



June 22, 2009

**644.014.01.001**

Department of Toxic Substances Control  
700 Heinz Avenue, Suite 200  
Berkeley, California 94710

Attention: Ms. Lynn Nakashima

**WORKPLAN FOR EVALUATION OF PRE-CONSTRUCTION CONDITIONS IN SOIL  
MEADE BY-PASS ROADWAY  
RICHMOND, CALIFORNIA**

Dear Ms. Nakashima:

PES Environmental, Inc. (PES) is pleased to present this Workplan For Evaluation of Pre-Construction Conditions in Soil (Workplan) beneath the proposed location of the temporary Meade By-Pass Roadway in Richmond, California (subject property or Site) (Plate 1). This Workplan has been prepared by PES on behalf of the Richmond Community Redevelopment Agency (Agency). PES understands the temporary roadway will be located along an inactive railroad spur and construction is tentatively scheduled to start in the spring of 2009.

The work scope described below consists of activities consistent with the scope of work discussed with representatives of your Agency, PES, University of California, Berkeley (UC Berkeley), Richmond Field Station (RFS), the Richmond Community Redevelopment Agency, and consultants to UC Berkeley during a meeting at the Richmond Field Station on September 23, 2008.

**BACKGROUND INFORMATION**

As currently planned, the majority of the by-pass road will be constructed on RFS property owned by UC Berkeley. Properties owned by the City of Richmond and Union Pacific Railroad are also located within the area of the proposed roadway. However, PES understands that under an order issued by the California Department of Toxic Substances Control (DTSC) for the RFS, sampling is required to be conducted on the portion of the project located on RFS property prior to new construction.

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Historically, a portion of the area was previously occupied by a Pacific Gas & Electric (PG&E) transformer manufacturing plant, as shown in Figure 9, which is presented in Appendix A. PES' review of reports prepared by others indicate that surface soil samples from 0 to 0.5 feet below ground surface (bgs) were collected on the UC Berkeley RFS, City of Richmond, and Union Pacific Railroad properties in the vicinity of the proposed temporary by-pass roadway in July 2006 and analyzed for polychlorinated biphenyls (PCBs). The locations of the surface soil samples are shown in Plate 2 and Figure 17 (Appendix A). As summarized in Tables D-14 and D-17 (Appendix A), total PCBs were detected in sample PCB16 at a concentration of 0.034 milligrams per kilogram (mg/Kg), PCB19 at 0.028 mg/kg, PCB11 at 0.011 mg/Kg, and PCB14 at 0.016 mg/Kg. PCBs were not detected at or above the respective laboratory reporting limit in any other samples collected in the vicinity of the proposed temporary by-pass roadway. No constituents other than PCBs were analyzed.

In accordance with DTSC sampling requirements, the scope of work proposed herein will provide additional assessment of metals, PCBs, volatile organic compounds (VOCs), semi-volatile organic compounds (SVOCs), pesticides and herbicides, and total petroleum hydrocarbons quantified as motor oil (TPHmo) in underlying soil in the vicinity of the proposed temporary by-pass roadway on the RFS property owned by UC Berkeley.

## **PROPOSED SCOPE OF WORK**

The scope of work for the pre-construction site evaluation includes the following activities: (1) field preparation activities; (2) collect and analyze soil samples; and (3) project management and reporting. These tasks are described below.

### **Field Preparation Activities**

All work activities will be conducted in accordance with the Site-specific Health & Safety Plan. The Health and Safety Plan will comply with applicable federal and California Occupational Safety and Health Administration (OSHA) guidelines. A copy of the Health & Safety Plan is presented in Appendix B. Once the acceptable sampling locations are identified, PES will contract a private underground utility locating service to conduct a subsurface electromagnetic survey to clear the proposed sampling locations of subsurface utilities. Underground Service Alert will also be contacted to schedule visits by public and private utility companies. Where appropriate, PES will obtain boring permits from the Contra Costa Environmental Health Division (CCEHD), the local permitting agency for subsurface investigations.

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### **Soil Matrix Sampling**

A total of six borings will be sampled during this investigation. Proposed sample locations are shown in Plate 2. As agreed upon in the September 28, 2008 meeting, four borings will be advanced at: (1) two locations beneath the alignment of the future roadway; and (2) at two additional locations at the approximate toe of the slope adjacent to the future roadway. Additionally, two additional sampling locations will be sampled, as follows: (1) one sample collected along the northern berm alignment (south of the railroad tracks) along the northern by-pass alignment; and (2) between previous sample locations PCB11 and PCB13. Surface soil sampling (0 to 6 inches bgs) will be conducted at all sample locations.

Soil matrix samples will be collected for chemical analysis at each boring location at depth intervals of 0 to 6 inches bgs, 2.5 to 3 feet bgs and 7 to 10 feet bgs. Samples will be submitted for analysis as follows: (1) California Title 22 metals by U.S. Environmental Protection Agency (EPA) Method 6010B/7400; (2) PCBs by U.S. EPA Method 8082A; (3) VOCs by U.S. EPA Method 8260B (non-surface soil samples only); (4) SVOCs by U.S. EPA Method 8270C; (5) pesticides and herbicides by U.S. EPA Method 8081A; and (6) TPHmo by U.S. EPA Method 8015M using silica gel cleanup.

Borehole drilling and sampling services will be provided by a licensed contractor possessing a valid C-57 water well contractor's license issued by the State of California, and in accordance with California Department of Water Resource Water Well Standards (Bulletin 74-90). The sampling will be conducted under the supervision of a California-registered geologist or engineer. The estimated depth of each soil boring is approximately 10 feet bgs.

The borings will be advanced utilizing a limited-access track-mounted direct-push drilling rig. A PES geologist or engineer will observe the borehole drilling and will prepare a lithologic log of the soil borings using the Unified Soil Classification System. Soil samples will be field screened for VOCs in the sample headspace using a photoionization detector (PID). The PID readings will be recorded on the soil boring log. Soil sampling depths may be modified based on the results of field screening, observations of changes in lithology, or visual or olfactory indications of VOCs.

Continuous soil cores will be collected using a dual-tube soil sampling system by driving a 4-foot long by 2-inch outside-diameter open-tube sampler into undisturbed soil. The open-tube sampler will be lined with one 4-foot long, clear acetate sample sleeve. Soil samples submitted for VOC analysis will be collected in accordance with U.S. EPA Method 5035, using a sampler device made of an inert composite polymer designed to collect, store and deliver soil in a sealed, headspace-free state. A minimum of three samplers will be collected at each interval selected to provide the laboratory with two samplers for low-level analysis and one sampler for high-level analysis. Soil samples collected for

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non-volatile analyses will be collected by cutting the acetate sample sleeve at the appropriate depths, sealing the ends of the sleeve with Teflon tape, and securing the ends of the sleeve with plastic end caps to prevent contamination and/or moisture loss.

Following soil sample collection, the containers will be labeled for identification and immediately placed in a chilled, thermally insulated cooler containing ice or blue ice. The cooler containing the samples will then be delivered under chain-of-custody protocol to a State-certified laboratory. Samples will be analyzed under a standard one-week turnaround time.

### **Equipment Decontamination**

To minimize the potential for cross-contamination between sampling locations, down-hole drilling equipment and soil and groundwater sampling equipment will be thoroughly cleaned prior to initiating work and between each sampling location. Soil sampling equipment will be washed in a dilute Alconox solution, rinsed with potable water, and final rinsed with distilled water between each sampling location. Direct-push drilling equipment will be pre-cleaned or decontaminated with a high-pressure hot water wash between sampling locations. Soil cuttings and decontamination fluids will be temporarily stored on-site in Department of Transportation-approved 55-gallon drums pending characterization and proper off-site disposal. Upon completion of sampling activities, each borehole will be grouted to the surface with a bentonite or cement grout in accordance with CCEHD requirements.

### **Handling, Storage, and Disposal of Investigation-Derived Wastes**

Decontamination rinsate and waste soil generated on behalf of the Agency during the investigation will be contained in secured and labeled 55-gallon steel drums and temporarily stored until proper off-site management in accordance with applicable State and Federal laws can be arranged. Investigation derived waste (IDW) generated from the sampling conducted on the City of Richmond-owned property will be segregated and stored separately. IDW will be temporarily stored on the concrete pad adjacent to Building 120 (Figure 5 in Appendix A) within a locked and gated compound. For waste characterization purposes, representative samples of soil containerized in the steel drums will be collected. Decontamination rinsate will be analyzed for parameters detected in the soil matrix samples. These materials will be managed (disposed or recycled) at an appropriate offsite facility based on the results of the laboratory analytical results of samples collected for characterization purposes. All IDW generated from sampling and decontamination activities will be properly disposed within 30 days of the generation date. Classification, transportation and disposal of IDW will be coordinated between the Agency, UC Berkeley and DTSC representatives.

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### **Imported Fill Material**

PES understands that imported fill material will be required to construct the Meade By-Pass Roadway. PES further understands that the specific volume of fill material has not been determined at this time. To assess whether proposed imported materials are suitable, the following procedures will be followed after the project has been formally approved by the Richmond City Council, and the volume, types and source of required fill material have been determined. Fill materials to be utilized at the Site will be selected and tested in accordance with the DTSC *Information Advisory, Clean Imported Fill Material, October 2001* (DTSC Advisory). Source areas for clean fill materials should be sampled and analyzed in accordance with the DTSC Advisory on the basis of the projected volume of fill material to be utilized, once determined. DTSC recommends appropriate selection of the fill source area and sampling for specific analytes based on the source area location (e.g., fill from a source area near an existing highway should be sampled for lead and polynuclear aromatic hydrocarbons). To minimize the potential for use of contaminated fill, the fill source area must be documented. Proper documentation should include detailed information regarding the former land use, previous environmental site assessments and findings, and the results of any testing performed. According to the DTSC Advisory, if such documentation is not available or is inadequate, samples of the fill material should be chemically analyzed for analytes based on knowledge of the prior land use and source area location.

Should fill sampling be required, the recommended sampling frequency will be based on either: (1) the area of the individual borrow area; or (2) the volume of the borrow area stockpiles (see DTSC Advisory for recommended sampling frequencies). The samples will be collected, analyzed, and evaluated prior to delivery of the imported fill material to the receiving site. Composite sampling may, or may not, be appropriate depending on the borrow area homogeneity; however, composite sampling is not acceptable for volatile or semivolatile organic compounds.

### **SCHEDULE**

The tentative schedule for implementation of the proposed scope of work is as follows:

- Within two weeks following DTSC approval of this Work Plan: (1) the application for the soil boring permits will be submitted; and (2) subcontractor services will be retained and scheduled for proposed soil matrix sampling activities;
- Pending approval of the above-described permits and assuming subcontractor availability, the soil matrix sampling activities should be completed within 45 days following DTSC approval of this Work Plan; and

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- A description of the methods and procedures of the soil matrix sampling activities will be presented in a report along with the results of these sampling activities. The report will also provide lithologic logs, tabulated data, illustrations, laboratory reports, and recommendations, as appropriate. The report will be submitted four weeks after receipt of laboratory analytical reports.

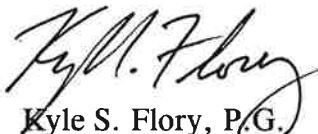
If you have any questions or require additional information, please call Kyle Flory at (415) 899-1600. PES is pleased to have the opportunity to submit this proposal and we look forward to working with you.

Very truly yours,

PES ENVIRONMENTAL, INC.



Chris Baldassari  
Project Geologist



Kyle S. Flory, P.G.  
Principal Geologist



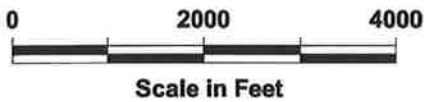
Attachments: Plate 1 – Site Location Map  
Plate 2 – Proposed Soil Sampling Locations

Appendix A – Pertinent Figures and Tables from Environmental Reports  
Prepared by Others

Appendix B – Health & Safety Plan

cc: Alan Wolken, Richmond Community Redevelopment Agency  
Jim Branch, Richmond Community Redevelopment Agency  
J. Kevin Hufferd, UC Berkeley  
Gregory J. Haet, UC Berkeley

**PLATES**



Google Earth aerial photo dated June 2007



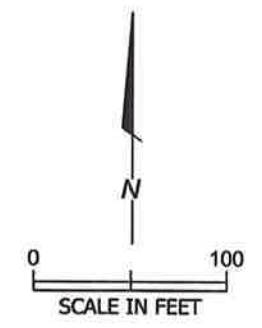
**Site Location Map**  
 Meade By-Pass, Pre-Construction Evaluation  
 Richmond, California

PLATE  
**1**





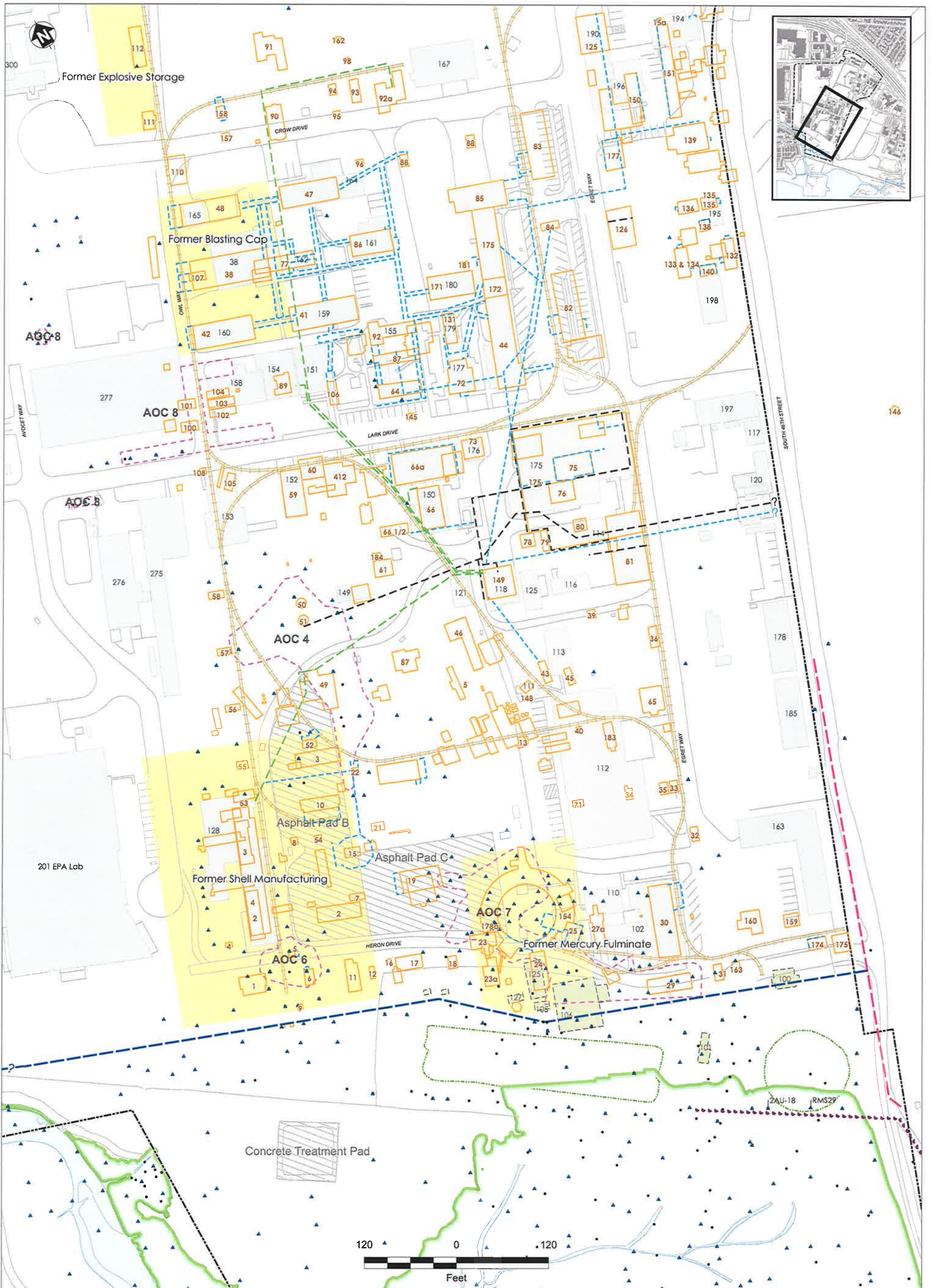
- Explanation**
- Approximate Property Boundary
  - Proposed Pre-Construction Soil Boring Location
  - PCB16** Approximate Location of Previous Surface Soil Sample (July 2006)
  - Sloped and/or Filled Sidewall of Proposed Roadbed
  - Proposed Temporary Roadway
  - IDW** Investigation Derived Waste



Google Earth aerial photo dated June 2007

**APPENDIX A**

**PERTINENT FIGURES AND TABLES FROM ENVIRONMENTAL REPORTS  
PREPARED BY OTHERS**



- AOC Boundaries
- Existing Building
- Removed or Relocated Building (RFS)
- Former California Cap Company Operations (1880s - 1948)
- Former California Cap Company Facilities/Buildings
- Former California Cap Company Tramway
- Former Pond
- Marsh Boundary
- Treatment Pad
- ▲ Existing Soil/Sediment Sampling Location
- Removed Soil/Sediment Sampling Location

