited to, the following:

(A) Specifying acceptable entry conditions;

(B) Isolating the permit space;

(C) Purging, inerting, flushing, or ventilating the permit space as necessary to eliminate or control atmospheric hazards;

(D) Providing pedestrian, vehicle, or other barriers as necessary to protect entrants from external hazards; and

(E) Verifying that conditions in the permit space are acceptable for entry throughout the duration of an authorized entry.

(4) Provide the following equipment (specified in subsections (A) through (I), below) at no cost to employees, maintain that equipment properly, and ensure that employees use that equipment properly:

(A) Testing and monitoring equipment needed to comply with subsection (d)(5);

(B) Ventilating equipment needed to obtain acceptable entry conditions;

(C) Communications equipment necessary for compliance with subsections (h)(3) and (i)(5); (D) Personal protective equipment insofar as feasible engineering and work practice controls do not adequately protect employees;

(E) Lighting equipment needed to enable employees to see well enough to work safely and to exit the space quickly in an emergency.

(F) Barriers and shields as required by subsection (d)(3)(D);

(G) Equipment, such as ladders, needed for safe ingress and egress by authorized entrants;

(H) Rescue and emergency equipment needed to comply with subsection (d)(9), except to the extent that the equipment is provided by rescue services; and

(I) Any other equipment necessary for safe entry into and rescue from permit spaces.

(5) Evaluate permit space conditions as follows when entry operations are conducted

(A) Test conditions in the permit space to determine if acceptable entry conditions exist before entry is authorized to begin, except that, if isolation of the space is infeasible because the space is large or is part of a continuous system (such as a sewer), pre-entry testing shall be performed to the extent feasible before entry is authorized and, if entry is authorized, entry conditions shall be continuously monitored in the areas where authorized entrants are working;

(B) Test or monitor the permit space as necessary to determine if acceptable entry conditions are being maintained during the course of entry operations, and

(C) When testing for atmospheric hazards, test first for oxygen, then for combustible gases and vapors, and then for toxic gasses and vapors.

NOTE: Atmospheric testing conducted in accordance with Appendix B would be considered as satisfying the requirements of this subsection. For permit space operations in sewers, atmospheric testing conducted in accordance with Appendix B, as supplemented by Appendix E, would be considered as satisfying the requirements of this subsection.

(6) Provide at least one attendant outside the permit space into which entry is authorized for the duration of entry operations;

NOTE: Attendants may be assigned to monitor more than one permit space provided the duties described in subsection (i) can be effectively performed for each permit space that is monitored. Likewise, attendants may be stationed at any location outside the permit space to be monitored as long as the duties described in subsection (i) can be effectively performed for each permit space that is monitored.

(7) If multiple spaces are to be monitored by a single attendant, include in the permit program the means and procedures to enable the attendant to respond to an emergency affecting one or more of the permit spaces being monitored without distraction from the attendant's responsibilities under subsection (i);

(8) Designate the persons who are to have active roles (as, for example, authorized entrants, attendants, entry supervisors, or persons who test or monitor the atmosphere in a permit space) in entry operations, identify the duties of each such employee, and provide each such employee with the training required by subsection (g).

(9) Develop and implement procedures for rescuing entrants from permit spaces, for providing necessary emergency services to rescued employees, for summoning additional rescue and emergency services, and for preventing unauthorized personnel from attempting a rescue;

(10) Develop and implement a system for the preparation, issuance, use, and cancellation of entry permits as required by this section;

(11) Develop and implement procedures to coordinate entry operations when employees of more than one employer are working simultaneously as authorized entrants in a permit space, so that employees of one employer do not endanger the employees of any other employer.

(12) Develop and implement procedures (such as closing off a permit space and canceling the permit) necessary for concluding the entry after entry operations have been completed;

(13) Review entry operations when the employer has reason to believe that the measures taken under the permit space program may not protect employees and revise the program to correct deficiencies found to exist before subsequent entries are authorized; and

NOTE: Examples of circumstances requiring the review of the permit space program are: any unauthorized entry of a permit space, the detection of a permit space hazard not covered by the permit, the detection of a condition prohibited by the permit, the occurrence of an injury or near-miss during entry, a change in the use or configuration of a permit space, and employee complaints about the effectiveness of the program.

(14) Review the permit space program, using the canceled permits retained under subsection (e)(6) within 1 year after each entry and revise the program as necessary, to ensure that employees participating in entry operations are protected from permit space hazards.

NOTE: Employers may perform a single annual review covering all entries performed during a 12-month period. If no entry is performed during a 12-month period, no review is necessary.

Appendix C presents examples of permit space programs that are considered to comply with the requirements of subsection (d).

(e) Permit system.

(1) Before entry is authorized, the employer shall document the completion of measures required by subsection (d)(3) by preparing an entry permit.

NOTE: Appendix D presents examples of permits whose elements are considered to comply with the requirements of this section.

(2) Before entry begins, the entry supervisor identified on the permit shall sign the entry permit to authorize entry.

(3) The completed permit shall be made available at the time of entry to all authorized entrants, by posting it at the entry portal or by any other equally effective means, so that the entrants can confirm that pre-entry preparations have been completed.

(4) The duration of the permit may not exceed the time required to complete the assigned task of job identified on the permit in accordance with subsection (f)(2).

