



ENVIRONMENTAL BIO-SYSTEMS, INC.

Innovative Solutions for a Better Environment

SITE SAFETY PLAN
prepared by
ENVIRONMENTAL BIO-SYSTEMS, INC.
for
JAMES PHILLIPSEN
for the
SOIL REMEDIATION ACTIONS AND
ELEMENTARY GROUNDWATER INVESTIGATION
at the
James Phillipson Property
1357 High Street
Alameda, California

1. GENERAL INFORMATION

This Site Safety Plan describes basic safety requirements for soil remediation actions and the elementary groundwater investigation at the James Phillipson property located at 1357 High Street in Alameda, California. The location of the site is shown on Figure 1, Location Map. The provisions of this plan apply to the employees of the Environmental Bio-Systems and its subcontractors working on this phase of the project. The subcontractors may elect to increase the safety requirements for their work with the prior concurrence of Environmental Bio-Systems, Inc., as described and accepted in writing.

This Site Safety Plan describes the expected potential hazards that may be encountered on site. Field work is expected to begin on December 6, 1990. If the site, the working condition, or the scope of work for this phase of the project change before or during the field work, this Site Safety Plan will be revised in keeping with these changes by Environmental Bio-Systems.

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2. SCOPE OF WORK

The scope of work for this phase of the project is described in the Work Plan: Soil Remediation Actions and Elementary Groundwater Investigation:: James Phillipsen Property, 1357 High Street, Alameda, California, prepared by Environmental Bio-Systems and dated May 7, 1990. Briefly, the field work will include the following tasks:

1. Removal and segregation of contaminated soil from areas adjacent to the former tank pit.
2. Backfilling of the excavation with uncontaminated soil.
3. Aeration or biological remediation of contaminated soil on site.
4. Installation and development of three ground-water monitoring wells and sampling of water from them.

3. PREPARATION FOR FIELD WORK

Authorities including state and local regulatory agencies and any private entities will be notified of the intended work. Permission and permits to perform the work will be obtained as necessary. Advisement will include notifying these parties of our intent to perform the field work with this Site Safety Plan in place. A locating service will be notified at least 48 hours in advance of the field work to map out or field mark locations of utilities on public property on or near the proposed site of underground work. The client has been requested to provide such information regarding utilities or other underground facilities on private property. Environmental Bio-Systems assumes no responsibility for utilities not so located. The first 5 feet of each boring will be hand-augered before any drilling equipment is operated. The extent of anticipated excavation will be clearly marked, soil stockpiling areas will be chosen in advance of excavation. Staging and decontamination areas will also be anticipated.

4. RESPONSIBILITY FOR PROJECT SAFETY

The project Manager for Environmental Bio-Systems, Inc., will be oversee project safety measures on site. As the environmental contractor, Management of Environmental Bio-Systems, Inc., is responsible for implementing this Site Safety Plan, for providing a copy of this Plan to subcontractors and other project participants as needed, and for advising site workers on health and safety matters. The Project Manager has the authority to suspend or modify work practices if site safety conditions change or to dismiss subcontractors whose conduct does not meet the requirements specified in this Plan.

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The Project Manager will also convey information in this Plan to the Environmental Bio-Systems personnel assigned to the project and to the senior representative of each subcontractor on the project. The Project Manager will address the following safety procedures on site:

- o Provisions of the Site Safety Plan, Company health and safety policies, and specific procedures.
- o Safety supplies and equipment inventory on site.
- o Daily safety meetings and advising workers regarding hazards.
- o Site control, decontamination, and contamination-reduction procedures.
- o Reporting accidents and incidents.

5. DESCRIPTION OF ANTICIPATED CONTAMINANTS

The contaminants expected to be encountered on site are gasoline and its hydrocarbon constituents. The anticipated contaminants and their exposure standards are listed in Table 1. The potential levels of exposure should not reach the permissible exposure limits (PEL) or the threshold limit values (TLV). The potential exposure pathways are inhalation and skin contact. Protective clothing specified in this Plan will be mandatory for field personnel. In addition, respirators should be within easy reach in case odors reach irritating levels or irritation of the respiratory tract occurs.