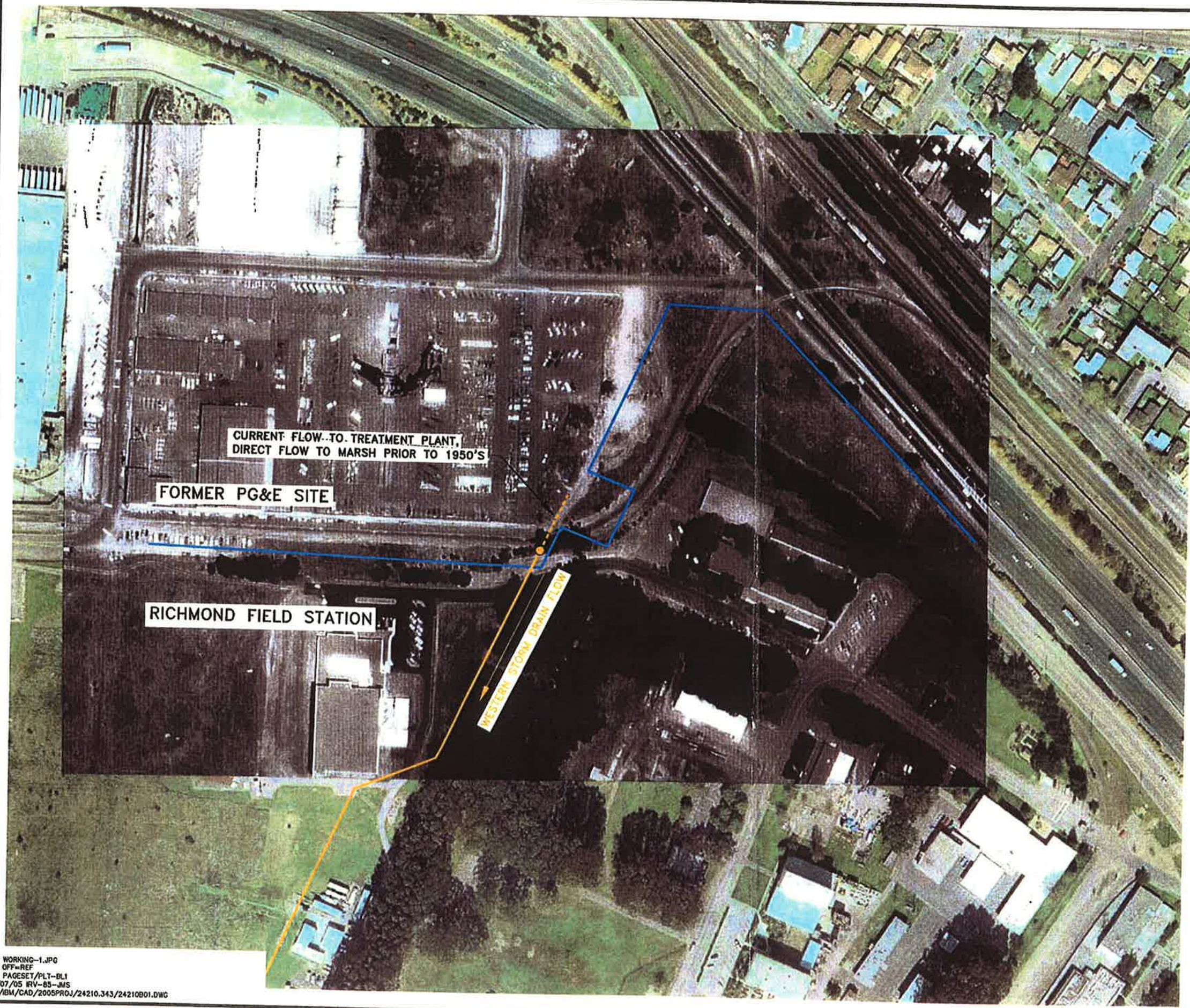
- Property Boundary
- Surface Water
- Roads and Other Landscape Features
- Biologically Active Permeable Barrier Wall
- Former Seawall (Approximate)
- Slurry Wall
- Former California Cap Company Utilities:
- Gas Line
- Fuel Line
- Hydraulic Line

Notes:  
 1. Some locations are approximate.  
 2. Former California Cap Company facility information is based on Sanborn maps from 1930 and 1941 and an earlier undated map signed by "J. Geo. Smith, C.E., Emeryville."  
 AOC Area of concern  
 RFS Richmond Field Station



**Richmond Field Station**  
**University of California, Berkeley**

**FIGURE 5**  
**LOCATION OF CURRENT AND**  
**FORMER FACILITIES IN THE**  
**CENTRAL PORTION OF RFS**  
 Current Conditions Report

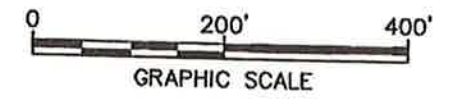


**LEGEND:**

- NORTHERN PROPERTY BOUNDARY
- WESTERN STORM DRAIN

**NOTE:**

HISTORICAL BLACK AND WHITE AERIAL PHOTO DATED 6/12/83.



UNIVERSITY OF CALIFORNIA, BERKELEY  
RICHMOND FIELD STATION  
SUMMARY OF PCB RESULTS

**FORMER PG&E SITE**



FIGURE  
**9**

X: WORKING-1.JPG  
L: OFF-REF  
P: PAGESET/PLT-BL1  
7/07/05 IRV-85-JMS  
F:/BM/CAD/2005PROJ/24210.343/24210B01.DWG



**FIGURE 17**  
**SOIL AND SEDIMENT**  
**SAMPLING LOCATIONS**  
**IN THE NORTHERN PORTION OF RFS**  
 Current Conditions Report

**TABLE D-14  
ANALYTICAL RESULT WITH SCREENING FOR PCBs IN SOIL AND SEDIMENT  
UPLAND AREA  
RICHMOND FIELD STATION**

Location ID	Depth (Feet)	Date Collected	Total PCBs (mg/kg)	Aroclor-1016 (mg/kg)	Aroclor-1221 (mg/kg)	Aroclor-1232 (mg/kg)	Aroclor-1242 (mg/kg)	Aroclor-1248 (mg/kg)	Aroclor-1254 (mg/kg)	Aroclor-1260 (mg/kg)	Aroclor-1262 (mg/kg)
<b>Commercial/Industrial SSTL</b>				50.2	10	10	10	10	10	10	10
HD2-6	1.39 - 1.39	12/11/2002	ND	<.016	<.032	<.016	<.016	<.016	<.016	<.016	NA
	2.89 - 2.89	12/11/2002	ND	<.014	<.027	<.014	<.014	<.014	<.014	<.014	NA
HD2-7	.94 - .94	12/11/2002	ND	<.013	<.027	<.013	<.013	<.013	<.013	<.013	NA
	2.44 - 2.44	12/11/2002	ND	<.014	<.028	<.014	<.014	<.014	<.014	<.014	NA
HD2-8	1.26 - 1.26	12/11/2002	ND	<.013	<.026	<.013	<.013	<.013	<.013	<.013	NA
	2.76 - 2.76	12/11/2002	ND	<.013	<.026	<.013	<.013	<.013	<.013	<.013	NA
HD2-9	.79 - .79	12/11/2002	ND	<.013	<.026	<.013	<.013	<.013	<.013	<.013	NA
	2.29 - 2.29	12/11/2002	ND	<.013	<.026	<.013	<.013	<.013	<.013	<.013	NA
MF2-2	0 - 0	09/09/2002	.057	<.013	<.025	<.013	<.013	<.013	.033	.024	NA
MF2-3	0 - 0	09/09/2002	.149	<.013	<.025	<.013	<.013	<.013	.1	.049	NA
MF2-7	0 - 0	09/09/2002	.018	<.013	<.025	<.013	<.013	<.013	<.012	.018	NA
NP-1	.5 - .5	09/10/2002	ND	<.013	<.025	<.013	<.013	<.013	<.013	<.013	NA
NSD-1	No Depth	09/23/2004	.39	<.011	<.022	<.011	<.011	.39	<.011	<.011	NA
NSD-2	No Depth	09/23/2004	.18	<.011	<.022	<.011	<.011	.18	<.011	<.011	NA
NSD-3	No Depth	09/23/2004	.78	<.011	<.022	<.011	<.011	.78	<.011	<.011	NA
NSD-4	No Depth	09/23/2004	ND	<.011	<.022	<.011	<.011	<.011	<.011	<.011	NA
OW2-1	1.02 - 1.02	09/09/2002	ND	<.013	<.026	<.013	<.013	<.013	<.013	<.013	NA
	9.02 - 9.02	09/09/2002	ND	<.013	<.026	<.013	<.013	<.013	<.013	<.013	NA
PCB16	0 - .5	07/25/2006	.034	<.012	<.025	<.012	<.012	<.012	.034	<.012	NA
PCB17	0 - .5	07/25/2006	ND	<.012	<.025	<.012	<.012	<.012	<.012	<.012	NA
PCB18	0 - .5	07/25/2006	ND	<.013	<.025	<.013	<.013	<.013	<.013	<.013	NA
RFSTA-B128SWALE-COMP	0 - 0	05/23/2006	ND	<.017	<.035	<.017	<.017	<.017	<.017	<.017	NA
SD MH-11	10 - 10.5	05/06/2004	ND	<.013	<.026	<.013	<.013	<.013	<.013	<.013	NA
	7 - 7.5	05/06/2004	ND	<.014	<.027	<.014	<.014	<.014	<.014	<.014	NA

**TABLE D-17  
ANALYTICAL RESULT WITH SCREENING FOR PCBs IN SOIL AND SEDIMENT  
OFF-SITE PROPERTY NORTH AREA  
RICHMOND FIELD STATION**

Location ID	Depth (Feet)	Date Collected	Total PCBs (mg/kg)	Aroclor-1016 (mg/kg)	Aroclor-1221 (mg/kg)	Aroclor-1232 (mg/kg)	Aroclor-1242 (mg/kg)	Aroclor-1248 (mg/kg)	Aroclor-1254 (mg/kg)	Aroclor-1260 (mg/kg)	Aroclor-1262 (mg/kg)
PCB01	0 - .5	07/25/2006	ND	<.012	<.024	<.012	<.012	<.012	<.012	<.012	NA
	0 - 0	07/25/2006	ND	<.012	<.024	<.012	<.012	<.012	<.012	<.012	NA
PCB03	0 - .5	07/25/2006	ND	<.012	<.025	<.012	<.012	<.012	<.012	<.012	NA
	0 - 0	07/25/2006	ND	<.012	<.024	<.012	<.012	<.012	<.012	<.012	NA
PCB05	0 - .5	07/25/2006	ND	<.013	<.026	<.013	<.013	<.013	<.013	<.013	NA
	0 - 0	07/25/2006	ND	<.012	<.024	<.012	<.012	<.012	<.012	<.012	NA
PCB07	0 - .5	07/25/2006	ND	<.013	<.026	<.013	<.013	<.013	<.013	<.013	NA
	0 - 0	07/25/2006	ND	<.012	<.024	<.012	<.012	<.012	<.012	<.012	NA
PCB09	0 - .5	07/25/2006	ND	<.013	<.025	<.013	<.013	<.013	<.013	<.013	NA
PCB10	0 - .5	07/25/2006	ND	<.013	<.026	<.013	<.013	<.013	<.013	<.013	NA
PCB11	0 - .5	07/25/2006	.011	<.012	<.025	<.012	<.012	<.012	<.012	.011	NA
PCB12	0 - .5	07/25/2006	ND	<.013	<.026	<.013	<.013	<.013	<.013	<.013	NA
PCB13	0 - .5	07/25/2006	ND	<.013	<.026	<.013	<.013	<.013	<.013	<.013	NA
PCB14	0 - .5	07/25/2006	.016	<.013	<.026	<.013	<.013	<.013	<.013	.016	NA
PCB15	0 - .5	07/25/2006	ND	<.012	<.025	<.012	<.012	<.012	<.012	<.012	NA
PCB19	0 - .5	07/25/2006	.028	<.013	<.025	<.013	<.013	<.013	<.013	.028	NA
PCB20	0 - .5	07/25/2006	ND	<.013	<.025	<.013	<.013	<.013	<.013	<.013	NA
SD MH-9	11 - 11.5	05/06/2004	ND	<.013	<.026	<.013	<.013	<.013	<.013	<.013	NA

Notes:

mg/kg Milligram per kilogram  
 NA Not available  
 < Nondetect  
 PCB Polychlorinated biphenyl

**APPENDIX B**

**HEALTH & SAFETY PLAN**





**HEALTH AND SAFETY PLAN  
EVALUATION OF PRE-CONSTRUCTION CONDITIONS IN SOIL  
MEADE BY-PASS ROADWAY  
RICHMOND, CALIFORNIA**

**JUNE 22, 2009**

By:

A handwritten signature in blue ink, appearing to read 'Chris Baldassari', written over a horizontal line.

Chris Baldassari  
Project Geologist

A handwritten signature in blue ink, appearing to read 'Kyle S. Flory', written over a horizontal line.

Kyle S. Flory, P.G.  
Principal Geologist

**644.014.01.001**

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## 1.0 INTRODUCTION

This Health and Safety Plan (HASP) has been prepared by PES Environmental, Inc. (PES) and describes the minimum health and safety requirements for field activities at the proposed location of the temporary Meade By-Pass road located on property owned by the University of California (UCB), and the City of Richmond, in Richmond, California (the site). The scope of work to be conducted is described in PES' document entitled *Workplan for Evaluation of Pre-Construction Conditions in Soil, Meade By-Pass Roadway, Richmond, California*, dated March 30, 2009 (Workplan).

In addition to the procedures and requirements described in this HASP, all onsite PES personnel shall follow applicable procedures and requirements specified by Federal, State, and local authorities, to include those requirements specified in Title 29 of the Code of Federal Regulations (CFR) 1910.120 and Title 8 of the California Code of Regulations, Section 5192 "Hazardous Waste Operations and Emergency Response" (T8-CCR, Section 5192). This HASP has been prepared to address the basic requirements of the overall safety and health program, with attention to aspects of site-specific activities. Any modifications made to this HASP because of encountered field conditions must be approved by the site Safety Officer (SSO) and/or Project Manager (PM). A copy of this HASP will be available at the site during all work activities.

The primary objectives of the HASP are to protect the well-being of field personnel and the community surrounding the site, and to provide onsite personnel an understanding of the potential chemical and general physical hazards that exist or may arise while field tasks are being performed at the site. Additionally, the information contained herein will define the safety precautions necessary to respond to hazardous materials issues, should they occur.

To accomplish the objectives, contractors, subcontractors, and their staff shall acknowledge and adhere to the policies and procedures established herein. Accordingly, all personnel assigned to this project shall read this HASP and sign the Agreement and Acknowledgment Statement (Appendix A) to certify that they have read, understood, and agreed to abide by its provisions.

### 1.1 Field Tasks

Field tasks covered under this HASP may include one or more of the following activities:

- Performing non-intrusive pre-field activities such as site walks, marking drilling locations, geophysical surveys, etc.;
- Conducting asphalt/concrete coring and patching;
- Conducting direct-push soil sampling; and
- Waste storage, characterization, and off-site disposal activities.

Many of the activities described above will include use of subcontractors (e.g., drilling contractors, geophysical surveyors, etc.). Field activities will be conducted under the supervision of PES personnel.

Future activities that are not described above and require additional health and safety precautions beyond this HASP will be included in an addendum to the HASP.

## **1.2 Site Background**

### **1.2.1 Location**

The site is composed of (1) the Richmond Field Station (RFS) site, owned and operated by the University of California, Berkeley and is located in a light industrial and office area that is used as an off-site academic research and teaching facility; and (2) a vacant parcel owned by the City of Richmond.

The RFS comprises approximately 96 upland acres of property used for academic institutional activities. The site topography is generally flat or gently sloping. Prevailing winds are anticipated to be from the west or southwest off San Francisco Bay.

### **1.2.2 Historical Facility Operations**

Historically, a portion of the project area was previously occupied by a Pacific Gas & Electric (PG&E) transformer manufacturing plant.

### **1.2.3 Site Characterization and Remediation Activities**

PES' review of reports prepared by others indicate that surface soil samples from 0 to 0.5 feet below ground surface (bgs) were collected on the UC Berkeley RFS, City of Richmond, and Union Pacific Railroad properties in the vicinity of the proposed temporary by-pass roadway in July 2006 and analyzed for polychlorinated biphenyls (PCBs). The locations of the surface soil samples are shown in Plate 2 and Figure 17 (Appendix A to the Workplan). As summarized in Tables D-14 and D-17 (Appendix A to the Workplan), Aroclor-1254 was detected in sample PCB16 at a concentration of 0.034 milligrams per kilogram (mg/Kg), and Aroclor-1260 was detected in samples PCB19 at 0.028 mg/kg, PCB11 at 0.011 mg/Kg, and PCB14 at 0.016 mg/Kg. Aroclors were not detected at or above the respective laboratory reporting limit in any other samples collected in the vicinity of the proposed temporary by-pass roadway. No constituents other than PCBs were analyzed.

### 1.2.4 Chemicals of Potential Concern

Based on available historical documentation of previous work performed in the vicinity of the proposed temporary by-pass roadway, the primary chemicals of potential concern (COPCs) are described herein. Chemical hazards associated with the COPCs are discussed in Section 3.1.

COPCs identified in surface soil are summarized below:

- PCBs.

COPCs not identified in soil but which may be present due to historical use or proximity are summarized below:

- Volatile Organic Compounds (VOCs) (not previously detected);
- Semi-Volatile Organic Compounds (SVOCs) (not previously detected);
- Poly-aromatic hydrocarbons (PAHs) (not previously detected);
- Pesticides (not previously detected);
- Lead (not previously detected);
- Arsenic (not previously detected); and
- Motor Oil (not previously detected).

### 1.3 Geology and Hydrogeology

Site geology at the RFS has been previously investigated by others. An excerpt of the site geology (Tetra Tech, 2007) is presented below:

The RFS is located at the distal end of an alluvial plain that slopes to the southwest. The Hayward Fault Zone transects the alluvial plain to the northeast, toward the Berkeley Hills. The alluvial plain consists of relatively recent Quaternary age deposits (less than 2 million years old). The lithology of the alluvial plain is primarily consolidated to unconsolidated clay, silt, sand, and gravel, with organic-rich clay and silt bordering the San Francisco Bay. The total thickness of the deposits ranges from shallow surface deposits, where the alluvium thins against the Berkeley Hills, to a depth of approximately 300 feet (URS Corporation [URS] 2000). These deposits are underlain by bedrock of the Mesozoic Franciscan Formation. The Franciscan Formation is a complex assemblage of serpentinite, greenstone, greywacke, chert, shale, sandstone, and schist, found on many ridges and mountains of the San Francisco Bay region (URS, 2000). Four major hydrogeologic units were defined for the RFS area as follows (Woodward-Clyde, 1993):

- Artificial Fill;
- Quaternary Alluvium;
- Bay Sediments; and
- Yerba Buena Mud (Older Bay Mud).