(5) The entry supervisor shall terminate entry and cancel the entry permit when:

(A) The entry operations covered by the entry permit have been completed; or

(B) A condition that is not allowed under the entry permit arises in or near the permit space.

(6) The employer shall retain each canceled entry permit for at least 1 year to facilitate the review of the permit space program required by subsection (d)(14). Any problems encountered during an entry operation shall be noted on the pertinent permit so that appropriate revisions to the permit space program can be made.

(f) Entry permit. The entry permit that documents compliance with this section and authorizes entry to a permit space shall identify:

(1) The permit space to be entered;

(2) The purpose of the entry;

(3) The date and the authorized duration of the entry permit;

(4) The authorized entrants within the permit space, by name or by such other means (for example, through the use of rosters or tracking systems) as will enable the attendant to determine quickly and accurately, for the duration of the permit, which authorized entrants are inside the permit space;

NOTE: This requirement may be met by inserting a reference on the entry permit as to the means used, such as roster or tracking systems, to keep track of the authorized entrants within the permit space.

(5) The personnel, by name, currently serving as attendants;

(6) The individual, by name, currently serving as entry supervisor, with a space for the signature or initials of the entry supervisor who originally authorized entry;

(7) The hazards of the permit space to be entered;

(8) The measures used to isolate the permit space and to eliminate or control permit space hazards before entry;

NOTE: Those measures can include the lockout or tagging of equipment and procedures for purging, inerting, ventilating, and flushing permit spaces.

(9) The acceptable entry conditions;

(10) The results of initial and periodic tests performed under subsection (d)(5) accompanied by the names or initials of the testers and by an indication of when the tests were performed;

(11) The rescue and emergency services that can be provided on-site and additional service that can be summoned and the means such as the equipment to use and the numbers to call for summoning those services;

(12) The communication procedures used by authorized entrants and attendants to maintain contact during the entry;

(13) Equipment, such as personal protective equipment, testing equipment, communications equipment, alarm systems, and rescue equipment, to be provided for compliance with this section;

(14) Any other information whose inclusion is necessary, given the circumstances of the particular confined space, in order to ensure employee safety; and

(15) Any additional permits, such as for hot work, that have been issued to authorize work in the permit space.

(g) Training.

(1) The employer shall provide training so that all employees whose work is regulated by this section acquire the understanding, knowledge, and skills necessary for the safe performance of the duties assigned under this section.

(2) Training shall be provided to each affected employee:

(A) Before the employee is first assigned duties under this section;

(B) Before there is a change in assigned duties;

(C) Whenever there is a change in permit space operations that presents a hazard about which an employee has not previously been trained;

(D) Whenever the employer has reason to believe either that there are deviations from the permit space entry procedures required by subsection (d)(3) or that there are inadequacies in the employee's knowledge or use of these procedures

(3) The training shall establish employee proficiency in the duties required by this section and shall introduce new or revised procedures, as necessary, for compliance with this section.

(4) The employer shall certify that the training required by subsections (g)(1) through (g)(3) has been accomplished. The certification shall contain each employee's name, the signatures or initials of the trainers, and the dates of training. The certification shall be available for inspection by employees and their authorized representatives.

(h) Duties of authorized entrants. The employer shall ensure that all authorized entrants:

(1) Know the hazards that may be faced during entry, including information on the mode, signs or symptoms, and consequences of the exposure;

(2) Properly use equipment as required by subsection (d)(4);

(3) Communicate with the attendant as necessary to enable the attendant to monitor entrant status and to enable the attendant to alert entrants of the need to evacuate the space as required by subsection (i)(6);

(4) Alert the attendant whenever:

(A) The entrant recognizes any warning sign or symptom of exposure to a dangerous situation, or

(B) The entrant detects a prohibited condition; and

(5) Exit from the permit space as quickly as possible whenever:

(A) An order to evacuate is given by the attendant or the entry supervisor,

(B) The entrant recognizes any warning sign or symptom of exposure to a dangerous situation,

(C) The entrant detects a prohibited condition, or

(D) An evacuation alarm is activated.

(i) Duties of attendants. The employer shall ensure that each attendant:

(1) Knows the hazards that may be faced during entry, including information on the mode, signs or symptoms, and consequences of the exposure;

(2) Is aware of possible behavioral effects of hazard exposure in authorized entrants;

(3) Continuously maintains an accurate count of authorized entrants in the permit space and ensures that the means used to identify authorized entrants under subsection (f)(4) accurately identifies who is in the permit space;

(4) Remains outside the permit space during entry operations until relieved by another attendant;

NOTE: When the employer's permit entry program allows attendant entry for rescue, attendants may enter a permit space to attempt a rescue if they have been trained and equipped for rescue operations as required by subsection (k)(1) and if they have been relieved as required by subsection (i)(4).

