



Matthew Rodriguez  
Secretary for  
Environmental Protection



## Department of Toxic Substances Control

Deborah O. Raphael, Director  
700 Heinz Avenue  
Berkeley, California 94710-2721



Edmund G. Brown Jr.  
Governor

March 14, 2012

Mr. Greg Haet  
EH&S Associate Director, Environmental Protection  
317 University Hall, No. 1150  
Berkeley, California 94720

Dear Mr. Haet:

The Department of Toxic Substances Control (DTSC) received the *Phase II Sampling Results Technical Memorandum (Technical Memorandum)*, dated January 20, 2012, for the University of California, Berkeley, Richmond Field Station, located at 1301 South 46<sup>th</sup> Street in Richmond, California. The Technical Memorandum contains the results of the soil sampling activities that were conducted in October 2011. The investigation was conducted in accordance with the Field Sampling Workplan, Phase II Sampling Plan dated September 12, 2011, and included soil sampling around historic transformer locations and in the Facilities Maintenance Corporation Yard. We have reviewed the Technical Memorandum along with DTSC's Human and Ecological Risk Office (HERO). HERO's comments are enclosed and our comments are as follows:

1. Page 5, Section 2.2.2 Corporation Yard: The ground surface for sample location CY11 is identified as both being soil and covered in compacted gravel. In addition, sample location CY12 is not described. Please revise the text.
2. Soil sampling for volatile organic compound (VOC) analysis: Describe in detail the sampling, preservation and handling methods used for soils that were analyzed for VOCs. Compare the methods and holding times that were used to EPA Method 5035. The 5035 methods typically used are subsampling using a device such as the encore sampler, placing samples on ice, and a 48 hour holding time. If 5035 or equivalent methods were not used, assess the data quality and determine if the analytical results should be flagged.
3. When describing the results of the semi-volatile organic compound samples, also present the polycyclic aromatic hydrocarbon (PAH) data as total benzo(a)pyrene equivalents.

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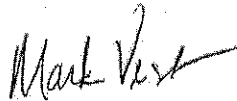
4. Section 4.0, Data Evaluation: The data evaluation should identify whether any chemical detections appear to be associated with any other types of chemicals or soil types. For example, was the elevated arsenic concentration in the corporation yard associated with the detection of clinder material? In addition, the data evaluation should consider previously collected data located within the same area and whether any preliminary correlations can be made.
5. Identify as data gaps the horizontal and vertical extent of contamination at locations where contaminant concentrations exceed commercial/industrial screening criteria.
6. Prepare a Section documenting data gaps associated with the Phase II work. Propose alternatives to continue the work. Consider a small focused effort in the short term, rolling work into the next investigation work plan, or possibly tying work into larger site investigation and development plans.

If you have any questions regarding this letter, please contact Lynn Nakashima at (510) 540-3839 or email at [lnakash@dtsc.ca.gov](mailto:lnakash@dtsc.ca.gov).

Sincerely,



Lynn Nakashima, Project Manager  
Senior Hazardous Substances Scientist  
Brownfields and Environmental  
Restoration Program  
Berkeley Office - Cleanup Operations



Mark Vest, P.G.  
Senior Engineering Geologist  
Brownfields and Environmental  
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Sacramento Office - Geologic Services

Enclosure

cc: see next page

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**Matt Rodriguez**  
Secretary for  
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## Department of Toxic Substances Control

Deborah O. Raphael  
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**Edmund G. Brown Jr.**  
Governor

### MEMORANDUM

**TO:** Lynn Nakashima  
Site Mitigation and Brownfields Reuse Program  
700 Heinz Avenue, Suite 200  
Berkeley, CA 90630

*Kimiko Klein*

**FROM:** Kimiko Klein, Ph.D.  
Staff Toxicologist Emerita  
Human and Ecological Risk Office (HERO)

**DATE:** March 9, 2012

**SUBJECT:** Phase II Sampling Results Technical Memorandum  
UNIVERSITY OF CALIFORNIA, BERKELEY, RICHMOND FIELD STATION  
PCA 11050 Site Code: 201605-00

#### Background

The University of California Richmond Field Station (UCRFS) is located on about 96 acres of former industrial upland and 56 acres of transition area, Western Stege Marsh, and the outboard area south of the bay trail. Industrial use of the uplands, including the manufacture of blasting caps containing mercury fulminate and a briquette company, has taken place from the 1870's until 1950, when the University of California purchased the property for use as an engineering research facility. A human health and ecological risk evaluation of the uplands and West Stege Marsh were completed in 2001. Several remedial measures have been implemented, and include the treatment and transport to the adjacent Zeneca property of mercury contaminated soils, installation of a biologically active permeable barrier (PAPB), installation of a slurry wall between the Zeneca property and the USRFS, excavation and removal of contaminated sediments from West Stege Marsh, and backfilling with clean fill to restore California clapper rail habitat. Soils with elevated arsenic concentrations in limited areas of the site have also been removed. The Human and Ecological Risk Office (HERO) has been requested to provide technical support for this site. A meeting was held on January 26, 2012, to discuss the results presented in the subject technical memorandum.