The Artificial Fill is heterogeneous, and contained pyrite cinders until most of the cinders were excavated as part of remediation activities by UC Berkeley in 2002 to 2004. The Quaternary Alluvium is also heterogeneous, with fine- to coarse-grained sediments. The Bay Sediments consist of fine- to very fine-grained sediments, while the Yerba Buena Mud is a homogeneous, fine-grained unit, which behaves as a regionally extensive aquitard.

**1.4 Amendments**

Any changes in the scope 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 SSO, or applicable individual.

**2.0 KEY PERSONNEL AND RESPONSIBILITIES**

The following management structure will be instituted for the purpose of successfully and safely completing this project. All contractors and subcontractors will act in accordance with applicable Federal, State, regional, and local regulations during all phases of the project. Health and safety training requirements for onsite project personnel are described in Section 4.0.

**2.1 Site Safety Officer, Project Manager, and Corporate Health and Safety Officer**

<b>Project Responsibility</b>	<b>Company Name</b>	<b>Name</b>	<b>Phone #</b>
Client	Richmond Community Redevelopment Agency	Jim Branch	(510) 307-8140
Project Manager	PES	Kyle Flory	(415) 899-1600
Site Safety Officer	PES	Chris Baldassari or other personnel who may be designated as project progresses	(415) 899-1600



<b>Project Responsibility</b>	<b>Company Name</b>	<b>Name</b>	<b>Phone #</b>
Off-Site Safety Officer	PES	Kyle Flory or other personnel who may be designated as project progresses	(415) 899-1600
Field Team Leader	PES	Chris Baldassari or other project personnel who may be designated as project progresses	(415) 899-1600
Corporate Health & Safety Officer	PES	William F. Frizzell	(415) 899-1600
Regulatory Oversight Agency	Department of Toxic Substances Control	Lynn Nakashima	(510) 540-3839

## **2.2 General Project Personnel Responsibilities**

The PM and SSO are responsible for assuring that adequate training and safety briefing(s) for the project are provided to the project team. The PM or SSO will provide a copy of this HASP to each member of the project field team. The PM is responsible for preparation and review of this HASP for accuracy and incorporating new information or guidelines which aid the SSO in further definition and control of the potential health and safety hazards associated with the project. The HSO is responsible for coordinating the PES corporate health and safety program.

### **2.2.1 Site Safety Officer Responsibilities**

The SSO has onsite responsibility for ensuring that all PES team members comply with the HASP. The SSO will be present during site operations. Immediately prior to initiating field activities, the SSO will conduct a tailgate briefing session for PES personnel and subcontractors to discuss PES' HASP and the procedures contained herein. Subcontractors will be responsible for complying with the minimum requirements specified in this HASP. It is the SSO's responsibility to inform field personnel of chemical and physical hazards, as he or she becomes aware of them. The SSO has the authority to monitor and correct health and safety problems as noticed onsite to include "Stop Work".

The SSO's responsibilities include:

- Ensuring compliance with this HASP;
- Providing site safety briefings for PES team members;

- Approving the selection of the types of personal protective equipment (PPE) to be used onsite for specific tasks and monitoring the compliance of field personnel for the routine and proper use of the PPE that has been designated for each task;
- Inspecting all PPE for PES team members prior to onsite use;
- Ensuring that air monitoring will be conducted in accordance with Section 6.0 of this HASP;
- Coordinating, upgrading, or downgrading PPE, as necessary, due to changes in exposure levels, monitoring results, weather, and other site conditions;
- Updating equipment or procedures to be used based on new information gathered during the site investigation and reporting to the PM all equipment malfunctions or deficiencies;
- Assisting and evaluating the effectiveness of decontamination procedures for PPE, sampling equipment and containers;
- Reporting to the PM any unsafe conditions or practices and all facts pertaining to incidents which result in injury or exposure to toxic materials;
- Ensuring that all project-related personnel have signed the personnel Agreement and Acknowledgment Statement contained in this HASP (Appendix B);
- Reporting any signs of fatigue, work-related stress, or chemical exposures to the PM immediately, or as soon as possible;
- Reporting any accidents or violations of the HASP to the PM immediately, or as soon as possible;
- Dismissing field personnel from the site if their actions or negligence endangers themselves, co-workers, or the public, and reporting the same to the PM immediately, or as soon as possible;
- Knowing emergency procedures, evacuation routes and the telephone numbers of the ambulance, local hospital, poison control center, fire and police departments;
- Supplying phone numbers, location and route to the nearest medical facility, and arranging for emergency transportation if necessary;
- Ensuring a first aid kit is available in work areas and that it is fully stocked;
- Assisting the PM in documenting compliance with the HASP by completing the standard PES forms;

- Enforcing the “buddy” system as appropriate for site activities;
- Entering the exclusion area in emergencies after notifying emergency services;
- Observing PES field team members for signs of exposure, stress, or other conditions related to preexisting physical conditions or site work activities; and
- Stopping operations that threaten the health and safety of the field team, and effecting evacuation of the site, if necessary.

### **2.2.2 Project Manager Responsibilities**

The PM is responsible for implementing the project and obtaining any necessary personnel or resources for the completion of the project. Specific duties include:

- Coordinating the activities of employees, contractors, and subcontractors, including their acknowledgement of this HASP, and ensuring that all employees and subcontractors have signed the Agreement and Acknowledgment Statement (Appendix B);
- Selecting field personnel for the work that is to be undertaken onsite;
- Ensuring that the tasks assigned are being completed as planned and are kept on schedule;
- Providing authority and resources to ensure that the SSO is able to implement and manage safety procedures;
- Ensuring that all persons allowed to enter the site (i.e., regulators, contractors, State officials, visitors) are made aware of the potential hazards associated with the substances known or suspected to be onsite, and are knowledgeable as to the location of the onsite copy of the specific HASP;
- Ensuring that the SSO is aware of all of the provisions of this HASP and is instructing all personnel onsite about the safety practices and emergency procedures defined in the HASP; and
- Ensuring that the SSO is adequately monitoring site safety.

## **3.0 HAZARD EVALUATION**

The potential for unknown hazards cannot be eliminated. Hazards can exist for all exposure routes such as inhalation, dermal contact, ingestion, and eye contact. The potential hazards to personnel working at the site have been principally identified as chemical exposures and

physical hazards associated with working in the vicinity of drilling rigs, well development rigs, trucks, and other heavy equipment. Potential hazards are described below.

### **3.1 Chemical Hazards**

Potential effects of any chemical exposure are dependent on several factors such as: toxicity of substance, time frame of exposure, concentration of substance producing the exposure, general health of person exposed, and individual use of hazard reduction methods.

Based on previous surface soil sampling results, the primary contaminants identified at this project site are PCBs. Based on historical uses in the area and proximity to railroad tracks, other potential contaminants may include VOCs, SVOCs, TPHmo, PAHs, creosote, pesticides, arsenic, and/or lead. VOCs, SVOCs, PAHs, and TPHmo have not been detected and are not included in the specific list of chemicals provided below. Some of these chemicals are not volatile but have the potential to become airborne during intrusive activities.

In addition to the known primary contaminant (PCBs) other chemicals of potential concern (COPCs) which, while their presence or absence is unknown, would act as drivers for potential health risks associated with the site activities described in Section 1.0 are described below:

#### **Chlorodiphenyl (42% chlorine; trade name Aroclor 1242)**

LEL/UEL = noncombustible liquid

TLV/PEL (TWA)/IDLH = 1 mg/m<sup>3</sup> / 10 mg/m<sup>3</sup>

Hazard Properties = Nonflammable Liquid, but exposure in a fire results in the formation of a black soot containing PCBs, polychlorinated dibenzofurans & chlorinated dibenzo-p-dioxins.

Exposure Routes = inhalation, skin absorption, ingestion, skin and/or eye contact

Target Organs = Skin, eyes, liver, reproductive system

Acute exposure symptoms = Irritation eyes; chloracne; liver damage; reproductive effects; [potential occupational carcinogen]

#### **Chlorodiphenyl (54% chlorine; trade name Aroclor 1254)**

LEL/UEL = noncombustible liquid

TLV/PEL (TWA)/IDLH = 0.5 mg/m<sup>3</sup> / 5 mg/m<sup>3</sup>

Hazard Properties = Nonflammable Liquid, but exposure in a fire results in the formation of a black soot containing PCBs, polychlorinated dibenzofurans & chlorinated dibenzo-p-dioxins.

Exposure Routes = inhalation, skin absorption, ingestion, skin and/or eye contact

Target Organs = Skin, eyes, liver, reproductive system

Acute exposure symptoms = Irritation eyes; chloracne; liver damage; reproductive effects; [potential occupational carcinogen]

#### **Motor Oil**

LEL/UEL = Not classified by OSHA as flammable or combustible

TLV(TWA)/IDLH = 5 mg/m<sup>3</sup>

Hazard Properties = toxic, harmful if swallowed

Exposure Routes = inhalation, ingestion, skin absorption

Target Organs = Eyes, digestive system, liver, kidneys, CNS

Acute exposure symptoms = Dermatitis; mildly toxic by ingestion

### **Creosote**

LEL/UEL = Not classified by OSHA

TLV(TWA)/IDLH = 0.2 mg/m<sup>3</sup> / 5 mg/m<sup>3</sup>

Hazard Properties = toxic, harmful if swallowed

Exposure Routes = inhalation, ingestion, skin absorption

Target Organs = Respiratory system, skin, bladder, kidneys

Acute exposure symptoms = Dermatitis, bronchitis

### **Benzoapyrene**

LEL/UEL = Not classified by OSHA

TLV(TWA)/IDLH = 0.2 mg/m<sup>3</sup> / 5 mg/m<sup>3</sup>

Hazard Properties = toxic, harmful if swallowed

Exposure Routes = inhalation, ingestion, skin absorption

Target Organs = Respiratory system, skin, bladder, kidneys

Acute exposure symptoms = Dermatitis, bronchitis, carcinogenic for long-term exposures

### **DDT**

LEL/UEL = not applicable

TLV(TWA)/IDLH = 0.5 mg/m<sup>3</sup>/ 500 mg/m<sup>3</sup>

Hazard Properties = toxic, carcinogen

Exposure Routes = inhalation, ingestion, skin absorption

Target Organs = respiratory system, eyes, PNS, kidneys, CNS, skin, liver

Acute exposure symptoms = dermatitis, ulceration of nasal septum, gastrointestinal disturbances, respiratory irritation

### **Dieldrin**

LEL/UEL = not applicable

TLV(TWA)/IDLH = 0.25 mg/m<sup>3</sup>/ 50 mg/m<sup>3</sup>

Hazard Properties = toxic, carcinogen

Exposure Routes = inhalation, ingestion, skin absorption

Target Organs = kidneys, CNS, skin, liver

Acute exposure symptoms = headache, vertigo, gastrointestinal disturbances, fatigue

### **Arsenic**

LEL/UEL = not applicable

NIOSH REL TWA/OSHA PEL TWA = 0.002 mg/m<sup>3</sup> (15-minute)/ 0.01 mg/m<sup>3</sup>

IDLH = 5 mg/m<sup>3</sup> (as As)

IP = not applicable

Hazard Properties = toxic, oxidizer, reacts with bromine azide to form highly toxic gas arsine, carcinogen

Exposure Routes = inhalation, ingestion, skin and/or eye contact

Target Organs = Liver, kidneys, skin, lungs, lymphatic system, lung and lymphatic cancer

Acute exposure symptoms = Gastrointestinal: severe abdominal pain, nausea and vomiting, and bloody or rice-water diarrhea; cardiovascular and respiratory: hypotension, shock; ventricular arrhythmia; congestive heart failure; and pulmonary edema; neurologic: light-headedness; headache; weakness, lethargy; delirium; encephalopathy; convulsions; coma; and sensorimotor peripheral neuropathy; hepatic and renal: elevated liver enzymes; hematuria, oliguria, proteinuria; and acute tubular necrosis, renal cortical necrosis; hematologic: anemia, leukopenia, thrombocytopenia, and disseminated intravascular coagulation; other: rhabdomyolysis, garlic odor on the breath, and delayed appearance of Mees lines.

## Lead

LEL/UEL = non-flammable

NIOSH REL TWA/OSHA PEL TWA = 0.050 mg/m<sup>3</sup> / 0.05 mg/m<sup>3</sup>

IP = not applicable

Hazard Properties = toxic

Exposure Routes = inhalation, ingestion, skin and/or eye contact

Target Organs = eyes, gastrointestinal tract, central nervous system, kidneys, blood, gingival tissue

Acute exposure symptoms = lassitude (weakness, exhaustion), insomnia, facial pallor, anorexia, weight loss, malnutrition, constipation, abdominal pain, colic, anemia, gingival line, tremor, paralysis wrist and ankles, encephalopathy, kidney disease, irritation eyes, hypertension

This plan concentrates on the measures necessary to prevent unnecessary exposure to these potential contaminants. Detailed properties of these chemicals, as excerpted from the National Institute of Occupational Safety and Health (NIOSH) Pocket Guide to Chemical Hazards website (<http://www.cdc.gov/niosh/npg/>) are presented in Appendix C. Hazard evaluation guidelines are presented in Appendix D.

### 3.2 General and Physical Hazards

Potential physical hazards are described below:

- Physical contact with heavy equipment;
- Physical contact with motor vehicles;
- Noise hazards from operating or working near heavy equipment;

- Mechanical hazards related to operation of excavation equipment, soil and groundwater sampling equipment, and drilling equipment;
- Buried utility lines (e.g., gas, electricity, and water) and energized overhead and underground power lines;
- Heat stress and cold stress;
- Sunburn;
- Slips/trips/falls due to unstable surfaces, or uneven terrain;
- Lifting/heaving objects;
- Fire hazards;
- Biological hazards such as:
  - Bees, wasps, ticks, insects, and snakes;
  - Airborne diseases (e.g., Hantavirus associated with rodent excrement or bird flu associated with bird excrement);
  - Poisonous plants (e.g., poison oak); and
- Hazards inherent to operating a passenger vehicle.

## **4.0 HAZARD MITIGATION**

### **4.1 Site Security**

Areas on site where hazardous substances are known to exist will be secured through demarcation tape and warning signs. Access to the work area (the work area or exclusion zone will be an approximate 20-foot perimeter around the drilling rig) will be restricted, and all personnel (regardless of status) requesting entry the work area will be required to report to the SSO and sign in on the site control log. All visitors will be briefed on site-specific safety and health issues.

Additional site control measures are presented in Section 7.0.

### **4.2 General Hazards Reduction**

The potential for unknown hazards cannot be eliminated. The following table outlines general potential site hazards and the corresponding general procedures for hazard reduction:

POTENTIAL HAZARDS	PROCEDURES FOR HAZARD REDUCTION
<p><b>1. Ingestion of hazardous materials</b> can occur by accidental swallowing of contaminated soils, liquids and/or transfer of the contaminated particles onto ingestible substances (such as food).</p>	<p>Eating, smoking, drinking and application of cosmetics is prohibited onsite. This minimizes the possibility of exposure to hazardous materials potentially encountered onsite via ingestion.</p>
<p><b>2. Physical hazards</b> in general such as:</p> <ul style="list-style-type: none"> <li><b>a) Slippery surfaces.</b></li> <li><b>b) Contaminated surfaces.</b></li> <li><b>c) Head/eye protection.</b></li> <li><b>d) Other hazards.</b></li> </ul>	<p>Use of approved skid-proof boots shall be required.</p> <p>Contact with contaminated surfaces, or surfaces suspected of being contaminated, should be avoided. This includes walking through, kneeling or placing equipment in puddles, mud, or discolored surfaces.</p> <p><b>ANSI approved</b> hard hats and safety glasses and will be worn at all times while onsite, and/or when head or eye hazards are present.</p> <p>Avoid standing near the edge of excavations.</p> <ul style="list-style-type: none"> <li>- Look for falling objects, slipping and tripping hazards (i.e., Visqueen sheets used to hold excavated soil can be slippery).</li> <li>- Secure the site with fences and post warning signs to prevent the exposure of unauthorized, unprotected people to site hazards.</li> <li>- Do not park or leave equipment near the edge of an excavation.</li> </ul>

**4.3 Noise Control**

Most work site noise will originate from heavy equipment. Noise exposures will be controlled to levels below the permissible noise exposure levels, which are equivalent to an 8-hour time weighted average (TWA) level of 85 decibels (dBA or 140 dB impact/pulse). As a result, equipment operators and observers will be required to use hearing protection when exposed to levels at or above 85 decibels. Noise hazard areas (areas experiencing greater than the 8-hour TWA of 85 dBA) must be appropriately identified and hearing protection for noise attenuation worn when in the area.

Reduction of exposures may be implemented by use of engineering controls or adequate hearing protection. Engineering controls may include isolation of the noise source by their enclosure and reduction of noise transmission by application of noise absorbing materials.

Use of portable playback devices (e.g., iPods) is prohibited for use as a hearing protection device. A copy of the OSHA Occupational Noise Standard, 29 CFR 1910.95 will be available and copies will be made available to employees upon request.



#### **4.4 Heat Stress Prevention**

Heat stress is a potential hazard on nearly all hazardous waste and/or construction related projects. If heat stress considerations become necessary, the SSO will implement the necessary steps and this SSP will be modified to reflect the hazard and necessary safe work practices. See OSHA's Heat Stress Card at <http://www.osha.gov/Publications/osh3154.pdf>.

A worker's risk for developing heat stress is greatly increased when wearing impermeable clothing or respirators. This type of clothing interferes with the body's normal cooling mechanisms by preventing the evaporation of perspiration. For workers who wear permeable clothing, work/rest schedules recommended in the current American Conference of Governmental Industrial Hygienists (ACGIH) Threshold Limit Values (TLV) for Heat Stress will be followed. For workers who wear semi-permeable or impermeable clothing, technical guidelines in "Occupational Safety and Health Guidance Manual for Hazardous Waste Site Activities" will be followed. Monitoring of personnel wearing impermeable clothing will commence when the ambient temperature is above 70 degrees Fahrenheit. Monitoring frequency will increase as the ambient temperature increases or as slow recovery rates are observed (see Section 6.6).