The anticipated contaminants are described briefly below. Information regarding the physical characteristics, incompatibilities, toxic effects, routes of entry, and target organs has been summarized from the NIOSH Pocket Guide to Chemical Hazards

Benzene

Benzene is colorless, aromatic liquid that may create an explosion hazard. It is incompatible with strong oxidizers, chlorine, and bromine with iron. Benzene is irritating to the eyes, nose, and respiratory system. Prolonged exposure may result in giddiness, headache, nausea, staggering gait, fatigue, bone marrow depression, or abdominal pain. Routes of entry include inhalation, absorption, ingestion, and skin or eye contact. Its targets are blood, the central nervous system, skin, bone marrow, eyes, and respiratory system. Benzene is carcinogenic.

Ethylbenzene

Ethylbenzene is a colorless aromatic liquid that may create an explosion hazard. It is incompatible with strong oxidizers and irritates the eyes and mucous membranes. Prolonged exposure may result in headache, dermatitis, narcosis, or coma. Routes of entry include inhalation, ingestion, and skin or eye contact. The target organs are the eyes, upper respiratory system, skin, and the central nervous system.

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Toluene

Toluene is a colorless, aromatic liquid that may create an explosion hazard. It is incompatible with strong oxidizers. Prolonged exposure may result in fatigue, confusion, euphoria, dizziness, headache, dilation of pupils, eye tearing, insomnia, dermatitis, or photophobia. Routes of entry are inhalation, absorption, ingestion, and skin or eye contact. The target organs are the central nervous system, liver, kidneys, and skin.

Xylene Isomers

Xylene is a colorless, aromatic liquid that may create an explosion hazard. It is incompatible with strong oxidizers and irritates the eyes, nose, and throat. Prolonged exposure may result in dizziness, excitement, drowsiness, staggering gait, corneal vacuolization, vomiting, abdominal pain, or dermatitis. Routes of entry are inhalation, absorption, ingestion, and skin or eye contact. Its targets are the central nervous system, eyes, gastrointestinal tract, blood, liver, kidneys, and skin.

6. MINIMUM SAFETY REQUIREMENTS FOR FIELD WORK

The following minimum safety requirements must be observed during field work:

1. Eating, drinking, and smoking will be restricted to a designated area.
2. Workers will wash hands and faces before eating, drinking, or smoking in the designated area.
3. The Project Manager will take precautions to avoid the following safety hazards: wet or oily surfaces that may cause slipping, falling objects including equipment and tools, falls from heights, tripping hazards, and faulty or inadequate protective equipment and tools.
4. Dust, dirt, liquids or other potentially contaminated materials should not be removed from clothing or equipment by blowing or shaking.
5. Gross decontamination and removal of all personal protective equipment will be performed before leaving the site. Contaminated clothing will be removed and collected in a drum for disposal.
6. Workers should inform the Project Manager and each other of symptoms indicating toxic materials, excessive heat, or other conditions that may be endangering health and safety. Such symptoms include dizziness, headaches, blurred vision, nausea, cramps, irritations (of skin, eyes, or respiratory tract), discoloration of skin, behavioral changes, loss of motor coordination, or changes in salivation, pupillary response, or speech.

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7. PROTECTIVE EQUIPMENT REQUIRED

Field personnel and visitors who enter the designated work areas are required to wear the following protective clothing and equipment: hard hats, steel-toed boots, and safety glasses.

The following equipment must be worn by workers: hard hats, steel toed boots of neoprene or polyvinyl chloride (or chemically resistant over boots if leather steel-toed boots are worn), safety glasses, gloves, (neoprene, nitrile or polyvinyl chloride), and standard Tyvek coveralls during any activity with a splash hazard. As noted above, respirators with appropriate cartridges must be readily available and useable in case site conditions require their use. Subcontractors are responsible for providing the required safety equipment for their employees.

8. RESPIRATORY PROTECTION

Employees are required to have a physical at the expense of Environmental Bio-Systems before respirators are issued to them. As part of their safety training, they are given information on proper methods of wearing and caring for their respirators. Training topics include the following: applicable OSHA regulations 1910.134 and 1910.120, selection of respiratory equipment that is appropriate to the respiratory hazards that may be encountered at the work site, proper fitting of respirators, functions and limitations of respirators, and methods of cleaning, disinfecting, inspecting, maintaining and storing respirators.