(5) Communicates with authorized entrants as necessary to monitor entrant status and to alert entrants of the need to evacuate the space under subsection (i)(6);

(6) Monitors activities inside and outside the space to determine if it is safe for entrants to remain in the space and orders the authorized entrants to evacuate the permit space immediately under any of the following conditions:

(A) If the attendant detects a prohibited condition;

(B) If the attendant detects the behavioral effects of hazards exposure in an authorized entrant;

(C) If the attendant detects a situation outside the space that could endanger the authorized entrants; or

(D) If the attendant cannot effectively and safely perform all the duties required under subsection (i);

(7) Initiate on-site rescue procedures and, if necessary, summon additional rescue and other emergency services as soon as the attendant determines that authorized entrants may need assistance to escape from permit space hazards;

(8) Takes the following actions when unauthorized persons approach or enter a permit space while entry is underway:

(A) Warn the unauthorized persons that they must stay away from the permit space;

(B) Advise the unauthorized persons that they must exit immediately if they have entered the permit space; and

(C) Inform the authorized entrants and the entry supervisor if unauthorized persons have entered the permit space;

(9) Performs non-entry rescues or other rescue services as part of the employer's on-site rescue procedure; and

(10) Performs no duties that might interfere with the attendant's primary duty to monitor and protect the authorized entrants.

(i) Duties of entry supervisors. The employer shall ensure that each entry supervisor:

(1) Knows the hazards that may be faced during entry, including information on the mode, signs or symptoms, and consequences of the exposure;

(2) Verifies, by checking that the appropriate entries have been made on the permit, that all tests specified by the permit have been conducted and that all procedures and equipment specified by the permit are in place before endorsing the permit and allowing entry to begin;

(3) Terminates the entry and cancels the permit as required by subsection (e)(5);

(4) Verifies that rescue services are available and that the means for summoning additional services are operable;

(5) Removes unauthorized individuals who enter or who attempt to enter the permit space during entry operations; and

(6) Determines, whenever responsibility for a permit space entry operation is transferred and at intervals dictated by the hazards and operations performed within the space, that entry operations remain consistent with terms of the entry permit and that acceptable entry conditions are maintained.

(k) Rescue and emergency services. The employer shall ensure that at least one standby person at the site is trained and immediately available to perform rescue and emergency services.

(l) The following requirements apply to employers who have employees enter permit spaces to perform rescue services.

(A) The employer shall ensure that each member of the rescue service is provided with, and is trained to use properly, the personal protective equipment and rescue equipment necessary for making rescues from permit spaces.

(B) Each member of the rescue service shall be trained to perform the assigned rescue duties. Each member of the rescue service shall also receive the training required of authorized entrants under subsection (g).

(C) Each member of the rescue service shall practice making permit space rescues at least once every 12 months, by means of simulated rescue operations in which they remove dummies, manikins, or actual persons from the actual permit spaces or from representative permit spaces. Representative permit spaces shall, with respect to opening size, configuration, and accessibility, simulate the types of permit spaces from which rescue is to be performed.

(D) Each member of the rescue service shall be trained in basic first-aid and in cardiopulmonary resuscitation (CPR). At least one member of the rescue service holding current certification in first aid and in CPR shall be available.

(2) When an employer (host employer) arranges to have persons other than the host employer's employees perform permit space rescue, the host employer shall:

(A) Inform the rescue service of the hazards they may confront when called on to perform rescue at the host employer's facility, and

(B) Provide the rescue service with access to all permit spaces from which rescue may be necessary so that the rescue service can develop appropriate rescue plans and practice rescue operations.

(3) To facilitate non-entry rescue, retrieval systems or methods shall be used whenever an authorized entrant enters a permit space, unless the retrieval equipment would increase the overall risk of entry or would not contribute to the rescue of the entrant. Retrieval systems shall meet the following requirements.

(A) Each authorized entrant shall use a chest or full body harness, with a retrieval line attached at a suitable point so that when rescued, the entrant presents the smallest possible profile (for example at the center of the entrant's back near shoulder level, or above the entrant's head). Wristlets may be used in lieu of the chest or full body harness if the employer can demonstrate that the use of a chest or full body harness is infeasible or creates a greater hazard and that the use of wristlets is the safest and most effective alternative.

(B) The other end of the retrieval line shall be attached to a mechanical device or fixed point outside the permit space in such a manner that rescue can begin as soon as the rescuer becomes aware that rescue is necessary. A mechanical device shall be available to retrieve personnel from vertical type permit spaces more than 5 feet deep.

(4) If an injured entrant is exposed to a substance for which a Material Safety Data Sheet (MSDS) or other similar written information is required to be kept at the worksite, that MSDS or written information shall be made available to the medical facility treating the exposed entrant.

(l) Appendices. Appendices A through E serve to provide information and non-mandatory guidelines to assist employers and employees in complying with the appropriate requirements of this section.

§5158. Other Confined Space Operations.

(a) Scope. For industries and operations specified in section 5156(b)(2) this section prescribes minimum standards for preventing employee exposure to dangerous air contamination and/or oxygen deficiency in confined spaces, as defined in subsection (b).

(b) Definitions.

(1) Confined Space. A space defined by the concurrent existence of the following conditions:

(A) Existing ventilation is insufficient to remove dangerous air contamination and/or oxygen deficiency which may exist or develop.

(B) Ready access or egress for the removal of a suddenly disabled employee is difficult due to the location and/or size of the opening(s).

(2) Dangerous Air Contamination. An atmosphere presenting a threat of causing death, injury, acute illness, or disablement due to the presence of flammable and/or explosive, toxic, or otherwise injurious or incapacitating substances.