Additionally, during periods of hot weather or other potentially heat stress conditions the following safe work practices must apply:

- Be on the alert to signs and symptoms of heat illness during periods of abnormally high heat;
- Know the symptoms of heat illness to watch for which includes excessive sweating, headache, poor concentration, muscle pain, headache, cramping, dizziness, irritability, loss of coordination, vomiting, blurry vision, confusion, lack of sweating, fainting, or seizures;
- Drink plenty of water throughout the day. Two gallons of water will be made available per PES employee per eight hour shift;
- Dress for conditions: wear lightweight, light-colored loose clothing, a wide-brimmed hat if possible, sunscreen, and sunglasses;
- Use cool compresses to stay cool;
- Take scheduled rest periods and spend them in the shade;
- Tell your supervisor immediately if you feel you may be getting sick from the heat;
- Know the locations of your closest drinking water supplies;
- Keep track of your coworkers; and

- Know how to contact emergency services in the event of heat illness and how to effectively report the work location to 911.

#### **4.5 Cold Stress Prevention**

Exposure to cold weather can lead to frost bite and/or hypothermia. The signs and symptoms of excessive exposure to cold are listed below:

When weather conditions are cold, wet and windy, the following precautions will be instituted:

- Field personnel should wear layered clothing. Mittens, heavy socks, hats, jackets/vests, long underwear, glove liners or other suitable clothing should be worn when air temperatures fall below 40°F. Chemical protective clothing will be worn over the warm garments when protective clothing is required by the field operations;
- At temperatures below 30°F, temperature insulating suits and gloves should be considered;
- Protective outerwear should be used to prevent wetting of work shoes and feet, when appropriate;
- Additional clothing worn in layers allows gradual removal as work activities generate metabolic heat;
- At temperatures below 35°F, raingear should be worn if an employee could become wet on the job;
- At temperatures below 35°F, employees shall be provided with warm (65°F or above) break areas. If appropriate, space heaters will be provided to warm hand and feet;
- Hot liquids such as soups and warm drinks should be consumed during break periods. Caffeine beverages should be limited due to attendant diuretic and circulatory effects;
- A buddy system shall be practiced at all times. An employee that is observed shivering or showing signs of frostbite shall leave the cold area immediately;
- Work should be arranged to avoid sitting or standing for long periods; and
- All employees, who work in cold areas should be trained in the following subjects:
  - Proper first aid treatment for cold stress;
  - Proper clothing practices;
  - Proper eating and drinking habits;
  - Recognition of impending adverse health effects due to cold; and
  - Safe work practices.

See Section 6.7 for cold stress monitoring.

#### **4.6 Sunburn Prevention**

Sunburn is caused by overexposure to ultraviolet light (sunshine). The symptoms of exposure are not usually apparent until two to four hours after the exposure ceases. Depending upon the severity of the exposure, the symptoms can range from reddening of the skin, accompanied by mild discomfort, to painful deep burns and blisters. Although light-haired, fair-skinned, blue-eyed personnel are at the greatest risk of sunburn, all complexion types can develop sunburn.

The physical hazard of sunburn can be controlled by: (1) providing a shady rest area; (2) wearing appropriate clothing (long pants and tee shirts, i.e. no tank tops); (3) wearing sunscreen with an appropriate protection factor, as appropriate; and (4) working in shifts.

#### **4.7 Heavy Equipment Operation and Traffic Hazard Control**

The potential physical (non-chemical) hazards associated with heavy machinery operation can be mitigated by maintaining adequate clearance around operating equipment. To implement this, safety cones or barricades will be placed in a 10- to 20-foot radius around the work area, where practicable. While working at the site, the field personnel must be aware of equipment movement and general traffic, including excavation and heavy machinery operations.

The contractor is responsible for all personnel associated with heavy equipment operation. Equipment operators should maintain a constant awareness of their surroundings and associated hazards. Constant visual or verbal contact between the equipment operators and laborers will facilitate such awareness. When operating heavy equipment near an embankment, a spotter shall be present at all times to observe the soil behavior on which the unit is situated. All heavy equipment shall be equipped with a roll over protection structure (ROPS) and seat belts. Operators shall use seat belts at all times when in the cab of operating equipment. All personnel will wear high visibility safety vests and hearing protection if appropriate.

Potential traffic hazards will be avoided by maintaining adequate clearance around moving equipment and vehicles and implementing safe speed practices. Where appropriate, a traffic control subcontractor will be used to provide traffic control (e.g., lane closures, placement of no parking signs) if work is to be conducted within or adjacent to city streets.

#### **4.8 Slip/Trip/Fall Hazard Control**

Prevention of slips/trips and fall hazards can be reduced to a minimum if employees use caution when working on slick, uneven or unsteady surfaces. The risk of injury will be minimized by implementing proper site control measures such as daily safety meetings, proper footwear and by keeping the work area free of obstructions.

#### **4.9 Lifting Hazard Control**

Field operations often require that heavy physical labor tasks be performed. All employees of PES will be instructed by the SSO in proper lifting techniques through safety meetings and demonstration. Additionally, PES employees will be instructed to not attempt to lift objects heavier than 60 pounds without mechanical assistance or the assistance of a fellow worker.

#### **4.10 Tool and Equipment Hazard Control**

Improper tool handling and inadequate maintenance will increase risk of injury during their use. Management of these hazards requires rigorous maintenance of tools and equipment. Contractors are responsible for effective training of employees in the proper use of tools. Hand tools that are damaged shall be tagged and removed from the work area. Equipment in need of maintenance or repair shall be tagged and removed from operation until repairs or replacement is accomplished. Only tools with immediate use will be present on site. Unused tools shall be assembled at a collection point and removed from underfoot and immediate use.

#### **4.11 Engineering Controls**

The generation of dust should be avoided. For those operations which may result in the generation of airborne dusts a water spray will be used to inhibit dust generation. In situations where dusts generated from work tasks, weather conditions, etc., cannot be controlled, work activities will be stopped until a control mechanism is in place, wind has subsided, etc.

If odors are present, the use of fans may be implemented to dissipate odors away from the work area.

#### **4.12 Work Practices**

Workers are expected to adhere to established safe work practices for their respective specialties. The need to exercise caution in the performance of specific work tasks while wearing PPE is made more acute due to: (1) weather conditions; (2) restricted mobility and reduced peripheral vision caused by the protective gear itself; (3) the need to maintain the integrity of the protective gear; and (4) the increased difficulty in communicating caused by respirators. Work at the site will be conducted according to established protocol and guidelines for the safety and health of all involved.

Among the most important of these principles for working at a hazardous waste site are the following:

- In any unknown situation, always assume the worst conditions and plan responses accordingly;
- Because no Personal Protective Equipment (PPE) is 100 percent effective, all personnel must minimize contact with contaminated materials. Plan work areas, decontamination

areas, and procedures accordingly. Do not place equipment on drums or the ground. Do not sit on drums or other materials. Do not sit or kneel on the ground in the Exclusion Zone or Contamination Reduction Zone. Avoid standing in or walking through puddles or stained soils;

- Smoking will not be allowed on-site, except in designated areas. Eating or drinking in the work area and before decontamination will not be allowed. Oral ingestion of contaminants is a major route of entry for introducing toxic substances into the body;
- Avoid heat and other work stresses related to wearing protective gear. Work breaks should be planned to prevent stress-related accidents and fatigue;
- Personnel must be observant of not only their own immediate surroundings, but also those of others. Everyone will be working under constraints; therefore, a team effort is needed to notice and warn of impending dangerous situations. Extra precautions are necessary when working near heavy equipment and while utilizing PPE because vision, hearing, and communication may be impaired;
- Personnel with any facial hair that interferes with the proper fit of the respirator will not be allowed to work on sites requiring Levels C, B, or A;
- Rigorous contingency planning and dissemination of plans to all personnel minimizes the impact of rapidly changing safety protocols in response to changing site conditions; and
- Personnel must be aware that chemical contaminants may mimic or enhance symptoms of other illnesses or intoxication. Drinking of alcohol while working on-site is prohibited during field investigation assignments.

#### **4.13 Fire Hazard Control**

Caution will be used to prevent sparks or open flames within areas containing vegetation. If welding or cutting is to be implemented, ensure hot sparks or slag does not come in contact with flammables. An approved A or B fire extinguisher, sufficient in size, will be immediately available (usually 25 feet) when performing welding or cutting. All heavy equipment (drill rigs, loaders, backhoes, dozers, etc.) shall have a minimum of one mounted 5-pound AB fire extinguisher. A minimum of one AB fire extinguisher shall be at each investigation or remediation site. Only approved containers will be used for storing flammable liquids. Oily rags and waste will be placed in appropriate containers. Fire protection equipment will be used for fire fighting only. The proper use and location of fire extinguishers will be known by all employees. Gasoline or other flammable liquids will not be used for cleaning. All fire hazards will be reported to the site superintendent immediately. Fire and emergency access lanes will be kept clear at all times in order to facilitate equipment entry and exit.

#### **4.14 Electrical Hazard Control**

Potential electrical hazards can be avoided by: (1) locating buried utilities in areas where subsurface work is performed; (2) making sure all equipment is properly grounded; (3) keeping equipment a safe distance away from overhead lines; (4) using ground-fault circuit breakers; and (4) taking appropriate action in the event a storm approaches (e.g., take shelter in building or vehicle; stay away from drill rig, isolated trees and standing water; stay low to ground). Underground Service Alert will be contacted a minimum of three (3) days prior to the onset of subsurface work to clear utilities.

#### **4.15 Bird Excrement and Amplified Fungal Growth Control**

Depending on the construction and age of a building or structure, bird or bat roosting areas may be identified by the presence of droppings (guano). Due to the presence of bacteria and fungi, exposure to bird excrement can precipitate asthma attack and induce severe respiratory infections such as psittacosis which is an atypical pneumonia marked by a very high fever. Direct fungal infection of the lungs may also produce an infection that is difficult to treat. As a result, personnel required to work in an area where such roosting activity has occurred will be required to wear the following PPE:

- At a minimum, a half-face air-purifying respirator with HEPA filters;
- Full body disposable coveralls, including hood;
- Rubber boots and gloves; and
- All other PPE as appropriate for the work area as identified by the SSO.

#### **4.16 Chemical Hazard Control**

The chemical hazards listed herein will be mitigated by a combination of engineering controls, air monitoring, and use of appropriate PPE, as needed. Monitoring requirements under this HASP are described in Section 6.0.

### **5.0 PERSONAL PROTECTIVE EQUIPMENT**

#### **5.1 Personal Protection Equipment and Levels of Protection**

PPE will be utilized at the site when engineering and/or work practices have been determined either impracticable or fail to protect workers. Tables 1 and 2 below described the standard PPE for non-hazardous and hazardous work zones.

<b>Table 1 Standard PPE for Non-Hazardous Work Zones</b>					
<b>Activity</b>	<b>Head/Face/Ear</b>	<b>Foot</b>	<b>Hands</b>	<b>Respirator</b>	<b>Clothing</b>
General Site labor	Hard hat (Class B or E) Safety glasses Hearing protection	Steel toed boots w/ puncture resistant insoles.	Leather/Nitrile gloves as needed	None*	Shirt w/sleeves. Long pants. High vis-reflectORIZED vest
Supervision of work	Hard hat (Class B or E) Safety glasses Hearing protection	Steel toed boots w/ puncture resistant insoles.	Leather/Nitrile gloves as needed	None*	Shirt w/sleeves. Long pants. High vis-reflectORIZED vest
Site Visitors	Hard hat (Class B or E) Safety glasses Hearing protection**	Steel toed boots w/ puncture resistant insoles.	None	None*	Shirt w/sleeves. Long pants. High vis-reflectORIZED vest
<p><b>Note:</b></p> <p>* Voluntary use of respirators is authorized for nuisance dusts and exposures known to be below PEL levels. For nuisance dust use disposable N, R or P95 or better (dispose of N or r types daily and P type weekly). For odors use half mask with OV or OV/P95 or better (change at start of week).</p> <p>** Hearing protection with adequate noise reduction rating (if consistently exposed to greater than 85 decibels steady-state or 140 decibels impulse). Workers should use clean hands to insert earplugs. Ample supplies of disposable earplugs will be available onsite.</p>					

<b>Table 2 Standard PPE for Hazardous Work Zones**</b>					
<b>Activity</b>	<b>Head/Face/Ear</b>	<b>Foot</b>	<b>Hands</b>	<b>Respirator</b>	<b>Clothing</b>
General Site labor	Hard hat (Class B or E) Safety glasses and/or goggles and face shield Hearing protection	Chemical resistant steel toed boots w/ puncture resistant insoles.	Chemical resistant gloves / gauntlets as needed	As determined by SSO and air monitoring.	Chemical impervious. High vis-reflectORIZED vest
Supervision of work	Hard hat (Class B or E) Safety glasses and/or goggles and face shield Hearing protection	Chemical resistant steel toed boots w/ puncture resistant insoles.	Chemical resistant gloves / gauntlets as needed	As determined by SSO and air monitoring.	Chemical impervious. High vis-reflectORIZED vest
Site Visitors	Hard hat (Class B) Safety glasses/goggles Hearing protection	Chemical resistant steel toed boots w/ puncture resistant insoles.	Chemical resistant gloves / gauntlets as needed	As determined by SSO and air monitoring.	Chemical impervious. High vis-reflectORIZED vest
** SSO to review above, modify and be specific as appropriate.					

Each worker will be responsible for maintaining his or her own PPE.

## **5.2 Level D**

Level D is the minimum acceptable PPE level for PES employees and subcontractors for the site. Level D personal protection is required where respiratory protection is not a requirement. An area may be designated as Level D when:

- No hazardous airborne contaminants are known to be present and the potential for a release of such hazards is low;
- Work operations preclude the splashing of hazardous/toxic materials on body surfaces; and
- There are no Level A zones within the same exclusion area.

Level D includes:

- Coveralls or normal work uniform, as prescribed by weather;
- Boots/shoes with steel shank and approved toe protection meeting American National Standards Institute (ANSI) Z41 PT99 requirements;
- ANSI-approved industrial safety glasses or goggles and hearing protection, and
- Hard hat meeting ANSI Z89.1-1986 requirements.

## **5.3 Modified Level D**

At the discretion of the SSO, Modified Level D may be requested to be the minimum acceptable level of protection in areas where intrusive and/or sampling activities will be conducted. Modified Level D provides minimal dermal protection, including skin protection from potentially-impacted soils. Respiratory protection is optional unless air-monitoring data indicates otherwise.

Modified Level D includes:

- Coveralls or normal work uniform;
- Polyethylene-coated Tyvek® suits for activities involving casual contact with potentially contaminated soils and/or groundwater. Activities involving bodily contact with groundwater in areas of known elevated concentrations of chemicals may require the use of Tyvek 9400 suits, at the discretion of the SSO;
- Nitrile gloves when handling contaminated soils. If contact with contaminated groundwater occurs, Silver shield inner gloves with Nitrile outer gloves may be required, at the discretion of the SSO;



- Boots/shoes with steel shank and approved toe protection meeting ANSI Z41 PT99;
- ANSI- approved industrial safety glasses or goggles; face shield, in addition to glasses or goggles, if splash hazards are present;
- Hearing protection;
- Chemical resistant polyvinyl chloride (PVC) or neoprene boots when working in groundwater and/or soils moistened by groundwater; and
- Hard hat meeting ANSI Z89.1-1986 requirements.

#### **5.4 Level C**

Level C personal protection is required in the area where respiratory protection of a lesser degree than the criteria established for Levels A or B is required, and the probability of skin contamination by dermal toxic materials is unlikely. An area may be designated as Level C when:

- Monitored levels of air contamination do not exceed the protection factors afforded by Air-Purifying Respirators (APR);
- Air contaminants have good warning properties;
- Contaminants are not known to be absorbed through, or toxic to, skin surface; and
- A reliable history of prior site entries exists without indications of acute or chronic health effects.

Level C includes:

- All PPE included in Modified Level D; and
- Respirator protection, as described herein.

#### **5.5 Levels A and B**

Level A personal protection is required in the area where the highest levels of contamination exist and is designated as the area where maximum respiratory, skin, and eye protection are required. Level B personal protection is required in the area where maximum respiratory protection is required; however, there is a low probability of dermal toxicity. Level B work is not approved under this HASP.

**Work in Levels A and B PPE is not approved under this HASP.**

## **5.6 Personal Protection Selection Matrix**

Based on site conditions, the PPE shown below is anticipated for the following work scopes:

<b>Work Scope</b>	<b>Anticipated PPE</b>
Mobilization	Level D
Pre-field activities (non-intrusive)	Level D
Coring and patching concrete or asphalt	Level D
Soil sampling	Modified Level D
Decontamination	Modified Level D
Demobilization	Level D
Waste characterization and removal	Modified Level D

If site conditions warrant, the SSO or PM will upgrade the PPE levels shown above, as appropriate.

## **6.0 EXPOSURE AIR MONITORING**

In accordance with 29 CFR 1910.120 (h), exposure air monitoring will be used to identify and quantify airborne levels of hazardous substances and health hazards to determine the appropriate level of employee protection needed onsite.

To the extent feasible, the presence of airborne contaminants will be evaluated through the use of portable monitoring equipment. Information gathered will be used to ensure the adequacy of the levels of protection being employed at the Site, and may be used as the basis for upgrading or downgrading levels of personal protection, at the discretion of the Site Safety Officer. In addition, the information gathered will be used verify that people off-Site are not potentially being exposed to airborne particulates and lead.

The following air sampling equipment will/may be utilized for dust and odor monitoring:

- Photo-Ionization Detector (PID); and
- Dust monitor (Miniram, Dataram, or similar).

## **6.1 Dust Occupational Action (Trigger) Levels**

### **6.1.1 PCBs**

The Permissible Exposure Limit (PEL) for soils containing PCBs at the site are established as follows:

### Assumptions and Allowable Limits:

1. PCBs are documented contaminants at the site and there is a potential for employee exposure on-Site;
2. Therefore, PCB exposure should be controlled to less than the Cal OSHA PEL;
3. Maximum PCB concentrations detected in soil are 0.034 mg/kg (=0.000000034 mg PCB/mg soil);
4. Maximum PCB concentrations in dust are 0.000000034 mg PCB/mg dust;
5. The lowest PEL for PCB (Chlorodiphenyl [54% chlorine; trade name Aroclor 1254]) concentrations in air is 0.5 mg/m<sup>3</sup>;
6. The Cal-OSHA PEL for total dust is 10 mg/m<sup>3</sup>;
7. The California Air Resources Board (CARB) specifies a ceiling level of no more than 50 micrograms per cubic meter ( $\mu\text{g}/\text{m}^3$ ) difference between upwind and downwind sampling locations;
8. Therefore total dust levels will be maintained at or below 50  $\mu\text{g}/\text{m}^3$ , which will ensure the levels of PCBs will remain below the Cal-OSHA PEL.