Respirators must not be used when atmospheres are, or may become, immediately dangerous to life or health or in atmospheres where the identity or concentration of contaminants is unknown. Respirators may not be used in atmospheres containing less than 19.5 percent oxygen.

Cartridges or canisters for respirators are selected and supplied to employees by Environmental Bio-Systems. Failure to choose or use a respirator equipped with cartridges or filters suitable for the contaminants on site may result in little or no protection against the contaminated atmosphere. Cartridges designed and specified for protection against specified gases and vapors are not appropriate for protection against airborne particles or other gases or vapors beyond the scope of that type of cartridge. The Site Safety Plan specifies the contaminants to be encountered, and the Project Manager will provide the cartridges, canisters or filters appropriate to these contaminants if use of respirators may be necessary.

Conditions of use of respirators include but are not limited to the following:

- The concentration of contaminants in the atmosphere
- Temperature and humidity of the ambient atmosphere
- Any previous use of the cartridges and filters
- The time since removing the cartridges or filters from their protective packaging

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- The level of physical activity of the wearer
- Other characteristics of the wearer

The respirator may have failed, cartridges may be inappropriate, or abnormal conditions may exist if the wearer observed any of the following conditions:

- Chemicals can be smelled or tasted
- Eyes, nose, or throat become irritated
- Breathing is difficult
- The air being inhaled becomes uncomfortably warm
- Headaches, dizziness, cramps, nausea, or blurred vision occur
- Skin becomes discolored
- Motor coordination, personality, or demeanor change
- Speech ability changes
- Excessive salivation is experienced
- Others observe changes in pupillary response of the wearer

If any of the above conditions are noted, the wearer of the respirator must leave the work zone for fresh air and advise the Project Manager immediately of the incident. The project Manager will reevaluate safety conditions on site.

9. SITE SAFETY MEETING

Field work each day will begin with a project-specific site safety meeting. Field personnel from Environmental Bio-Systems and its subcontractors will attend the meeting to be briefed on the provisions of this Site Safety, to review the project tasks, and to discuss any safety issues or questions. The meeting will be led by the Project Manager. In addition fit-testing of respiratory protective devices will be conducted as part of the safety orientation meeting when the use of a respirator may be required. On safety meetings are essential to alerting personnel to the hazards associated with the expected contaminants.

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10. WORK ZONES AND BARRICADES

Exclusion zones will be designated around borings and other excavations. Only essential workers equipped with the specified safety equipment will be allowed in these exclusion zones. Borings will be drilled at safe distances from the utilities, as located by the service for the public property and the Client for private property.

Cones, wooden barricades, or a suitable alternative will be used to deny public access to work areas. If for any reason the safety of the public (such as a motorist or pedestrian) may be endangered, work will cease until the situation is remedied. Cones and warning signs will be used when necessary to redirect motorists or pedestrians and in keeping with any permit requirements.

11. DECONTAMINATION

Gross decontamination will be done on site at the conclusion of work including work breaks, tasks or use of particular equipment, and the work day. Gross decontamination will include washing contaminated equipment with a trisodium phosphate solution. Steam cleaning is an acceptable alternative for heavy equipment and tools. Disposal on site in drums is also an acceptable alternative for items such as gloves and Tyvek suits.

12. EMERGENCY RESPONSE PROCEDURES

If emergency releases or accidents such as fires, explosions, or property damage occur, the Management of Environmental Bio-Systems must be notified immediately. If necessary, local fire or response agencies should be called, and the Client should be advised as soon as time permits. If physical injury occurs, first aid should be administered and the injured worker should be transported to the nearest hospital or emergency medical clinic for treatment. The location of the hospital nearest to the subject site is shown on the Location Map, Figure 1. A physician's attention is required regardless of the severity of the injury.

If personnel are exposed to hazardous materials on site, typical responses should include the following:

For skin or eye contact, wash and rinse affected area(s) thoroughly with copious amounts of soap and water, then provide appropriate medical attention. Eyes and skin should be rinsed for a minimum of 15 minutes after chemical contamination.