(A) Dangerous air contamination due to the flammability of a gas or vapor is defined as an atmosphere containing the gas or vapor at a concentration greater than 20 percent of its lower explosive (lower flammable) limit.

(B) Dangerous air contamination due to a combustible particulate is defined as a concentration greater than 20 percent of the minimum explosive concentration of the particulate.

(C) Dangerous air contamination due to the toxicity of a substance is defined as the atmospheric concentration immediately hazardous to life or health.

NOTE: This definition of dangerous air contamination due to the toxicity of a substance does not preclude the requirement to control harmful exposures, under the provisions of Article 107, to toxic substances at concentrations less than those immediately hazardous to life or health.

(3) Oxygen Deficiency. An atmosphere containing oxygen at a concentration of less than 19.5 percent by volume.

(c) Operation Procedures and Employee Training. The employer shall implement the provisions of this subsection before any employee is permitted to enter a confined space.

(1) Operating Procedures.

(A) Written, understandable operating and rescue procedures shall be developed and shall be provided to affected employees

(B) Operating procedures shall conform to the applicable requirements of this section and shall include provision for the surveillance of the surrounding area to avoid hazards such as drifting vapors from tanks, piping and sewers.

(2) Employee Training. Employees, including standby persons required by subsection (e)(1)(D), shall be trained in the operating and rescue procedures, including instructions as to the hazards they may encounter.

(d) Pre-entry. The applicable provisions of this subsection shall be implemented before entry into a confined space

(1) Lines which may convey flammable, injurious, or incapacitating substances into the space shall be disconnected, blinded, or blocked off by other positive means to prevent the development of dangerous air contamination and/or oxygen deficiency within the space. The disconnection or blind shall be so located or done in such a manner that inadvertent reconnection of the line or removal of the blind are effectively prevented.

EXCEPTION: This subsection does not apply to public utility gas distribution systems.

NOTE: This subsection does not require blocking of all laterals to sewers or storm drains. Where experience or knowledge of industrial use indicates materials resulting in dangerous air contamination may be dumped into an occupied sewer, all such laterals shall be blocked.

(2) The space shall be emptied, flushed, or otherwise purged of flammable, injurious or incapacitating substances to the extent feasible.

(3) The air shall be tested with an appropriate device or method to determine whether dangerous air contamination and/or an oxygen deficiency exists and a written record of such testing results shall be made and kept at the work site for the duration of the work. Affected employees and/or their representative shall be afforded an opportunity to review and record the testing results.

(4) Where interconnected spaces are blinded off as a unit, each space shall be tested and the results recorded, in accordance with subsection (d)(3), and the most hazardous condition so found shall govern procedures to be followed.

(5) If dangerous air contamination and/or oxygen deficiency does not exist within the space, as demonstrated by tests performed in accordance with subsection (d)(3), entry into and work within the space may proceed subject to the following provisions:

(A) Testing, in accordance with subsection (d)(3), shall be conducted with sufficient frequency to ensure that the development of dangerous air contamination and/or oxygen deficiency does not occur during the performance of any operation.

(B) If the development of dangerous air contamination and/or an oxygen deficiency is imminent, the requirements prescribed by subsection (e) shall also apply.

(6) Where the existence of dangerous air contamination and/or oxygen deficiency is demonstrated by tests performed in accordance with subsection (d)(3), existing ventilation shall be augmented by appropriate means.

(7) When additional ventilation provided in accordance with subsection (d)(6) has removed dangerous air contamination and/or oxygen deficiency as demonstrated by additional testing conducted (and recorded) in

accordance with subsection (d)(3), entry into and work within the space may proceed subject to the provisions of subsection (d)(5).

(8) No source of ignition shall be introduced until the implementation of appropriate provisions of this section have ensured that dangerous air contamination due to flammable and/or explosive substances does not exist.

(9) Whenever oxygen-consuming equipment such as salamanders, plumbers' torches or furnaces, and the like, are to be used, measures shall be taken to ensure adequate combustion air and exhaust gas venting.

(10) To the extent feasible, provision shall be made to permit ready entry and exit.

(11) Where it is not feasible to provide for ready exit from spaces equipped with automatic fire suppression systems employing harmful design concentrations of toxic or oxygen-displacing gases, or total foam flooding, such systems shall be deactivated. Where it is not practical or safe to deactivate such systems, the provisions of subsection (e) related to the use of respiratory protective equipment shall apply during entry into and work within such spaces.

(e) Confined Space Operations.

(1) Entry Into and Work Within Confined Spaces. The requirements of this subsection apply to entry into and work within a confined space whenever an atmosphere free of dangerous air contamination and/or oxygen deficiency cannot be ensured through the implementation of the applicable provisions of subsection (d), or whenever, due to the existence of an emergency, it is not feasible to ensure the removal of dangerous air contamination and/or an oxygen deficiency through the implementation of the applicable provisions of subsection (d).

(A) Tanks, vessels, or other confined spaces with side and top openings shall be entered from side openings when practicable.

NOTE: For the purposes of this Order, side openings are those within 3 1/2 feet of the bottom.

(B) Appropriate, approved respiratory protective equipment, in accordance with Section 5144, shall be provided and worn.