#### 6.1.2 Total Dust

During activities covered by the Workplan and this HASP, the dust standard will be based on the PM 10 ambient air quality standards adopted by the California Air Resources Board (CARB), which specifies a ceiling level of no more than 50 micrograms per cubic meter difference between upwind and downwind sampling locations. If this level is exceeded, additional dust suppression activities such as water application for dust suppression will be conducted during work activities. The ceiling level of 50 micrograms per cubic meter represents the Bay Area attainment standard for 24-hour 10 micro diameter (PM<sub>10</sub> – 24-hour) particulate matter.

Results of monitoring information shall be recorded, and will include time, date, location operations, and any other conditions that may contribute to potential exposures. All maintenance and calibration information shall be maintained and made available upon request. The monitoring equipment will be calibrated in accordance with the manufacturer's specifications, and the records of such maintained with the project health and safety plan.

## **6.2 Dust Measurement and Mitigation Procedures**

### **6.2.1 Dust Control**

A MiniRAM dust meter (PDM-3 or equivalent) will be used to measure real-time dust levels. Action levels will be based on the Site HASP. Background dust levels will be established in the field and the dust levels at background, work zone and downwind areas will be monitored every 30 minutes during work and if conditions change (e.g., wind speeds increase). If dust levels exceed the PM 10 standard for 15 minutes or more in the worker breathing zone, then work should be stopped and mitigation measures undertaken before work resumes.

### **6.2.2 Worker Protection**

Worker protection will be conducted according to the Site HASP. Worker protection will use respirators, real-time monitors, rotation of crews in work areas, and/or mitigation of dust as necessary to meet the health and safety requirements.

### **6.2.3 Dust Mitigation Measures**

Dust mitigation measures will be specified based on the results of the dust monitoring. The best (most reasonable) available control measures will be used to minimize dust emissions. The preferred method of dust control at this Site is spraying water over the dust source(s) periodically to keep the exposed surface moist. Plastic sheets will be used to cover stockpiled soil and construction debris as well as other exposed areas. If the wind speed rises to greater than 15 miles per hour (mph), operations will cease.

Control measures for fugitive dust include, but are not limited to, the following procedures:

- Dust monitoring;
- Watering the area of demolition and/or excavation at least twice daily, if applicable;
- Covering construction debris and/or soil stock piles with plastic tarps or equivalent;
- Ceasing operation during high wind (greater than 15 mph);
- Sufficiently watering and/or securely covering material transported off-Site; and
- Minimizing the area that requires drilling, excavation and/or earth moving operation.

Prior to departure to the surface streets surrounding the Site, the waste-hauling trucks will be checked for material residue and rinsed down in the contaminant reduction zone. Following exit of trucks bearing excavated material, the public paved roadways surrounding the Site will be checked for any material possibly tracked out, despite mitigation efforts. The roadways will be cleaned of this material, if needed.

### 6.3 Total Organic Vapor Monitoring and Action Levels

The PID will serve as one of the primary instruments for personal exposure monitoring during excavation. The instrument will be utilized to characterize potential employee exposure and the need for PPE upgrades/downgrades. Air monitoring will be conducted in accordance with the requirements set forth in the Site HASP.

Prior to the onset of intrusive activities, the PID/OVA will be calibrated following instructions provided by the manufacturer. Background readings will be recorded in the field for documentation purposes (Appendix E). Background monitoring will commence under Level D PPE.

Air monitoring will be conducted as follows:

- A minimum of twice per field mobilization to document ambient VOC levels in each active exclusion zone;
- Intermittently as field work proceeds, and at a frequency commensurate with all field tasks to adequately protect workers from potential chemical exposures;
- Immediately, if noticeable odors occur during field activities;
- When work begins at a different location of the site;
- When a different type of operation is initiated; and
- When required by the SSO.

The following levels of PPE will be used if PID/OVA and colorimetric tube concentrations inside the active exclusion zones are measured:

- Less than or equal to background: Level D;
- Greater than background and less than 5 ppm above background: Level C;
- Greater than 5 ppm: Field activities will be immediately halted, and the location will be vacated until further evaluation.

These action levels in the exclusion zone were selected based on the protection factor (PF) afforded by a half-face APR equipped with combination high efficiency particulate air (HEPA) and organic vapor/acid gas cartridges. The PF for a half-face APR is 10. This means that the respirator can be worn in most cases up to 10 times the Threshold Limit Value (TLV) for the chemical. Since the lowest TLV for most compounds is 1 ppm, a half-face APR could be worn when ambient levels of VOCs are 10 ppm or less [permissible ambient level = PF x TLV = 10 x 1 ppm = 10 ppm]. These action levels are considered to be conservative.

## 6.4 Direct-Reading Instrument Action Levels for Area Monitoring

Direct reading instrument action levels are presented below:

Monitored Parameter	Action Level	Response to Action Level
<b>Volatile organic compounds (VOCs)</b> in the work area using a PID or flame ionization detector (FID). Initially twice per day to determine potential hazard if conditions met as identified above. Frequency may be downgraded/upgraded based upon measure levels, as noted in Section 6.3.	$\geq 1$ ppm continuous reading in the breathing zone for 1 minute.	The onsite SSO shall: <ol style="list-style-type: none"> <li>1. Notify the site Superintendent.</li> <li>2. Stop work – Reassess exposure levels, reassess PPE.</li> <li>3. Onsite SSO shall contact Project CIH and determine acceptable ambient concentrations of VOCs and level of PPE necessary to resume work.</li> <li>4. Upgrade to Level C respiratory protection with HEPA and organic cartridges.</li> <li>5. Introduce feasible engineering controls (i.e. blower fan).</li> <li>6. Continue monitoring, with PID or FID then, collect detector tube sample as appropriate.</li> <li>7. Check concentrations as established (e.g. detector tube sampling for vinyl chloride).</li> </ol>
<b>VOCs</b> in the work area using a PID or FID. Initially twice per day to determine potential hazard. Frequency may be downgraded/upgraded based upon measure levels.	$\geq 5$ ppm continuous reading in the breathing zone for 1 minute.	The onsite SSO shall: <ol style="list-style-type: none"> <li>1. Stop work.</li> <li>2. Identify source of airborne contamination.</li> <li>3. Implement necessary controls to maintain sustained VOC levels to less than 5 ppm.</li> </ol>
<b>Dust</b> in the work area using a MiniRAM or similar. Continual monitoring of total dust levels.	$\geq 50 \mu\text{g}/\text{m}^3$ (PM 10 standard) continuous reading in the breathing zone for 15 minutes.	The onsite SSO shall: <ol style="list-style-type: none"> <li>1. Stop work.</li> <li>2. Identify source of nuisance dust.</li> <li>3. Implement necessary controls to maintain sustained dust levels to less than <math>50 \mu\text{g}/\text{m}^3</math>.</li> </ol>

## 6.5 Employee Exposure Monitoring

If in the opinion of the PM and/or SSO that employees potential to airborne contaminants may exceed specified PELs and/or Action Levels, employee exposure monitoring will be conducted

as shown below and compared to applicable workplace exposure standards (i.e., PELs). Employees will be notified of exposures as required by regulations.

### **Employee Exposure Monitoring Requirements During Soil Disturbance Activities**

<b>Contaminant and Equipment</b>	<b>Collection and Analytical Methods</b>	<b>Frequency, Duration and Location</b>	<b>Calibration Schedule</b>
VOCs Air sampling pump equipped with charcoal tube.	NIOSH 1501	One sample per job task for an 8-hour period, for actual operator exposure period.	Twice daily using primary standard calibration device.

### **6.6 Heat Stress and Stroke Monitoring**

Heat stress is the adverse stress to the body due to exposure to excess heat. It can greatly diminish the ability of the body to function properly. Therefore, all personnel involved in work activities will become acquainted with the symptoms of heat stress and the necessary response actions for treatment. Because the incidence of heat stress depends on a variety of factors, all workers will be monitored. Hazards associated with heat stress include the following:

- Heat Rash – may result from continuous exposure to heat or to humid air;
- Heat Cramps – caused by heavy sweating causing cold clammy skin. Usually associated with inadequate electrolyte replacement. Heat cramps can cause muscle spasms, pain in the hands, feet and abdomen;
- Heat Exhaustion – occurs from increased stress on various body organs including inadequate blood circulation due to cardiovascular insufficiency or dehydration. Heat exhaustion can cause pale, cool, moist skin, heavy sweating, dizziness, and nausea and fainting; and
- Heat Stroke – the most serious form of heat stress. Temperature regulation fails and the body temperature rises to critical levels (usually above 106 degrees F). Immediate action must be taken to prevent serious injury and death. Competent medical help must be obtained. Heat stroke can cause red, hot unusually dry skin. Symptoms include lack of or reduced perspiration nausea, dizziness, confusion, and strong rapid pulse and coma. Do not try to treat on-site, give liquids or other treatments.

During the day-to-day fieldwork, the SSO, PM, and workers must be alert for the signs and symptoms of heat related incidents. Heat related conditions are hazards that exist when individuals are required to work in warm temperatures while wearing protective equipment.

The SSO will monitor the ambient air temperature and humidity utilizing local information sources.

Employees working in protective clothing will be observed for the following signs and symptoms of heat stress, dizziness and nausea, profuse sweating, skin color change, vision problems, delirium, fainting, weakness, fatigue, cramping, and hot red, dry skin.

Employees who exhibit heat-related symptoms will be monitored on-site by the SSO or other competent person. Monitoring heat related symptoms will consist of measuring the heart rate and body temperature to prevent the onset of heat stress illness. Heart rate will be measured by the radial pulse of the wrist for thirty seconds as early as possible in the resting period. Body core temperature can be measured by means of an “ear” thermometer.

The heart rate at the beginning of the rest period should not exceed 100 beats per minute. If the heart rate is in excess of the above guideline, the next work period will be shortened by one-third, while the length of the rest period stays the same. If the heart rate is in excess of 110 beats per minute at the beginning of the next rest period, the following work cycle will be further shortened by one-third. An employee with a body core temperature in excess of 99.5 degrees F will not be allowed to return to work after the rest period until the core temperature returns to 99 degrees or below.

Breaks in a shaded area will be taken if any worker exhibits or believes necessary to mitigate the symptoms of heat stress such as excessive sweating, muscle spasms, thirst, dizziness, rapid/weak pulse, flushed skin, loss of consciousness, or convulsions. The breaks will last until symptoms are relieved and/or the pulse of the worker is less than 110 beats per minute. Workers experiencing heat stress will be required, if conscious, to consume two to four pints of electrolyte fluid or cool water every hour while resting in a shaded area.

The individual should not return to work until symptoms are no longer recognizable. If the symptoms appear critical, persist or get worse, immediate medical attention will be sought. For severe heat stress, workers will be examined by a health-care professional as soon as possible.

## **6.7 Cold Stress Monitoring**

Cold Stress is the adverse stress to the body due to exposure to excess cold. Cold stress symptoms and monitoring tips are presented below.



<b>Condition</b>	<b>Signs and Symptoms</b>
Hypothermia – A condition when a person’s body loses heat faster than it can be produced.	Vague, slow, slurred speech, impaired judgment, forgetfulness, memory lapses, drowsiness, inability to use the hands.
Frostbite – A condition where a part of the body is frozen.	Loss of the sensation of touch, pressure and pain in the affected part of the body. This may occur without awareness of any numbness. Just before freezing, the skin becomes bright red and at freezing, small patches of white appear on the skin.

If any of these signs or symptoms are identified in site personnel, the SSO will immediately remove the worker from the cold, contact the emergency numbers (911) shown in Section 10.0.

## **7.0 SITE CONTROL, ENGINEERING CONTROLS, AND WORK PRACTICES**

In accordance with 29 CFR 1910.120 (h), the SSO will be in charge of onsite activities and will be responsible for general work practices and site control. The SSO will be responsible for establishing site-specific work zones and for maintaining site access, communication, and security.

Communication between field team members will consist of verbal communications either directly, or through mobile phones. Site access should be limited and secured by a fence or similar site control device during intrusive activities and after working hours. Breaches in the fence or locked gates, should they occur, will be repaired as soon as possible. In addition, signs should be posted indicating the presence of hazards onsite and that unauthorized individuals should keep out.

### **7.1 Visitor Log**

A log of personnel visiting, entering, or working on the site shall be maintained. The log shall include the following: date, name, agency or company, time entering and exiting site, time entering and exiting the exclusion zone (if applicable).

### **7.2 Access Control**

Controlled access to work areas is required to protect personnel working on the site as well as to limit the potential for transporting contaminants off site. Depending on the size of the work site, hazards and contaminants present, and complexity of the work, access control may range from verbally cautioning non-authorized personnel to stay away from the work area, to a program including site security, signs, or formal sign in and sign out procedures. Some general work practices for access control are noted below:

**For small-scale site investigations or activities** that are short-term projects (i.e. days, not weeks or months), identify a work area to the work crew and keep persons not associated with the jobsite out of the work area. If the site is in an area where non-authorized persons are likely to be encountered, traffic cones, demarcation tape, and signs identifying the area as a controlled access area may be used.

**For more extensive projects** where work may be done for weeks or longer, the team should deploy more extensive access controls. They should:

- Set up physical barriers to prevent unauthorized persons from entering the work site;
- Keep the number of personnel and equipment on site to the minimum required to do the project effectively and safely;
- Establish work zones within the site (see the next section- work zones);
- Establish controlled access points to be used by authorized personnel;
- Track the entry and exit of personnel through a check-in, checkout system; and
- Establish a formal decontamination corridor from exclusion zones.

### **7.3 Work Zones**

Field project managers working under health and safety plans for hazardous waste operations are required to establish work zones to prevent or reduce the spread of site contaminants to non-contaminated areas on or off site. The work zones (exclusion zone, contaminant reduction zone (CRZ), support zone, and mobile work zone) are described in more detail in the following subsections. Movement between zones should be restricted to those that need access to a specific area, and entry and exit between zones should be through designated access control points.

The actual locations of the zones will be determined prior to set up. The staging area will be used for communications and will be a contaminant-free zone. The CRZ will lie between the staging area and the exclusion zone and will be determined by the SSO. The exclusion zone may be delineated with red tape and cones or barricades. Personnel not immediately involved in the field activity at hand will not be allowed within the exclusion zone.

#### **7.3.1 Exclusion Zone**

The exclusion zone should include any area where contamination is known or suspected. Areas of air, water, or soil that are contaminated with hazardous materials (biohazards, radioactive materials, chemicals) should be included in the exclusion zone. The zone should be well known to site workers. On smaller projects, this can be a verbal identification to site workers,

such as “A 20-foot radius around the drill rig”. On larger projects, or in areas that may be encountered by observers or the general public, the zone may need to be defined with red tape, traffic cones or in some instances, fencing and barriers. The need will be job specific and the method should be identified by the site HSO. Some work practices that should be followed in the exclusion zone include:

- Employees in the exclusion zone must wear the PPE designated in this site health and safety plan for tasks executed within the zone;
- No eating, drinking, chewing gum or tobacco, smoking, application of cosmetics, including application of lip balm, sunscreen, or insect repellent is allowed in the exclusion zone;
- Sitting or kneeling in areas of high concentrations of contaminants should be avoided;
- If any PPE becomes defective, the employee should leave the work area via the designated egress area, decontaminate as needed, and replace the defective PPE before returning to work in the exclusion zone;
- The use of illegal drugs or consumption of alcohol is prohibited on all projects; and
- When leaving the exclusion zone, employees should exit via the designated access/egress point(s) and follow decontamination procedures as described by the HSO and this HASP.

### **7.3.2 Contaminant Reduction Zone (CRZ)**

A CRZ is established to provide a transition between the exclusion zone and the support zone. The CRZ is set up at the access control points of the exclusion zone and will vary in size depending on the complexity of activities that need to occur within the zone. For small site investigations, the CRZ may simply be a designated area near containers set up to collect used disposable PPE and some soap and water. For larger projects, the CRZ may include specific decontamination points and be staffed by personnel specifically designated to participate in the decontamination of personnel and equipment exiting the exclusion zone. Depending on the site contaminants, level of contamination, and decontamination procedures, personnel in the CRZ may be required to wear protective clothing, gloves, or respirators. The specific requirements will be outlined by the HSO. The CRZ should be placed in an area that is not contaminated at the boundary of the exclusion zone.

### **7.3.3 Support Zone**

The support zone is established near the entrance to the site and is far enough from the exclusion zone and CRZ that specialized protective clothing or respirators are not used. The use of normal field PPE such as hard hats, safety glasses, and safety work boots is expected except for areas such as office trailers, break and lunch areas, or other designated areas.

Operational support activities and equipment storage and maintenance areas are located in the support zone. No equipment or personnel should go from the exclusion zone to the support zone without passing through the CRZ and being decontaminated in accordance with the requirement set forth by the SSO.

#### **7.3.4 Mobile Work Zone**

For those projects that involve brief periods of work in multiple locations, a specific area may be designated as the exclusion zone for the duration of the work performed in that area. The exclusion zone can be terminated (provided there are no ongoing hazards or potential exposures to contaminants) and moved to the next area of work. For example, during soil borings or well installation, the exclusion zone can be defined as, “1.5 times the mast height” of the drill rig, or a 20-foot radius, whichever is greater. Once the boring has been closed, or well installed and secured, and all drill cuttings have been secured, the area can be opened up and a new exclusion zone established around the next boring location.

#### **7.3.5 Considerations When Establishing Work Zones**

Work zones should be large enough to perform tasks within the zone safely, with no exposure to hazards to personnel outside the zone, but they should also be small enough to be able to secure and control access. Some considerations in establishing work zones include:

- Physical and topographical features of the site;
- Dimensions of the contaminated area;
- Weather;
- Physical, chemical, and toxicological characteristics of contaminants and chemicals used in the zone;
- Potential for exposure to site contaminants;
- Known and estimated concentrations of contaminants;
- Air dispersion of contaminants;
- Fire and explosion potential;
- Planned operations and space needed to perform the work safely;
- Surrounding areas;
- Decontamination procedures; and
- History of job site.