## Document Reviewed

The HERO reviewed a document entitled "Phase II Sampling Results Technical Memorandum, University of California, Berkeley, Richmond Field Station, Richmond, California", dated January 20, 2012, and prepared by Tetra Tech EM Inc. The HERO received this memorandum electronically on January 20, 2012.

## General Comments

The HERO reviewed the entire technical memorandum but focused on those sections that could affect human health risk assessment. The HERO did not review the attachment that contains the complete analytical results and understands that other DTSC staff have reviewed the memorandum for adherence to quality control objectives and adequacy of sample locations and data analysis. Phase II sampling consisted of soil sampling in historic transformer locations and an area of stained soil near an above ground storage tank. The soil of the corporation yard located along the boundary between the field station and the former Zeneca site was also sampled, since chemicals and equipment are stored there and volatile organic compounds have been detected in groundwater beneath the yard.

This sampling effort indicates that:

- polychlorinated biphenyls (PCBs) were detected in soil at a number of transformer locations;
- metals and polycyclic aromatic hydrocarbons (PAHs) were detected in soil associated with the historic area where operations of the former California Cap Company took place; and,
- trichloroethylene (TCE), metals, PAHs, dioxins, and PCBs were detected in soil in the corporation yard.

As a general comment, this report does not include, but should have, discussions of potential sources of detected contaminants, recommendations for further sampling, and a description of the potential impacts on site investigation that may take place as a result of site development.

The HERO has the following specific comments.

## Specific Comments

1. Page 3 Section 1.2 Investigation Purpose. This section summarizes the purpose of Phase II sampling and should be revised to include a paragraph discussing the former "transformer house" associated with the California Cap Company (CCC) as a data gap and providing a rationale for the expanded soil sampling that took place in this area.

2. Page 10 Section 4.1 PCB-Containing Transformer Sampling Results – Significantly elevated PCBs in soil were detected at two locations near Building 112. Further evaluation of this area and possibly other transformer locations are necessary for the complete characterization of PCB soil contamination, and this should be discussed in this section.
3. Page 11 Section 4.1 PCB-Containing Transformer Sampling Results – Metals and Semi-Volatile Organic Compounds. Elevated levels of arsenic, cadmium and lead were detected in soil at the CCC "transformer house" location. Semi-volatile organic compounds (SVOCs) were also detected. A discussion of possible source(s) of these contaminants and comparison with urban background concentrations, as appropriate, should be included in this section. In addition, the carcinogenic PAHs detected should be converted to Benzo(a)pyrene (BaP) equivalents and those BaP equivalent concentrations compared to the BaP California Human Health Screening Levels (CHHSLs). The equivalency factors are listed in the errata sheet contained in the *DTSC Preliminary Endangerment Assessment (PEA) Guidance Manual (Second Printing June 1999)*.
4. Page 12 Section 4.2 Corporation Yard Sampling Results – Volatile Organic Compounds (VOCs). TCE was detected in soil samples close to the boundary between the corporation yard and the former Zeneca site and may be associated with the TCE contamination in underlying groundwater. Further evaluation of these detections should be discussed in the text. Specifically, these data should be integrated with data collected by consultants for the former Zeneca site and then the identified data gaps should be addressed to fully characterize the extent of VOC contamination.
5. Page 13 Section 4.2 Corporation Yard Sampling Results – Semi-Volatile Organic Compounds. Elevated PAH soil concentrations were detected in the corporation yard. As stated in a previous specific comment, the carcinogenic PAHs detected should be converted to BaP equivalents and those BaP equivalent concentrations compared to BaP CHHSLs.
6. Page 14 Section 4.2 Corporation Yard Sampling Results – Metals. Elevated soil concentrations of arsenic, cadmium, lead, manganese, and mercury were detected. A discussion of potential sources of these metals and/or comparison with local background concentrations, as appropriate, should be included in the text.
7. Page 15 Section 4.2 Corporation Yard Sampling Results – Polychlorinated Biphenyls. Low levels of PCBs were detected over much of the corporation yard area. A discussion of the potential source(s) of these PCBs and possible additional evaluation should be included in the text.