(C) An approved safety belt with an attached line shall be used. The free end of the line shall be secured outside the entry opening. The line shall be at least 1/2-inch diameter and 2,000-pounds test.

EXCEPTION: Where it can be shown that a safety belt and attached line would further endanger the life of the employee.

(D) At least one employee shall stand by on the outside of the confined space ready to give assistance in case of emergency. At least one additional employee who may have other duties shall be within sight or call of the standby employee(s).

1. The standby employee shall have appropriate, approved, respiratory protective equipment, including an independent source of breathing air which conforms with Section 5144(e), available for immediate use.

2. A standby employee (or employees) protected as prescribed by subsection (e)(1)(D) 1. may enter the confined space but only in case of emergency and only after alerting at least one additional employee outside of the confined space of the existence of an emergency and of the standby employee's intent to enter the confined space.

(E) When entry must be made through a top opening, the following requirements shall also apply

1. The safety belt shall be of the harness type that suspends a person in an upright position.

2. A hoisting device or other effective means shall be provided for lifting employees out of the space.

(F) Work involving the use of flame, arc, spark, or other source of ignition is prohibited within a confined space (or any adjacent space having common walls, floor, or ceiling with the confined space) which contains, or is likely to develop, dangerous air contamination due to flammable and /explosive substances.

(G) Whenever gases such as nitrogen are used to provide an inert atmosphere for preventing the ignition of flammable gases or vapors, no flame, arc, spark, or other source of ignition shall be permitted unless the oxygen concentration is maintained at less than 20 percent of the concentration which will support combustion.

1. Testing of the oxygen content shall be conducted with sufficient frequency to ensure conformance with this paragraph.

2. A written record of the results of such testing shall be made and kept at the work site for the duration of the work.

3. Affected employees and/or their representative shall be provided an opportunity to review and record the testing results.

(H) Only approved lighting and electrical equipment, in accordance with the Low-Voltage Electrical Safety Orders, shall be used in confined spaces subject to dangerous air contamination by flammable and/or explosive substances.

(I) Employees working in confined spaces which have last contained substances corrosive to the skin or substances which can be absorbed through the skin shall be provided with, and shall be required to wear, appropriate personal protective clothing or devices in accordance with Article 10.

(2) Precautions for Emergencies Involving Work in Confined Spaces.

(A) At least one person trained in first aid and cardiopulmonary resuscitation (CPR) shall be immediately available whenever the use of respiratory protective equipment is required subsection (e)(1). Standards for CPR training shall follow the principles of the American Heart Association or the American Red Cross.

(B) An effective means of communication between employees inside a confined space and a standby employee shall be provided and used whenever the provisions of subsection (e)(1) require the use of respiratory protective equipment or whenever employees inside a confined space are out of sight of the standby employee(s). All affected employees shall be trained in the use of such communication system and the system shall be tested before each use to confirm its effective operation.

§5159. Confined Space Operations. [Repealed]

Appendix A — Permit-Required Confined Space Decision Flow Chart

Appendix A: Permit Required Confined Space Decision Flow Chart

Appendix B — Procedures for Atmospheric Testing.

Atmospheric testing is required for two distinct purposes: evaluation of the hazards of the permit space and verification that acceptable entry conditions for entry into that space exist.

(1) Evaluation testing. The atmosphere of a confined space should be analyzed using equipment of sufficient sensitivity and specificity to identify and evaluate any hazardous atmospheres that may exist or arise, so that

appropriate permit entry procedures can be developed and acceptable entry conditions stipulated for that space. Evaluation and interpretation of these data, and development of the entry procedure, should be done by, or reviewed by, a technically qualified professional (e.g., Cal/OSHA consultation service, or certified industrial hygienist, registered safety engineer, certified safety professional, certified marine chemist, etc.) based on evaluation of all serious hazards.

(2) Verification testing. The atmosphere of a permit space which may contain a hazardous atmosphere should be tested for residues of all contaminants identified by evaluation testing using permit specified equipment to determine that residual concentrations at the time of testing and entry are within the range of acceptable entry conditions. Results of testing (i.e., actual concentration, etc.) should be recorded on the permit in the space provided adjacent to the stipulated acceptable entry condition.

(3) Duration of testing. Measurement of values for each atmospheric parameter should be made for at least the minimum response time of the test instrument specified by the manufacturer.

(4) Testing stratified atmospheres. When monitoring for entries involving a descent into atmospheres that may be stratified, the atmospheric envelope should be tested a distance of approximately 4 feet (1.22 m) in the direction of travel and to each side. If a sampling probe is used, the entrant's rate of progress should be slowed to accommodate the sampling speed and detector response.

(5) Order of testing. A test for oxygen is performed first because most combustible gas meters are oxygen dependent and will not provide reliable readings in an oxygen deficient atmosphere. Combustible gases are tested for next because the threat of fire or explosion is both more immediate and more life threatening, in most cases, than exposure to toxic gases and vapors. If tests for toxic gases and vapors are necessary, they are performed last.

Appendix C — Examples of Permit-required Confined Space Programs.

Example 1.

Workplace. Sewer entry.

Potential hazards. The employees could be exposed to the following:

Engulfment.