#### 7.4 General Hazardous Waste Site Work Practices

Workers are expected to adhere to established safe work practices for their respective specialties (i.e., drilling, sampling, well development, etc.). A general Code of Safe Practices is presented in Appendix F. The need to exercise caution in the performance of specific work tasks while wearing PPE is made more acute due to: (1) weather conditions; (2) restricted mobility and reduced peripheral vision caused by the protective gear itself; (3) the need to maintain the integrity of the protective gear; and (4) the increased difficulty in communicating caused by respirators. Work at the site will be conducted according to established protocol and guidelines for the safety and health of all involved.

Among the most important of these principles for working at a site where hazardous materials are present are the following:

- A buddy system shall be employed. Work should be scheduled so that no person works unobserved within the exclusion zone at any time. Each worker within the exclusion zone should maintain visual contact with at least one other worker on the site. All site personnel should remain aware of each other and monitor each other's condition;
- In any unknown situation, always assume the worst conditions and plan responses accordingly;
- Because no PPE is 100% effective, all personnel must minimize contact with excavated or potentially contaminated materials. Plan work areas, decontamination areas, and procedures accordingly. Do not place equipment on drums or the ground. Do not sit on drums or other materials. Do not sit or kneel on the ground. Avoid standing in or walking through puddles or stained soils;
- **Smoking, eating, or drinking in potentially contaminated work areas will not be allowed.** To mitigate heat stress, water, Gatorade, or other non-alcoholic fluids may be consumed via squirt bottles in the contaminant reduction zone with the approval of the SSO. Open bottles, cups, etc. will not be permitted. Prior to doing such activities (outside of potentially contaminated areas), individual shall wash his/her hands and face prior to such. Oral ingestion of contaminants is a major route of entry for introducing toxic substances into the body;
- Avoid heat and other work stresses related to wearing protective gear. Work breaks should be planned to prevent stress-related accidents and fatigue;
- Personnel must be observant of not only their own immediate surroundings, but also those of others. Everyone will be working under constraints; therefore, a team effort is needed to notice and warn of impending dangerous situations. Extra precautions are necessary when working near heavy equipment and while utilizing PPE because vision, hearing, and communication may be impaired;

- Personnel with any facial hair that interferes with the proper fit of the respirator will not be allowed to work on sites requiring Level C. Work under Levels A and B is not permitted under this HASP;
- Sitting or kneeling should be avoided in areas of known or suspected areas of contamination. Hands and face should be thoroughly washed when leaving the work area. Defective PPE should be repaired or replaced immediately;
- Rigorous contingency planning and dissemination of plans to all personnel minimizes the impact of rapidly changing safety protocols in response to changing site conditions; and
- Personnel must be aware that chemical contaminants may mimic or enhance symptoms of other illnesses or intoxication. Drinking of alcohol while working onsite is prohibited during field investigation assignments.

Safe work practices to be employed during the entire progress of field activities are as follows:

- Set up, assemble, and check out all equipment for integrity and proper function prior to starting work activities;
- Do not use faulty or suspect equipment; and
- Use only new and intact protective clothing.

Additional standard safe work practices are listed in the PES Injury and Illness Prevention Program, a copy of which is located at the PES corporate office. The Cal OSHA Safe Work Practices requirements will be posted at the job site.

## **7.5 Personal Hygiene and Decontamination**

### **7.5.1 General**

Decontamination procedures for Level D and Modified Level D conditions consist of being required to wash hands with soap and potable water after performing any onsite activities and prior to ingestion of food or liquids. Decontamination procedures for onsite personnel during Level C conditions will follow applicable NIOSH/OSHA regulations. Decontamination procedures will be monitored by the SSO to determine their effectiveness.

### **7.5.2 Personal Decontamination**

In the event that Level C PPE is donned to protect against hazardous waste and/or materials, the sequence for personnel decontamination for Level C PPE field activities is described below. Personnel decontamination for Level D and Modified Level D PPE activities will include the applicable procedures described below. Decontamination will occur at either a

temporary job site decontamination pad or at a central decontamination pad. The SSO will determine specific methods as follows:

- If gross contamination is present, wash PPE in detergent or other appropriate solution and rinse in clean water;
- Remove hard hat;
- Remove disposable over-boots (if used);
- Remove outer gloves;
- Wash chemical-resistant boots with detergent solution and rinse with clean water;
- Remove coveralls or Tyvek suit. Starting at the neck, roll the coveralls off from the inside out and down past the boots. Take care to prevent the release and dispersion of dusts or prevent contact with decontamination water that may have accumulated on the coveralls. Do not contaminate clothing inside the coveralls during removal;
- Place disposable PPE in an appropriate container for disposal;
- Remove the respirator. Dispose of cartridges in PPE disposal container;
- Clean and disinfect the respirators and place into a plastic bag for storage;
- Remove liner gloves;
- Thoroughly wash hands and face; and
- Soap and water for hand and face cleansing will be available in the contaminant reduction zone (showers are not anticipated for this scope of work).

All disposable protective clothing shall be removed during decontamination and shall be disposed in a lidded container lined with a labeled drum liner. All waste generated at the site shall be disposed of according to the hazard classification of the debris. Wash hands with hand sanitizer stored on-site.

### **7.5.3 Respirators**

Respirators if donned to protect against hazardous substances and other non-disposable PPE will be cleaned with alcohol wipes or manufacturer's supplied cleaning agents. When dry, respirators will be stored in accordance with PES's Respiratory Protection Program. Cartridges cannot be cleaned. New cartridges will be installed at the start of each shift.

## **7.6 Equipment Decontamination**

Equipment utilized on the site (radios, instruments, samples, tools, drill rigs, other construction equipment) will be decontaminated as needed prior to leaving the site. Smaller equipment can be protected from contamination by draping, masking, storing or otherwise covering the instruments with plastic (to the extent feasible) without hindering operation of the unit.

In the event that equipment comes in contact with potentially contaminated soil or water, the equipment will be cleaned before and after each use on this project. Decontamination will consist of combinations of steam cleaning and/or detergent (Liquinox® or equivalent) wash, tap water rinse, and distilled water rinse. Water from the decontamination activities will be collected in 55-gallon drums.

Contaminated portable equipment will be taken from the drop area and the protective coverings removed and disposed in appropriate containers. Any dirt or obvious contamination will be brushed or wiped off with a disposable paper wipe. The units can then be placed inside in a clean plastic tub, wiped off with damp disposable wipes, and dried. The units will be checked, standardized, and recharged as necessary for the next day's operation, and then prepared with new protective coverings.

All contaminated articles and waste decontamination materials shall be properly containerized, labeled, and disposed of properly.

Additional standard safe work practices are listed in the PES Injury and Illness Prevention Program, a copy of which is located at the PES corporate office.

## **7.7 Sanitation**

Temporary sanitary facilities will be established or identified at the site for the duration of the work and will be serviced at regular intervals. Workers will complete the following personal hygiene procedures before leaving the work site:

- Toilet and hand washing facilities will be located on site or an alternate sanitary facility and their specific location identified prior to beginning work activities;
- Where employees are engaging in the application of any operations involving substances which may be harmful to the employees, cleansing facilities shall be provided in proximity of the worksite and shall be so equipped as to enable employees to remove such substances. Depending upon the problem, these facilities may be in the form of ordinary soap and water or in the form of special compounds designed specifically for removal of the harmful material from skin surfaces;
- Potable drinking water will be on site for use by PES site personnel;



- Personal protective equipment shall be kept clean and in good repair. Safety devices, including protective clothing worn by the employee, shall not be interchanged among the employees until properly cleaned; and
- All equipment leaving the site will be free of gross hazardous and non hazardous waste (i.e. mud and/or soil).

## **7.8 Illumination**

All work will be done in accordance with the requirements of 8 CCR 5192(m). If poor light levels are identified during any activity, adequate illumination levels will be provided to provide a minimum of 20 foot-candles in any work area.

## **7.9 Electrical Equipment Safety**

All portable electrical hand tools and cords shall be inspected daily or when used to ensure safe operation. Any equipment found defective is to be tagged and removed from service until repairs are completed. All portable equipment will be run through a portable ground fault circuit interrupter (GFCI). Each GFCI will be tested daily using the test circuit built into the unit. Any unit failing the test will be tagged and removed from service until repairs can be completed.

All receptacles will be tested prior to use (using portable tester) to ensure that the receptacle has an adequate ground circuit and the wiring is proper. Units that fail the test will be tagged and put out of service until repairs can be made.

All electrical equipment and power cables used in and around structures containing petrochemical contamination must be explosion-proof and/or intrinsically safe and equipped with a three-wire ground lead.

## **7.10 Fire Prevention**

If the potential for the accumulation of flammable vapors exist, periodic vapor-concentration measurements should be taken with an explosimeter or combustimeter. If at any time the vapor concentrations exceed 20% of LEL, then the SSO, or designated field worker, should immediately shut down all operations.

Only approved 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 15 feet of any work area in which petroleum products or solvents in free-floating, dissolved or vapor forms, or other flammable liquids may be present.

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

### **7.11 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. Drinking 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. Contact lenses should not be worn by persons working on the site.

## **8.0 EMERGENCY RESPONSE PLAN AND CONTINGENCY PLAN**

This emergency response and contingency plan, as developed under the requirements of 29 CFR 1910.120 (1), applies to "on-site emergency responses" only. Much of the information for this section is covered elsewhere within this HASP; therefore, only the items not previously addressed will be included.

Emergency recognition, prevention, safe distances, places of refuge and emergency contacts will be discussed at the beginning of the project with all onsite personnel.

### **8.1 Emergency Response Plan**

#### **8.1.1 Required Emergency Equipment**

The following emergency equipment will be onsite at all times:

- A first aid kit for minor injuries. The location of the first aid kit and appropriate PPE will be clearly indicated;
- Spill control materials and equipment;
- Fire extinguishers;
- Portable eyewash;
- Telephone; and
- Emergency alarm.

### 8.1.2 Offsite Emergency Assistance

In the event of an emergency, the following emergency telephone numbers should be used: If an emergency situation occurs on the site, the PM and SSO must evaluate and critique the emergency response procedures and follow-up with corrective actions where necessary. In the event of an accident or emergency situation, immediate action must be taken by the first person to recognize the event. First aid equipment is located on site inside the PES field vehicle. Notify (1) the Site Safety Officer, and (2) the Project Manager and/or Health and Safety Officer about the situation immediately after emergency procedures are implemented.

MSDS and/or NIOSH Pocket Guide pages will be provided to medical response personnel.

**Richmond Fire Department:** 911

**Richmond Police Department:** 911

#### **Hazardous Materials Response:**

National Response Center - 1-(800) 424-8802

California Office of Emergency Response - 1-(800) 852-7550

California Poison Action Line - 1-(800) 222-1222

#### **Environmental Emergency:**

PES Office: (415) 899-1600

State OES: (800) 852-7550

Regional EPA Office: (415) 744-2000

National Response Center: (800) 424-8802 (EPA 24-Hotline)

### 8.1.3 Route to Nearest Emergency Hospital

Kaiser Permanente Richmond Medical Center  
Department of Emergency Medicine  
901 Nevin Ave.  
Richmond CA 94801  
Ph: (510) 307-1566

#### **Route to Hospital (also shown on attached map):**

- Head southeast on Seaver Ave toward S 47th St
- Slight left at S 47th St
- Turn left at Meade St
- Turn right at Erlandson St/Regatta Blvd/Syndicate Ave (signs for I-580/San Rafael)
- Continue to follow Erlandson St/Regatta Blvd
- Turn left to merge onto I-580 W

- Take exit 9B for Harbour Way N
- Merge onto S Harbor Way/Harbour Way S (signs for Cutting Blvd/Downtown)
- Continue to follow Harbour Way S
- Turn left at Nevin Ave

Destination will be on the right: 901 Nevin Ave

#### **8.1.4 Project Contacts:**

Client:	Jim Branch, Richmond Community Redevelopment Agency (510) 307-8140
DTSC	Lynn Nakashima (510) 540-3839
PES PM:	Kyle Flory (415) 899-1600; cell 415-497-2729
PES SSO:	Chris Baldassari (415) 899-1600; cell 415-497-2731
PES Corporate HSO:	Nick Pogoncheff (415) 899-1600

#### **8.2 Usual Procedure for Injury**

1. Call for ambulance/medical assistance, if necessary. Notify the receiving hospital of the nature of physical injury or chemical overexposure.
2. If time allows, send/take pertinent information (i.e., Material Safety Data Sheet-MSDS) to medical facility (Appendix G).
3. If the injury is minor, proceed to administer first aid, and then immediately notify the Site Safety Officer.
4. PM and HSO must be notified of situation.

If an accident, injury, or illness has occurred on site, an Accident/Injury/Illness Investigation report form will be filled out by the SSO within 48 hours of the incident and added to the personnel file. The form is presented in Appendix H.

#### **8.3 Emergency Treatment**

When transporting an injured person to a hospital, bring this HASP 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:

1. Ingestion:  
 Refer to Table 1 or the applicable MSDS (if available) for specific recommendation and/or CALL THE POISON CONTROL CENTER AT: 911 FOR INSTRUCTIONS.

2. Inhalation:  
 DO NOT ENTER CONFINED SPACE UNLESS PROPERLY EQUIPPED AND HAVE A STANDBY PERSON.

**Move the person from the contaminated environment.** Initiate cardiopulmonary resuscitation (CPR) if necessary. Call or have someone call, for medical assistance. Refer to Table 1 or the applicable MSDS (if available) for additional specific information. If necessary, transport the victim to the nearest hospital as soon as possible.

3. Skin Contact:  
**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.

4. Eyes:  
**Hold eyelids open and rinse the eyes immediately with copious 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 hospital as soon as possible.

#### **8.4 Spill and Discharge Control**

Spills of soils and water will be cleaned up as soon as possible once they are observed with appropriate methods including wet methods, and/or HEPA vacuums.

Employees cleaning up debris and waste in the exclusion zone/ regulated area where respirators are required shall wear respirators which are selected, used and fitted per PES' Respiratory Protection Program Requirements.

#### **8.5 Notification of Spills and Discharges**

If the spill or discharge is reportable, and/or human health or the environment is threatened, notify the National Response Center, Contra Costa County Environmental Health Department, Richmond Police and Fire Department non-emergency line, and the PM. Spills or leaks, regardless of their quantity will be reported to the PM immediately following discovery. A follow-up written report will be submitted to the PM within seven (7) days after the initial report. The written report will be in narrative form and as minimum include the following:

- A description of the material spilled including identity and quantity. Photographs showing the location and extent of the spill;
- A statement as to whether the amount spilled is EPA/State reportable and when and to whom it was reported;
- Exact time and location of the spill, including a description of the area involved; and
- Containment procedure initiated and a full description of the cleanup measures taken, or to be taken, including disposal location of the spill residue.

In the case of imminent danger to the health of site personnel and/or site tenants, call 911.

### **8.6 Evacuation Procedures**

Various emergencies may warrant a site evacuation. These may include: fire, explosion, chemical release, or personal injury.

Personnel encountering a hazardous situation shall **instruct others on site to evacuate the vicinity IMMEDIATELY** and call the (1) SSO, and (2) the PM and/or the HSO for instructions.

The site must not be re-entered until the situation has been corrected.

In the event of an evacuation, the work party will move upwind. Wind direction can be noted by the use of a windsock located on the site or other indicators (i.e., flags, trees, waves, etc.). When conditions warrant moving away from the work site, the crew will relocate upwind a distance of approximately 100 feet or further, as indicated by the site monitoring instruments. If the decontamination area is upwind and far enough from the event, the work crew will quickly pass through the decontamination area to remove contaminated clothing.

When the SSO determines that conditions warrant evacuation of downwind residences and commercial operations, local agencies will be notified and assistance requested. Designated on-site personnel will initiate evacuation of the immediate off-site area without delay. The following signals (i.e., truck/car horn) will be utilized for site evacuation/emergencies:

- 1 long blast – Evacuate;
- 1 short blast – Attention; and
- 2 blasts – Fire.

## **8.7 Procedures for Discovery of Areas of Unknown Contamination**

Site intrusive activities may result in the identification of previously unknown areas or types of contamination. To determine if an environmental condition is unknown, the PM and/or SSO should review all available soil and groundwater analytical reports which may provide and/or describe known types of compounds previously discovered on the site, the magnitude of the detections, and the specific locations where they were discovered. This information will guide in determining whether an encountered environmental condition is unknown and therefore will trigger contingency monitoring, as described in the succeeding paragraphs below.

Unknown conditions which may trigger contingency monitoring procedures during site development include, but are not limited to the following:

- Oily, shiny, or saturated soil or separate-phase product in previously undocumented areas;
- Soil with a significant chemical or hydrocarbon-like odor in previously undocumented areas; and
- Significantly discolored soil that reasonably indicates a concentrated source of metals within the site other than metals naturally occurring or otherwise known to be present in the native soils.

Upon the discovery of one of the conditions identified above, and if the conditions on the site vary materially from those previously documented such that they could require either alternative or additional measures to protect human health or additional calculations and assessments to confirm that the existing site measures will be sufficiently protective, PES will conduct contingency monitoring.

Contingency monitoring, if conducted, will consist of the following steps. If unknown areas of potential concentrated metals are encountered, additional analyses should be conducted for the suspected constituents to assess the potential leachability of the metals. If the encountered materials are suspected to be volatiles, the following contingency monitoring procedures may be followed by trained site personnel (i.e. SSO) protected in at least Level C PPE depending upon the risk (work will halt if Level B PPE is warranted and the PM and HSO will be notified for re-evaluation of the site conditions and applicability of the HASP):

Conduct contingency monitoring by taking organic vapor readings using an organic vapor meter (e.g. PID or equivalent) to screen for the presence of fuel, oil, or solvents. If the PID/FID indicates that an unknown area of fuel, oil, or solvents has been detected, the client and/or regulatory agency will be notified to determine if additional sampling is appropriate prior to continuing construction in that area. Such additional characterization will not be required if the client and/or regulatory agency concurs that the current risk management measures already mitigate the risk of the chemicals detected in this area. PID/FID or equivalent screening methods will be conducted by experienced personnel only.