If inhalation occurs, move the person to fresh air, decontaminate external areas, and transport to the hospital.

If ingestion occurs, decontaminate external areas and transport the worker to the hospital.

If puncture wounds or lacerations occur, decontaminate external areas and transport the worker to the hospital.

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13. EMERGENCY INFORMATION

- Fire and police 911
- Ambulance 911
- Alameda hospital (415) 537-4337

2070 Clinton Avenue
Alameda, ca

Directions to hospital: Go southwest on High Street to Encinal Avenue. Turn right and go northwest to Park Street. Turn left on Park Street and go three blocks to Clinton Avenue. Turn right on Clinton Avenue. Go approximately three blocks northwest on Clinton. The Alameda Hospital will be on the left side of the street at the intersection of Clinton and Willow Street. Distance is approximately 1 mile.

- Environmental Bio-Systems, Inc., (415) 429-9988
- Tim Babcock, car telephone (415) 265-1736
- Tim Babcock, pager (415) 745-2145
- Poison Control Center (800) 523-2222
- CHEMTREC (800) 424-9300

Note: Only call CHEMTREC if no other source of emergency information can be reached. CHEMTREC stands for Chemical Transportation Emergency Center, a public service of the Chemical Manufacturer's Association. CHEMTREC can usually provide hazard information, warnings, and guidance when given the identification number or the name of the product and the nature of the problem. CHEMTREC can also contact the appropriate experts.

14. LIMITATIONS

This Site Safety Plan was developed in accordance with generally accepted standards of current safety practice in the State of California. The terms of this Plan should not be considered valid after 1 year because of the changing regulations in environmental and safety practice. Environmental Bio-Systems, Inc., is not able to eliminate the risks associated with environmental and hazardous waste or toxic sites. No guarantees or warrants, express or implied, are provided with this Plan.

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This Site Safety Plan has been reviewed by the following persons:

Environmental Bio-Systems, Inc.
Project
Manager: _____

Environmental Bio-Systems, Inc.
Manager: _____

Others: _____

This Site Safety Plan may be amended or modified in writing. Any amendments or modifications are attached and are listed below. These items have also been reviewed and approved by the personnel named above.

Attached Amendments or Modifications: None as of December 3, 1990.

TABLE 1
 EXPOSURE LIMITS OF ANTICIPATED CHEMICAL CONTAMINANTS
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Contaminant	PEL	EL	ED	CL	TWA	STEL
Benzene [skin] & [carc]	1*	---	-----	---	10*	5*
Ethylbenzene	100*	---	-----	---	100*	125*
Gasoline	300*	---	-----	---	300*	500*
Toluene [skin]	100*	200*	10 min per 8 hrs	500*	100*	150*
Xylene [skin]	100*	200*	30 min per 8 hrs	300*	100*	150*

- PEL - permissible exposure limit: 8-hour, time-weighted average, California Occupational Safety and Health Administration Standard (CAL-OSHA)
- EL - excursion limit: maximum concentration of an airborne contaminant to which an employee may be exposed without regard to duration provided the 8-hour time-weighted average for PEL is not exceeded (CAL-OSHA)
- ED - excursion duration: maximum time period permitted for an exposure above the excursion limit but not exceeding the ceiling limit (CAL-OSHA)
- CL - ceiling limit: maximum concentration of airborne contaminant which employees may be exposed permitted (CAL-OSHA)
- TWA - time-weighted average: 8-hour, [(same as threshold limit value (TLV)], American Conference of Governmental Industrial Hygienists (ACGIH)
- STEL - short-term exposure limit: 15-minute time-weighted average (ACGIH)
- * - parts of gas or vapor per million parts air
- [carc] - substance identified as a suspected or confirmed carcinogen
- [skin] - substance may be absorbed into the bloodstream through the skin, mucous membranes, or eyes
- Federal OSHA benzene limits given for PEL and STEL; STEL has a 50-minute duration limit
- Federal OSHA gasoline limit given for PEL; STEL is the same for FED-OSHA and ACGIH