Presence of toxic gases. Equal to or more than 10 ppm hydrogen sulfide as measured as an 8-hour time weighted average. If the presence of other toxic contaminants is suspected, specific monitoring programs will be developed.

Presence of explosive flammable gases. Equal to or greater than 10% of the lower flammable limit (LFL).

Oxygen Deficiency. A concentration of oxygen in the atmosphere equal to or less than 19.5% by volume.

A. ENTRY WITHOUT PERMIT/ATTENDANT

Certification. Confined spaces may be entered without the need for a written permit or attendant provided that the space can be maintained in a safe condition for entry by mechanical ventilation alone as provided in Section 5157(c)(5). All spaces shall be considered permit-required confined spaces until the pre-entry procedures demonstrate otherwise. Any employee required or permitted to pre-check or enter an enclosed/confined space shall have successfully completed, as a minimum, the training as required by the following sections of these procedures. A written copy of operating and rescue procedures as required by these procedures shall be at the work site for the duration of the job. The Confined Space Pre-Entry Check List must be completed by the LEAD WORKER before entry into a confined space. This list verifies completion of items listed below. This check list

shall be kept at the job site for duration of the job. If circumstances dictate an interruption in the work, the permit space must be re-evaluated and a new check list must be completed.

Controls of atmospheric and engulfment hazards.

Pumps and Lines. All pumps and lines which may reasonably cause contaminants to flow into the space shall be disconnected, blinded and locked out, or effectively isolated by other means to prevent development of dangerous air contamination or engulfment. Not all laterals to sewers or storm drains require blocking. However, where experience or knowledge of industrial use indicates there is a reasonable potential for contamination of air or engulfment into a occupied sewer, then all affected laterals shall be blocked. If blocking and/or isolation requires entry into the space the provisions for entry into a permit-required confined space must be implemented.

Surveillance. The surrounding area shall be surveyed to avoid hazards such as drifting vapors from the tanks, piping, or sewers.

Testing. The atmosphere within the space will be tested to determine whether dangerous air contamination and/or oxygen deficiency exists. Detector tubes, alarm only type gas monitors and explosion meters are examples of equipment that may be used to test permit space atmospheres. Testing shall be performed by the LEAD WORKER who has successfully completed the Gas detector training for the monitors he will use. The minimum parameters to be monitored are oxygen deficiency, LFL, and hydrogen sulfide concentration. A written record of the pre-entry test results shall be made and kept at the work site for the duration of the job. The supervisor will certify in writing, based upon the results of the pre-entry testing, that all hazards have been eliminated. Affected employees shall be able to review the testing results. The most hazardous conditions shall govern when work is being performed in two adjoining, connecting spaces.

Entry Procedures. If there are no non-atmospheric hazards present and if the pre-entry tests show there is no dangerous air contamination and/or oxygen deficiency within the space and there is no reason to believe that any is likely to develop, entry into and work within may proceed. Continuous testing of the atmosphere in the immediate vicinity of the workers within the space shall be accomplished. The workers will immediately leave the permit space when any of the gas monitor alarm set points are reached as defined. Workers will not return to the area until a SUPERVISOR who has completed the gas detector training has used a direct reading gas detector to evaluate the situation and has determined that it is safe to enter.

Rescue. Arrangements for rescue services are not required where there is no attendant. See the rescue portion of section B., below, for instructions regarding rescue planning where an entry permit is required.

B. ENTRY PERMIT REQUIRED

Permits. Confined Space Entry Permit. All spaces shall be considered permit-required confined spaces until the pre-entry procedures demonstrate otherwise. Any employee required or permitted to pre-check or enter a permit-required confined space shall have successfully completed, as a minimum, the training as required by the following sections of these procedures. A written copy of operating and rescue procedures as required by these procedures shall be at the work site for the duration of the job. The Confined Space Entry Permit must be completed before approval can be given to enter a permit-required confined space. This permit verifies completion of items listed below. This permit shall be kept at the job site for the duration of the job. If circumstances cause an interruption in the work or a change in the alarm conditions for which entry was approved, a new Confined Space Entry Permit must be completed.

Control of atmospheric and engulfment hazards.

Surveillance. The surrounding area shall be surveyed to avoid hazards such as drifting vapors from tanks, piping or sewers.

Testing. The confined space atmosphere shall be tested to determine whether dangerous air contamination and/or oxygen deficiency exists. A direct reading gas monitor shall be used. Testing shall be performed by the SUPERVISOR who has successfully completed the gas detector training for the monitor he will use. The minimum parameters to be monitored are oxygen deficiency, LFL and hydrogen sulfide concentration. A written record of the pre-entry test results shall be made and kept at the work site for the duration of the job. Affected employees shall be able to review the testing results. The most hazardous conditions shall govern when work is being performed in two adjoining, connected spaces.

Space Ventilation. Mechanical ventilation systems, where applicable, shall be set at 100% outside air. Where possible, open additional manholes to increase air circulation. Use portable blowers to augment natural circulation if needed. After a suitable ventilating period, repeat the testing. Entry may not begin until the testing has demonstrated that the hazardous atmosphere has been eliminated.