If an unknown area of suspected contamination has been identified and the client and/or regulatory agency has requested additional characterization, the following steps will, in general, be taken:

- Samples will be collected from the identified area and analyzed for volatiles and/or TPH compounds, depending on the suspected type of contamination. The sampling strategy will be discussed with the client and/or regulatory agency prior to the initiation of the sampling activities; and
- Analytical results collected from the suspected source will be compared to the health based site-specific target levels (SSTLs) developed and approved for the site. If the levels are below the relevant health based SSTLs, and the client and/or regulatory agency concludes that the potential for ecological impacts is insignificant and does not require mitigation, then soil removal activities will not be required and the soil may be temporarily stored elsewhere pending reuse on the site and the soils will be contained during transport within the site so as to minimize the potential for spillage and exposure.

## **9.0 EMPLOYEE TRAINING, MEDICAL SURVEILLANCE, AND MONITORING**

### **9.1 PES Employee Training Requirements**

The project field staff have completed 40 hours of comprehensive health and safety training, which meets the requirements of Title 29 CFR 1910.120, T8-CCR, Section 5192 and an 8-hour supervisory course in health and safety management, including training on site safety planning, emergency planning, and drilling safety. Project personnel are required to maintain their training by successfully completing approved annual 8-hour refresher courses.

Documentation for all training completed by PES personnel is available from the HSO on request.

### **9.2 Employee Training Program**

In accordance with the DTSC HASP guidance document, PES will make available to DTSC upon request a summary of the PES hazardous materials health and safety training program and a list of elements included in such program. Documentation of training for project personnel will be readily available, upon request.

### **9.3 Medical Surveillance Program**

All PES employees have fulfilled the applicable training and medical monitoring requirements described in 40 CFR 1910.120 and T8-CCR, Section 5192.



### **9.3.1 Medical Evaluation of Employees**

The medical evaluation tests include:

- Collecting personal and occupational histories of the employee;
- Physical examination by qualified medical personnel;
- Laboratory blood tests including a complete blood cell count and chemistry;
- Urinalysis;
- Pulmonary function tests;
- Vision and hearing tests to required hertz levels;
- Chest x-rays (if required); and
- Electrocardiogram.

### **9.3.2 Medical Evaluation of Subcontractors**

All subcontractors to PES shall provide evidence of having met the same medical monitoring requirements as cited in Section 9.3.1, prior to performing onsite work.

### **9.4 Retention of Medical Records**

All medical records and personnel exposure monitoring data will be held at the PES office for the period required under 8 CCR 3204(d).

### **9.5 Subcontractor Training Requirements**

Subcontractors and similarly associated personnel involved in any intrusive activity associated with this project will be required to be 40-hour health and safety trained (as described above) and medically qualified to don a respirator, should respiratory protection become necessary. If site conditions vary drastically from those anticipated in the HASP, other medical surveillance procedures may become necessary, as required. Subcontractors involved in non-intrusive work activities (e.g., land surveying) will be required to provide proof of a combination of training and work experience to satisfy the 40-hour minimum requirement and have completed 24 hours of supervised on-the-job training.

The environmental conditions of the property shall be disclosed to all subcontractors who will be engaged in field activities, including, but not limited to, asphalt/concrete removal, shallow excavations, soil boring and well installations, groundwater sampling, and other subsurface activities where contact with potentially contaminated soil and/or groundwater is possible.

It is the individual contractor/subcontractor's responsibility to provide a site-specific health and safety plan and construction safety training, if applicable.

## **10.0 CONFINED SPACE OPERATIONS**

**Entry into confined spaces is not anticipated for this project and no confined space entry will be permitted on this project.** However, if entry becomes necessary as determined by the PM it will be conducted under PES's strict Confined Spaces Entry requirements. OSHA defines a "confined space" as, a space:

- Large enough and so configured that an employee can bodily enter and perform assigned work;
- Having 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
- That is not designated for continuous employee occupancy.

Furthermore, OSHA defines a "Permit-Required Confined Space (permit space)" as one that has one or more of the following characteristics:

- Contains or has a potential to contain a hazardous atmosphere;
- Contains a material that has the potential for engulfing an entrant;
- 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 small cross-section; or
- Contains any other recognized serious safety or health hazard.

Personnel entering non-permit and permit-required confined spaces must have generic and site-specific Confined Spaces Training and be specifically authorized by the SSO and PM to participate in confined space operations.

## **11.0 WASTE STORAGE, TRANSPORTATION, AND HANDLING PROCEDURES**

### **11.1 Management of Soil**

Waste derived from soil borings will be placed in secured, labeled drums for sampling and future disposal. The chemical analyses to be conducted will be determined on the basis of the

anticipated destination of the material (e.g., landfill disposal, offsite backfill area, etc.) and/or the suspected contaminant(s) (based on the field evaluation techniques and/or historical sampling data relevant to the specific area of the site from which the material was excavated). Pending results of the drum characterization, appropriate handling and management alternatives will be evaluated.

## **11.2 Management of Fluids**

Potentially chemically-affected rinsate will be generated during decontamination activities and managed appropriately as investigation-derived waste (IDW). Appropriate PPE, as described previously in Section 5.0, will be donned prior to implementation of any work activity involving IDW fluids. The chemical analyses to be conducted for waste characterization purposes will be determined on the basis of the soil sample analytical results. Water used in the decontamination of downhole equipment will be contained and stored in drums in a secure location for future sampling and disposal.

## **12.0 REFERENCES**

Cal/OSHA Regulations as specified in Title 8, California Code of Regulations, Subchapters 4 and 7.

National Institute of Occupational Safety and Health (NIOSH), *Pocket Guide to Chemical Hazards*. September 2005.

OSHA Regulations in 29 CFR 1910.120 (Federal Register 45654, December 19, 1986; Updated March 6, 1989).

Sax, N. Irving and Richard J. Lewis, Sr., *Dangerous Properties of Industrial Materials*, Van Nostrand Reinhold, New York, 1989.

Tetra Tech EMI inc., 2007. Current Conditions Report, University of California, Berkeley Richmond Field Station, Richmond, California. April 5.

**APPENDIX A**

**AGREEMENT AND ACKNOWLEDGEMENT STATEMENT**

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**AGREEMENT AND ACKNOWLEDGMENT STATEMENT**

**Site Health and Safety Plan Agreement**

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

1. I have read and fully understand the Plan and my individual responsibilities.
2. I agree to abide by the provisions of the Plan.

_____ Name	_____ Signature
_____ Company	_____ Date
_____ Name	_____ Signature
_____ Company	_____ Date
_____ Name	_____ Signature
_____ Company	_____ Date
_____ Name	_____ Signature
_____ Company	_____ Date
_____ Name	_____ Signature
_____ Company	_____ Date

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_____ Company	_____ Date
_____ Name	_____ Signature
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_____ Company	_____ Date
_____ Name	_____ Signature
_____ Company	_____ Date
_____ Name	_____ Signature
_____ Company	_____ Date

**Site Health and Safety Plan Agreement**

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

1. I have read and fully understand the Plan and my individual responsibilities.
2. I agree to abide by the provisions of the Plan.

\_\_\_\_\_  
Name

\_\_\_\_\_  
Signature

\_\_\_\_\_  
Company

\_\_\_\_\_  
Date

\_\_\_\_\_  
Name

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Name

\_\_\_\_\_  
Signature

\_\_\_\_\_  
Company

\_\_\_\_\_  
Date

**APPENDIX B**

**SITE SAFETY PLAN AMENDMENT SHEET**



**APPENDIX B**

**SITE HEALTH AND SAFETY PLAN AMENDMENT SHEET**

Project Name: \_\_\_\_\_

Project Number: \_\_\_\_\_

Location: \_\_\_\_\_

Changes in field activities or hazards:

**Proposed Amendment:**

Proposed by: \_\_\_\_\_ Date: \_\_\_\_\_

Approved by: \_\_\_\_\_ Date: \_\_\_\_\_

Declined by: \_\_\_\_\_ Date: \_\_\_\_\_

Amendment Number: \_\_\_\_\_

Amendment Effective Date: \_\_\_\_\_

**APPENDIX C**

**NATIONAL INSTITUTE FOR OCCUPATIONAL SAFETY AND HEALTH (NIOSH)  
POCKET GUIDE DATA SHEETS FOR CHEMICALS OF POTENTIAL CONCERN**

## APPENDIX C

### **NATIONAL INSTITUTE FOR OCCUPATIONAL SAFETY AND HEALTH (NIOSH) POCKET GUIDE DATA SHEETS FOR CHEMICALS OF POTENTIAL CONCERN**

NIOSH data sheets for site constituents of potential concern (COPCs), where available, were obtained at the following website: <http://www.cdc.gov/niosh/npg/>. The NIOSH website should be accessed to obtain additional information referenced in the sheets below, including the appendices web links cited therein.

NIOSH data sheets are not available for total petroleum hydrocarbons quantified as diesel (TPHd), as motor oil (TPHmo).

Data sheets are presented below for the following chemicals previously detected at the site: coal tar pitch volatiles (which includes creosote and benzo(a)pyrene [BAP]), speciated polychlorinated biphenyls (PCBs) as Aroclor 1242 and Aroclor 1254, arsenic, and lead.

<b>Chlorodiphenyl (42% chlorine) (speciated PCB)</b>		CAS 53469-21-9	
C <sub>6</sub> H <sub>4</sub> ClC <sub>6</sub> H <sub>3</sub> Cl <sub>2</sub> (approx)		RTECS <a href="#">TQ1356000</a>	
Synonyms & Trade Names  Aroclor® 1242, PCB, Polychlorinated biphenyl		DOT ID & Guide 2315 <a href="#">171</a>	
Exposure Limits	NIOSH REL*: Ca TWA 0.001 mg/m <sup>3</sup> <a href="#">See Appendix A</a> [*Note: The REL also applies to other PCBs.]		
	OSHA PEL: TWA 1 mg/m <sup>3</sup> [skin]		
IDLH Ca [5 mg/m <sup>3</sup> ] See: <a href="#">53469219</a>	Conversion		
<b>Physical Description</b> Colorless to light-colored, viscous liquid with a mild, hydrocarbon odor.			
MW: 258 (approx)	BP: 617-691°F	FRZ: -2°F	Sol: Insoluble
VP: 0.001 mmHg	IP: ?		Sp.Gr(77°F): 1.39
Fl.P: NA	UEL: NA	LEL: NA	
Nonflammable Liquid, but exposure in a fire results in the formation of a black soot containing PCBs, polychlorinated dibenzofurans & chlorinated dibenzo-p-dioxins.			
<b>Incompatibilities &amp; Reactivities</b>  Strong oxidizers			
<b>Measurement Methods</b> NIOSH <a href="#">5503</a> ; OSHA <a href="#">PV2089</a> See: <a href="#">NMAM</a> or <a href="#">OSHA Methods</a>			
<b>Personal Protection &amp; Sanitation</b> ( <a href="#">See protection codes</a> ) Skin: Prevent skin contact Eyes: Prevent eye contact Wash skin: When contaminated Remove: When wet or contaminated Change: Daily Provide: Eyewash, Quick drench		<b>First Aid</b> ( <a href="#">See procedures</a> ) Eye: Irrigate immediately Skin: Soap wash immediately Breathing: Respiratory support Swallow: Medical attention immediately	
<b>Respirator Recommendations</b> NIOSH <b>At concentrations above the NIOSH REL, or where there is no REL, at any detectable concentration:</b> (APF = 10,000) Any self-contained breathing apparatus that has a full facepiece and is operated in a pressure-demand or other positive-pressure mode (APF = 10,000) Any supplied-air respirator that has a full facepiece and is operated in a pressure-demand or other positive-pressure mode in combination with an auxiliary self-contained positive-pressure breathing apparatus <b>Escape:</b> (APF = 50) Any air-purifying, full-facepiece respirator (gas mask) with a chin-style, front- or back-mounted organic vapor canister having an N100, R100, or P100 filter. <a href="#">Click here</a> for information on selection of N, R, or P filters./Any appropriate escape-type, self-contained breathing apparatus <a href="#">Important additional information about respirator selection</a>			

**Exposure Routes**

inhalation, skin absorption, ingestion, skin and/or eye contact

**Symptoms**

Irritation eyes; chloracne; liver damage; reproductive effects; [potential occupational carcinogen]

**Target Organs**

Skin, eyes, liver, reproductive system

**Cancer Site**

[in animals: tumors of the pituitary gland & liver, leukemia]

See also: [INTRODUCTION](#) See MEDICAL TESTS: [0175](#)

<b>Chlorodiphenyl (54% chlorine) (speciated PCB)</b>		CAS 11097-69-1	
C <sub>6</sub> H <sub>3</sub> Cl <sub>2</sub> C <sub>6</sub> H <sub>2</sub> Cl <sub>3</sub> (approx)		RTECS <a href="#">TQ1360000</a>	
Synonyms & Trade Names  Aroclor® 1254, PCB, Polychlorinated biphenyl		DOT ID & Guide 2315 <a href="#">171</a>	
Exposure Limits	NIOSH REL*: Ca TWA 0.001 mg/m <sup>3</sup> <a href="#">See Appendix A</a> [*Note: The REL also applies to other PCBs.]		
	OSHA PEL: TWA 0.5 mg/m <sup>3</sup> [skin]		
IDLH Ca [5 mg/m <sup>3</sup> ] See: <a href="#">IDLH INDEX</a>	Conversion		
<b>Physical Description</b> Colorless to pale-yellow, viscous liquid or solid (below 50°F) with a mild, hydrocarbon odor.			
MW: 326 (approx)	BP: 689-734°F	FRZ: 50°F	Sol: Insoluble
VP: 0.00006 mmHg	IP: ?		Sp.Gr(77°F): 1.38
Fl.P: NA	UEL: NA	LEL: NA	
Nonflammable Liquid, but exposure in a fire results in the formation of a black soot containing PCBs, polychlorinated dibenzofurans, and chlorinated dibenzo-p-dioxins.			
<b>Incompatibilities &amp; Reactivities</b>  Strong oxidizers			
<b>Measurement Methods</b> NIOSH <a href="#">5503</a> ; OSHA <a href="#">PV2088</a> See: <a href="#">NMAM</a> or <a href="#">OSHA Methods</a>			
<b>Personal Protection &amp; Sanitation</b> ( <a href="#">See protection codes</a> ) Skin: Prevent skin contact Eyes: Prevent eye contact Wash skin: When contaminated Remove: When wet or contaminated Change: Daily Provide: Eyewash, Quick drench		<b>First Aid</b> ( <a href="#">See procedures</a> ) Eye: Irrigate immediately Skin: Soap wash immediately Breathing: Respiratory support Swallow: Medical attention immediately	
<b>Respirator Recommendations</b> NIOSH <b>At concentrations above the NIOSH REL, or where there is no REL, at any detectable concentration:</b> (APF = 10,000) Any self-contained breathing apparatus that has a full facepiece and is operated in a pressure-demand or other positive-pressure mode (APF = 10,000) Any supplied-air respirator that has a full facepiece and is operated in a pressure-demand or other positive-pressure mode in combination with an auxiliary self-contained positive-pressure breathing apparatus <b>Escape:</b> (APF = 50) Any air-purifying, full-facepiece respirator (gas mask) with a chin-style, front- or back-mounted organic vapor canister having an N100, R100, or P100 filter. <a href="#">Click here</a> for information on selection of N, R, or P filters./Any appropriate escape-type, self-contained breathing apparatus <a href="#">Important additional information about respirator selection</a>			

**Exposure Routes**

inhalation, skin absorption, ingestion, skin and/or eye contact

**Symptoms**

Irritation eyes, chloracne; liver damage; reproductive effects; [potential occupational carcinogen]

**Target Organs**

Skin, eyes, liver, reproductive system

**Cancer Site**

[in animals: tumors of the pituitary gland & liver, leukemia]

See also: [INTRODUCTION](#) See ICSC CARD: [0939](#) See MEDICAL TESTS: [0176](#)

<b>Arsenic (inorganic compounds, as As)</b>		CAS 7440-38-2 (metal)	
As (metal)		RTECS <a href="#">CG0525000</a> (metal)	
Synonyms & Trade Names  Arsenic metal: Arsenia Other synonyms vary depending upon the specific As compound. [Note: OSHA considers "Inorganic Arsenic" to mean copper acetoarsenite & all inorganic compounds containing arsenic except ARSINE.]		DOT ID & Guide 1558 <a href="#">152</a> (metal) 1562 <a href="#">152</a> (dust)	
Exposure Limits	NIOSH REL: Ca C 0.002 mg/m <sup>3</sup> [15-minute] <a href="#">See Appendix A</a>		
	OSHA PEL: [1910.1018] TWA 0.010 mg/m <sup>3</sup>		
IDLH Ca [5 mg/m <sup>3</sup> (as As)] See: <a href="#">7440382</a>	Conversion		
<b>Physical Description</b> Metal: Silver-gray or tin-white, brittle, odorless solid.			
MW: 74.9	BP: Sublimes	MLT: 1135°F (Sublimes)	Sol: Insoluble
VP: 0 mmHg (approx)	IP: NA		Sp.Gr: 5.73 (metal)
Fl.P: NA	UEL: NA	LEL: NA	
Metal: Noncombustible Solid in bulk form, but a slight explosion hazard in the form of dust when exposed to flame.			
<b>Incompatibilities &amp; Reactivities</b>  Strong oxidizers, bromine azide [Note: Hydrogen gas can react with inorganic arsenic to form the highly toxic gas arsine.]			
<b>Measurement Methods</b> NIOSH <a href="#">7300</a> , <a href="#">7301</a> , <a href="#">7303</a> , <a href="#">7900</a> , <a href="#">9102</a> ; OSHA <a href="#">ID105</a> See: <a href="#">NMAM</a> or <a href="#">OSHA Methods</a>			
<b>Personal Protection &amp; Sanitation</b> ( <a href="#">See protection codes</a> ) Skin: Prevent skin contact Eyes: Prevent eye contact Wash skin: When contaminated/Daily Remove: When wet or contaminated Change: Daily Provide: Eyewash, Quick drench		<b>First Aid</b> ( <a href="#">See procedures</a> ) Eye: Irrigate immediately Skin: Soap wash immediately Breathing: Respiratory support Swallow: Medical attention immediately	
<b>Respirator Recommendations</b> ( <a href="#">See Appendix E</a> ) NIOSH <b>At concentrations above the NIOSH REL, or where there is no REL, at any detectable concentration:</b> (APF = 10,000) Any self-contained breathing apparatus that has a full facepiece and is operated in a pressure-demand or other positive-pressure mode (APF = 10,000) Any supplied-air respirator that has a full facepiece and is operated in a pressure-demand or other positive-pressure mode in combination with an auxiliary self-contained positive-pressure breathing apparatus <b>Escape:</b> (APF = 50) Any air-purifying, full-facepiece respirator (gas mask) with a chin-style, front- or back-mounted acid gas canister having an N100, R100, or P100 filter. <a href="#">Click here</a> for information on selection of N, R, or P filters./Any appropriate escape-type, self-contained breathing apparatus			