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8. Page 15 Section 4.2 Corporation Yard Sampling Results – Dioxins. Dioxins were detected in soil, and these results should be discussed in the text with respect to potential source(s) and/or association with urban background.
9. Tables 2 through 13. These tables summarize the data obtained in the Phase II sampling effort. A) Across the tops of these tables, various screening levels for the chemicals of potential concern are given. The Hawaii Department of Health (DOH) Environmental Action Levels (EALs) should be removed from these tables, as these EALs have not been reviewed or accepted for use at California sites. B) Those chemical concentrations that exceed their most conservative screening levels should be bolded in the tables.

### Conclusions

This technical memorandum report is a clearly written transmittal of the data obtained in the Phase II soil sampling effort. The major deficiencies identified by the HERO in the comments above are the lack of critical analysis of the data with respect to identifying potential sources of the elevated chemical concentrations detected, relating these concentrations to local background, and evaluating the need for further characterization in affected areas.

If you have further questions, please contact me at [Kklein@dtsc.ca.gov](mailto:Kklein@dtsc.ca.gov) or by telephone at 510 540 3762.

*Kimiko Klein for:*  
**Reviewed by:** Claudio Sorrentino, Ph.D.  
Senior Toxicologist  
Human and Ecological Risk Office

**cc:** J. Michael Eichelberger, Ph.D.  
Staff Toxicologist  
Human and Ecological Risk Office

Mark Vest, P.G., C.E.G.  
Senior Engineering Geologist  
Geologic Services Unit



Mathew Rodriguez  
Secretary for  
Environmental Protection



## Department of Toxic Substances Control


Deborah O. Raphael, Director  
8800 Cal Center Drive  
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Edmund Gerald Brown Jr.  
Governor

### MEMORANDUM

TO: Lynn Nakashima  
Senior Hazardous Substances Scientist  
Site Mitigation and Brownfields Reuse Program  
700 Heinz Avenue, Suite 200  
Berkeley, CA 90630

FROM: J. Michael Eichelberger, Ph.D.   
Staff Toxicologist  
Human and Ecological Risk Office (HERO)  
Ecological Risk Assessment Section (ERAS)

DATE: February 16, 2012

SUBJECT: PHASE II SAMPLING RESULTS TECHNICAL MEMORANDUM  
UNIVERSITY OF CALIFORNIA, BERKELEY, RICHMOND FIELD  
STATION, RICHMOND, CALIFORNIA.

PCA: 11050

SITE CODE: 201605-00

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### Background

The University of California Richmond Field Station is located on former industrial land and consists of 96-acres of uplands and 13-acres of tidal marsh and marsh edge habitat. Industrial use of the uplands, particularly for the manufacture of blasting caps containing mercury fulminate, has been documented as early as the 1870's and continued until 1950 when the University of California purchased the property for use as a research facility. Documented releases of chemicals of potential ecological concern (COPECs) including metals, polychlorinated biphenyls (PCBs), polycyclic aromatic hydrocarbons (PAHs) and volatile organic compounds (VOCs) have been reported. An ecological risk evaluation of the uplands and West Stege Marsh were completed in



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2001. Several remedial measures have been implemented since 2002, and include, but are not limited to, treatment and transport to the adjacent Zeneca property of mercury-contaminated soils, installation of a biologically active permeable barrier and excavation and removal of contaminated sediments from a portion of West Stege Marsh, and backfilling with clean fill to restore California clapper rail habitat. The site includes upland habitats including rare coastal prairie and wetlands consisting of saltwater marsh. The current report submitted for DTSC/HERO/ERAS review is a Phase II Field Sampling Plan that proposes additional sampling to address data gaps associated with PCB-containing transformer locations, above ground storage tanks (ASTs) and the Corporation Yard. DTSC/HERO/ERAS staff participated in a site walk with University of California staff, and their consultants on May 12, 2011 to review specific proposed sampling areas.

### Document Reviewed

ERAS reviewed "Phase II Sampling Results Technical Memorandum University of California, Berkeley, Richmond Field Station, Richmond, California". The report was prepared by Tetra Tech EM Inc. (Oakland, California), is dated January 20, 2012 and is hereafter referred to as the report. ERAS received the report via an Envirostor request dated January 23, 2012 for review.

### Scope of the Review

The report was reviewed for scientific content related to ecological risk assessment. Grammatical or typographical errors that do not affect the interpretation of the text have not been noted.

### ERAS General Comments

ERAS, has no comments to provide to the report. Sample locations are located in areas with no significant habitat and these areas will be used in the future under the present site use which precludes significant use by ecological receptors and therefore there are no completed pathways for Chemicals of Potential Ecological Concern in site media to those receptors. Comments concerning potential Human Health exposure will be addressed by Dr. Kimi Klein of HERO.

Reviewed by: Brian Faulkner, Ph.D.   
Staff Toxicologist, ERAS

Cc: James M. Polisini, Ph.D.  
Senior Toxicologist, HERO/ERAS