Entry Procedures. The following procedure shall be observed under any of the following conditions:

- 1.) Testing demonstrates the existence of dangerous or deficient conditions and additional ventilation cannot reduce concentrations to safe levels;
- 2.) The atmosphere tests as safe but unsafe conditions can reasonably be expected to develop.
- 3.) It is not feasible to provide for ready exit from spaces equipped with automatic fire suppression systems and it is not practical or safe to deactivate such systems; or
- 4.) An emergency exists and it is not feasible to wait for pre-entry procedures to take effect.

All personnel must be trained. A self contained breathing apparatus shall be worn by any person entering the space. At least one worker shall stand by the outside of the space ready to give assistance in case of emergency. The standby worker shall have a self contained breathing apparatus available for immediate use. There shall be at least one additional worker within sight or call of the standby worker. Continuous powered communications shall be maintained between the worker within the confined space and standby personnel.

If at any time there is any questionable action or non-movement by the worker inside, a verbal check will be made. If there is no response, the worker will be moved immediately. Exception: If the worker is disabled due to falling or impact, he/she shall not be removed from the confined space unless there is immediate danger to his/her life. Local fire department rescue personnel shall be notified immediately. The standby worker may only enter the confined space in case of an emergency (wearing the self contained breathing apparatus) and only after being relieved by another worker. Safety belt or harness with attached lifeline shall be used by all workers entering the space with the free end of the line secured outside the entry opening. The standby worker shall attempt to remove a disabled worker via his lifeline before entering the space.

When practical, these spaces shall be entered through side openings— those within 3 ½ feet (1.07 m) of the bottom. When entry must be through a top opening, the safety belt shall be of the harness type that suspends a person upright and a hoisting device or similar apparatus shall be available for lifting workers out of the space.

In any situation where their use may endanger the worker, use of a hoisting device or safety belt and attached lifeline may be discontinued.

When dangerous air contamination is attributable to flammable and/or explosive substances, lighting and electrical equipment shall be Class I, Division 1 rated per National Electrical Code and no ignition sources shall be introduced into the area.

Continuous gas monitoring shall be performed during all confined space operations. If alarm conditions change adversely, entry personnel shall exit the confined space and a new confined space permit issued.

Rescue. Call the fire department services for rescue. Where immediate hazards to injured personnel are present, workers at the site shall implement emergency procedures to fit the situation.

Example 2.

Workplace. Meat and poultry rendering plants.

Cookers and dryers are either batch or continuous in their operation. Multiple batch cookers are operated in parallel. When one unit of a multiple set is shut down for repairs, means are available to isolate that unit from the others which remain in operation.

Cookers and dryers are horizontal, cylindrical vessels equipped with a center, rotating shaft and agitator paddles or discs. If the inner shell is jacketed, it is usually heated with steam at pressures up to 150 psig (1034.25 kPa). The rotating shaft assembly of the continuous cooker or dryer is also steam heated.

Potential Hazards. The recognized hazards associated with cookers and dryers are the risk that employees could be:

1. Stuck or caught by rotating agitator;
2. Engulfed in raw material or hot, recycled fat;
3. Burned by steam from leaks into the cooker/dryer steam jacket or the condenser duct system if steam valves are not properly closed and locked out;
4. Burned by contact with hot metal surfaces, such as the agitator shaft assembly, or inner shell of the cooker/dryer;
5. Heat stress caused by warm atmosphere inside cooker/dryer;
6. Slipping and falling on grease in the cooker/dryer;
7. Electrically shocked by faulty equipment taken into the cooker/dryer;
8. Burned or overcome by fire or products of combustion; or
9. Overcome by fumes generated by welding or cutting done on grease covered surfaces.

Permits. The supervisor in this case is always present at the cooker/dryer or other permit entry confined space when entry is made. The supervisor must follow the pre-entry isolation procedures described in the entry permit in preparing for entry, and ensure that the protective clothing, ventilating equipment and any other equipment required by the permit are at the entry site.

Control of hazards.

Mechanical. Lock out main power switch to agitator motor at main power panel. Affix tag to the lock to inform others that a permit entry confined space entry is in progress.

Engulfment. Close all valves in the raw material blow line. Secure each valve in its closed position using chain and lock. Attach a tag to the valve and chain warning that a permit entry confined space entry is in progress. The same procedure shall be used for securing the fat recycle valve.

Burns and heat stress. Close steam supply valves to jacket and secure with chains and tags. Insert solid blank at flange in cooker vent line to condenser manifold duct system. Vent cooker/dryer by opening access door

at discharge end and top center door to allow natural ventilation throughout the entry. If faster cooling is needed, use a portable ventilation fan to increase ventilation. Cooling water may be circulated through the jacket to reduce both outer and inner surface temperatures of cooker/dryers faster. Check air and inner surface temperatures in cooker/dryer to assure they are within acceptable limits before entering, or use proper protective clothing.

Fire and fume hazards. Careful site preparation, such as cleaning the area within 4 inches (10.16 cm) of all welding or torch cutting operations, and proper ventilation are the preferred controls. All welding and cutting operations shall be done in accordance with the requirements of California Code of Regulations, Title 8, welding standards. Proper ventilation may be achieved by local exhaust ventilation, or the use of portable ventilation fans, or a combination of the two practices.

Electrical shock. Electrical equipment used in cooker/dryers shall be in serviceable condition.