[Important additional information about respirator selection](#)

**Exposure Routes**

inhalation, skin absorption, skin and/or eye contact ingestion

**Symptoms**

Ulceration of nasal septum, dermatitis, gastrointestinal disturbances, peripheral neuropathy, respiratory irritation, hyperpigmentation of skin, [potential occupational carcinogen]

**Target Organs**

Liver, kidneys, skin, lungs, lymphatic system

**Cancer Site**

[lung & lymphatic cancer]

See also: [INTRODUCTION](#) See ICSC CARD: [0013](#) See MEDICAL TESTS: [0017](#)

<b>Lead</b>		CAS 7439-92-1	
Pb		RTECS <a href="#">OF7525000</a>	
Synonyms & Trade Names Lead metal, Plumbum		DOT ID & Guide	
Exposure Limits	NIOSH REL*: TWA (8-hour) 0.050 mg/m <sup>3</sup> <a href="#">See Appendix C</a> [*Note: The REL also applies to other lead compounds (as Pb) -- <a href="#">see Appendix C.</a> ]		
	OSHA PEL*: [1910.1025] TWA 0.050 mg/m <sup>3</sup> <a href="#">See Appendix C</a> [*Note: The PEL also applies to other lead compounds (as Pb) -- <a href="#">see Appendix C.</a> ]		
IDLH 100 mg/m <sup>3</sup> (as Pb) See: <a href="#">7439921</a>	Conversion		
<b>Physical Description</b> A heavy, ductile, soft, gray solid.			
MW: 207.2	BP: 3164°F	MLT: 621°F	Sol: Insoluble
VP: 0 mmHg (approx)	IP: NA		Sp.Gr: 11.34
Fl.P: NA	UEL: NA	LEL: NA	
Noncombustible Solid in bulk form.			
<b>Incompatibilities &amp; Reactivities</b> Strong oxidizers, hydrogen peroxide, acids			
<b>Measurement Methods</b> NIOSH <a href="#">7082</a> , <a href="#">7105</a> , <a href="#">7300</a> , <a href="#">7301</a> , <a href="#">7303</a> , <a href="#">7700</a> , <a href="#">7701</a> , <a href="#">7702</a> , <a href="#">9100</a> , <a href="#">9102</a> , <a href="#">9105</a> ; OSHA <a href="#">ID121</a> , <a href="#">ID125G</a> , <a href="#">ID206</a> See: <a href="#">NMAM</a> or <a href="#">OSHA Methods</a>			
<b>Personal Protection &amp; Sanitation</b> <a href="#">(See protection codes)</a> Skin: Prevent skin contact Eyes: Prevent eye contact Wash skin: Daily Remove: When wet or contaminated Change: Daily		<b>First Aid</b> <a href="#">(See procedures)</a> Eye: Irrigate immediately Skin: Soap flush promptly Breathing: Respiratory support Swallow: Medical attention immediately	
<b>Respirator Recommendations</b> <a href="#">(See Appendix E)</a> NIOSH/OSHA <b>Up to 0.5 mg/m<sup>3</sup>:</b> (APF = 10) Any air-purifying respirator with an N100, R100, or P100 filter (including N100, R100, and P100 filtering facepieces) except quarter-mask respirators. <a href="#">Click here</a> for information on selection of N, R, or P filters. (APF = 10) Any supplied-air respirator <b>Up to 1.25 mg/m<sup>3</sup>:</b> (APF = 25) Any supplied-air respirator operated in a continuous-flow mode (APF = 25) Any powered, air-purifying respirator with a high-efficiency particulate filter <b>Up to 2.5 mg/m<sup>3</sup>:</b> (APF = 50) Any air-purifying, full-facepiece respirator with an N100, R100, or P100 filter. <a href="#">Click here</a> for information on selection of N, R, or P filters. (APF = 50) Any supplied-air respirator that has a tight-fitting facepiece and is operated in a continuous-flow mode (APF = 50) Any powered, air-purifying respirator with a tight-fitting facepiece and a high-efficiency particulate filter			

(APF = 50) Any self-contained breathing apparatus with a full facepiece

(APF = 50) Any supplied-air respirator with a full facepiece

**Up to 50 mg/m<sup>3</sup>:**

(APF = 1000) Any supplied-air respirator operated in a pressure-demand or other positive-pressure mode

**Up to 100 mg/m<sup>3</sup>:**

(APF = 2000) Any supplied-air respirator that has a full facepiece and is operated in a pressure-demand or other positive-pressure mode

**Emergency or planned entry into unknown concentrations or IDLH conditions:**

(APF = 10,000) Any self-contained breathing apparatus that has a full facepiece and is operated in a pressure-demand or other positive-pressure mode

(APF = 10,000) Any supplied-air respirator that has a full facepiece and is operated in a pressure-demand or other positive-pressure mode in combination with an auxiliary self-contained positive-pressure breathing apparatus

**Escape:**

(APF = 50) Any air-purifying, full-facepiece respirator with an N100, R100, or P100 filter. [Click here](#) for information on selection of N, R, or P filters./Any appropriate escape-type, self-contained breathing apparatus

[Important additional information about respirator selection](#)

### Exposure Routes

inhalation, ingestion, skin and/or eye contact

### Symptoms

Lassitude (weakness, exhaustion), insomnia; facial pallor; anorexia, weight loss, malnutrition; constipation, abdominal pain, colic; anemia; gingival lead line; tremor; paralysis wrist, ankles; encephalopathy; kidney disease; irritation eyes; hypertension

### Target Organs

Eyes, gastrointestinal tract, central nervous system, kidneys, blood, gingival tissue

**Coal Tar Pitch Volatiles**

CAS  
65996-93-2  
RTECS  
[GF8655000](#)

## Synonyms &amp; Trade Names

Synonyms vary depending upon the specific compound (e.g., pyrene, phenanthrene, acridine, chrysene, anthracene & benzo(a)pyrene). [Note: 2713 [153](#) (acridine) DOT ID & Guide NIOSH considers coal tar, coal tar pitch, and creosote to be coal tar products.]

**Exposure****Limits**

**NIOSH REL:** Ca TWA 0.1 mg/m<sup>3</sup> (cyclohexane-extractable fraction)  
[See Appendix A](#) [See Appendix C](#)  
**OSHA PEL:** TWA 0.2 mg/m<sup>3</sup> (benzene-soluble fraction) [1910.1002]  
[See Appendix C](#)

## IDLH

Ca [80 mg/m<sup>3</sup>] See: [Conversion](#)  
[65996932](#)

## Physical Description

Black or dark-brown amorphous residue.

Properties vary depending upon the specific compound.

## Combustible Solids

## Incompatibilities &amp; Reactivities

Strong oxidizers

## Measurement Methods

OSHA [58](#)

See: [NMAM](#) or [OSHA Methods](#)

## Personal Protection &amp; Sanitation

([See protection codes](#))

Skin: Prevent skin contact

Eyes: Prevent eye contact

Wash skin: Daily

Remove: No recommendation

Change: Daily

## First Aid

([See procedures](#))

Eye: Irrigate immediately

Skin: Soap wash immediately

Breathing: Respiratory support

Swallow: Medical attention immediately

## Respirator Recommendations

NIOSH

**At concentrations above the NIOSH REL, or where there is no REL, at any detectable concentration:**

(APF = 10,000) Any self-contained breathing apparatus that has a full facepiece and is operated in a pressure-demand or other positive-pressure mode

(APF = 10,000) Any supplied-air respirator that has a full facepiece and is operated in a pressure-demand or other positive-pressure mode in combination with an auxiliary self-contained positive-pressure breathing apparatus

**Escape:**

(APF = 50) Any air-purifying, full-facepiece respirator (gas mask) with a chin-style, front- or back-mounted organic vapor canister having an N100, R100, or P100 filter. [Click here](#) for information on selection of N, R, or P filters./Any appropriate escape-type, self-contained breathing apparatus

[Important additional information about respirator selection](#)

Exposure Routes

inhalation, skin and/or eye contact

Symptoms

Dermatitis, bronchitis, [potential occupational carcinogen]

Target Organs

respiratory system, skin, bladder, kidneys

Cancer Site

[lung, kidney & skin cancer]

**APPENDIX D**

**EXPLANATION OF HAZARD EVALUATION GUIDELINES**

## APPENDIX D

### EXPLANATION OF HAZARD EVALUATION GUIDELINES

#### **Hazard: Airborne Contaminants**

##### **Guideline**

##### **Explanation**

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

The TLV-TWA concentration for a normal 8-hour workday and a 40-nearly all workers may be repeatedly exposed without adverse effect.

Permissible Exposure Limit (PEL)

A time-weighted average concentration similar to (and in many cases derived from) TLV values.

Immediately Dangerous to Life or Health (IDLH)

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

#### **Hazard: Explosion**

##### **Guideline**

##### **Explanation**

Lower Explosive Limit (LEL)

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

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.

#### **Hazard: Fire**

##### **Guideline**

##### **Explanation**

Flash Point

The lowest temperature at which the vapor of a combustible liquid can be made to ignite momentarily in air.

**APPENDIX E**

**DIRECT READING INSTRUMENT LOG**



### APPENDIX E

### DIRECT READING INSTRUMENT LOG

Project Name: \_\_\_\_\_ Address: \_\_\_\_\_  
Surveyor's Name: \_\_\_\_\_ Date: \_\_\_\_\_  
Instrument: \_\_\_\_\_ Serial Number: \_\_\_\_\_  
Calibration Date and Time: \_\_\_\_\_

Contaminant	Time	Reading	Contaminant	Time	Reading

**APPENDIX F**

**CODE OF SAFE PRACTICES**

## APPENDIX F

### CODE OF SAFE PRACTICES

(This is a suggested code. It is general in nature and intended as a basis for preparation by the contractor of a code that fits his operations more exactly.)

#### GENERAL

1. All persons shall follow these safe practice rules, render every possible aid to safe operations, and report all unsafe conditions or practices to the foreman or superintendent.
2. Foremen shall insist on employees observing and obeying every rule, regulation, and order as is necessary to the safe conduct of the work, and shall take such action as is necessary to obtain observance.
3. All employees shall be given frequent accident prevention instructions. Instructions shall be given at least every 10 working days.
4. Anyone known to be under the influence of drugs or intoxicating substances that impair the employee's ability to safely perform the assigned duties shall not be allowed on the job while in that condition.
5. Horseplay, scuffling, and other acts that tend to have an adverse influence on the safety or well-being of the employees shall be prohibited.
6. Work shall be well planned and supervised to prevent injuries in the handling of materials and in working together with equipment.
7. No one shall knowingly be permitted or required to work while the employee's ability or alertness is so impaired by fatigue, illness, or other causes that it might unnecessarily expose the employee or others to injury.
8. Employees shall not enter manholes, underground vaults, chambers, tanks, silos, or other similar places that receive little ventilation, unless it has been determined that is safe to enter.
9. Employees shall be instructed to ensure that all guards and other protective devices are in proper places and adjusted, and shall report deficiencies promptly to the foreman or superintendent.
10. Crowding or pushing when boarding or leaving any vehicle or other conveyance shall be prohibited.
11. Workers shall not handle or tamper with any electrical equipment, machinery, or air or water lines in a manner not within the scope of their duties, unless they have received instructions from their foreman.
12. All injuries shall be reported promptly to the foreman or superintendent so that arrangements can be made for medical or first aid treatment.
13. When lifting heavy objects, the large muscles of the leg instead of the smaller muscles of the back shall be used.
14. Inappropriate footwear or shoes with thin or badly worn soles shall not be worn.
15. Materials, tools, or other objects shall not be thrown from buildings or structures until proper precautions are taken to protect others from the falling objects.

**APPENDIX G**

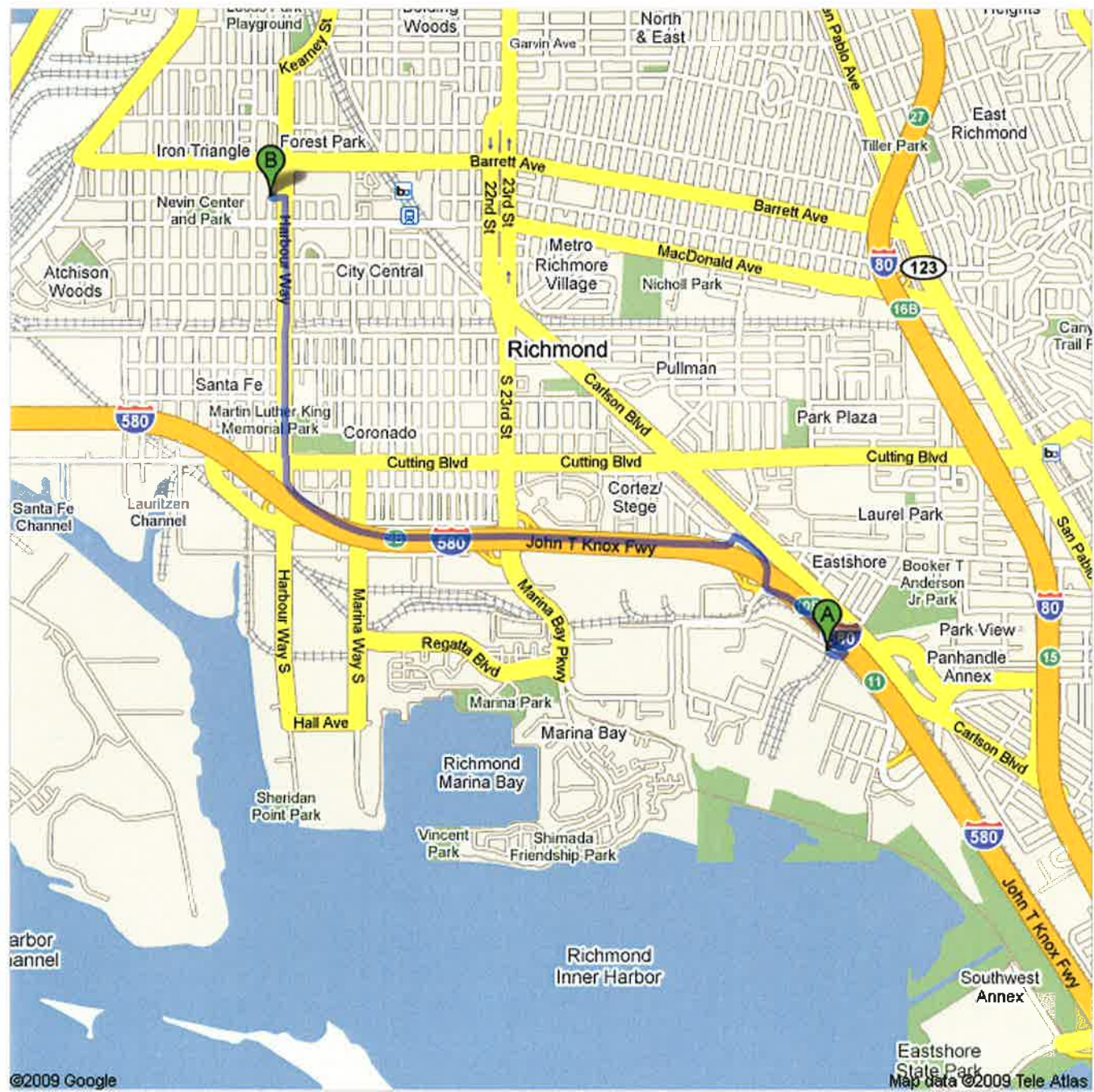
**ROUTE TO HOSPITAL**



### Directions to 901 Nevin Ave, Richmond, CA 94801

2.9 mi – about 6 mins

**Save trees. Go green!**  
 Download Google Maps on your phone at [google.com/gmm](http://google.com/gmm)

 Meade St, Richmond, CA 94804

- 
1. Head **southeast** on **Seaver Ave** toward **S 47th St** go 217 ft  
total 217 ft
  -  2. Slight **left** at **S 47th St** go 69 ft  
total 285 ft
  -  3. Turn **left** at **Meade St**  
About 1 min go 0.3 mi  
total 0.4 mi
  -  4. Turn **right** at **Erlandson St/Regatta Blvd/Syndicate Ave** (signs for **I-580/San Rafael**)  
Continue to follow Erlandson St/Regatta Blvd go 0.2 mi  
total 0.6 mi
  -  5. Turn **left** to merge onto **I-580 W**  
About 2 mins go 1.1 mi  
total 1.6 mi
  6. Take exit **9B** for **Harbour Way N** go 0.4 mi  
total 2.0 mi
  7. Merge onto **S Harbor Way/Harbour Way S** (signs for **Cutting Blvd/Downtown**)  
Continue to follow Harbour Way S  
About 2 mins go 0.9 mi  
total 2.9 mi
  -  8. Turn **left** at **Nevin Ave**  
Destination will be on the right go 230 ft  
total 2.9 mi

 901 Nevin Ave, Richmond, CA 94801

---

These directions are for planning purposes only. You may find that construction projects, traffic, weather, or other events may cause conditions to differ from the map results, and you should plan your route accordingly. You must obey all signs or notices regarding your route.

Map data ©2009 , Tele Atlas

**APPENDIX H**

**ACCIDENT, INJURY, ILLNESS INVESTIGATION REPORT**