Slips and falls. Remove residual grease before entering cooker/dryer.

Attendant. The supervisor shall be the attendant for employees entering cooker/dryers.

Permit. The permit shall specify how isolation shall be done and any other preparations needed before making entry. This is especially important in parallel arrangements of cooker/dryers so that the entire operation need not be shut down to allow safe entry into one unit.

Rescue. When necessary, the attendant shall call the fire department as previously arranged.

Example 3.

Workplace. Workplaces where tank cars, trucks, and trailers, dry bulk tanks and trailers, railroad tank cars, and similar portable tanks are fabricated or serviced.

A. During fabrication. These tanks and dry-bulk carriers are entered repeatedly throughout the fabrication process. These products are not configured identically, but the manufacturing processes by which they are made are very similar.

Sources of hazards. In addition to the mechanical hazards arising from the risks that an entrant would be injured due to contact with components of the tank or the tools being used, there is also the risk that a worker could be injured by breathing fumes from welding materials or mists or vapors from materials used to coat the tank interior. In addition, many of these vapors and mists are flammable, so the failure to properly ventilate a tank could lead to a fire or explosion.

Control of hazards.

Welding. Local exhaust ventilation shall be used to remove welding fumes once the tank or carrier is completed to the point that workers may enter and exit only through a manhole. (Follow the requirements of California Code of Regulations, Title 8, welding standards at all times.) Welding gas tanks may never be brought into a tank or carrier that is a permit entry confined space.

Application of interior coatings/linings. Atmospheric hazards shall be controlled by forced air ventilation sufficient to keep the atmospheric concentration of flammable materials below 10% of the lower flammable limit (LFL) (or lower explosive limit (LEL), whichever term is used locally). The appropriate respirators are provided and shall be used in addition to providing forced ventilation if the forced ventilation does not maintain acceptable respiratory conditions.

Permits. Because of the repetitive nature of the entries in these operations, an "Area Entry Permit" will be issued for a 1 month period to cover those production areas where tanks are fabricated to the point that entry and exit are made using manholes.

Authorization. Only the area supervisor may authorize an employee to enter a tank within the permit area. The area supervisor must determine that conditions in the tank trailer, dry bulk trailer or truck, etc. meet permit requirements before authorizing entry.

Attendant. The area supervisor shall designate an employee to maintain communication by employer specified means with employees working in tanks to ensure their safety. The attendant may not enter any permit entry confined space to rescue an entrant or for any other reason, unless authorized by the rescue procedure, and even then, only after calling the rescue team and being relieved by as attendant by another worker.

Communications and observation. Communications between attendant and entrant(s) shall be maintained throughout entry. Methods of communication that may be specified by the permit include voice, voice powered radio, tapping or rapping codes on tank walls, signalling tugs on a rope, and the attendant's observation that work activities such as chipping, grinding, welding, spraying, etc., which require deliberate operator control continue normally. These activities often generate so much noise that the necessary hearing protection makes communication by voice difficult.

Rescue procedures. Acceptable rescue procedures include entry by a team of employee-rescuers, use of public emergency services, and procedures for breaching the tank. The area permit specifies which procedures are available, but the area supervisor makes the final decision based on circumstances. (Certain injuries may make it necessary to breach the tank to remove a person rather than risk additional injury by removal through an existing manhole. However, the supervisor must ensure that no breaching procedure used for rescue would violate terms of the entry permit. For instance, if the tank must be breached by cutting with a torch, the tank surfaces to be cut must be free of volatile or combustible coatings within 4 inches (10.16 cm) of the cutting line and the atmosphere within the tank must be below the LFL.)

Retrieval line and harnesses. The retrieval lines and harnesses generally required under this standard are usually impractical for use in tanks because the internal configuration of the tanks and their interior baffles and other structures would prevent rescuers from hauling out injured entrants. However, unless the rescue procedure calls for breaching the tank for rescue, the rescue team shall be trained in the use of retrieval lines and harnesses for removing injured employees through manholes.

B. Repair or service of "used" tanks and bulk trailers.

Sources of hazards. In addition to facing the potential hazards encountered in fabrication or manufacturing, tanks or trailers which have been in service may contain residues of dangerous materials, whether left over from the transportation of hazardous cargoes or generated by chemical or bacterial action on residues of non-hazardous cargoes.

Control of atmospheric hazards. A "used" tank shall be brought into areas where tank entry is authorized only after the tank has been emptied, cleansed (without employee entry) of any residues, and purged of any potential atmospheric hazards.

Welding. In addition to tank cleaning for control of atmospheric hazards, coating and surface materials shall be removed 4 inches (10.16 cm) or more from any surface area where welding or other torch work will be done and care taken that the atmosphere within the tank remains well below the LFL. (Follow the requirements of California Code of Regulations, Title 8, welding standards, at all times.)

Permits. An entry permit valid for up to 1 year shall be issued prior to authorization of entry into used tank trailers, dry bulk trailers or trucks. In addition to the pre-entry cleaning requirement, this permit shall require the employee safeguards specified for new tank fabrication or construction permit areas.

Authorization. Only the area supervisor may authorize an employee to enter a tank trailer, dry bulk trailer or truck within the permit area. The area supervisor must determine that the entry permit requirements have been met before authorizing entry.